

FALKRIK COUNCIL: DRAFT LOCAL HEAT AND ENERGY EFFICIENCY STRATEGY



October 2023

Table of Contents

List of Tables	3
List of Figures	3
1 Executive Summary.....	5
2 Glossary.....	6
2.1 Abbreviations	6
2.2 Terms	6
3 Introduction	10
3.1 Overview of LHEES	10
3.2 LHEES Strategy Layout	10
3.3 Strategy Scope and Limitations.....	11
4 background Information	12
4.1 LHEES Structure, function, scope and stages.....	12
4.1.1 LHEES Structure.....	12
4.1.2 Function of LHEES	12
4.1.3 LHEES Approach	13
4.2 Engagement and consultation	14
4.2.1 Internal Engagement.....	14
4.2.2 External Engagement	15
4.3 Local Authority Formalities	21
5 Existing Progress Towards LHEES Priorities	21
5.1 LHEES Content and Context	21
5.1.2 Heat Decarbonisation	22
5.1.2 Energy Efficiency	22
5.1.3 Fuel Poverty	22
5.1.4 Heat Networks	23
5.1.5 Low Carbon Technologies	23
.....	23
5.1.6 Summary of resources	24
5.2 Summary of ongoing work at Local Authority	25
5.2.1 Public Buildings Retrofits	25
5.2.2 Progress towards EESSH.....	25
5.2.3 Area based Programmes.....	25
5.2.4 Local Development Plans	26
5.2.5 Local Housing Strategies & Housing Investment Plan	27
5.2.6 Heat Network Activity.....	27

5.2.7 LHEES Pilot	27
6 Policy & Strategy Content	28
6.1 Summary of policy landscape	28
6.2 National policy and strategy	29
6.3 Local policy and strategy, and linkages.....	30
6.4 Priorities and Targets	32
6.4.1 Heat Networks	32
6.4.2 Off-Gas Grid Buildings.....	33
6.4.3 Poor Building Energy Efficiency.....	33
6.4.4 Poor Building Energy Efficiency as a Driver for Fuel Poverty.....	33
6.4.5 Mixed tenure, Mixed Use and Historic Buildings.....	33
6.4.6 On-Gas Grid Buildings	34
6.5 Indicators, Criteria and Weightings	34
7 Baselineing	35
7.1 Baseline Summary across the local authority	35
.....	37
7.2 Core Indicators	37
7.2.1 Energy Efficiency	37
7.2.2 Fuel Poverty	39
7.3 Intermediate Zones.....	41
7.3.1 Falkirk Grahamston.....	41
7.3.2 Bo'ness Kinneil	43
7.3.3 Braes Villages	44
7.4 Fabric First Approach	45
8 Heat Decarbonisation Pathways and Strategic Zones	46
8.1 Heat Decarbonisation Pathways – heat network zones	46
8.1.1 Heat Network Zones – Baseline Criteria	48
8.1.2 Heat Network Overview – Stringent Screening Criteria	50
8.1.3 Heat Network Overview – Baseline and Stringent Criteria.....	51
8.1.4 Potential Heat Network Zone	52
.....	53
8.2 Heat decarbonisation pathways – building-level intervention.....	Error! Bookmark not defined.
8.2 Heat decarbonisation pathways – building-level intervention.....	54
8.3 Zoning Overview	55
9 Summary of Strategy Findings and Next Steps	60
10 References	61

11 Appendices.....	62
11.1 Community Engagement Plan.....	62
11.2 Stakeholder Mapping Table Example	63
.....	63
Engagement Leaflet	64

List of Tables

Table 1: LHEES Considerations.....	13
Table 2: Overview of RSL Consultation, June 2022.....	19
Table 3: National Policy and Strategy Review.....	29
Table 4: Local Policy and Strategy Review	31
Table 5: Council Zones ranked for poor energy efficiency priority.....	38
Table 6: Zones where poor energy efficiency is likely to be an acting driver for fuel poverty.....	40
Table 7: Potential Anchor Loads in the Falkirk Council Area	47
Table 8: Heat network summary, using baseline screening criteria.....	49
Table 9: Heat Network Summary, using stringent screening data	50
Table 10: Heat Network Summary, using baseline and stringent screening criteria.....	52

List of Figures

Figure 1: Summary of LHEES Stages.....	14
Figure 2: Stakeholder Mapping Exercise.....	15
Figure 3: Tenant Type, taken from the Local heat & Energy Efficiency Consultation Questionnaire, 2022	16
Figure 4: Heating Type Efficiency, taken from the Local Heat & Energy Efficiency Consultation	16
Figure 5: Awareness of the Impacts of Fossil Fuels, taken from the Local Heat & Energy Efficiency Strategy Consultation Questionnaire, 2022.....	17
Figure 6: Willingness to change heating system, taken from Local Heat & Energy efficiency Strategy Consultation Questionnaire, 2022	18
Figure 7: What tools people would like to assist them in becoming more energy efficient, taken from Local heat & Energy efficiency Strategy consultation Questionnaire, 2022.....	18
Figure 8: Overview of LHEES Interactive Engagement Tool (<i>Decarbonise Falkirk, 2023</i>).....	21
Figure 9: Home Heat Loss (Scottish Energy Grants, 2018)	23
Figure 10: Summary data from the Baseline Tool, Section 1: Summary Statistics (<i>LA Dashboard</i>)	36
Figure 11: Summary data from the Baseline Tool, Section 1: Summary Statistics (<i>LA Dashboard</i>)	37
Figure 12: Average SAP score per Data Zone across Falkirk	39
Figure 13: Average fuel poverty risk across Falkirk (<i>EST Mapping, 2023</i>)	41
Figure 14: Summary for intermediate zone, Falkirk Grahamston, poor energy efficiency as a driver for fuel poverty (<i>Taken from Baseline tool</i>)	42
Figure 15: Uninsulated Wall (Construction and Tenure) As a percentage of propertied within Falkirk Grahamston within a specified fuel poverty rate). (Taken from baseline tool)	42

Figure 16: Summary for intermediate Zone, Bo’ness Kinneil, poor energy efficiency as a driver for fuel poverty (Taken from Baseline tool)	43
Figure 17: Uninsulated Wall (Construction and Tenure) As a percentage of propertied within Bo’ness Kinneil (within a specified fuel poverty rate).(Taken from baseline tool)	44
Figure 18: Summary for intermediate zone, Braes Villages, poor energy efficiency as a driver for fuel poverty (taken from baseline tool)	45
Figure 19: Uninsulated Wall (Construction and Tenure) As a percentage of propertied within Braes Villages (within a specified fuel poverty rate).(Taken from baseline tool)	45
Figure 20: Heat Map displaying Strategic Sites and Existing Projects across Falkirk (LDP Assessment, 2018)	47
Figure 21: Potential Anchor Loads in Falkirk council Area GIS (LDP assessment, 2018)	48
Figure 22: Potential Heat network Zones identified using baseline screening criteria across Falkirk Council (National Assessment, 2022)	49
Figure 23: Potential Heat network Zones identified using baseline screening criteria across Falkirk Council (National Assessment, 2022)	50
Figure 24: Potential Heat network Zones identified using baseline and stringent screening criteria across Falkirk Council (National Assessment, 2022).....	51
Figure 25: Largest potential heat network zone identified in Falkirk using stringent screening criteria (National Assessment, 2022)	53
Figure 26: ASHP, EST Mapping 2023	55
Figure 27: Wall Insulation, Falkirk Grahamston (Home Analytics, 2023)	56
Figure 28: Property tenure, Falkirk Grahamston (Home Analytics, 2023).....	57
Figure 29: Property tenure, Bo'ness Kinneil. (Home Analytics, 2023)	58

1 Executive Summary

Local Heat and Energy Efficiency Strategies (LHEES) are at the heart of a place based, locally led and tailored approach to the heat transition. This strategy will underpin an area-based approach to heat and energy efficiency planning and delivery and sets out the long-term plan for decarbonising heat in buildings and improving energy efficiency across the Falkirk local authority area. LHEES is primarily driven by Scotland's statutory targets for greenhouse gas emissions reduction and fuel poverty:

- Net zero emissions by 2045 and 75% reduction by 2030.
- In 2040, as far as reasonably possible, no household in Scotland is in fuel poverty.

This strategy sets out how each segment of the building stock needs to change to meet national and local objectives, including achieving zero greenhouse gas emissions in the building sector, and the removal of poor energy efficiency as a driver of fuel poverty. This is done through identifying strategic heat decarbonisation zones and setting out the principal measures for reducing buildings emissions within each zone, and prioritising areas for delivery, against national and local priorities.

Accompanying the Strategies will be a Delivery Plan, this will be developed in partnership with key stakeholders, and provide a strong basis for action for local communities, government, investors, developers and wider stakeholders, pinpointing areas for targeted intervention and early, low-regrets measures.

As established in the Local Heat and Energy Efficiency Strategies (Scotland) Order 2022, LHEES has a two-part structure. The first part includes the improvement of the energy efficiency of buildings in the local authority's area, and second includes the reduction of greenhouse gas emissions resulting from the heating of such buildings.

This strategy assesses the Energy efficiency of the building stock across the Falkirk council area, taking into consideration both domestic and non-domestic buildings. Findings, which are outlined fully in section 7 highlight the three zones with the lowest levels of energy efficiency are Falkirk Grahamston, Bo'ness Kinneil and the Braes villages. Poor wall insulation and fuel type are the main drivers for this. In terms of heat decarbonisation, 94% of properties in the Falkirk Council area are on the gas grid, highlighting the reliance on fossil fuels. This strategy assesses the need for energy efficiency improvements and heat decarbonisation technology in attempt to decrease the impact our buildings have on the environment.

In terms of energy efficiency, poor wall insulation in properties that are owner occupied and of solid stone construction has been highlighted as a driver for fuel poverty. Additionally, areas with limited access the gas grid are more likely to suffer from fuel poverty. In terms of heat decarbonisation, several potential heat networks have been identified in areas where fuel poverty is high.

2 Glossary

2.1 Abbreviations

Acronym	Description
EES	Energy Efficient Scotland
EESSH	Energy Efficiency Standard for Social Housing
EPC	Energy Performance Certificate
EST	Energy Saving Trust
GIS	Geographic Information System
HEEPS:ABS	Home Energy Efficiency Programmes for Scotland: Area Based Schemes
IZ	Intermediate Zone
LA	Local Authority
LHEES	Local Heat and Energy Efficiency Strategy
LPG	Liquefied Petroleum Gas
mxd	Map Exchange Document
PEAT	Portfolio Energy Analysis Tool
SAP	Standard Assessment Procedure
ToC	Table of Contents
UPRN	Unique Property Reference Number

2.2 Terms

Terms	Description
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Baselining	Baselining is the purpose of understanding at local authority or strategic level, the status of the buildings against the Priorities, Targets and Indicators set out in the Baseline tool.
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.
Criteria	Criteria are the settings applied to the Indicators for each Priority 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 priorities & 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 low carbon heat supply information layers within a district heating analysis.
Data Zone	Data zones are groups output areas which have populations of around 500 to 1,000 residents.
Delivery Area	Delivery Areas (sometimes referred to as Delivery Level Areas) are a term used for all LHEES Priorities apart from Heat Networks. These Areas will be an important starting point for identifying a range of projects, regulation and actions that are within the competence of the Scottish Government and local authorities (projects and actions to be developed in the LHEES Delivery Plan). Delivery Areas are at a higher granularity than Strategic Zones, are generated as part of LHEES Stage 4 and are presented in the LHEES Delivery Plan. Guidance is provided for one approach to identify Delivery Areas, but there are other approaches that local authorities may wish to use. The identification of Delivery Level Areas through LHEES will be indicative only, with further investigation being required to determine the viability of progressing projects associated with the area identification activity.
Detailed practitioner guidance Steps	These Steps form part of the detailed practitioner guidance in LHEES Stage 4, Generation of Initial Areas to set out particularly suitable heat network zones and to support project identification.
Indicator	For a given Priority, the purpose of an Indicator is 1) To act as a key information field to help characterise the local authority using the Baseline tool as part of LHEES Stage 3 (authority-wide and at a strategic level); 2) To act as a key information field to support strategic zoning and generation of initial delivery areas (as part of LHEES Stage 3 and 4); 3) if suitable, to act as a key information field to measure progress against Targets over the duration of the LHEES - set out in LHEES Stage 8, LHEES Delivery Plan. For some Priorities, one Indicator may be sufficient, but for others a range may be appropriate. The LHEES methodology sets out a core set of default Indicators 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.
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.
LHEES Delivery Plan	An LHEES Delivery Plan is an action plan that enables a local authority and its partners to work towards delivery of the changes identified in the LHEES Strategy. Actions will contribute to achieving Scotland’s statutory targets on net zero greenhouse gas emissions and fuel poverty, as well as enabling the delivery of changes to buildings and local infrastructure needed to fulfil the Scottish Government’s objectives relating to heat and energy efficiency in buildings. The Delivery Plan will clarify stakeholder roles and responsibilities in delivering the Strategies; build on existing plans and policies, such as

	HEEPS:ABS Plans, as far as possible and; coordinate across local partners and provide a mechanism for identifying new delivery actions.
LHEES Priorities	<p>The LHEES Priorities are a list of technologies, building typologies and policy priorities that the LHEES Methodology uses to identify and target interventions. They include:</p> <ul style="list-style-type: none"> - Heat networks - Off-gas grid buildings. - On-gas grid buildings <p>Secondary outcomes include:</p> <ul style="list-style-type: none"> - Poor building energy efficiency - Poor building energy efficiency as a driver for fuel poverty - Mixed-tenure, mixed-use properties, and historic buildings
LHEES Stages	<p>There are 8 LHEES Stages. 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 guidance templates included alongside this methodology– LHEES Strategy guidance and LHEES Delivery Plan guidance. The completion of these two templates will satisfy the completion of LHEES Stages 7 and 8. The 8 LHEES Stages are:</p> <ol style="list-style-type: none"> 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	<p>An LHEES Strategy identifies what needs to be done to change buildings and relevant local infrastructure by 2045 to fulfil the Scottish Government’s objectives and local priorities relating to heat and energy efficiency in buildings. These interventions might occur at building level or in energy supply networks or in a combination of both. The Strategy will reflect national and local priorities, policies, and wider strategies. Where feasible, it will consider local and national factors, such as the timing of planned infrastructure upgrades, access to resources and funding, major projects, decisions over the gas grid and community engagement.</p>
Mixed-tenure, mixed-use and historic buildings	<p>Mixed-tenure and mixed-use buildings could include a mixture of owner occupied, private rented and social housing, and 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.</p>
Potential Zones	<p>The Heat Networks Priority follows a distinct methodology to the other LHEES Priorities – Stage 3 does not apply and the outputs from Stage 4 are of a different type, showing Potential Zones for Heat Networks as opposed to the identification of Delivery Areas (notionally using a 100m raster approach). The Heat Networks Priority analysis and activity carried out within LHEES is also anticipated to support activity related to formal zone designation as required by the Heat Networks Act. For these reasons, the analysis carried out in Stage 4 for Heat Networks 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 could also inform actions around further investigation / progression within the LHEES Delivery Plan.</p>
Raster	<p>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.</p>
Strategic Level Zone	<p>Strategic Zones (sometimes referred to as Strategic Level Zones) are a term used for all LHEES Priorities apart from Heat Networks. Strategic Level Zones are identified in Stage 3 and are presented in the LHEES Strategy. These zones offer a visualisation of the potential pathways to decarbonise the building stock at a local authority level, split out by intermediate zone level. They are useful to understand the baseline performance, the scale of potential and initial areas of focus. Strategic Zones could be used to inform or prioritise focus areas for the more granular identification of Delivery Level Areas.</p> <p>The identification of Strategic Zones through LHEES will be indicative only.</p>

Targets	Targets are the measurable aspect of the Priority 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.
Weighting	For some Priorities, 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 Priority. 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

As set out in the draft Heat in Buildings Strategy (*Scottish Government, 2021*). Local Heat & Energy Efficiency Strategies (LHEES) are at the heart of a place based, locally led and tailored approach to the heat transition. These local Strategies will underpin an area-based approach to heat and energy efficiency planning and delivery. LHEES Strategies will set out the long-term plan for decarbonising heat in buildings and improving their energy efficiency across an entire local authority area.

LHEES is primarily driven by Scotland's statutory targets for greenhouse gas emissions reduction and fuel poverty:

- Net zero emissions by 2045 and 75% reduction by 2030.
- In 2040, as far as reasonably possible, no household in Scotland is in fuel poverty.

For the Falkirk local authority area, this strategy will:

- set out how each segment of the building stock needs to change to meet national and local objectives, including achieving zero greenhouse gas emissions in the building sector, and the removal of poor energy efficiency as a driver of fuel poverty,
- identify strategic heat decarbonisation zones, and set out the principal measures for reducing buildings emissions within each zone, and
- prioritise areas for delivery, against national and local priorities.

Accompanying the Strategy will be the LHEES Delivery Plan, which will be developed in partnership with key stakeholders, and provide a strong basis for action for local communities, government, investors, developers and wider stakeholders, pinpointing areas for targeted intervention and early, low-regrets measures.

The purpose of this LHEES Strategy is to present the evidence base that identifies what needs to be done across the local authority to change buildings and local infrastructure by 2045 to fulfil the Scottish Government's objectives and local priorities relating to heat in buildings. The interventions as set out occur at the building level, in heat networks or in a combination of both. The Strategy reflects national and local priorities, policies, and wider strategies. Where feasible, it considers local and national factors, such as the timing of planned infrastructure upgrades, access to resources, major projects, decisions over the gas grid and stakeholder/community engagement. Accompanying this LHEES Strategy is an LHEES Delivery Plan, which is an action plan that enables the local authority and its partners to work towards delivery of the changes identified in the LHEES Strategy.

3.2 LHEES Strategy Layout

The main priority areas for the strategy along with the LHEES Stages are covered in Section 4.1. Section 4 also summarises the stakeholder engagement and community consultation that supported the development of this Strategy in Section 4.2 and local authority formalities are covered in Section 4.3.

Section 5 presents Falkirk council's progress on working towards the LHEES Priorities via existing policies, programmes, and projects. This includes a literature review focusing on the LHEES Priority areas, to build necessary context. This is followed by a summary of the ongoing work across the local authority, including work being undertaken by wider stakeholders in these Priority areas.

Section 6 presents the policy and strategy context for the LHEES. This includes an overview of national policy, strategy and targets in Section 6.2 and the local policy landscape and drivers in Section 6.3, including here, linkages to national policy. This Section also summarises and presents the Indicators and associated Criteria and Weightings that are selected as part of the LHEES Strategy and are taken forward to be used in the Baseline tool and for the Generation of Strategic Zones and Potential Zones for Heat Networks (LHEES Stages 3 and 4) (Section 6.4).

The progress and baselining of the local authority against the LHEES Priorities is covered in Section 7. This includes a presentation of local authority level building stock characteristics, energy efficiency performance and counts on key Indicators like mixed-tenure, mixed-use and historic buildings.

A key purpose of this LHEES Strategy is to generate Strategic Zones and pathways for heat decarbonisation that can identify the most suitable solution for local areas. The spatial zones identified for this LHEES Strategy are covered in Section 8 and are set out for heat network zones and off-gas and on-gas heat decarbonisation potential.

Lastly, a summary of the LHEES Strategy findings (from Sections 6 to 8), as well as next steps is presented in Section 9.

3.3 Strategy Scope and Limitations

Both domestic & non-domestic buildings across the Falkirk council area will be included within the LHEES Scope. This will incorporate domestic homes, businesses, and council stock. Building energy, which is included in scope 1 & 2 emissions, are being addressed within this strategy. Scope focus will be limited to buildings with consideration being given to the transport/fleet sector as there are linkages here. These are only considerations and transport/fleet will not be included within the LHEES strategy and delivery plan officially. There are limitations to this methodology in terms of the scope, data and the tools developed. These are summarised below, as well as an indication for how these limitations could be addressed.

Limitations:

The data used within this study is mainly derived from the Home Analytics data set. This data set is not always accurate and needs to be constantly updated to be valid. There are often gaps within this data set and it doesn't always match up with the data we hold internally. Other limitations include staff knowledge and experience within the Council's Energy and Climate Change team, alongside time constraints. Financial pressures have also prevented the procurement to consultants.

4 background Information

4.1 LHEES Structure, function, scope and stages

4.1.1 LHEES Structure

As established in the Local Heat and Energy Efficiency Strategies (Scotland) Order 2022, LHEES should have a two-part structure.

A local heat and energy efficiency 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

A local heat and energy efficiency delivery plan is a document setting out how a local authority proposes to support implementation of its local heat and energy efficiency strategy.

LHEES Strategy – An LHEES Strategy identifies what needs to be done to change buildings and relevant local infrastructure by 2045 to fulfil the Scottish Government’s objectives and local priorities relating to heat and energy efficiency in buildings. These interventions might occur at building level or in energy supply networks or in a combination of both. The Strategy will reflect national and local priorities, policies, and wider strategies. Where feasible, it will consider local and national factors, such as the timing of planned infrastructure upgrades, access to resources and funding, major projects, decisions over the gas grid and community engagement.

LHEES Delivery Plan – An LHEES Delivery Plan is an action plan that enables a local authority and its partners to work towards delivery of the changes identified in the LHEES Strategy. Actions will contribute to achieving Scotland’s statutory targets on net zero greenhouse gas emissions and fuel poverty, as well as enabling the delivery of changes to buildings and local infrastructure needed to fulfil the Scottish Government’s objectives relating to heat and energy efficiency in buildings. The Delivery Plan will clarify stakeholder roles and responsibilities in delivering the Strategies; build on existing plans and policies, such as HEEPS:ABS Plans, as far as possible and; coordinate across local partners and provide a mechanism for identifying new delivery actions.

4.1.2 Function of LHEES

LHEES will set out the long-term plan for decarbonising heat in buildings and improving their energy efficiency across an entire local authority area, framed around the following LHEES Priorities. These are summarised Table 1.

- Heat decarbonisation.
 - This comprises identifying off-gas areas that will transition primarily from heating oil and LPG, and potentially viable heat networks in urban areas.
 - On-gas grid heat decarbonisation. To meet our emissions targets, we must reduce significantly - and eventually phase out entirely - our use of natural gas. By 2030 at least 1 million homes will have to have switched to zero emissions heat, away from high

carbon heating such as gas. This Priority will identify on-gas areas that will transition to zero carbon heating. It should be noted that currently the LHEES methodology does not identify where hydrogen or other decarbonised alternatives to gas could be used.

- Heat networks.
- Energy efficiency and other outcomes include identifying areas in which:
 - Poor building energy efficiency is prevalent and where it acts as a driver of fuel poverty. This would enable the Scottish Government to continue to ensure that the area-based energy efficiency and heat decarbonisation projects through the HEEPS:ABS programme will be effective in reducing fuel poverty, as well as highlighting where extreme fuel poverty is prevalent and further measures may be needed.
 - Mixed tenure, mixed use and historic buildings. For mixed-tenure and mixed-use, building level intervention is likely to be the most effective way to reduce emissions caused by heating. For historic buildings (including those in conservation areas and listed buildings), these are categories that may require established alternative approaches to the installation of low carbon heat and energy efficiency solutions, or where specific advice and support might be available. Identifying such areas would enable the public sector to coordinate or regulate to achieve this outcome.

Table 1: LHEES Considerations

	No.	LHEES Consideration	Description
Heat decarbonisation	1	Off-gas grid buildings	Transitioning from heating oil and LPG in off-gas areas
	2	On-gas grid buildings	On-gas grid heat decarbonisation
	3	Heat networks	Decarbonisation with heat networks
Energy efficiency and other outcomes	4	Poor building energy efficiency	Poor building energy efficiency
	5	Poor building energy efficiency as a driver for fuel poverty	Poor building energy efficiency as a driver for fuel poverty
	6	Mixed-tenure, mixed-use and historic buildings	Mixed-tenure, mixed-use buildings, listed buildings, and buildings in conservation areas

4.1.3 LHEES Approach

There are 8 LHEES Stages involved in the completion of a full LHEES and these are outlined in Figure 1. The writing of the LHEES Strategy and Delivery Plan are stage 7 and 8. The purpose of this LHEES Strategy is to bring together the data analysis and evidence base generated from completing LHEES Stages 1-3, and the heat network zoning in Stage 4. Sections 4 -6 will feed directly into the LHEES Delivery plan, which is found in a separate document.

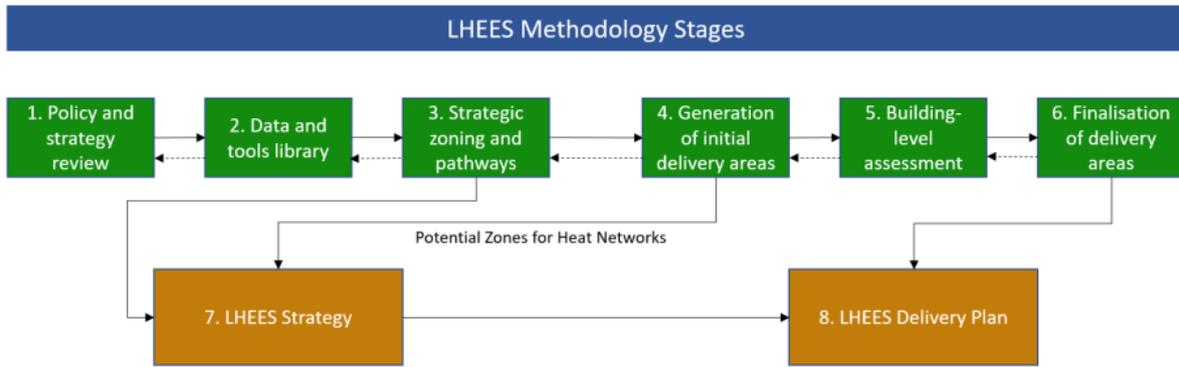


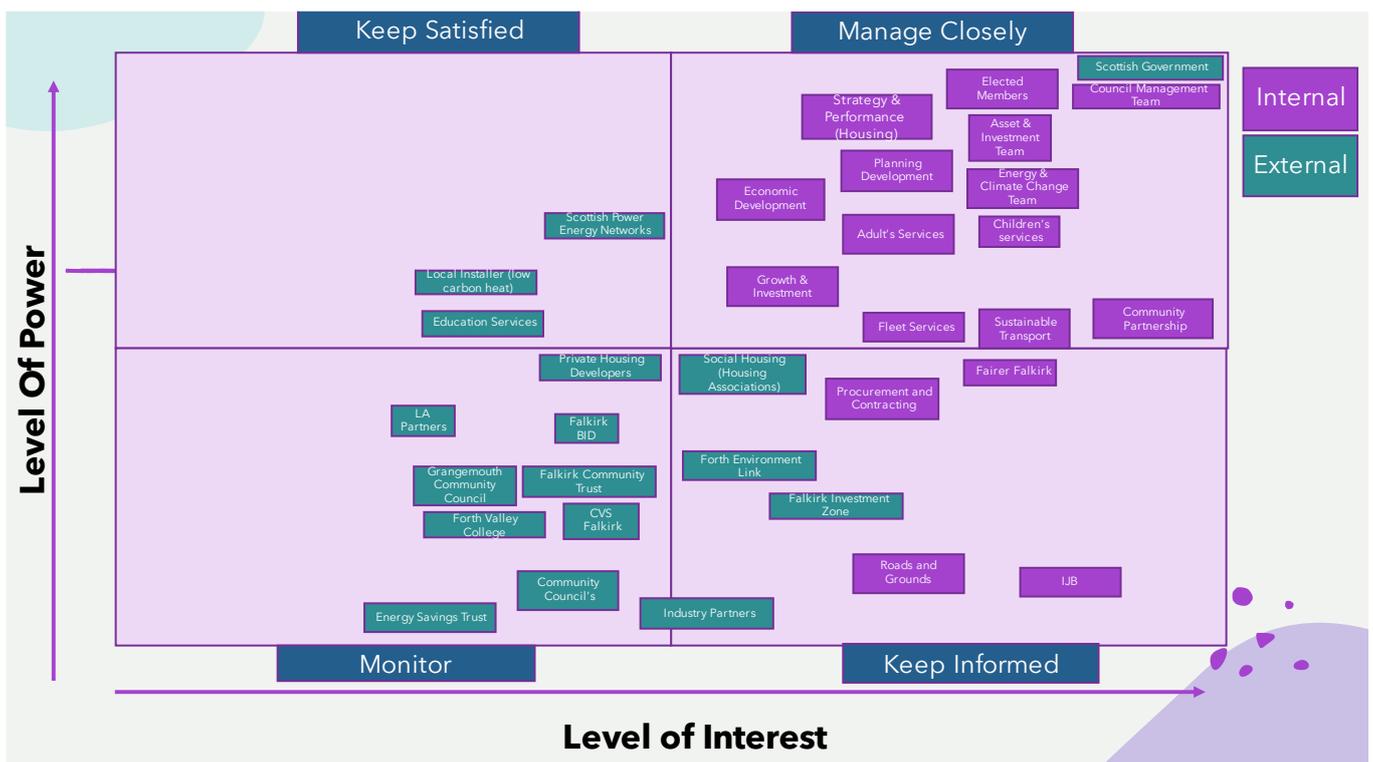
Figure 1: Summary of LHEES Stages

4.2 Engagement and consultation

This section will outline the stakeholder engagement activities undertaken by Falkirk council surrounding the production of the LHEES strategy. This summary will draw on engagement undertaken from Stages 1-4 and community consultation.

4.2.1 Internal Engagement

LHEES strategy and delivery plan production, led by officers with the Energy & Climate Change team began initial stakeholder engagement internally. One-to-one meetings were set up between the LHEES lead and relevant internal stakeholders. Discussion involved an overview of the LHEES context and outputs, outlining whether that team would have relevant inputs to LHEES, or subsequently be impacted by LHEES. Stakeholders were then ranked by power, interest, and priority, in relation to



each stage of the strategy, allowing a detailed stakeholder map to be produced. This stakeholder map found, in Figure 2, highlights internal stakeholders in purple. This is a working map and stakeholders have moved around depending on each stage of the strategy. Once the internal stakeholder group was complete, the LHEES lead formed an LHEES Implementation Group, a group where key internal stakeholders would meet to discuss LHEES needs. This group was formed in January 2022 and a motion was agreed at the Falkirk council Executive meeting of 22nd February, recognising the importance of the LHEES Implementation Group in tackling the climate emergency, and that an official Energy Management Monitoring Group should be established. This group has been established and includes an officer from each service and elective member representation.

Figure 2: Stakeholder Mapping Exercise

4.2.2 External Engagement

Figure 2 also highlights external stakeholders. This exercise was undertaken in a similar way to internal stakeholders. One-to-one meetings were undertaken to discuss each external stakeholder's involvement with LHEES and to determine what stage would be relevant to them. This initial exercise allowed the LHEES lead to create email groups for information sharing. Part of Falkirk's LHEES engagement has involved several consultations involving local businesses, RSL's and Community groups.

4.2.2.1 Community Consultation

'Decarbonise Falkirk' is the name of Falkirk's LHEES community engagement campaign. The LHEES lead and officers from the Energy & Climate Change team attended several events to engage with the public directly concerning LHEES. Leaflets and branded merchandise were distributed around Falkirk, sharing information on LHEES, energy saving tips and leading people to a short survey.

The questionnaire asked a range of questions about energy efficiency. 300 leaflets were handed out and 34 individuals responded to the survey. As displayed in figure 3, most of the participants were homeowners, with some private and social tenants also.

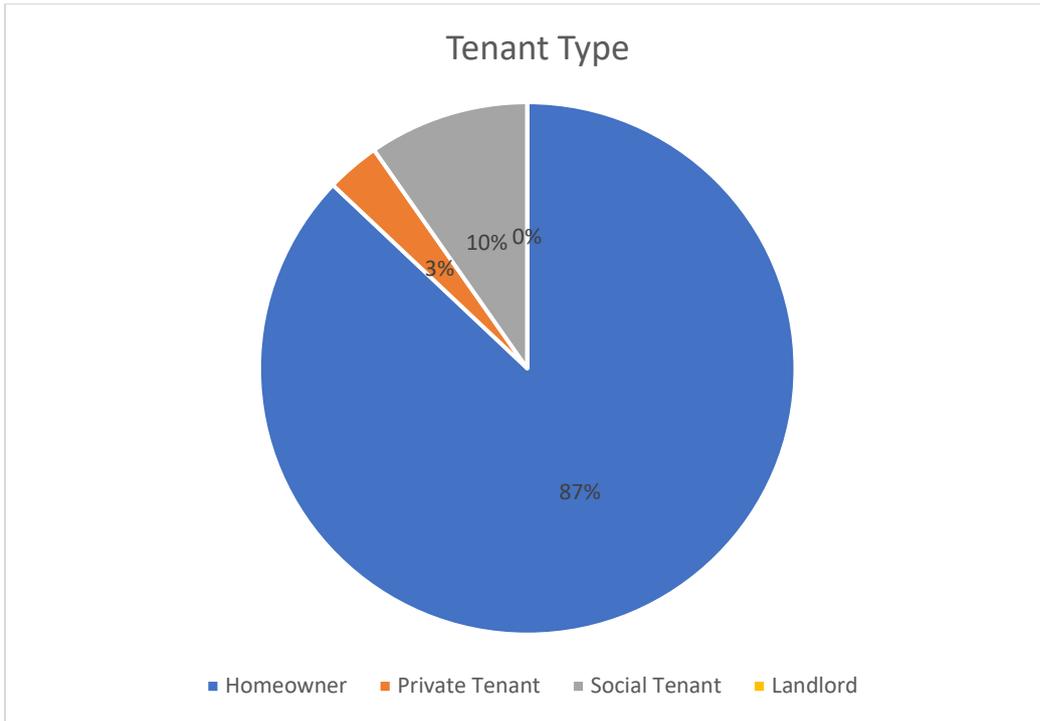


Figure 3: Tenant Type, taken from the Local heat & Energy Efficiency Consultation Questionnaire, 2022

The survey asked how individuals heated their properties, either via gas, electric, oil, coal or other. It also asked whether people found their systems to be efficient. Figure 4 presents the results of this question, highlighting that most individuals in the Falkirk area had gas heating systems. There was a mixed response as to whether people found their system to be efficient or not, and many people were unsure. From those who has electric heating, the majority found this to be inefficient.

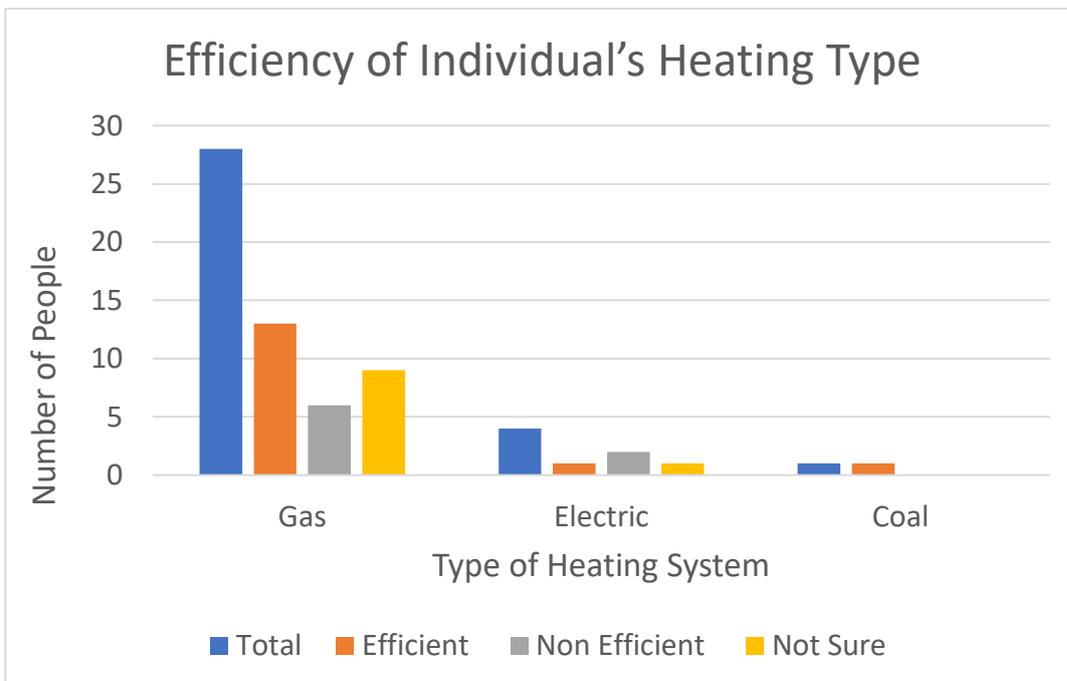


Figure 4: Heating Type Efficiency, taken from the Local Heat & Energy Efficiency Consultation

The questionnaire also focused on the environmental impacts of heat, to understand the knowledge base of the community. Individuals were asked to indicate whether they had an awareness of the impacts of fossil fuel powered heating systems and whether they understood how their actions could help. The results (figure 5) shows that 94% of people were aware of the impacts of fossil fuels, however 50% of these people were not aware of how their actions could help. 6% of respondents were unaware of the impacts that fossil fuels have on the environment.

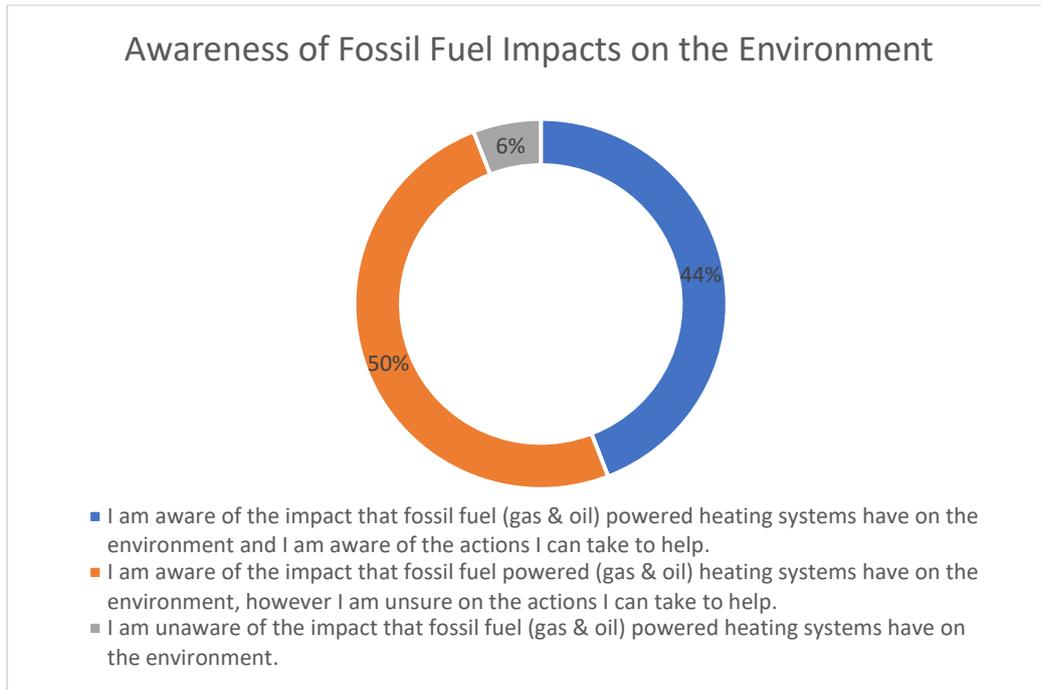


Figure 5: Awareness of the Impacts of Fossil Fuels, taken from the Local Heat & Energy Efficiency Strategy Consultation Questionnaire, 2022

Further on to the previous question, the survey asked if individuals would be willing to upgrade to a low carbon heating system, such as a heat pump or a heat network. Details on these technologies were given as part of the survey. As displayed in figure 6, 53% of respondents were willing to change, 34% were unsure and 13% said they would not change.

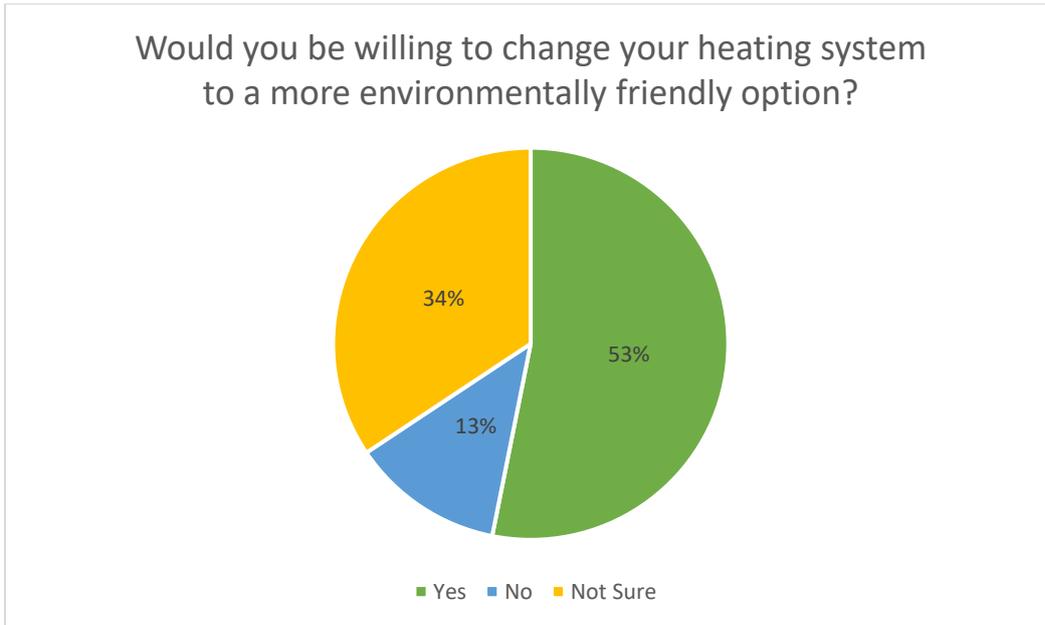


Figure 6: Willingness to change heating system, taken from Local Heat & Energy efficiency Strategy Consultation Questionnaire, 2022

Finally, the questionnaire asked what tools people would require assisting them in making changes to the energy efficiency of their property. The answer selection included advice, funding, and access to information regarding low carbon options, noting that respondents could select more than one answer. The results are shown in figure 7, highlighting that of those who would be willing to change their system, they would like to see access to funding opportunities and advice to assist with this change. This information will then assist in how we tackle our engagement going forward.

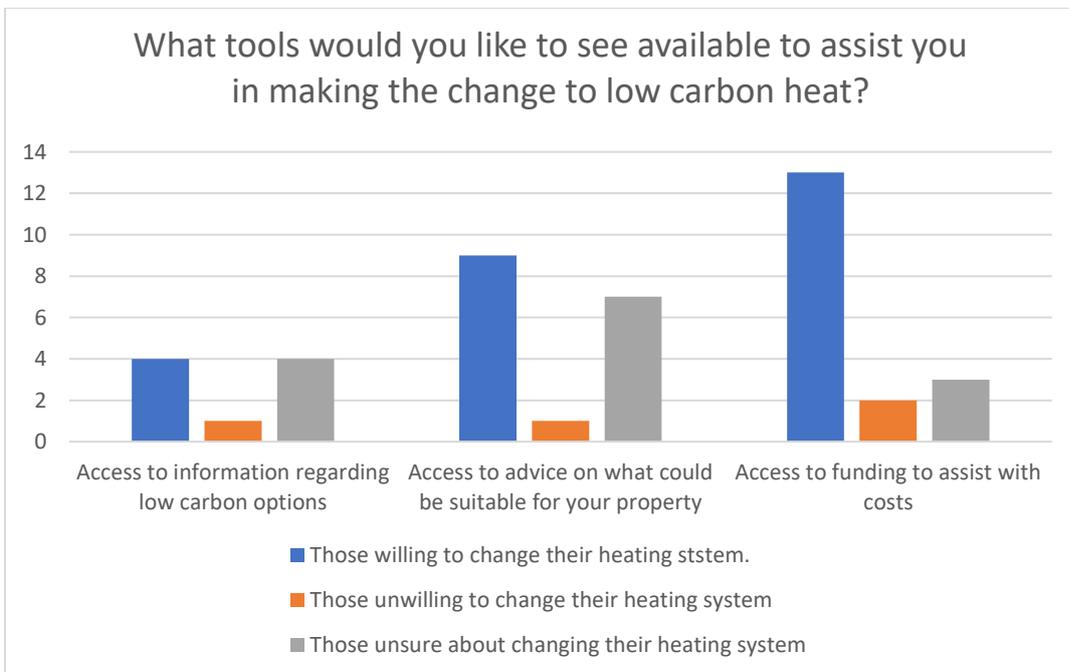


Figure 7: What tools people would like to assist them in becoming more energy efficient, taken from Local heat & Energy efficiency Strategy consultation Questionnaire, 2022

The purpose of this engagement campaign was to gain an understanding of the community’s awareness of energy efficiency and their willingness to make changes. Overall, although the response rate to this survey was low, the results have shown some key trends. It is evident that many people are aware of the impact of their heating system on the environment, however there is less of an awareness of how to reduce this impact. This trend was clear when discussing these issues with individuals at face-to-face engagement events. The team at Falkirk will endeavour to improve our information sharing skills to advise individuals on how they can make a change.

4.2.2.2 Business Engagement:

Falkirk Council has a strong relationship with local businesses and has a team dedicated to supporting them. The LHEES lead has worked with the Businesses team to create a range of tools to support local businesses through the LHEES process, focussing on energy efficiency and heat decarbonisation. The Energy Efficiency Fund is a fund for local small and medium enterprises to embrace net zero ambitions and to support Scotland’s national net-zero greenhouse gas emissions target by 2045. This discretionary Fund provides financial assistance to help businesses meet their net zero targets. The Fund can provide up to 50% grant support (up to £10,000 per grant) to support local businesses to make energy changes to business premises and operations. For example, a move to low carbon heating systems, solar powered energy, or other measures to reduce emissions. Several businesses have already gone through this process and received funding for a range of energy efficiency measures.

As part of the Energy Efficiency Fund, funding has been granted for a Local Carbon Business Advisor. This advisor will be able to assist businesses with their applications and advise on what technologies will be most suitable for them. It is expected that this post will encourage more businesses to apply for the fund.

4.2.2.3 Registered Social Landlord Consultation

A consultation consisting of a short survey of 5 questions was sent out to RSL’s in the Falkirk council area. The purpose of this exercise was to gauge how much RSL’S knew about LHEES and what plans they had in place to decarbonise going forward. Table 2 provides an overview of the key results.

Table 2: Overview of RSL Consultation, June 2022

Housing Association	What are your objectives and scope of Influence regarding LHEES?	How do you plan to communicate with tenants?	Do you have a timeline of events to achieve Energy Efficiency Targets?
Kingdom Housing Association Ltd	We are about to publish our first Net Zero Strategy as part of our Corporate Plan. It underpins our commitment to climate change and reduce our carbon footprint, not just in relation to our existing stock and newbuild programme but across all areas of our business’.	‘Publication of Corporate Plan, the use of a range of mediums and the introduction of a customer and staff climate change awareness programme.’	We have outlined our priorities over the next 5 years including the progress of planned improvements in accordance with EESSH 2, the implementation of low carbon heating in newbuilds by 2024 in accordance with the proposed new Heat Standard, adoption of a fabric first approach and delivery of innovation projects including the use of off-site construction and low carbon technologies as part of our mainstream development programme.

Beild Housing	We are a RSL providing housing options to for elderly residents. Our almost all of our tenants fall into vulnerable categories. We provide a service to these tenants but also have a duty of care to deliver a just transition to low carbon heat and energy options.	We engage with our tenants directly through various means of communication. All our sites have a warden who speaks with our tenants on a face-to-face basis while we also provide. Solutions will be site specific, and we will engage with our tenants accordingly, but we also have a wider scoped tenant engagement forum.	We are bound to achieving EESSH2 within the designated timescales, which is challenging. WE will consider options and wherever possible exceed the carbon mitigation wherever possible.
Wheatly Group	Our 'organisation's assets' can be split into two groups. Those that are Corporate, ie anything related to the business estate and assets we use to provide our services or for staff, and RSL lettable properties, ie all our social or mid-market rental assets. For Corporate we have set a self-imposed target to be Carbon Neutral by 2026; we will review then and set a higher target thereafter. For our RSL lettable property assets we are seeking to achieve or where possible surpass the EESSH2 targets by 2032.	We have a range of channels. Either through our online or periodical tenant directed communications, or in the case of where investment is taking place within a community there are communication strategies and personnel resources that are attached to the capital investment project.	Yes, in terms of regulatory obligations, ie EESSH2. However not yet on a property-by-property basis
Link Group Ltd	Zero emissions heating in new build housing by 2024 and all new build contractors to provide environmental plans. Net zero carbon housing for new build projects by 2026 in line with Government Targets and asset contracts over £500k to provide carbon and energy environmental plans. By 2030 no gas boilers, by 2032 EESH to achieved EPC B rating on existing assets. 2040 achieve all stock net zero.	Through our Business Plan, website, newsletters, AGM and any Tenant consultation events	No answer
Places for People	To achieve the Scottish Governments targets as a minimum but looking to capitalise on any appropriate new technology to assist with our long term aims.	Directly via our Customer Care and Housing Officers.	Yes, as a minimum by the Scottish Governments target dates.

4.2.2.4 Engagement Tool (external stakeholders)

LHEES lead has worked with an external company called Crunchy Carrots to produce an external engagement tool to assist with stakeholder communication obligations surrounding carbon reduction of heat in domestic and non-domestic buildings. The tool covers both council assets but also represent area wide stakeholder involvement including how private tenants, businesses and community groups can decarbonise. The interactive map allows users to hover over illustrated images of interest and presents the user with a text box with advice, information, and links of interest. This tool has formed the basis for Falkirk's external engagement surrounding LHEES since its launch in September 2022 and will continue to be our main avenue for communication on LHEES objectives. An insight into the map can be seen in figure 8 and full access to this engagement tool can be found here: <https://decarbonisefalkirk.org/>



Figure 8: Overview of LHEES Interactive Engagement Tool (Decarbonise Falkirk, 2023)

4.3 Local Authority Formalities

A full Equality and Poverty Impact Assessment (EPIA) is being undertaken for the LHEES Strategy. This EPIA will cover both the Strategy and Delivery Plan. The results of this can be found on Falkirk Council’s Climate Change Webpage [here](#).

A Strategic Environmental Assessment (SEA) Screening report has been undertaken for the LHEES Outputs specifically and results have indicated that a full SEA is not required.

5 Existing Progress Towards LHEES Priorities

5.1 LHEES Content and Context

This section will provide a short literature review of the LHEES priorities, providing context and background to supplement this strategy. This review will cover:

1. Heat decarbonisation
2. Energy efficiency
3. Fuel poverty (with a focus on energy efficiency as a driver)
4. Heat networks
5. Technologies and measures e.g., heat pumps, biomass, hydrogen, insulation types
6. Summary of useful resources and support for energy efficiency and heating upgrades for private building owners

5.1.2 Heat Decarbonisation

Heating systems in homes and buildings are commonly fuelled by fossil fuels. These high carbon emitting fuels are contributing to the climate crisis by increasing the greenhouse effect (*UKRI, 2023*). Heating is one of the biggest sources of carbon emissions in Scotland, contributing to climate change. The decarbonisation of heat is essential to significantly reduce Scotland's carbon emissions, in line with the goals set out by the Government to reach net-zero by 2045. Scotland's 2.5 million homes account for around 13% of the nation's total greenhouse gas emissions as roughly 81% of homes in Scotland use gas as their heating fuel (*Scottish Government, 2021*). The Scottish Government's Heat in Buildings Strategy aims to improve Scotland's buildings and how they supply their heat, ensuring that Scotland reaches net zero commitments and addresses fuel poverty. Ways to decarbonise heat will include introducing district heat networks and heat pumps.

Decarbonisation of the grid will be essential in meeting Scotland's net zero targets. Decarbonising the grid indicates reducing its carbon emissions, as in, decreasing the emissions per unit of electricity generated. Therefore, heating systems driven by electricity will be less carbon intensive (*National Grid, 2023*).

5.1.2 Energy Efficiency

Energy efficient is a term used to explain using less energy to perform the same task. For example, using energy efficient light bulbs will use less energy than a normal bulb when ran for the same length of time. There are several benefits from becoming energy efficient, including reducing greenhouse gas emissions, reducing energy demand, and lowering costs (*IEA, 2023*). Ensuring that individuals in a household or building are carrying out energy efficient practices is important to ensure energy is not being wasted.

5.1.3 Fuel Poverty

Fuel poverty is the condition by which a household is unable to afford to heat their home to a comfortable temperature. It is caused by low income, high fuel prices, poor energy efficiency and unaffordable housing prices. The Fuel Poverty Act was passed in 2019 and sets statutory targets for reducing fuel poverty, introduced a new definition which aligned fuel poverty more closely with relative income poverty and required Scottish ministers to produce a comprehensive strategy to show how they intend to meet the targets. Fuel poverty is now defined by the Scottish Government as any household spending more than 10% (20% for extreme fuel poverty) of their income on energy, after housing costs have been deducted. New figures published by the Scottish Government show that in 2018 a quarter of households in Scotland were in fuel poverty at around 619,000 while one in ten were in extreme fuel poverty at 279,000 (*Scottish government, 2021*).

Fuel poverty can be alleviated by improving household income and their ability to comfortably pay bills, reduce fuel costs, and most importantly, energy consumption by improving energy efficiency. Energy efficiency is a key driver for fuel poverty. By improving energy efficiency in the home, the

householder will be able to utilise their energy more efficiently, reducing energy wastage and overall energy costs.

5.1.4 Heat Networks

A heat network, often called district heating, is a distribution system of insulated pipes, taking heat from a central source and delivering it to several domestic or non-domestic buildings. Heat networks are popular in countries such as Denmark and Sweden, they can cover a large area such as a town or sometimes cities. Often, they are local and supply a small cluster of buildings. District heating has several advantages compared to individual heating systems. They are more energy efficient as usually they produce both heat and electricity in a combined heat and power plant, this has an added benefit of reducing greenhouse gas emissions. Due to these systems using less fuel to heat a greater quantity of buildings compared with individual boilers, they are more cost effective and building owners can see an average 25% decrease in their heating bills (*Heat Network Support, 2023*).

The Heat Networks (Scotland) Act 2021 (the Act) was passed in February 2021. The Act aims to accelerate the deployment of heat networks in Scotland setting ambitious targets for heat to be supplied by heat networks (2.6 Terawatt hours (TWh) of output by 2027 and 6 TWh of output by 2030 – 3% and 8% respectively of current heat supply). A large focus of Falkirk's LHEES will be on assessing the suitability for heat networks (*Scottish Government, 2021*).

5.1.5 Low Carbon Technologies

Before low carbon heat technology is considered, a fabric first approach is important. This involves insulating a property to make it more energy efficient before introducing new heat technology. Figure 9 highlights where a property will lose its heat, indicating the importance of sound insulation. Often low carbon heat technology requires a property to be well insulated, otherwise the property will not be heated adequately. Required insulation includes, loft, underfloor and wall. While improved glazing and draft proofing is also important.



Figure 9: Home Heat Loss (Scottish Energy Grants, 2018)

Once a property is adequately insulated, consideration can be given to low carbon heat technology. A heat pump captures heat from outside and moves it into the property. It uses electricity to do this,

but the heat energy delivered to the property is much more than the electrical energy used to power the system. As a heat pump captures heat that is already present in the environment, the system itself does not burn any fuel and therefore emits no carbon dioxide. There are two main types of heat pump, ground, and air, and both pumps can deliver both heat and hot water to a building. Heat pumps are more efficient than other heating systems because the amount of heat they produce is more than the amount of electricity they use.

Biomass boilers are also an option for low carbon heating. Biomass is a renewable energy source, generated from burning wood, plants and other organic matter, such as manure or household waste. It releases carbon dioxide when burned, but considerably less than fossil fuels. Biomass heating systems burn wood pellets, chips, or logs to provide warmth in a single room or to power central heating and hot water boilers. It is important that the fuel sources are locally sourced, to ensure that the system is as environmentally sustainable as possible.

Hydrogen could be a potential frontrunner for heating homes in the future. It is suggested that hydrogen will be used in areas less suited to electrification or unsuitable for heat pumps. The main role for hydrogen currently only appears to be in areas like shipping and hard-to-decarbonise parts of industry. Low carbon gas (hydrogen and biomethane) could potentially meet just 13% of overall domestic heat demand, though it may also add value in 'topping up' heat in homes where the main heating system is a heat pump (SGN, 2022). There may be additional localised uses for hydrogen too. In regions where 'green' hydrogen produced by abundant renewable electricity could be used as a form of energy storage, it may be more practical to heat homes from this source. For example, hydrogen could be used for residential heating in low population areas located near to hydrogen production facilities, if electrification of these homes is difficult. There are some pilot hydrogen heating schemes in Scotland, unlike natural gas, hydrogen produces no carbon at the point of use. However, switching over is not straight forward, all existing boilers would need to be replaced and the pipework would require an upgrade to become hydrogen ready. Currently, there is no blueprint for a conversion of the gas grid to hydrogen anywhere in the world. Therefore, hydrogen could be a low carbon option in the future but not something that is ready to be rolled out nationally, and therefore won't be considered within the LHEES.

5.1.6 Summary of resources

In Scotland there are several useful resources for advice and funding for energy efficiency measures. Home Energy Scotland is funded by the Scottish Government and is the main supplier of energy advice and grant funding in Scotland. Their email and phone service along with their website provided users with details advice on energy efficiency measures and low carbon renewable technologies. Funding includes interest free loans and full or part funded grants for householders and landlords. The Warmer Home Scotland Scheme delivered by Warmworks is another government funded scheme to assist with energy efficiency. This scheme is means tested and can provide the householder with improved heating system, renewable technology, and insulation. Home Energy Efficiency Programmes for Scotland (HEEPS) is another funding platform to tackle fuel poverty and increase energy efficiency. Householders can benefit from insulation measures and sometimes heat pump installation either fully or part funded. Business Energy Scotland and Zero Waste Scotland also provide funding and support to small local businesses across Scotland.

There are also resources specific to each local authority such as the Energy Efficiency Fund, where council sourced funding provides business with assistance up to £10,000 to improve the energy efficiency of their business property.

5.2 Summary of ongoing work at Local Authority

5.2.1 Public Buildings Retrofits

We are currently going through another phase of the Non-Domestic Energy Efficiency Framework for ten sites. This is looking at what in depth energy efficiency improvements can be made to these buildings to best inform future investment programmes. It will include low carbon heating retrofit as well as solar PV in these buildings. We are also working with High School partners to work towards installing LED lighting and Solar PV in each of these schools, following on from some LED lighting replacements at a group of our high schools in 2020 - savings in CFPR tonnage.

5.2.2 Progress towards EESSH

The Energy Efficiency Standard for Social Housing (EESH) replaces Section 35 of the Scottish Housing Quality Standard (SHQS). EESH2 is currently under review by the Scottish Government to strengthen and realign it with their net zero ambitions and they expect to report back on this later during 2023.

Each year Falkirk Council provides an update to the Social Housing Regulator on progress made towards the SHQS and EESH targets.

Stock Level compared to SHQS and EESH 2021/22 - 2022/23

Date	Stock Level	SHQS	EESH
21/22	16658	59.85%	96.93
22/23	16719	70.05%	95.01%

Source Social Housing Regulator Charter return

5.2.3 Area based Programmes

Falkirk Council continue to assist Owner Occupiers and Private Sector Landlords in previously owned local authority estates with improving the energy efficiency of their homes. Projects are based on construction type, Council Tax Band A-C, poor energy efficiency and low SIMD area. Each year funding from the Scottish Government's Area Based Scheme (ABS) is used to improve the energy

performance of Owners homes. The ABS scheme is part of the Scottish Government's wider strategy to tackle climate change and improve energy efficiency in Scotland. It aims to help households reduce their energy bills, improve their thermal comfort and health, and support the transition to a low-carbon economy.

The Council has been successful in securing around £3.8m funding over the period of the last LHS and has assisted 483 Owners including 26 Private Landlords improve the energy efficiency of their home.

Some of the key features of the ABS scheme include:

- Eligibility: The scheme is open to homeowners and private renters in Scotland.
- Measures: The programme covers a range of energy efficiency measures, including insulation, heating upgrades, and renewable heat technologies.
- Funding: The programme provides funding to local authorities and RSL's to deliver energy efficiency measures.
- Assessment: A home energy assessment is carried out to determine the most suitable energy efficiency measures for each home.
- Implementation: The energy efficiency measures are installed by approved contractors.

Future projects will continue the programme of external wall insulation to non-traditionally constructed homes and replacement heating for flats connected to the Combined Heat & Power system in Callendar Park. Promotion of the Scottish Government grants and loans via Home Energy Scotland to Owner Occupiers and Private Landlords will continue.

5.2.4 Local Development Plans

In terms of energy efficiency, Policy IR13 of the Falkirk Local Development Plan (LDP2) is intended to meet the requirements of Section 3F of the Town and Country Planning Act by requiring low and zero-carbon generating technologies to be installed on new buildings to deliver a percentage of the carbon dioxide emissions reduction required by Building Standards. The policy is designed to ensure that the percentage reduction to be achieved through low and zero-carbon generating technology correlates with the most up-to-date building standards sustainability labelling at the time. Eligible technologies include wind, solar/PV, hydro and heat pumps. More detail is set out in [SG14 Renewable and Low Carbon Energy](#).

Scottish Planning Policy requires Local Development Plans to support the development of such networks, with heat mapping used as a tool to identify opportunities for co-location of heat sources and heat demand. Policy IR14 of the Falkirk Local Development Plan (LDP2) requires major new developments to consider the potential for heat networks, including futureproofing of sites for future connection to such networks, and address this within their Energy Statement, and overall masterplan where appropriate. Further guidance on this rapidly evolving area of work is set out in SG14, which supports the policies in the LDP and provides guidance to developers and other stakeholders. LDP2 included new development sites across the Council area, including housing, business, and mixed-use sites, and the LDP and LHEES will eventually be required to have a symbiotic relationship in terms of identifying heat network zones.

SG14 also sets new standards for requiring new development to incorporate standards for active and passive EV charging infrastructure into new development.

5.2.5 Local Housing Strategies & Housing Investment Plan

The Local Housing Strategy for 2023 -2028 is currently under review and due to be published late 2023. Section 8 covers, fuel poverty, energy efficiency and climate change. This section pays due to Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 requiring Scotland to become net zero by 2045 with interim targets for 2030 (75% reduction) and 2040 (90%) and also the Fuel Poverty (Targets, Definition and Strategy) (Scotland) Act 2019 requiring no more than 5% of all households to be living in fuel poverty by 2040 as far as reasonably possible, with interim targets for 2030 (15%) and 2035 (10%). The strategy will focus on the recognition that Scottish Government and Falkirk Council can only have limited impact on increasing household incomes and reducing the cost of energy. However, both Falkirk Council can progress improvements on the energy efficiency of housing which should improve the thermal comfort and reduce the amount of energy a household needs to use to heat their home.

The Housing Investment Programme is in place to ensure its housing stock meets the Scottish Housing Quality Standard (SHQS). To ensure this standard is maintained, comprehensive stock condition information is collected to provide an overall position statement on the housing stock condition. Current programmes in place include a triple glazing project for all council homes and renewable energy projects, including ASHP heating, solar PV, and battery storage installation.

5.2.6 Heat Network Activity

Falkirk has a history of district heat network suitability studies. The terrain and dynamic of the council areas has meant that train lines, canals and motorways have prevented many heat network possibilities from preceding. There is currently a district heat network at Calendar Park in Falkirk. This is a gas-powered CHP plant with 6 flat blocks being connected to the plant. This included 400 flats and 71% of residents. In 2019 this network was extended. The SAP rating of the blocks improved from 35 to 65 and the blocks are no longer considered as being in fuel poverty. Through LHEES, further heat network assessment is being undertaken to determine the possibility of new sites. Further information on this expansion can be found in the accompanying Delivery Plan.

5.2.7 LHEES Pilot

As part of LHEES phase 2 pilot Falkirk procured a consultant to complete a provisional LHEES which set to consider four scenarios for the public estate in the Falkirk Council region.

1. An action plan relating to bringing current building stock up to anticipated target levels as established by the Scottish Government's Energy Efficient Scotland Routemap 2018.
2. Given available resources, the realistic suite of works achievable, without further borrowing and what performance target they would achieve.
3. Using identified barriers in previous scenarios, an overview of how to bridge the gap between expectation and what can be implemented and how it could be best funded within the Council's overall budget.
4. In recognition of the Council's declaration of a climate emergency in the summer of 2019 and aspiration to achieve Net Zero Carbon by 2030 for the Falkirk Council region, what

would be required to achieve this in public buildings as an accelerated works package above meeting national requirements.

The provisional LHEES was then applied to two case studies in Grangemouth and Falkirk Town Centre, to evaluate how they could be used to meet the targets identified for the Council. The proposed LHEES developed a low regrets approach for the Council to progress. This strategy is summarised as follows:

- Differentiate buildings into two classifications: Low Emitting Buildings and High Emitting Buildings. In developing this LHEES we have established that the top 70 emitters account for 80% of all council carbon emissions; therefore, these should be focused on for improvements.
- Carry out a review of each high emitting building and develop a shortlist of low carbon heat solutions for each building. This is expanded upon in Section 4.4.
- Develop a programme of works, implementing energy efficiency improvements and low carbon heat solutions for buildings.

The provisional LHEES has established ambitions target to decarbonise their public buildings and this LHEES has developed a clear, coherent strategy for how this can be achieved on a low-regrets basis. By prioritising energy efficiency and end of life replacements over the next ten years, this LHEES keeps open the possibility of exploiting hydrogen, should it become available in the future, whilst still making carbon savings in the short to medium term.

6 Policy & Strategy Content

6.1 Summary of policy landscape

The national heat and energy efficiency policy landscape in the Scotland is well developed and LHEES will form part of this jigsaw. The Heat Networks (Scotland) Act places a duty on local authorities to carry out a review to consider areas within its boundaries that are likely to be suitable for heat network construction. Although this guidance sits outside the scope of LHEES, the LHEES strategy and delivery plan will support consideration and presentation of evidence relating to the matters set out within Section 48 of the Heat Networks (Scotland) Act 2019. Therefore, LHEES and the duties of the Heat Network Scotland Act interact. The Fuel Poverty (Targets, Definition and Strategy) (Scotland) Act 2019 will shape the LHEES as one key priority is energy efficiency as a driver for fuel poverty. The targets from this strategy will form an important aspect of each local authorities LHEES plans. LHEES will also site within the Energy Efficiency Standard for Social Housing (EESH 1&2) and The Planning (Listed Building Consent and Conservation Area Consent Procedure) (Scotland) Regulations 2015 as these regulations directly apply to the way domestic properties are constructed. LHEES must feed into the policy landscape to ensure energy ad heat decarbonisation is recognised as a priority across the local authority area.

6.2 National policy and strategy

This sub-section reviews and summarises the national and UK level policy that are relevant and linked to LHEES. The summary, presented in table 3, highlights similar themes to the LHEES Priority areas e.g., national policy related to heat decarbonisation, energy efficiency, heat networks and fuel poverty.

Table 3: National Policy and Strategy Review

Name	Date	Overview
The Climate Change (Emissions Reduction Targets) (Scotland) Act	2019	Targets to reduce Scotland's emissions of all GHGs to net-zero. Net-zero by 2045; 56% by 2020; 75% by 2030; 90% by 2040
Update to the Climate Change Plan	2018–2032	This update to Scotland's 2018-2032 Climate Change Plan sets out the Scottish Government's pathway to our new and ambitious targets set by the Climate Change Act 2019. It is a key strategic document on our green recovery from COVID-19.
The Fuel Poverty (Targets, Definition and Strategy) (Scotland) Act	2019	The Bill sets out a new target relating to the eradication of fuel poverty, as well as providing a revised definition of fuel poverty. By 2040: no more than 5% of households in Scotland are in fuel poverty; no more than 1% of households in Scotland are in extreme fuel poverty. By 2030: 15% (FP); 5% (EFP) and by 2035: 10% (FP); 3% (EFP)
The Heat in Buildings Strategy	2021	Updates the Energy Efficient Scotland route map and commits to putting in place standards and regulation for heat and energy efficiency to ensure that all buildings are energy efficient by 2035 and use zero emission heating and cooling systems by 2045. "Heat target (TBC) By 2030 over 1 million homes and 50,000 non-domestic buildings to convert to using zero or low emissions heating systems "
Energy Efficiency Standard for Social Housing (EESH 1&2)	EESH 1 2014 EESH 2 2019	The Standard aims to improve the energy efficiency of social housing in Scotland. Proposed a target to maximise the number of homes in the social rented sector achieving EPC B by 2032.
The Scottish Energy Strategy	2017 (Update due in 2022)	The 2050 vision for energy in Scotland is to provide a "flourishing, competitive local and national energy sector, delivering secure, affordable, clean energy for Scotland's households, communities and businesses". Its 3 core principles are to: take a whole-system view; provide an inclusive energy transition; and have a smarter local energy model. By 2030, the equivalent of 50% of the energy for Scotland's heat, transport, and electricity consumption to be supplied from renewable sources.
The National Planning Framework	NPF4 due in 2022	The National Planning Framework (NPF) sets the context for development planning in Scotland and provides a framework for the spatial development of Scotland as a whole.
Hydrogen Policy Statement	2020	Sets out vision for Scotland to become a leading hydrogen nation in the production of reliable, competitive, sustainable

		hydrogen, securing Scotland’s future as a centre of international excellence as we establish the innovation, skills and supply chain to underpin our energy transition.
Tenements (Scotland) Act	2004	The Tenement Management Scheme, as outlined in Schedule 1 of the Tenements (Scotland) Act 2004, lists the ‘scheme property’ (explaining what parts for the tenement every flat owner should maintain) and explains how to come to arrangements about maintenance (‘scheme decisions’) and how costs are shared between owners.
Historic Environment Policy for Scotland	2019	"HEPS outlines three policies on managing change to the historic environment: <ul style="list-style-type: none"> - Decisions affecting the historic environment should ensure that its understanding and enjoyment as well as its benefits are secured for present and future generations. - Plans, programmes, policies and strategies, and the allocation of resources, should be approached in a way that protects and promotes the historic environment. - Changes to specific assets and their context should be managed in a way that protects the historic environment. Opportunities for enhancement should be identified where appropriate.
The Planning (Listed Building Consent and Conservation Area Consent Procedure) (Scotland) Regulations	2015	"Listed building consent is the mechanism by which planning authorities ensure that any changes to listed buildings are appropriate and sympathetic to their character. It helps to protect what is a rare and unique resource. Conservation area consent controls the demolition of unlisted buildings in conservation areas"
Heat Networks Delivery Plan	2021	Sets out how provisions of the Heat Networks Scotland Act 2021 and wider policy will contribute to increasing heat networks in Scotland. The Heat Networks (Scotland) Act 2021 sets ambitious targets for heat to be supplied by heat networks – 2.6 Terawatt hours (TWh) of output by 2027 and 6 TWh of output by 2030 – 3% and 8% respectively of current heat supply. To meet these targets, we need to significantly increase our use of heat networks across Scotland, and build a heat networks sector which delivers clean and affordable heat, develops local supply chains, and contributes to a resilient energy system

6.3 Local policy and strategy, and linkages

Table 4 provides an overview of the local heat and energy efficiency policy landscape. Noting that these strategies and plans will be considered when developing and implementing the LHEES. LHEES will have an interaction with the Local Housing Strategies (LHS). Section 11 of the LHS guidance refers to LHEES. Although LHEES will not change the reporting duties on fuel poverty, energy efficiency and climate change, the analysis required to produce LHEES, along with the resulting Strategies and Delivery Plans will provide key evidence to support reporting in the LHS. At the same time, the outcomes and actions set out in the LHS will feed into and shape LHEES. LHEES will have a similar interaction with local authorities’ Local Development Plans (LDP).

The draft Fourth National Performance Framework (NPF4)²¹ states that: ‘In taking forward national developments we expect delivery partners to consider how the development interacts with the provision of heat for the surrounding area, potentially in connection with LHEES and emerging plans for the heat sector in the longer term. LDPs should consider the area’s LHEES and areas of heat network potential and any designated heat network zones when allocating land’. Local Development Plan sites should be considered when undertaking zoning as part of LHEES, in particular feeding into potential heat network zones. These local strategies will feed into LHEES directly, however the additional strategies and plans outlined in table 3 will also have a relation.

Table 4: Local Policy and Strategy Review

Name	Date	Overview
Climate Emergency Action Plan	2022	
Corporate Plan	2020	This outlines the councils’ priorities. Sets out the councils commitment to ask the right questions to the relevant people at the correct time. Vows to act on what we have been told and if not possible, explain reasons why not. A focus on setting trust within the community
Local Development Plan (LDP2)	2020	Sets out planning policies guiding future development across the Council area. It indicates how our town centres and greenspaces should develop, and how our natural and historic environment should be protected and enhanced. LDP4 will have a direct relation to LHEES.
Towards a Fairer Falkirk Strategy (Fuel Poverty)	2019	Sets out the ambition for Falkirk Council and the Community Planning partnership to understand and address the impact of poverty on individuals, families, and communities in our area. Our strategy focuses on four key themes, fairer money, fairer access, fairer culture, and fairer childhood
Community Engagement Strategy	2019	Put’s the community at the heart of decision making. allows the public, private, third and community sectors to engage and be involved in decision making. LHEES will have a direct impact on communities - following the community engagement strategy and taking direction from the team will allow successful engagement throughout the LHEES process
Local Housing Strategy (LHS)	2021	The strategy is in place to ensure affordable and suitable housing for the Falkirk Council area. The strategy sets out to create sustainable communities, tackle fuel poverty, improve energy efficiency and prevent climate change. The strategy has 5 priority areas: 1. Increase housing Supply 2. Create sustainable communities 3. Improve access to housing 4. Provide housing/support to vulnerable groups 5. Tackling Fuel Poverty, Energy Efficiency and Climate Change 6. Improve housing conditions
Strategic Housing Investment Plan (SHIP)	2021	Strategic Housing Investment Plan (referred to as the SHIP) this refers to our approach for new build properties across council and housing association (i.e. affordable social housing). The targets specified in the LHS 2017-2022

		are 491 units per year, this includes 368 private and 123 affordable homes.
Community Engagement Strategy	2019	This strategy will drive change in the way the Council engages with people and communities. This means changing not only the way we take decisions but the way all of our officers and services engage and support people.
Economic Strategy	2015	The economic strategy sets out our ambitions for the area's future, creating a smarter, more sustainable economy which offers opportunity for all. The purpose of this Strategy is to: Plan for sustainable economic growth and identify how to maximise Falkirk's economic potential

6.4 Priorities and Targets

This section will provide an overview of the LHEES Priorities in relation to Falkirk. The LHEES Priorities are a list of technologies, building typologies and policy priorities that is used throughout the LHEES strategy to identify and target interventions. Provide justification for criteria and weighting. They include:

Low Regrets Heat Decarbonisation:

- Heat networks
- Off-gas grid buildings

Secondary outcomes:

- Poor building energy efficiency
- Poor building energy efficiency as a driver for fuel poverty
- Mixed-tenure, mixed-use and historic building

Heat decarbonisation:

- On-gas grid buildings

6.4.1 Heat Networks

The first priority for low regrets heat decarbonisation is for the local authority to identify potential heat network zones. The analysis is intended to highlight zones where heat networks present a potential decarbonisation option, rather than identify areas where development is immediately economically viable. It does this using threshold values for heat demand density and considering the proximity of large heat demands that could form the basis of a network. In addition to the heat demand-driven analysis to identify heat dense areas, various opportunities and constraints relating to development potential are considered to inform decisions e.g., proximity of identified zones to existing heat networks. The zoning that takes place here serves as initial analysis that will inform decisions on the designation of heat network zones as outlined in the Heat Networks (Scotland) Act 2021.

6.4.2 Off-Gas Grid Buildings

The second low regrets priority is to identify possible low regrets off-gas heat decarbonisation pathways and opportunities at a strategic and delivery level. This process involves the grouping of properties into 3 key categories for heat decarbonisation:

- 1) Those with immediate potential for heat pump retrofit (i.e., well insulated properties with a wet heating system, excluding any consideration of electricity network impacts or costs of any network upgrades)
- 2) Those with secondary potential for heat pump retrofit (i.e., properties in need of moderate fabric / heat distribution system upgrade to be heat pump ready)
- 3) Those with tertiary potential for heat pump retrofit (i.e., properties in need of significant fabric / heat distribution system upgrade to be heat pump ready) or those not suited to heat pump technology, with electric (storage or direct) or biomass likely to be the most viable decarbonisation technology.

An additional Category 0 is used to identify properties that already have a low or zero emissions heating system (currently this is limited to heat pumps but could be extended to include biomass if this information is provided in future Home Analytics updates), and those that are connected to a heat network (defined as communal heating in Home Analytics).

6.4.3 Poor Building Energy Efficiency

Moving on to secondary outcomes, the next priority is for the local authority to identify possible locations at a strategic and delivery level where poor building energy efficiency exists across the local authority. This could be low levels of wall insulation, loft insulation or glazing – or a combination of these measures.

6.4.4 Poor Building Energy Efficiency as a Driver for Fuel Poverty

This priority is similar to the above. Poor building energy efficiency is a recognised factor that can contribute to fuel poverty. The focus of this Priority is to provide guidance to enable the local authority to identify possible locations at a strategic and delivery level where poor building energy efficiency acts as a driver for fuel poverty. Within areas of high fuel poverty, this could be where low levels of wall insulation, loft insulation or glazing exist, potentially in combination.

6.4.5 Mixed tenure, Mixed Use and Historic Buildings

The third secondary outcome Priority is for the local authority to identify at a strategic and delivery level where there are buildings of mixed-tenure or mixed-use and where there are historic buildings (covering listed buildings and conservation areas). Currently, this is covered by three focus areas:

1. Mixed-tenure and mixed-use buildings
2. Listed buildings
3. Conservation areas

6.4.6 On-Gas Grid Buildings

The final Priority addressing heat decarbonisation is for the local authority to identify potential on-gas heat decarbonisation pathways and opportunities at a strategic and delivery level, at this stage exploring only building readiness for heat pump retrofit. This process involves the grouping of buildings into 3 principal categories to outline where heat pump retrofit is appropriate (recognising that an alternative hydrogen pathway exists, but there is limited potential to explore through the LHEES at this stage).

1. Buildings with immediate technical potential for heat pump retrofit (i.e., well insulated properties with a wet heating system, excluding any consideration of electricity network impacts or costs of any network upgrades).
2. Buildings with secondary technical potential for heat pump retrofit (i.e., properties in need of moderate fabric / heat distribution system upgrade to be heat pump ready).
3. Buildings with tertiary potential for heat pump retrofit (i.e., properties in need of significant fabric / heat distribution system upgrade to be heat pump ready) or those not suited to heat pump technology. There is no sub-categorisation of category 3 properties for On-Gas Grid as the electric and biomass options are less likely to be suitable for these properties.

An additional Category 0 is used to identify properties that are connected to a heat network (defined as communal heating in Home Analytics).

6.5 Indicators, Criteria and Weightings

The LHEES methodology sets out default indicators, Criteria and Weightings that are used in following LHEES stages for baselining and the creation of strategic zones. For each LHEES Priority the local authority will set out default Indicators, Criteria, and associated Weightings, which should underpin the analysis across subsequent LHEES Stages. This section will summarise the final Indications, Criteria and Weightings that have been used within the analysis outlined in Sections 7 and 8.

Indicators, which are used for the core LHEES analysis and evidence base act as a key information field to help characterise the local authority and to support strategic zoning and generation of initial delivery areas. Additionally, they can be used to measure progress against targets throughout the duration of the LHEES. An example of an indicator would be, 'wall insulation' or 'heat demand'. Criteria are the settings applied to the indicators for each priority to support Baselining, Strategic Zoning, and the identification of Delivery Areas. For example, Criteria is a simple 'yes/no' applied to the Indication e.g., 'wall insulation (Y/N)' to identify properties with uninsulated walls. Another example is the definition of an anchor loach within the Heat Network analysis, which applies a minimum threshold to the 'heat demand' Indicator'. For some priorities a range of indicators may be necessary. Weightings simply are applied based on the importance of the indicator.

7 Baseline

7.1 Baseline Summary across the local authority

This section will provide a thematic overview of how Falkirk council's baseline is performing.

With data from the address gazetteer and Home Analytics, the baseline for Falkirk council has been derived. Figure 10 displays a basic summary of this data, outlining the number of properties within the Falkirk council area and the number of which that a specific heat demand, EPC rating, income, and insulation type. It is found that a significant number of properties are in fuel poverty or extreme fuel poverty. This is related to a high number of properties having an EPC rating between D-G, and a high number of houses having no wall insulation. It cannot be assumed from this data set the quality of glazing or loft insulation within these properties. The Heat in Building's strategy have set regulations requiring that all residential properties in Scotland achieve an EPC rating of at least C by 2033, where technically and legally feasible and cost-effective. Therefore, work is needed to bring Falkirk's building stock up to standard.

Figure 11 provides a more detailed summary of the local authority. It is found that 87% of properties within the Falkirk council area are heated via mains gas, and 9% by electricity. These electric heated properties will take precedence in line with the LHEES Priorities. As stated in the Heat and Building's Strategy (2021), that to encourage the transition to zero carbon heating systems, we will legislate to introduce a new heat standard for Scotland that will require all homes to use zero carbon heating systems by a 'backstop date' in 2045, therefore work will need to be done in all areas of Falkirk's building stock. Additionally, it is found that only 50% of properties have 250mm or more of loft insulation and 20% of properties have zero loft insulation, this will also be of great importance when analysing the possibility for low carbon heat. Other key points to note are the age of properties in the Falkirk council area: the majority of homes in the area were built between 1950 and 1980, and around 22% of homes were built pre-1950. Additionally, 76% of properties are owner occupied and 8% are privately rented, this adds challenge as to how we can encourage homeowners to make energy efficiency investments.

Section 5.2, Summary of ongoing work at local authority outlines the projects and resources being deployed to try and improve the issues highlighted above. The LHEES work will build and expand on these projects in attempt to improve the energy efficiency of the homes and buildings within the Falkirk Council area.

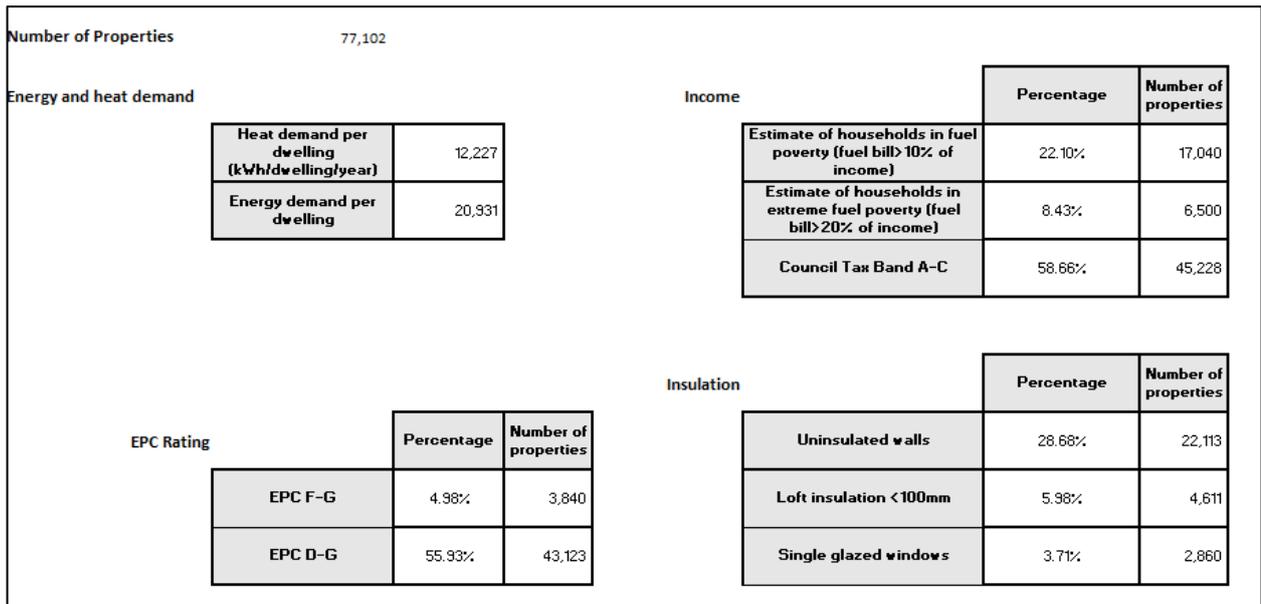


Figure 10: Summary data from the Baseline Tool, Section 1: Summary Statistics (LA Dashboard)



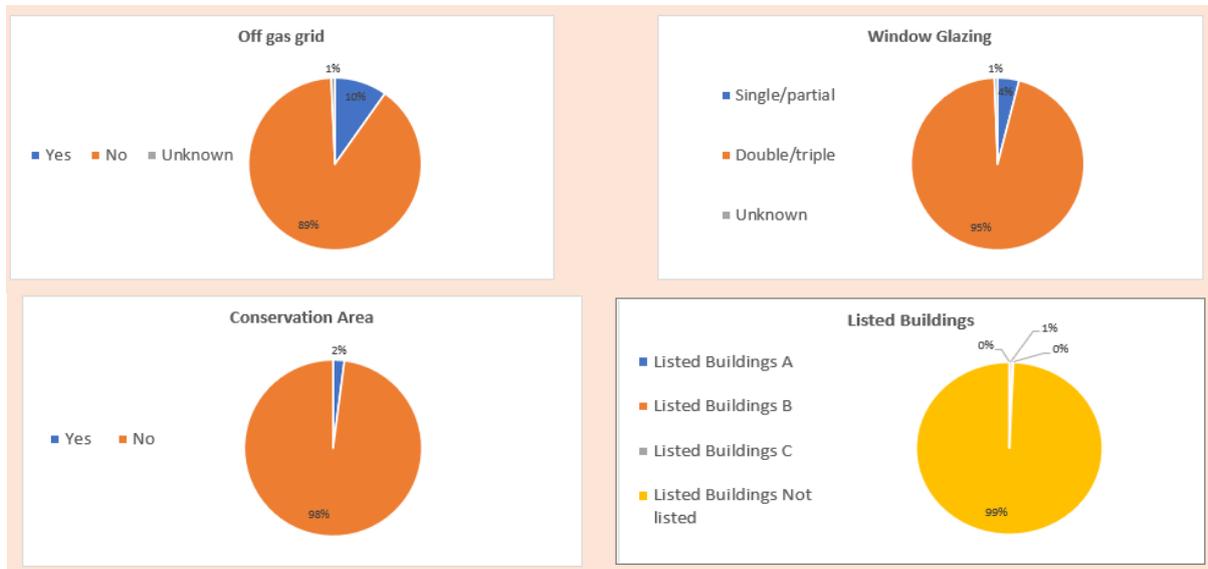


Figure 11: Summary data from the Baseline Tool, Section 1: Summary Statistics (LA Dashboard)

7.2 Core Indicators

This section examines further the Baseline data for Falkirk by analysing at Intermediate Zone Level. There are 42 different intermediate zones in the Falkirk council area. Taking key information from the previous section, focus will be given to energy efficiency, fuel poverty and on gas/off gas areas. Relevant core indicators will be used for each analysis and explanation will be provided as to why each indicator and weighting has been used. Recommendations and conclusions will be serviced across strategic zones.

7.2.1 Energy Efficiency

When assessing energy efficiency, three core indicators are used; loft insulation between 0-99mm, single glazed windows and wall insulation. For this assessment all three indicators have equal weighting as they all have an equal impact on energy efficiency and its impact on that household being in fuel poverty. As seen in Table 5, Falkirk Grahamston, Bo'ness Kinneil and Grangemouth Town centre have the highest rankings for poor energy efficiency across the council area.

As taken from the Baseline tool assessment, Bo'ness Kinneil, Falkirk Grahamston, Redding and Stenhousemuir East have the highest number of properties with poor loft insulation. Subsequently these areas also have the highest number of properties with single glazed windows. In addition to these zones, Falkirk Bantaskin also has a high percentage of properties with single glazed windows. Regarding wall insulation, 45% of properties in Bo'ness Douglas and Bo'ness Kinneil are uninsulated. 51% of properties in Falkirk Grahamston and roughly 40% of properties in Stenhousemuir East,

Therefore, we can conclude that areas with the lowest level of energy efficiency are Bo’ness Kinneil and Falkirk Grahamston.

By assessing this information further, taking into consideration the number of properties in each zone and using weightings, we can see that Falkirk Grahamston has the highest number of properties that have potential for intervention, followed by Kinneil and Grangemouth town centre. This highlights the importance of improved glazing and insulation when assessing the energy efficiency of a property. The Energy Efficiency Standard for Social Housing (EESH 1&2), The Fuel Poverty (Targets, Definition and Strategy) (Scotland) Act and The Heat in Buildings Strategy all acknowledge the need for fabric improvements.

Table 5: Council Zones ranked for poor energy efficiency priority

Ranking	Zones with highest Total Weighted Score	Number of interventions identified
1	Falkirk - Grahamston	1,696
2	Bo'ness - Kinneil	1,091
3	Grangemouth - Town Centre	991
4	Bo'ness - Douglas	1,034
5	Braes Villages	1,085
6	Stenhousemuir East	798
7	Falkirk - Bantaskin	870
8	Stenhousemuir - Antonshill	761
9	Polmont	958
10	Falkirk - Town Centre and Callendar Park	1,192
11	Redding	676
12	Brightons and Wallacestone	835

When this information is compared with SAP scores, there is a strong correlation. The Standard Assessment Procedure (SAP) is the methodology used by the government to assess and compare the energy and environmental performance of dwellings. These indicators of performance are based on estimates of annual energy consumption for the provision of space heating, domestic hot water, lighting, and ventilation. As seen in the map in figure 12, areas with a low SAP score include the Braes Villages, Grangemouth, and specific areas of Falkirk and Bo’ness.

Average SAP score per Data Zone across Falkirk

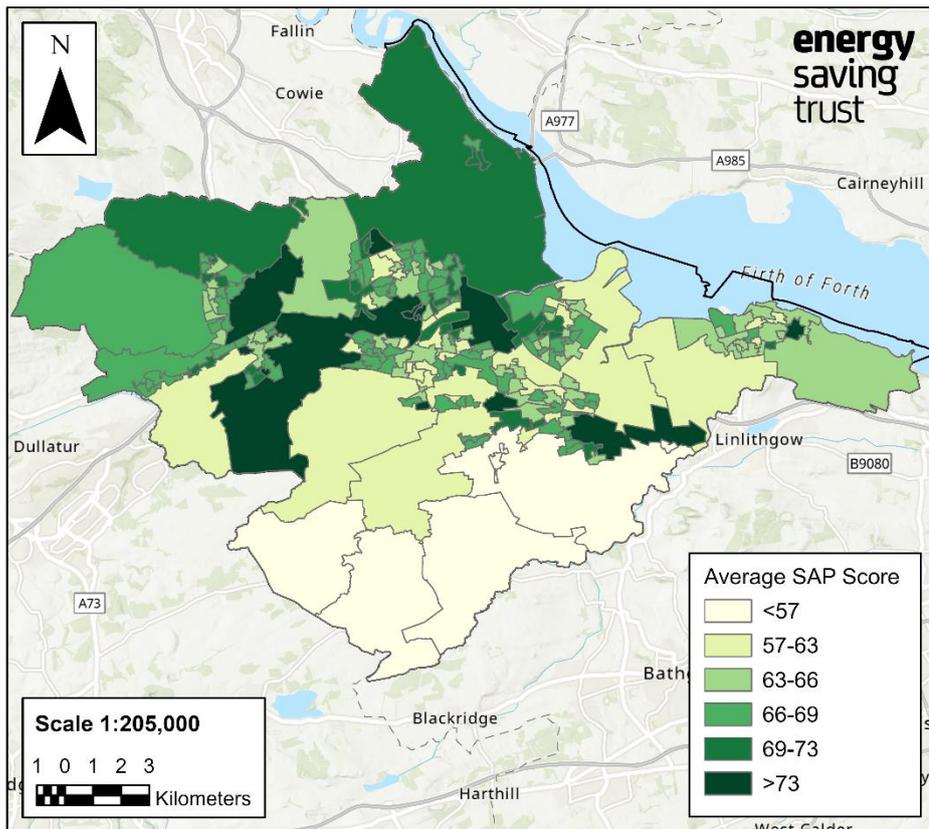


Figure 12: Average SAP score per Data Zone across Falkirk

7.2.2 Fuel Poverty

Table 6 provides an overview of the zones where poor energy efficiency is likely to be a driver for fuel poverty. From the baseline tool we conclude that the three zones with the lowest ranking for fuel poverty, driven by poor energy efficiency are Falkirk Grahamston, Bo'ness, and Breas Villages. These results are expected as these zones have been identified in the previous section as having poor levels of energy efficiency.

Table 6: Zones where poor energy efficiency is likely to be an acting driver for fuel poverty

Ranking	Zones with highest Total Weighted Score, where poor energy efficiency is likely to be acting as a driver for fuel poverty
1	Falkirk - Grahamston
2	Braes Villages
3	Bo'ness - Kinneil
4	Falkirk - Town Centre and Callendar Park
5	Falkirk - Camelon East
6	Grangemouth - Town Centre
7	Hallglen and Glen Village
8	Falkirk - Tamfourhill
9	Falkirk - Bainsford and Langlees
10	Stenhousemuir West
11	Falkirk - Camelon West
12	Redding

As identified in section 7.2.1 Energy Efficiency, Falkirk Grahamston and Bo'ness have been highlighted as areas with high levels of poor energy efficiency indicators, however Braes villages was not, this highlights that energy efficiency indicators are not the only drivers for fuel poverty. Data taken from mapping exercises and the baseline tool have highlighted that the Braes Villages are shown to have high numbers of properties off the gas grid, highlighting that off gas grid areas are correlated with areas of fuel poverty. This is reflected by the map presented in figure 10, where we can spatially see the fuel poverty areas in dark purple. It is concluded that energy efficiency and access to the gas grid are the main causes of fuel poverty in the Falkirk area.

Average fuel poverty risk across Falkirk

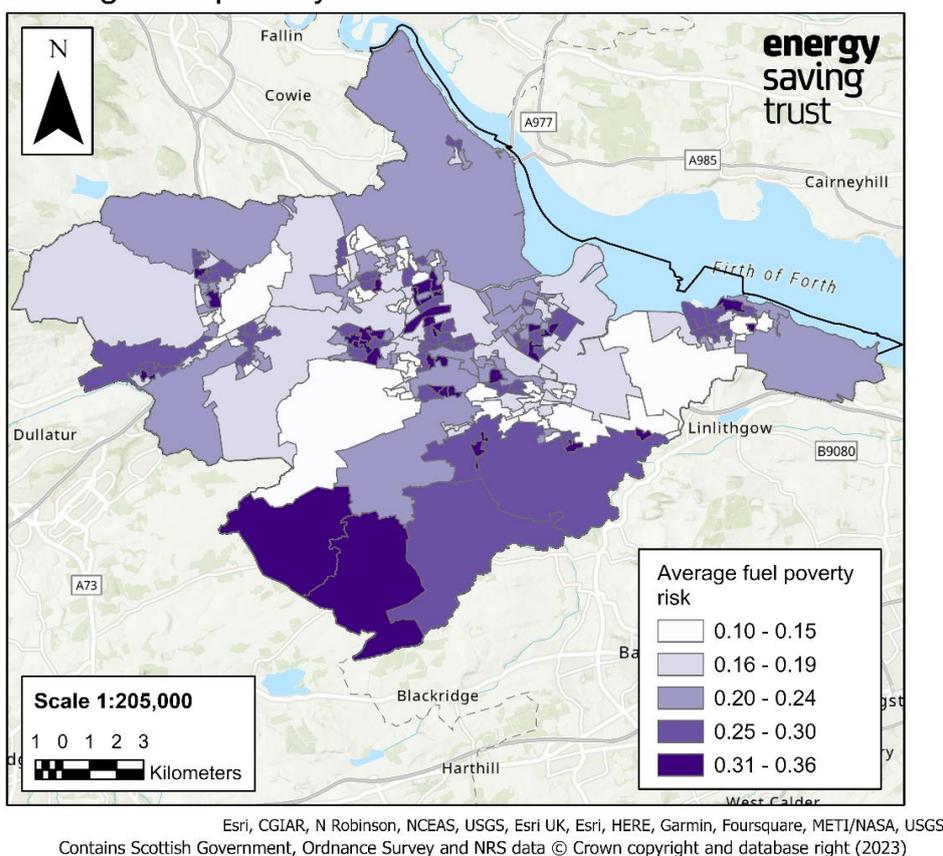


Figure 13: Average fuel poverty risk across Falkirk (EST Mapping, 2023)

7.3 Intermediate Zones

This section will focus on the intermediate zones highlighted for intervention in section 7.2.1 and 7.2.2. Taking each zone in turn to analyse the key drivers for fuel poverty and potential intervention. Zones highlighted include Falkirk Grahamston, Bo'ness – Kinneil, and the Braes Villages.

7.3.1 Falkirk Grahamston

The intermediate zone Falkirk Grahamston has 2,195 properties, 89% of properties on the gas grid and 27% of these properties being in fuel poverty. Figure 14 presents the summary statistics for domestic properties where poor energy efficiency is likely to be a driver for fuel poverty, while figure 15 condenses data concerning wall insulation. It is concluded from this summary that there is a high level of poor loft insulation and uninsulated walls. 53% of properties are of solid construction, making these properties more difficult to insulate but not impossible. It is also worth noting that 50% of these properties are owner occupied, highlighting the need for government intervention and funding to assist homeowners with energy efficiency improvements. However, it is unlikely that any HEEPS ABS projects would be completed on a sandstone building due to the structural issues, therefore making intervention difficult.

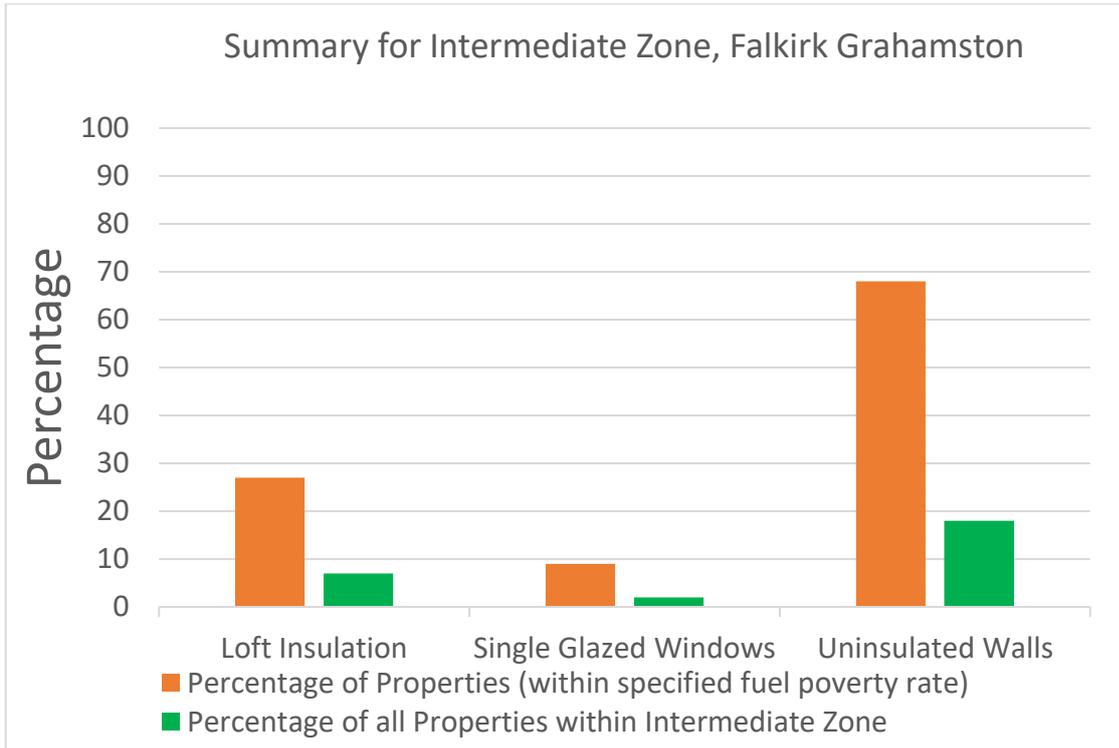


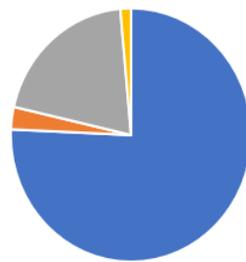
Figure 14: Summary for intermediate zone, Falkirk Grahamston, poor energy efficiency as a driver for fuel poverty (Taken from Baseline tool)

Uninsulated Walls - Tenure (As a % of properties (within a specified fuel poverty rate))



- Housing Association
- Local Authority
- Owner Occupied
- Privately Rented

Uninsulated Walls - Construction (As a % of properties within specified fuel poverty rate)



- Solid Brick/Stone
- Cavity Construction
- Timber Frame
- System Built

Figure 15: Uninsulated Wall (Construction and Tenure) As a percentage of properties within Falkirk Grahamston within a specified fuel poverty rate). (Taken from baseline tool)

7.3.2 Bo'ness Kinneil

The intermediate zone for Bo'ness Kinneil has 1694 properties, with 27% being in fuel poverty and 96% of these properties bring on the gas grid. As seen in Figure 16, compared with Falkirk Grahamston their energy efficiency indicators are much better with only 10% of properties having low levels of loft insulation and only 35% of properties having uninsulated walls. Therefore, it is difficult to determine why this area has such high levels of fuel poverty in line with Falkirk Grahamston when their properties seem to be better insulated and are more likely to be on the gas grid. Noting that 96% of properties in this area are on gas. It can be assumed, after reference to the SIMD data set, that income is the key driver of fuel poverty in this area.

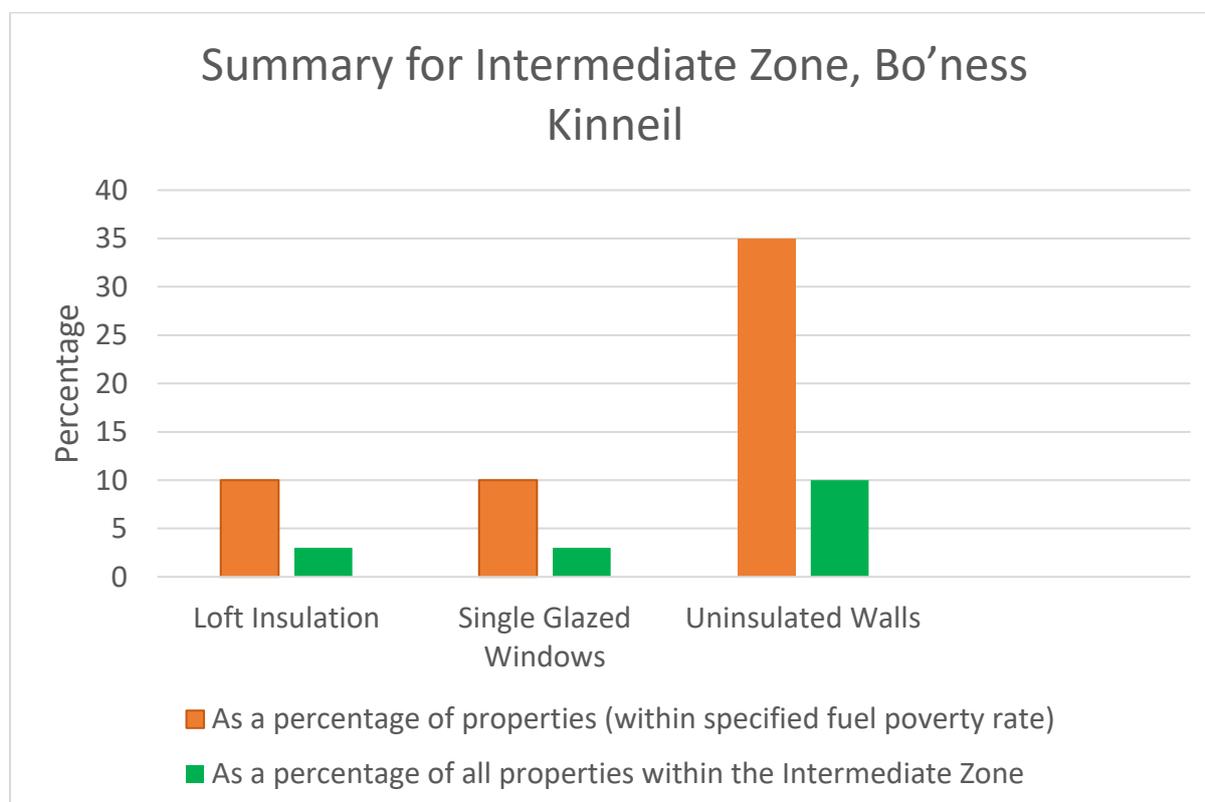


Figure 16: Summary for intermediate Zone, Bo'ness Kinneil, poor energy efficiency as a driver for fuel poverty (Taken from Baseline tool)

It is worth noting that a higher percentage of properties (14%) are Local Authority owned, as seen in Figure 17. We can see that a large proportion of properties are of solid stone construction making them harder to heat. This would likely be the cause of high fuel poverty numbers. It is crucial to highlight the potential that this data is not 100% accurate. Local knowledge highlights that most local authority properties of suitable construction have been insulated, therefore any properties that are uninsulated, we can assume they are 'hard to treat'.

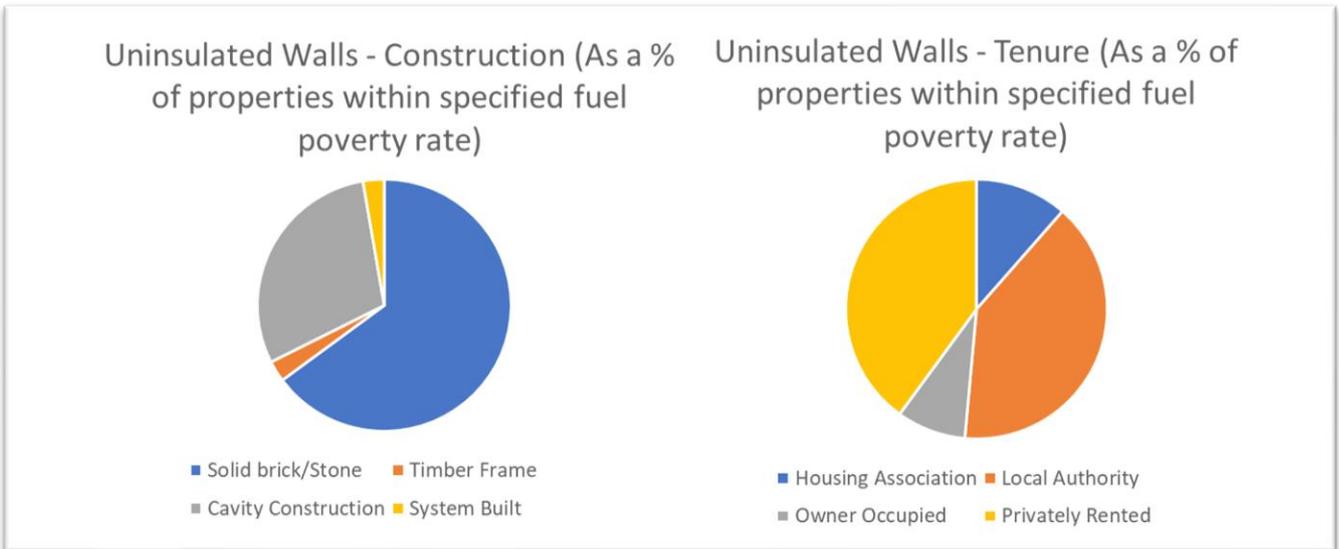


Figure 17: Uninsulated Wall (Construction and Tenure) As a percentage of properties within Bo'ness Kinneil (within a specified fuel poverty rate). (Taken from baseline tool)

7.3.3 Braes Villages

The intermediate zone Braes Villages has 2117 properties, with 31% of these bring in fuel poverty and only 3% (56) properties being on the gas grid. This area is known for having very high levels of fuel poverty, with 28% of households being in extreme fuel poverty, the highest seen across the local authority. Although it's clear from figure 18 that insulation levels could be improved, data shows that this area has only 1% of properties on the gas grid, therefore we can assume that it is the electric heating that is causing the exceptionally high fuel costs for these households. There is a Local Authority run project in process to provide 700 properties in this zone with a gas connection, in attempt to reduce fuel poverty. This has been a popular decision with tenants. Environmental concerns have been raised and many council tenants have now had the option to have either gas, or a heat pump installed, with many opting for a heat pump. However, it is worth noting that some properties (figure 19) here are owner occupied or social housing and do not have the means to change the method of heating.

Similarly, to the previous section on Bo'ness, Falkirk Council Officers have found this data surprising as the Local Authority has insulated the majority of homes in this area. Therefore, an extra section (7.4) has been added for Local Authority domestic review, focusing on a fabric first approach.

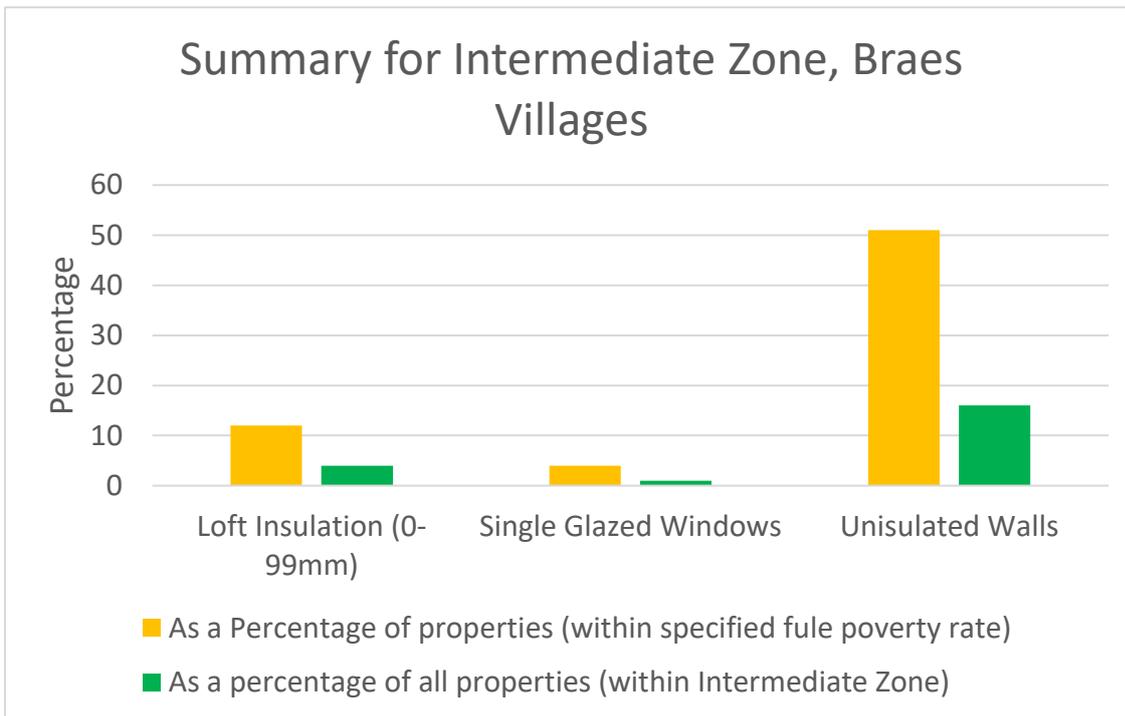


Figure 18: Summary for intermediate zone, Braes Villages, poor energy efficiency as a driver for fuel poverty (taken from baseline tool)

We can visualize in figure 18 below, that a large proportion of the properties in fuel poverty are local authority owned. Therefore, it is expected that the council intervention, as mentioned above, will have a positive impact here. However, from looking at the construction data in figure 19, many uninsulated properties are of solid construction, making them less suitable for a heat pump.

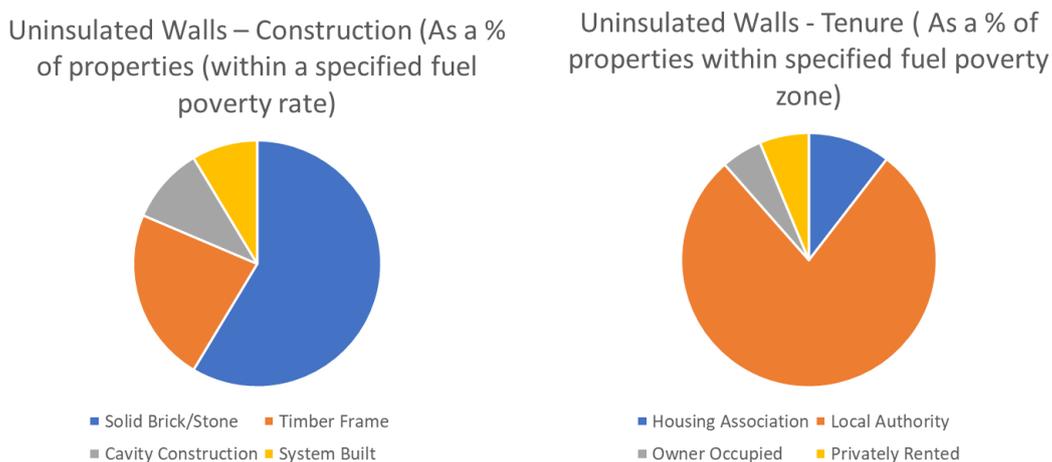


Figure 19: Uninsulated Wall (Construction and Tenure) As a percentage of properties within Braes Villages (within a specified fuel poverty rate). (Taken from baseline tool)

7.4 Fabric First Approach

The data analysis found in section 7 highlights 3 areas of potential intervention, considering fuel poverty across the whole council estate, including all tenures. As discussed, several local authority properties were highlighted as being insulated, which council records show to be inaccurate. Therefore, this section has been added to support the run out of future HEEPS ABS projects and focusses on a fabric first approach for local authority properties. A fabric first approach is imperative to ensuring our stock can have low carbon heat and is something that the council can act on immediately.

Continuing to use EST Home Analytics data, officers have further filtered the data set based on fuel poverty, local authority tenure and wall insulation specifically. When filtering fuel poverty, the 4 top deciles were selected (deciles 1-4), highlighting 31,460 addresses. From this data set EPC A-C were removed as they are also at the Scottish Government's target rating. This highlighted a total of 13,515 addresses over 9 areas. AAs discussed, this section is focusing on uninsulated walls, therefore officers removed all properties with insulated walls from the data set. To add to this assessment, all pre 1919 properties were removed as they will have solid walls with no cavity. Note that these properties could be added in as EWI or IWI could be a possibility here, even though very expensive, however adding them back in did not change the top areas.

Top 4 areas are:

- 1 – Falkirk North
- 2- Grangemouth
- 3- Upper Braes
- 4- Falkirk South

When filtering on tenure the local authority numbers were low, as expected, and many local authority properties are insulated and at EPC C. This short assessment will be used to determine future ABS projects in the Falkirk area.

8 Heat Decarbonisation Pathways and Strategic Zones

8.1 Heat Decarbonisation Pathways – heat network zones

As outlined in section 5, the council currently operates a 1.12MW gas powered CHP system alongside a 2MW gas fired boiler at Callendar park in Falkirk. This provides thermal energy to 6 blocks of 84 flats. These flats are found within Callendar park estate and Callendar house, noting that this is a non-domestic building. Additional district heating schemes within the Falkirk area include Calachem multi-user site, where heat and power are provided by Calachem to nearby chemical sector users. And lastly, INEOS operate a site wide heat and power network across the Grangemouth Refinery and petrochemicals complex. Additionally, the council is taking forward the Grangemouth Energy project alongside Scottish Enterprise to assess the overall energy requirement of Grangemouth industries.

Due to the Falkirk area having a high level of industrial sites, there is a high concentration of energy consumption as shown on the Scotland Heat Map. This provides Falkirk council with an opportunity

to determine if a heat network, which is often a resource efficient, low carbon and cost-effective energy solution could be introduced. The map in figure 20 shows the broad areas where there is likely to be most potential. Identifying any current operational schemes nearby may pose a future link or expansion.

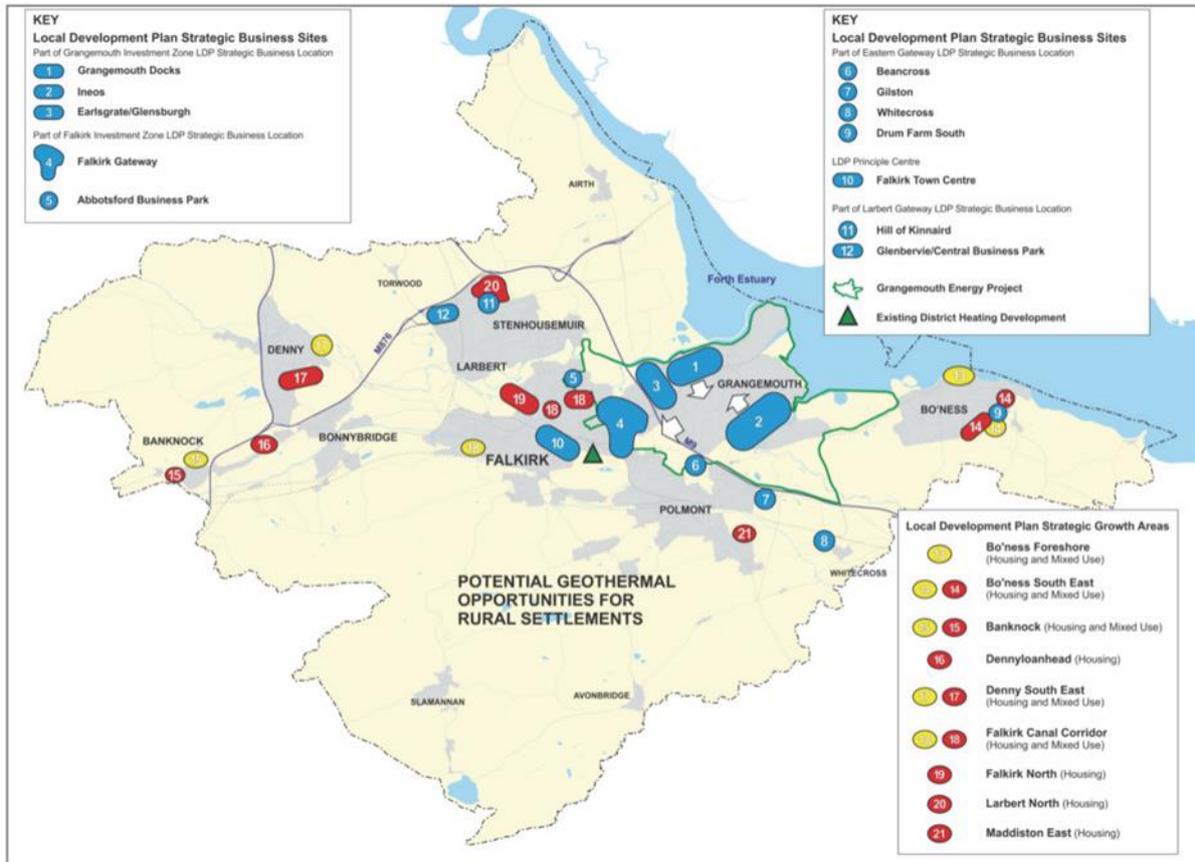


Figure 20: Heat Map displaying Strategic Sites and Existing Projects across Falkirk (LDP Assessment, 2018)

This section will outline further heat network analysis. The process of identifying whether there is potential for further district heating in Falkirk has been through a desk-based study. High heat demand, which is displayed on the maps in orange/red colours identify areas where there is a demand for heat, usually areas with large housing developments. Potential anchor loads are areas where excess heat has been identified. These are often land uses and buildings which are likely to have heat loads which vary little over a 24-hour period, such as a public swimming pool or a hospital. Examples of potential anchor loads in the Falkirk are outlined in table 7 and displayed visually in figure 21.

Table 7: Potential Anchor Loads in the Falkirk Council Area

Map ID	Name of Anchor Load	Sector
1	Forth Valley College	Public
2	Falkirk Stadium	Public
3	Graeme High School	Public
4	Grangemouth High School	Public
5	Grangemouth Leisure Centre	Public
6	Braes High School	Public

7	Scottish Prison Service	Public
8	Bo'ness Academy	Public
9	Bo'ness Community Hospital	Public
10	FC Municipal Buildings and Town Hall	Public
11	Falkirk Police Station	Public
12	Falkirk Community Hospital	Public
13	St. Mungos High School	Public
14	Camelon Crematorium	Public
15	Falkirk HS & Banktaskine PS	Public
16	Mariner Leisure Centre	Public
17	Denny high School	Public
18	Carronbank House	Public
19	Forth Valley hospital	Public
20	Bellsdyke Hospital	Public
21	Bo'ness recreation Centre	Public
22	Inchyra Hotel	Private
23	Carriden Processing	Private
24	ASDA Bankside Distribution Centre	Private
25	Falkirk Distillery	Private

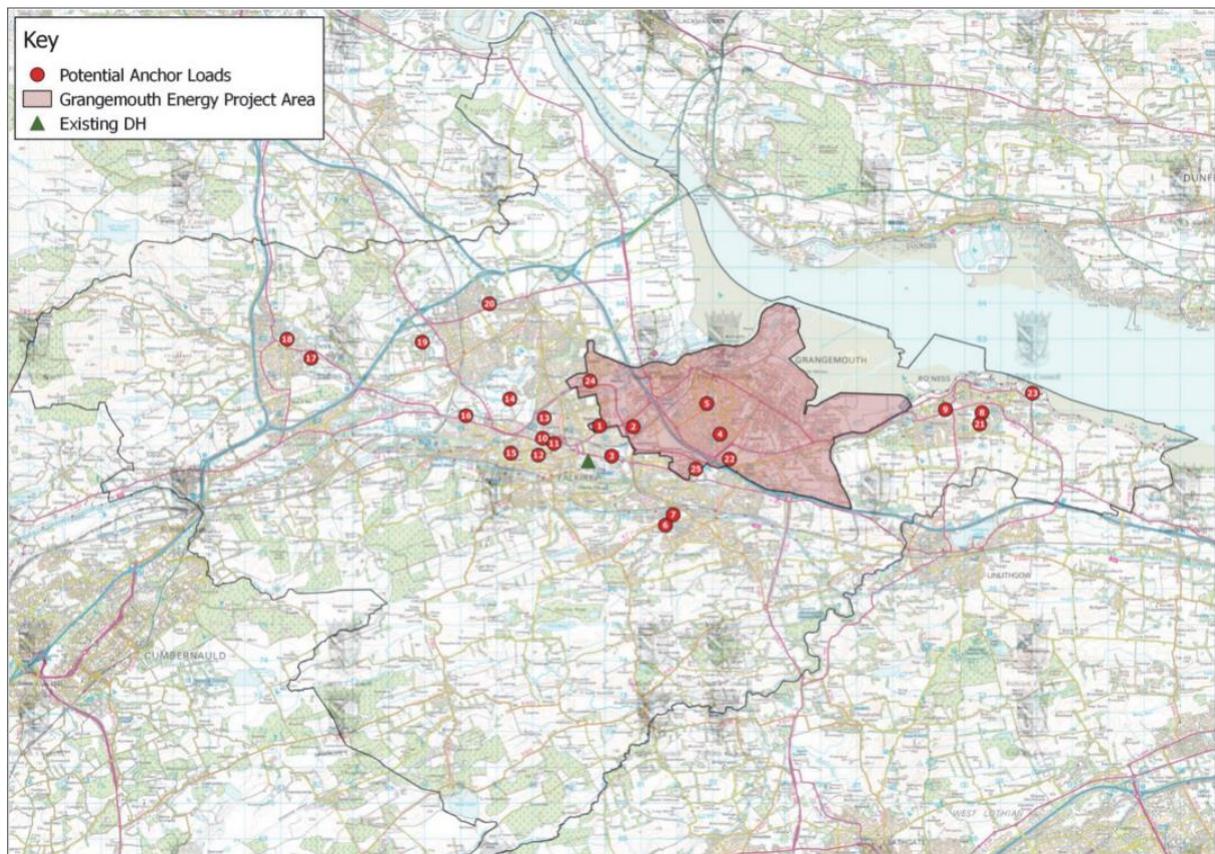


Figure 21: Potential Anchor Loads in Falkirk council Area GIS (LDP assessment, 2018)

8.1.1 Heat Network Zones – Baseline Criteria

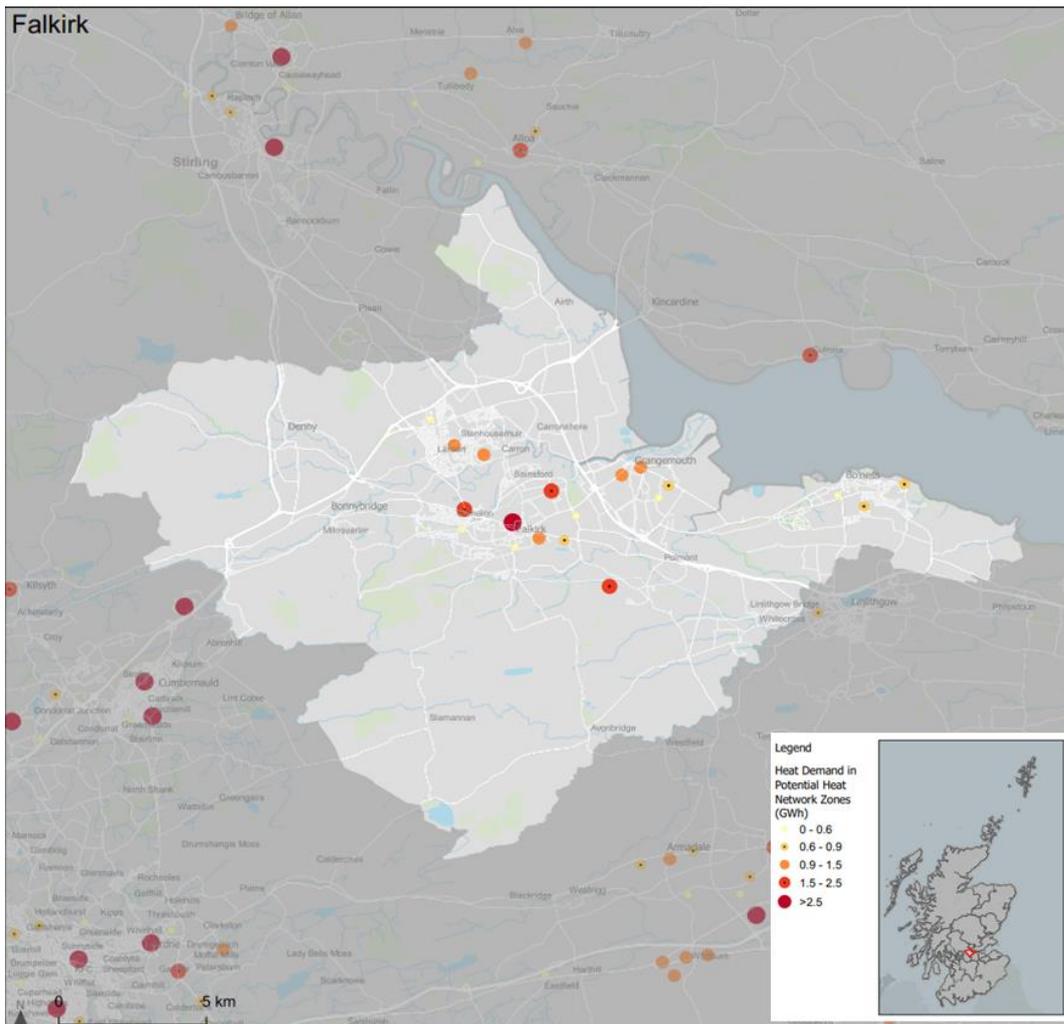


Figure 22: Potential Heat network Zones identified using baseline screening criteria across Falkirk Council (National Assessment, 2022)

Figure 22 displays a spatial map showing potential heat network zones identified within the Falkirk council area, using analysis from the minimum baseline screening criteria. This generates potential heat network zones using a 4,000 kWh/m linear heat density and requires at least two anchor loads within a heat network zone. Potential zones are shown using scaled points rather than zone outlines at this scale. Table 8 highlights the key points from this analysis.

Table 8: Heat network summary, using baseline screening criteria

	Key Points:
1	There are 73 anchor loads within potential zones
2	5,154 domestic properties are within potential zones with a total heat demand of 79 GWh/a, accounting for 35% of total heat demand.
3	882 non-domestic properties are within potential zones with a total heat demand of 144 GWh/a, accounting for 64% of total heat demand
4	There are 1,443 mixed-tenure domestic properties within potential zones, with a total heat demand of 22.0 GWh/a
5	there are 129 mixed-use properties within potential zones, with a total heat demand of 4.2 GWh/a.

6	There are 800 heritage properties within potential zones, with a total heat demand of 22.4 GWh/a.
7	An estimate of 1,236 properties within potential zones have occupants in fuel poverty, with an estimate of 511 properties having occupants in extreme fuel poverty

8.1.2 Heat Network Overview – Stringent Screening Criteria

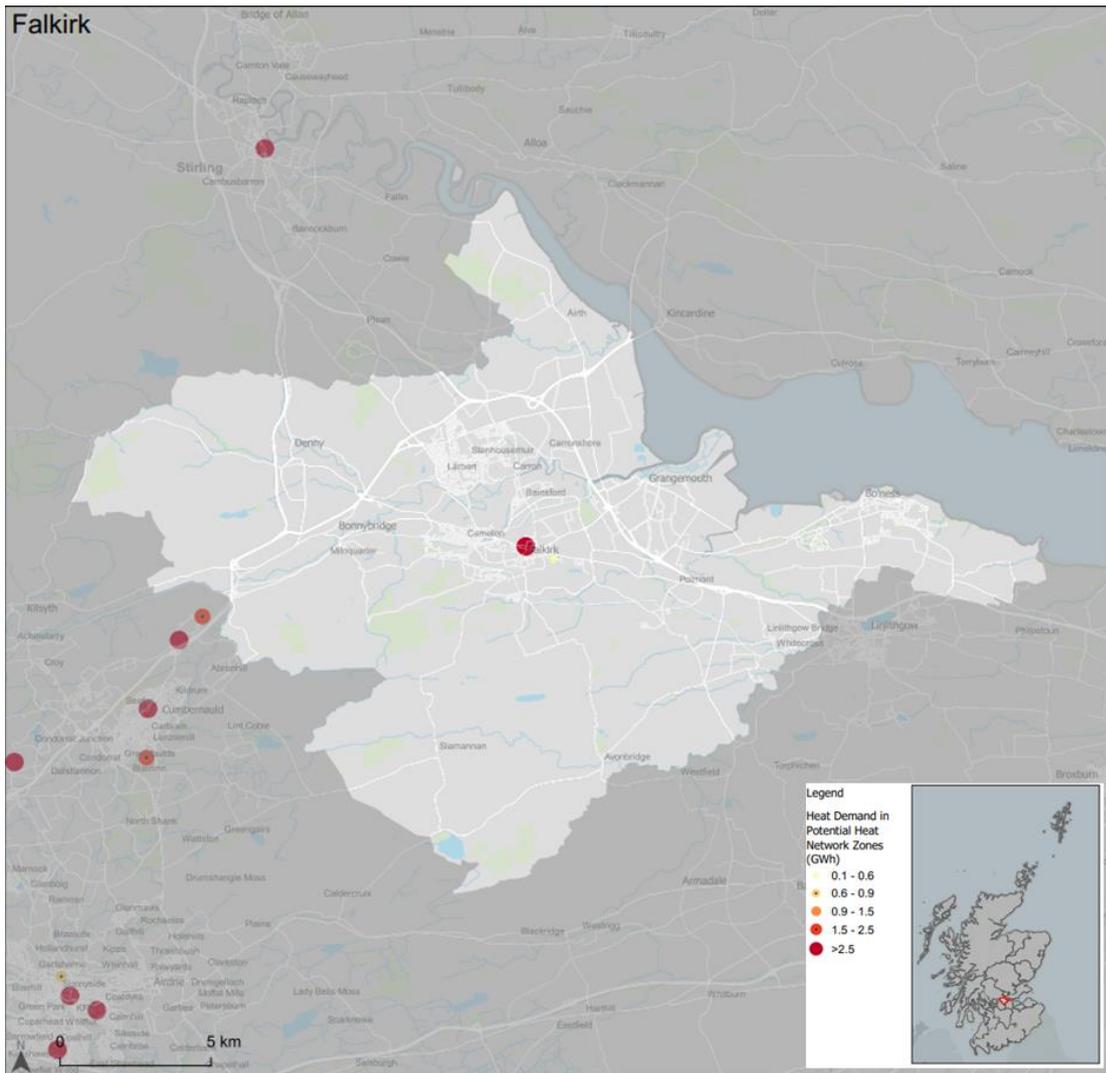


Figure 23: Potential Heat network Zones identified using baseline screening criteria across Falkirk Council (National Assessment, 2022)

Figure 23 highlights potential heat network zones identified within Falkirk Council using the Stringent screening settings. These stringent criteria generate potential heat network zones using 800kWh/m linear heat density and requires at least 5 anchor loads. An estimate of 76 properties within potential zones have occupants in fuel poverty, with an estimate of 30 properties having occupants in extreme fuel poverty. Table 9 highlights the key points from this analysis.

Table 9: Heat Network Summary, using stringent screening data

Key Points:

1	Using these criteria there are 2 potential heat zones
2	Potential zones identified contain properties with a total heat demand of 51 GWh/a, which is 0.4% of the national demand (within potential zones identified at the Stringent screening level).
3	There are 15 anchor loads within potential zones.
4	620 domestic properties are within potential zones with a total heat demand of 16 GWh/a, accounting for 31% of total heat demand.
5	309 non-domestic properties are within potential zones with a total heat demand of 35 GWh/a, accounting for 69% of total heat demand.
6	There are 235 mixed-tenure domestic properties within potential zones, with a total heat demand of 7.7 GWh/a.
7	There are 66 mixed-use properties within potential zones, with a total heat demand of 0.9 GWh/a.

8.1.3 Heat Network Overview – Baseline and Stringent Criteria

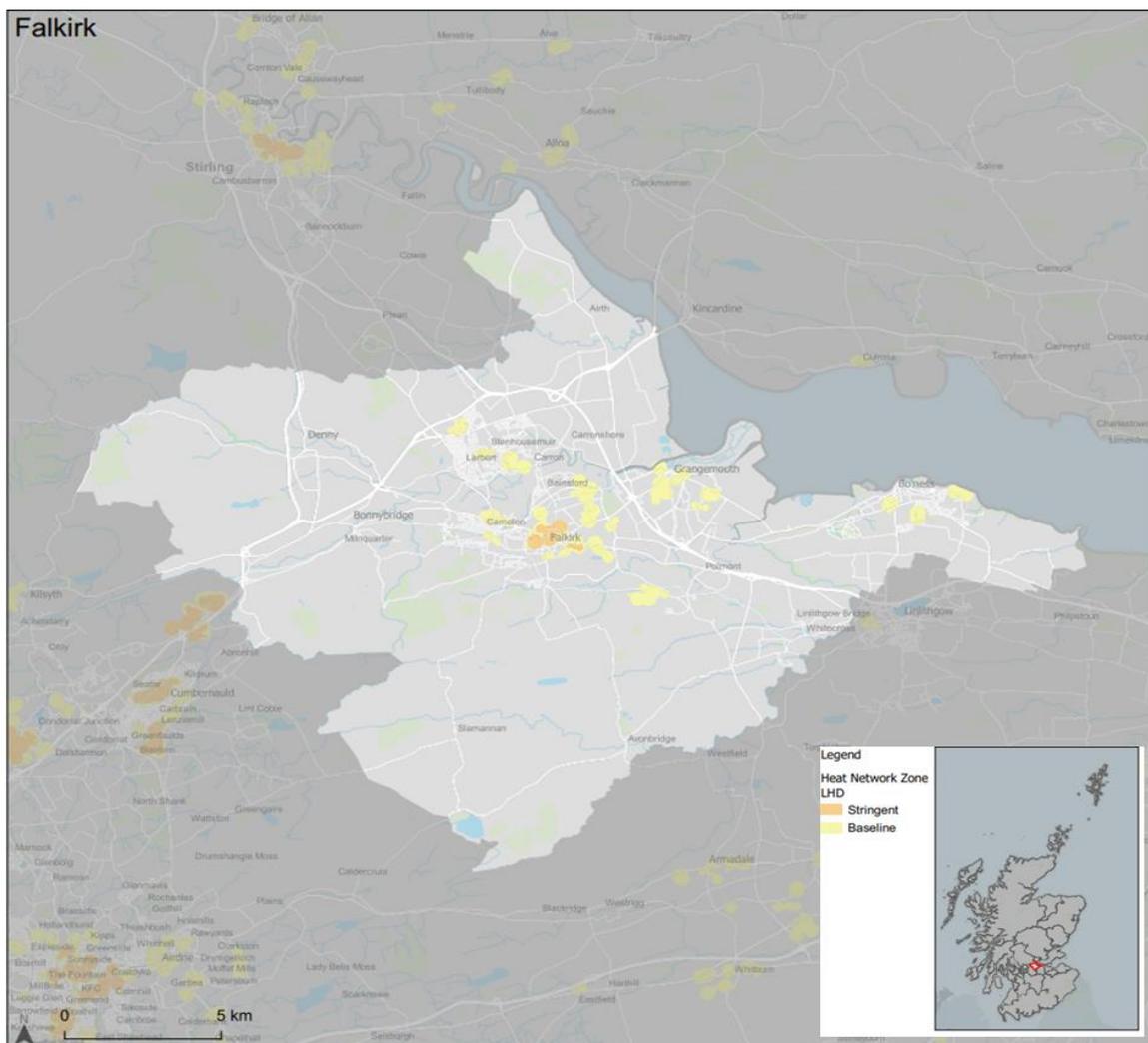


Figure 24: Potential Heat network Zones identified using baseline and stringent screening criteria across Falkirk Council (National Assessment, 2022)

The map presented in Figure 24 shows potential heat network zones identified within Falkirk Council using both the Baseline and Stringent screening settings. Analysis uses different levels of screening criteria to generate potential heat network zones using three different criteria: baseline, 4000 kWh/m/yr linear heat density and at least two anchor loads; and stringent, 8000 kWh/m/yr linear heat density and at least five anchor loads. Table 10 highlights the key points, separated by baseline screening and stringent screening.

Table 10: Heat Network Summary, using baseline and stringent screening criteria

	Key Points	
	Potential Baseline Zones	Potential Stringent Zones
1	There are 19 potential zones within Falkirk Council	Using these criteria there are 2 potential heat zones.
2	Potential zones identified contain properties with a total heat demand of 225 GWh/a, which is 1% of the national demand (within potential zones identified at the Baseline screening level).	Potential zones identified contain properties with a total heat demand of 51 GWh/a, which is 0.4% of the national demand (within potential zones identified at the Stringent screening level).
3	There are 73 anchor loads within potential zones.	There are 15 anchor loads within potential zones.
4	5,154 domestic properties are within potential zones with a total heat demand of 79 GWh/a, which accounts for 35% of total heat demand.	620 domestic properties are within potential zones with a total heat demand of 16 GWh/a, accounting for 31% of total heat demand.
5	882 non-domestic properties are within potential zones with a total heat demand of 144 GWh/a, which accounts for 64% of total heat demand.	309 non-domestic properties are within potential zones with a total heat demand of 35 GWh/a, accounting for 69% of total heat demand.
6	There are 1,443 mixed-tenure domestic properties within potential zones, with a total heat demand of 22.0 GWh/a.	There are 235 mixed-tenure domestic properties within potential zones, with a total heat demand of 7.7 GWh/a.
7	There are 129 mixed-use properties within potential zones, with a total heat demand of 4.2 GWh/a.	There are 66 mixed-use properties within potential zones, with a total heat demand of 0.9 GWh/a.
8	There are 800 heritage properties within potential zones, with a total heat demand of 22.4 GWh/a.	There are 548 heritage properties within potential zones, with a total heat demand of 16.1 GWh/a.
9	An estimate of 1,236 properties within potential zones have occupants in fuel poverty, with an estimate of 511 properties having occupants in extreme fuel poverty	An estimate of 76 properties within potential zones have occupants in fuel poverty, with an estimate of 30 properties having occupants in extreme fuel poverty.

8.1.4 Potential Heat Network Zone

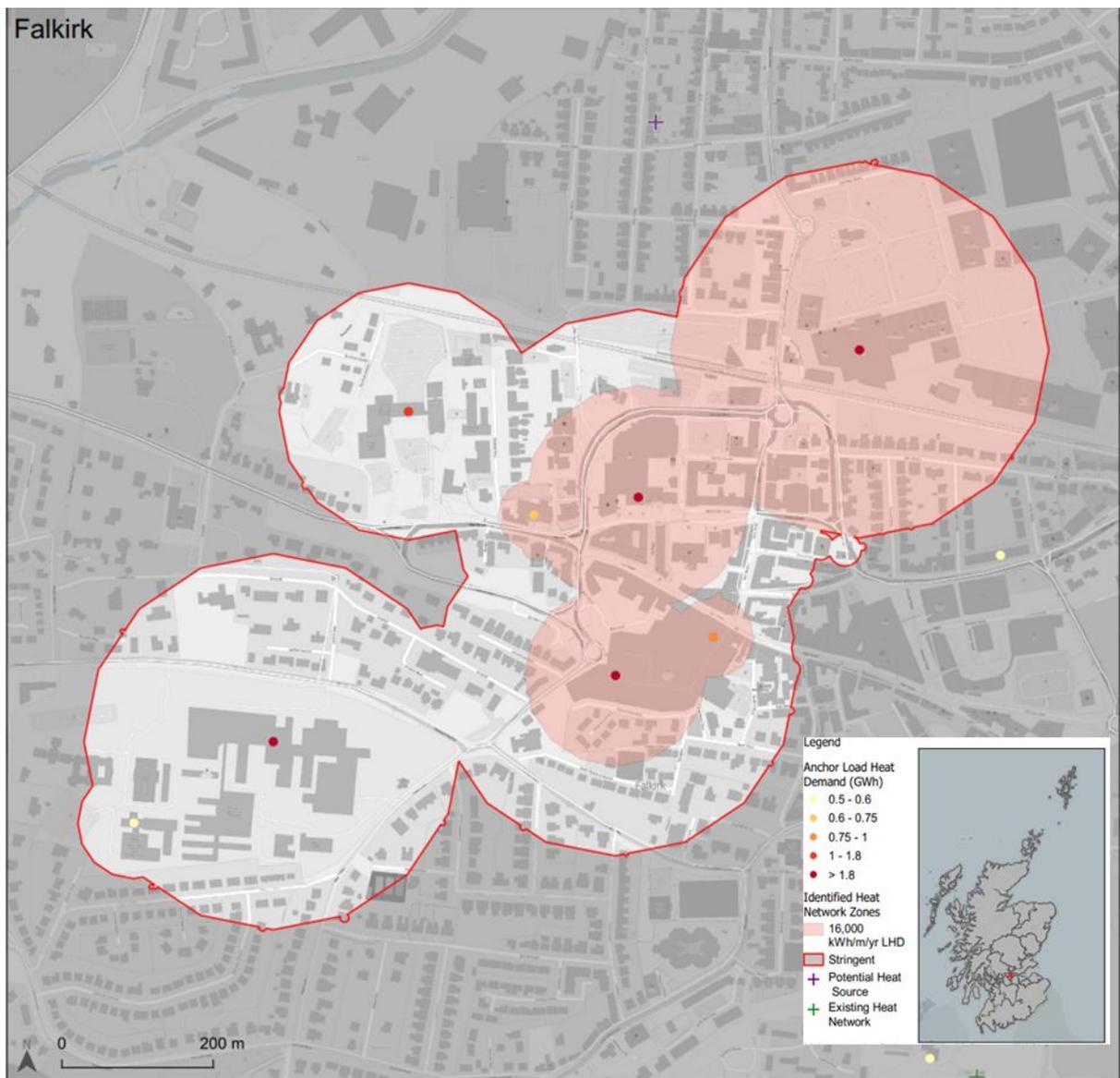


Figure 25: Largest potential heat network zone identified in Falkirk using stringent screening criteria (National Assessment, 2022)

Figure 25 shows the largest potential heat network zone identified within Falkirk using the stringent screening settings. This zone is found in the Centre of Falkirk between garrison Place and High Street. The potential zone is shown by zone outline rather than a scaled or graduated colour point at this scale. Also shown, where available, are locations of existing heat networks, local development plan sites and potential sources of low carbon heat supply. This analysis uses the stringent screening criteria which generates potential heat network zones using an 8000 kWh/ m/yr linear heat density and requiring at least five anchor loads within a potential heat network zone. The largest of these potential zones is defined as that with the highest total heat demand and the map provided is for the largest zone in Falkirk. To highlight the highest demand concentrations, potential zones with a 16000 kWh/m/yr linear heat density and at least five anchor loads are also presented if such areas fall within the potential zone. For context existing heat networks and potential heat sources identified in the 2020 Scotland Heat Map are also shown. Table 11 presents the key summary statistics from this analysis.

Table 11: Summary Statistics for Largest Potential heat Network Zone Falkirk

Summary Statistics				
Zone Summary		Characteristic Summary		
Total heat demand (GWh)	47	No. domestic properties (within heat network zones)	613	
No. properties	925	No. non-domestic properties (within heat network zones)	309	
No. anchor loads	8	No. mixed tenure properties	228	
% of heat from anchor loads	51%	No. mixed use properties	66	
		No. heritage properties	543	
		No. fuel poverty households	70	
		No. pre-1919 properties	569	
		Unattributed heat demand (GWh)	0	
		No. unattributed properties	3	
Fuel Poverty				
Estimated number of domestic properties classified as their householders living under:	No. properties	% of domestic properties*	Heat demand (GWh)	% of heat demand*
Fuel poverty (fuel bill >10% income after housing)	70	11.3%	0.4	3.9%
Extreme fuel poverty (fuel bill >20% income after housing)	24	4.0%	0.3	2.3%

8.2 Heat decarbonisation pathways – building-level intervention

Heat decarbonisation pathways for building level pathways will consider energy efficiency and whether the property is on the gas grid. Stage 7 outlined three zones that would benefit most from intervention. Falkirk Grahamston was the zone with the highest level of poor energy efficiency for fuel poverty, alongside having the most properties suitable for intervention. Bo'ness Kinneil followed closely being, showing areas where similar intervention could be suitable. Braes villages were highlighted as being mainly off the gas grid, therefore heat decarbonisation could be more effective compared to energy efficiency intervention.

Figure 26 presents a spatial overview of properties that are heated by fossils fuel and those suitable for an ASHP. Factors considered for the suitability of an ASHP include, insulation, construction type and heat demand. Areas of dark green highlight areas of intervention where heat pumps could be successful, there are areas with a high number of suitable properties that are on the gas grid. The area in pale blue highlights the Braes Villages, an area where properties are not on the gas grid and are not suitable for a heat pump. This area could be a zone where a potential heat network could be most beneficial.

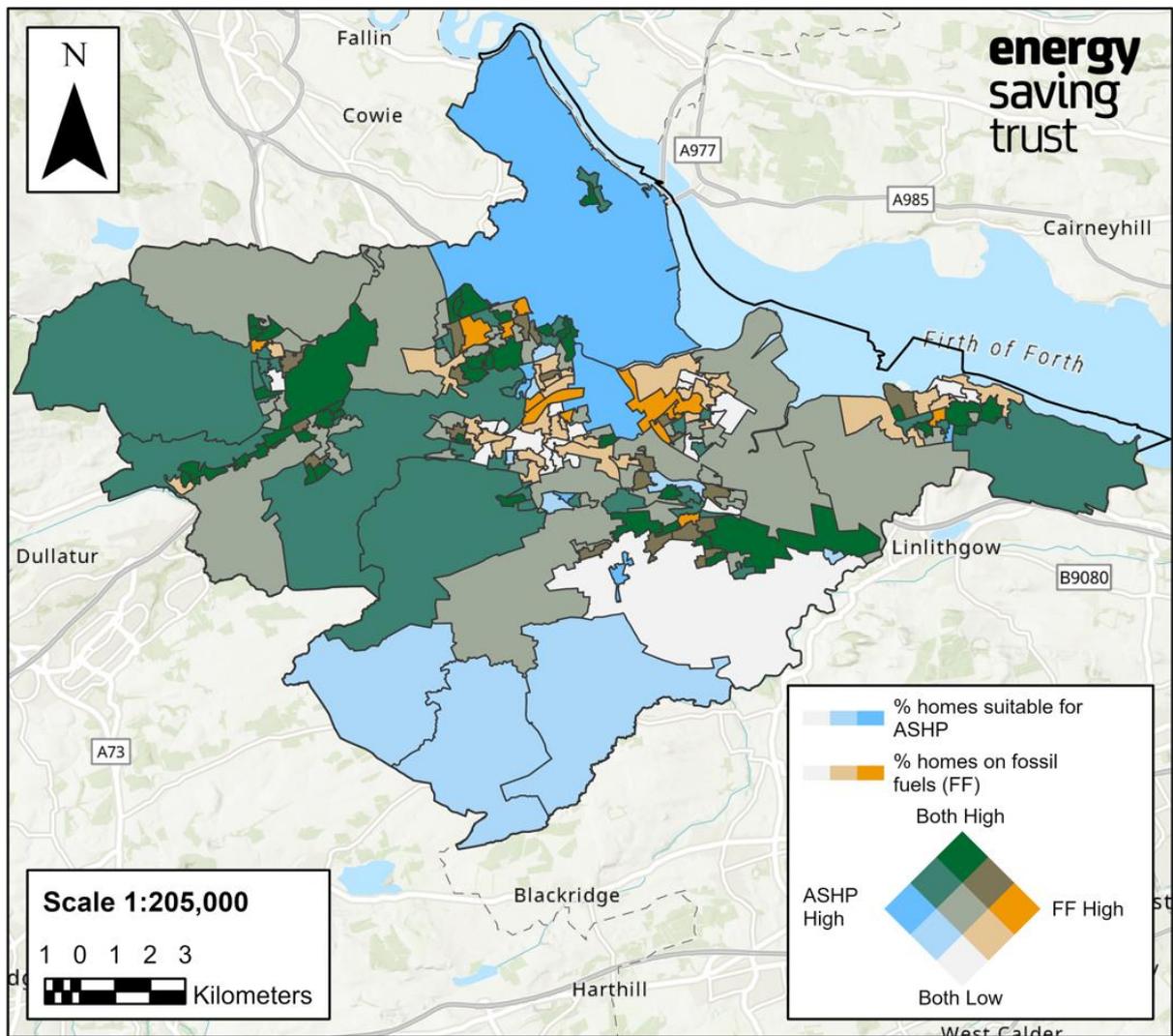


Figure 26: ASHP, EST Mapping 2023

8.3 Zoning Overview

This section will outline intervention potential for each zone, outlining any previous or ongoing projects.

8.3.1 Falkirk Grahamston

Falkirk Grahamston Zone is in central Falkirk, a residential area with 78% of domestic properties connected to the gas grid. Previous assessment showed the need for improved energy efficiency in this area. Figure 26 shows that this area is not yet suitable for ASHP intervention, it is concluded that this is due to a large proportion of properties being of solid wall construction and being uninsulated (Figure 28). The zone overview (figure 27) highlights that this zone is in the top quartile for fuel poverty and is performing very poorly compared to the local authority average. This overview confirms that 53% of properties have uninsulated walls and 54% have EPC D-G. Only 6% of

properties here are local authority, with 52% being owner occupied. Therefore, further investigation into a fabric first approach would be recommended for this zone.

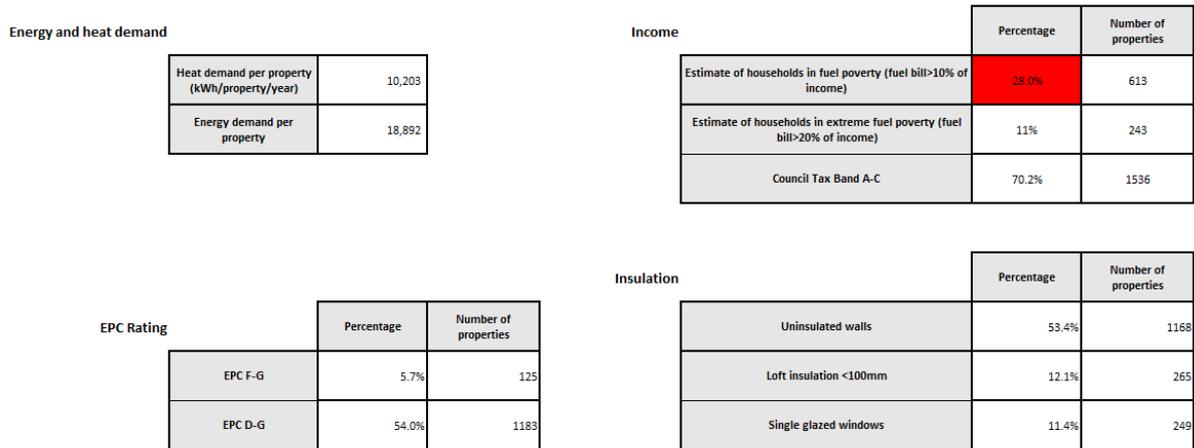


Figure 27: Summary domestic overview of Falkirk Grahamston, Baseline tool 2023.

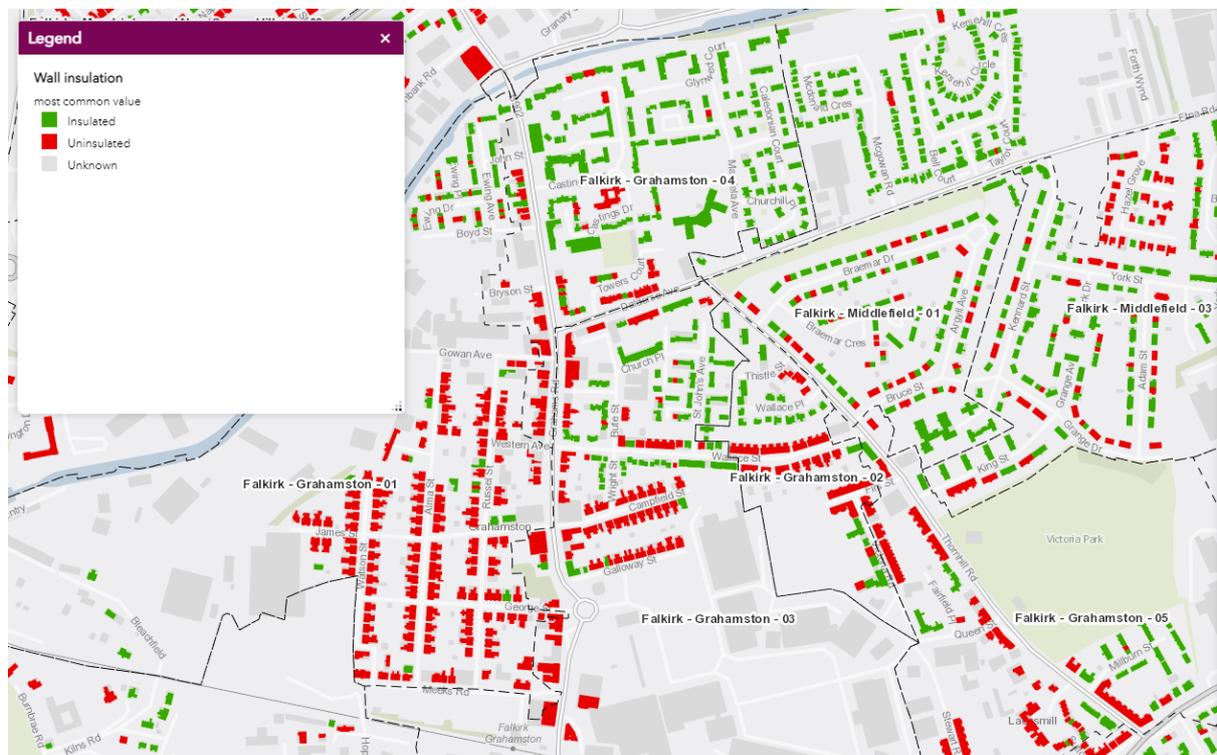


Figure 27: Wall Insulation, Falkirk Grahamston (Home Analytics, 2023)

Figure 28 highlights that these properties that are shown in red are of solid stone construction, and are uninsulated, are also mainly owner occupied. Therefore, intervention here will be difficult. Communication, advice, and access to funding opportunities will be essential for this zone to improve. Due to this area being mainly of solid stone construction, ASHP intervention may not be successful. Additionally, a lot of these properties are on flat construction, making the fixing of ASHP units difficult. Therefore, a district heating network could be of use here.

In terms of district heat networks in this zone, the largest potential heat network outlines in section 8.1.4. is located within 50m of the Falkirk Grahamston Zone. The 2021/2022 LDP Housing Land Audit

highlights several future projects going ahead in this area, these range from local authority, NHS health board and private developers. These new projects should be considered when further assessing any future heat networks here.

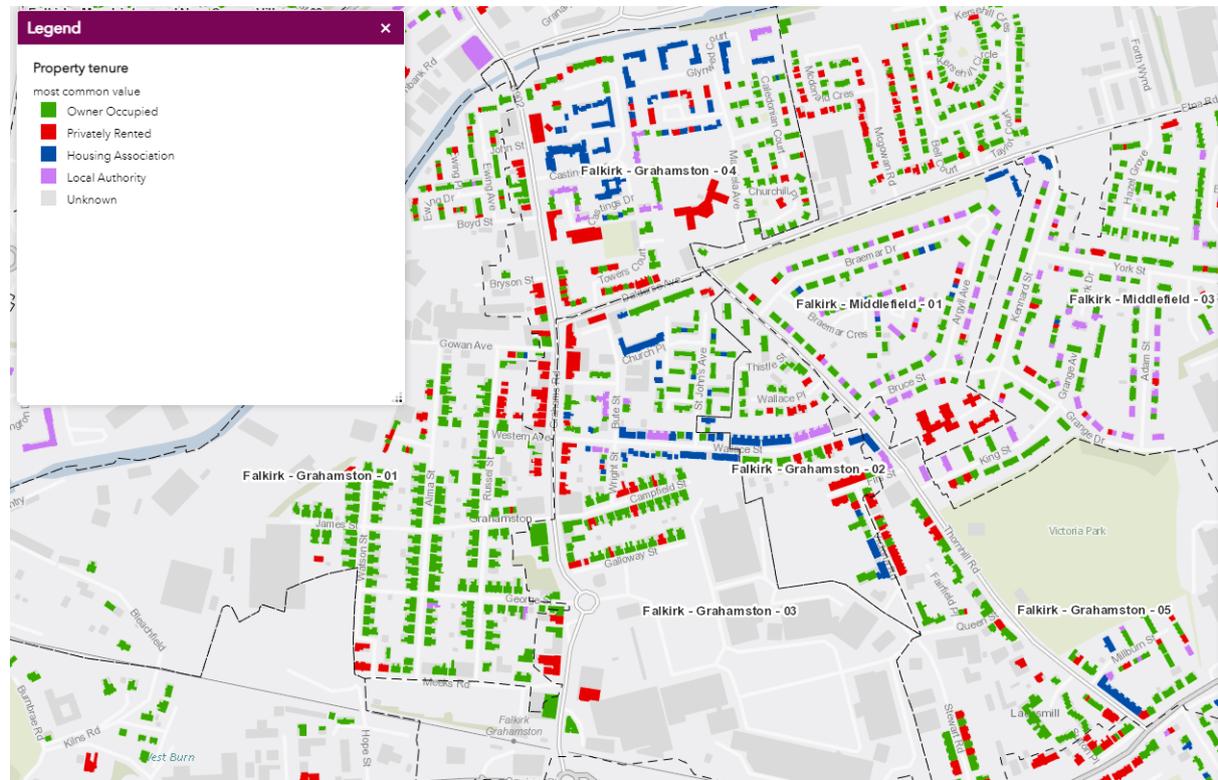


Figure 28: Property tenure, Falkirk Grahamston (Home Analytics, 2023)

There is already a CHP heat network situated in Callendar Park, south of Falkirk Grahamston. There is work ongoing to make this a low carbon heat source and then potentially extending this up into the Falkirk town centre. The summary overview in figure 27 shows that the average heat demand here is 10,203 (KWh/property/year), couple with this being part of the largest potential heat zone in Falkirk, his area has high potential for success. Further details will be outlined in the LHEES Delivery Plan.

8.3.2 Bo'ness Kinneil

Bo'ness Kinneil is a community located east within the Falkirk Council boundary, by the Firth of Forth. A large proportion of this community is on the gas grid and energy efficiency indicators are not as poor as Falkirk Grahamston, however, could still be improved. Figure 26 highlights that this area may also not be suitable for ASHP intervention. However, when we look closer at the building level intervention, figure 27 shows that there is mix of tenures, with more local authority owned properties. The data shows that that these properties are well insulated (both loft and wall), and therefore could be suitable for a heat pump project. The properties with no wall insulation and mostly owner occupied, making intervention more difficult as outlined above.

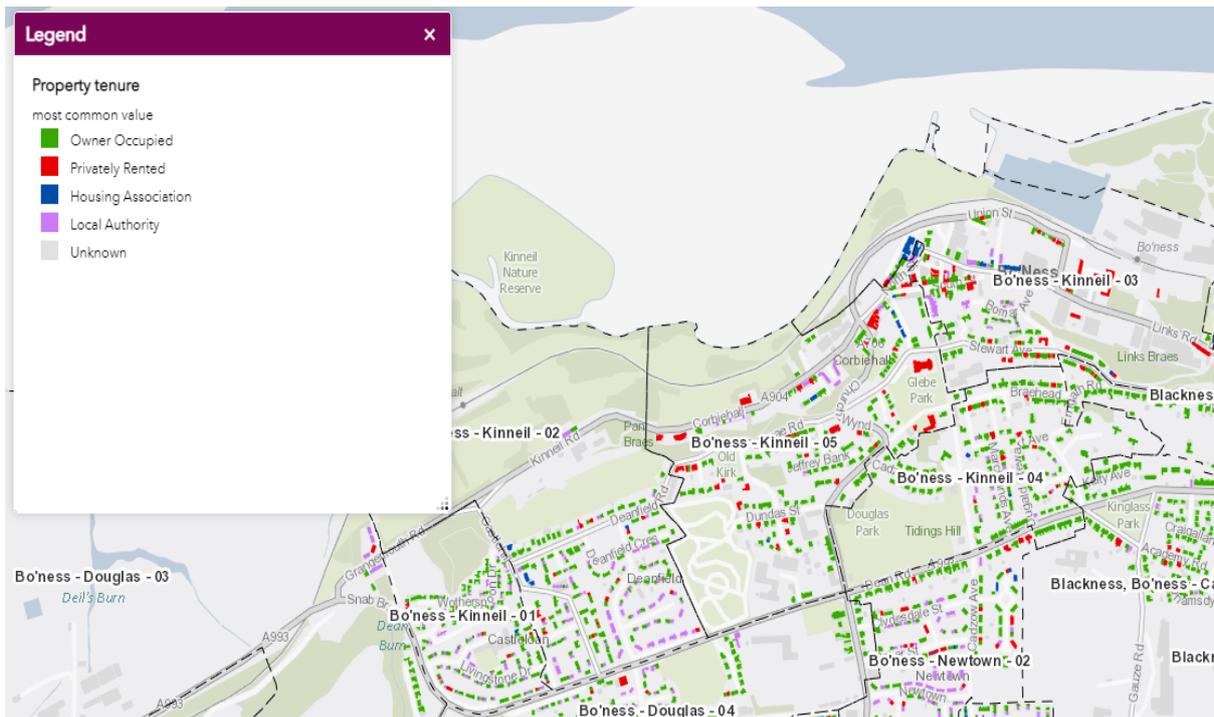


Figure 29: Property tenure, Bo'ness Kinneil. (Home Analytics, 2023)

There are several potential anchor-loads nearby this area, Bo'ness Community Hospital is a potential Anchor load within this zone and could be used to heat and power the properties within this area. The 2021/2022 LDP Housing Land Audit highlights several future projects going ahead in this area, these are mainly large housing developments from private developer including Persimmon. These new projects should be considered when further assessing any future heat networks here.

8.3.3 Braes Villages

Braes Villages differs from the previous zones as this zone has only 1% of properties connected to the gas grid. It is worth noting that Falkirk Council installed gas central heating in 767 homes in the Slamannan, Avonbridge, California and Whitecross areas in June 2022. These areas are more rural compared with other communities in Falkirk and as highlighted in figure 31, 31% of households are in fuel poverty, this is the highest level for Falkirk. As concluded in section 7, the high level of electric heat could be the reason for such a high level of fuel poverty. We also know that many local authority homes have been insulated, however there is a high percentage of properties in this area that are uninsulated. Additionally, from the heat network assessment, there are no viable anchor loads in the area. Therefore, heat pump retrofit, as reflected in figure 30, will be the best option in this zone, crucially, with a fabric first approach and accompanied with solar PV to assist with costs.

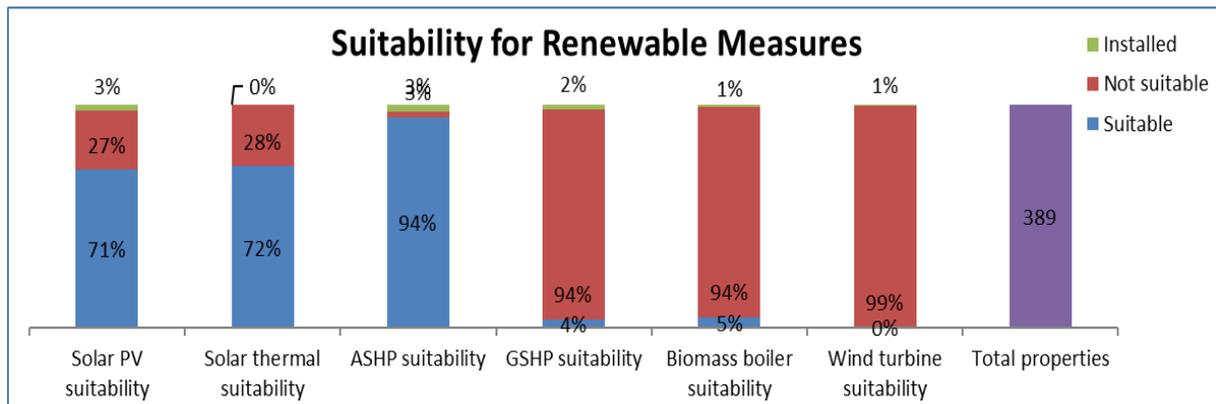


Figure 30: Suitability for renewable Measures Braes Villages, Baeline Tool, 2023

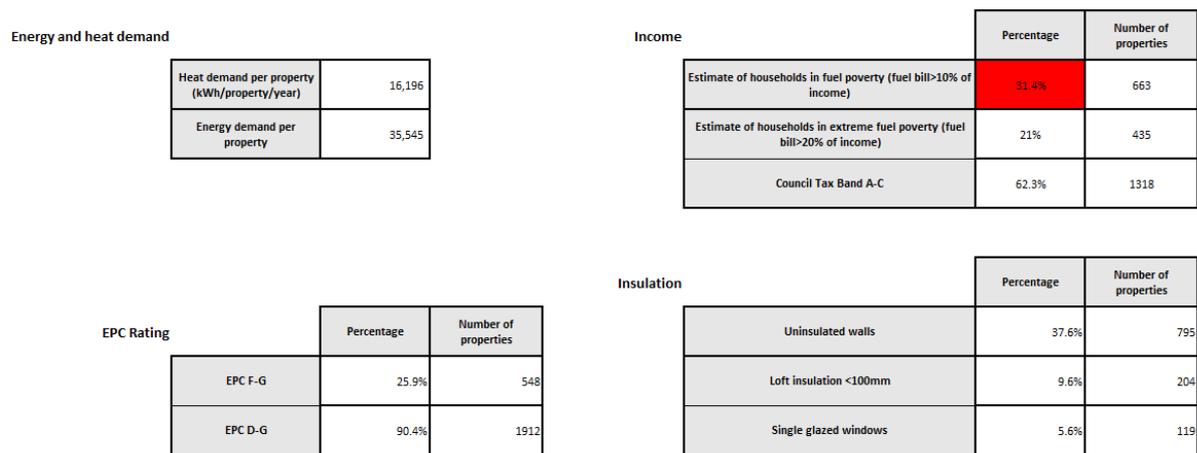


Figure 31: Summary domestic overview of Bo'ness Kinneil, Baseline tool 2023.

As discussed previously, the Upper section of the Braes villages has been highlighted for 'fabric first' intervention. The majority of the local authority properties here are insulated, however those that are not, and other tenures have been highlighted for ABS intervention. Additional activity in this area is the proposed gas connection for another 700 homes. Senior civil servants have raised concerns over this new connected as it is conflicting with decarbonisation plans. Additionally, there is potential legislation coming into force to prevent these new connections. There have been 2 projects (phase 1 & 2), where ASHP and Solar PV have been offered to tenants as an alternative for gas. Community engagement was undertaken to increase uptake. Many tenants opted to have ASHP, and a phase 3 project will be going ahead to provide more tenants with this low carbon system. The gas connection for the remaining homes will begin work in October 2023.

Officers will continue to work to increase the uptake of ASHP in this area. Noting that all new gas boilers will be hydrogen ready.

9 Conclusion

Overall, several strategic zones with potential heat decarbonisation and energy efficiency intervention have been highlighted across the Falkirk area. When considering the Falkirk Council area, Falkirk Grahamston, Bo'ness Kinneil and Braes Villages have been highlighted for high levels of poor energy efficiency, high level of fuel poverty and each zone has a range of possibility for retrofit. For the Falkirk Council owned domestic properties, the top areas for poor levels of energy efficiency were Falkirk North, Grangemouth, and Upper Braes. These areas will be of focus throughout future HEEPS ABS work.

This strategy has outlined the potential for a range of decarbonisation intervention across the council area. Heat Networks, ASHP retrofit and fabric improvements being the key drivers for decarbonisation. The area surrounding Falkirk Grahamston is urban and poses a suitable opportunity for a heat network. As outlined within the accompanying Delivery Plan, potential extension of the current heat network at Callander Park could reach the Falkirk Grahamston area. Bo'ness Kinneil has more opportunities for intervention. The strategy findings highlight the possibility of an ASHP project in the area as there are pockets with good levels of insulation. Additionally, there are options for a heat network in this area, using local infrastructure and the possibility of tapping into mine water heat or sewage heat. The Brae's villages are mainly rural and therefore a heat network will not be suitable. Expansion of the current ASHP work going on here will pose as most beneficial.

The accompanying Delivery Plan will outline all projects, both current and future, that will assist Falkirk Council in decarbonising heat and reaching crucial carbon emission targets. Several of the projects within the Delivery Plan reflect the findings found within this Strategy and include projects relating to ASHP retrofit, heat networks and the potential for tapping into mine water and sewage. Even with these projects in place, Falkirk Council has a long way to go to reach Net Zero carbon emissions from buildings. The Strategy and Delivery Plan will be updated every 5 years to reflect this, and we will continue to assess our building stock to kickstart relevant decarbonisation projects.

10 References

Heat Network Support, 2023. 'Heat Networks in Scotland'. Available Online at [Heat Networks in Scotland - Heat Network Support Unit](#) (Last Accessed 24/03/23).

IEA, 2023. 'Energy efficiency: The first fuel of a sustainable global energy system' Available Online at [Energy efficiency – Topics - IEA](#) (last Accessed 24/03/23)

National Grid, 2023. 'Contribution to Decarbonisation) Available Online at [Contribution to decarbonisation | National Grid ET](#) (Last Accessed 24/03/23)

Scottish Energy Grants, 2018. 'Free cavity wall insulation for electric heated properties' Available Online at [Free Cavity Wall Insulation - Electric Heated Homes - Insulation Grants \(scottishenergygrants.co.uk\)](#) (Last Accessed 24/03/23)

Scottish Government, 2021. 'Heat in Buildings Summary Document' Available Online [Heat in Buildings Strategy - Summary document \(www.gov.scot\)](#) (Last Accessed 24/03/23)

Scottish Government, 2021. 'Heat Network Scotland Act' Available Online at <https://www.legislation.gov.uk/asp/2021/9/2021-03-31> (Last Accessed 24/03/23)

SGN, 2023. 'RWE and SGN announce green hydrogen partnership for domestic heat in Scotland' Available Online at [RWE and SGN announce green hydrogen partnership for domestic heat in Scotland | SGN Your gas. Our network.](#) (Last Accessed 20/03/23)

Scottish Government, 2021. 'Tackling Fuel Poverty in Scotland'. Available Online [Tackling Fuel Poverty in Scotland: A Strategic Approach \(www.gov.scot\)](#) (Last Accessed 24/03/23)

UKRI, 2023. 'The Greenhouse Effect'. Available online at [The greenhouse effect - British Geological Survey \(bgs.ac.uk\)](#) (Last Accessed 24/03/23)

11 Appendices

11.1 Community Engagement Plan

Dates	Project Activity	Objectives	Communications Activity
January 2022	First LHEES Implementation Group	Bring internal stakeholders together to discuss LHEES	Presentation outlining LHEES structure and outcomes. Also discussed the importance of communication between teams.
February 2022	Landlord Forum	Provide Registered Landlords with a detailed overview of LHEES Allow landlords to ask any questions	Presentation
March 2022	LHEES Implementation Group Meeting (This group is now called the Energy management Monitoring Group)	Bring internal stakeholders together to discuss LHEES	Teams meeting, small presentation and time for questions/updates for each team
June 2022	Begin Creation of LHEES Engagement tool	Educate and involve public with LHEES decision making	Interactive map of the Falkirk area in place to communicate obligations and considerations surrounding LHEES. We are also considering a living drawing which would explain why we would need to decarbonise heat in buildings.
June 2022	RSL Consultation	Find out how much RSL's new about LHEES, their awareness and their plans surrounding decarbonisation.	Open worded questionnaire of 4-5 questions.
July/August/September 2022	Public Consultation, attending a number of events. Questionnaire.	Educate and involve public with LHEES decision making	'Decarbonise Falkirk' is the name of Falkirk's LHEES community engagement campaign. The LHEES lead and officers from the Energy & Climate Change team attended a number of events to engage with the public directly concerning LHEES. Leaflets and branded merchandise were distributed around Falkirk, sharing information on LHEES, energy saving tips and leading people to a short survey.
October 2022	Internal Stakeholder Updates	Information sharing	1-1 teams calls with relevant teams. Presentation
November 2022	Energy Efficiency Fund Launch	Engage with businesses and encourage update of low carbon heat/energy efficiency fabric etc	Information shared through newsletters and social media. One to one discussions with those interested in the scheme.
January 2023	LHEES Tool Launch	Information sharing with all stakeholders. Pointing stakeholders to funding opportunities and relevant advice.	Team worked with an external company called Crunchy Carrots to produce an external engagement tool to assist with stakeholder communication obligations surrounding carbon reduction of heat in domestic and non-domestic buildings
February 2023	Tenant Talk Article	Information sharing with local authority tenants	Passage in the tenant talk article describing LHEES and it's purpose and how people could save energy.
February 2023	Landlord Engagement	Information sharing with landlords to make them aware of LHEES commitments.	Passage in the Landlord newsletter explaining LHEES and it's purpose, focusing on it's impact on private landlords.
May/June 2023	Public consultation	Educate and involve public with LHEES decision making	'Decarbonise Falkirk' is the name of Falkirk's LHEES community engagement campaign. The LHEES lead and officers from the Energy & Climate Change team attended a number of events to engage with the public directly concerning LHEES. Leaflets and branded merchandise were distributed around Falkirk, sharing information on LHEES,

11. 2 Stakeholder Mapping Table Example

INTERNAL STAKEHOLDERS							
Team	Priority	Power	Interest	Notes	Action	Existing Documents	
Council Management Team	1	High	High	To secure funding for Infrastructure and grow the local economy of Falkirk and Grangemouth. Improved job and life prospects for Falkirk's Citizens. Through LHEES we will require Leadership (Political), Local Development Expertise and Political Will	Keep Informed		
Elected Members	1	High	High		Keep Informed		
Asset and Investment	1	High	High	Overview: The asset (stock) and investment (money) team focus mainly on the tenanted stock, making sure that the housing is meeting standards for EESH. They create programmes as part of the capital programme for improvements etc. The team assesses housing issues and demand in the Falkirk Area by managing the council's new build housing programme and maintaining the current housing stock. Carole is specifically working in energy efficiency, mainly with owner occupiers looking for insulation through HEEPS: ABS. LHEES Specific: Is ASHP an options then mass education is needed as working at an ambient temperature is different for people. A big issue is the pre-war stock as bringing them up to <u>standard</u> (EPC B) will be difficult – often tenants refuse or can't afford.	Engage Regularly	<p>LHS - Local Housing Strategy 2017 - 2022 (falkirk.gov.uk)</p> <p>EESH: Home energy and fuel poverty: Energy efficiency in social housing - gov.scot (www.gov.scot)</p> <p>SHIP- Policies & strategies - Local Housing Strategy Falkirk Council</p>	
Strategy & Development	1	High	Medium	The strategy and performance team takes more of a broader view compared to the asset and investment team. The focus is mostly on the private sector stock looking at the Local Development Plan. They also consider RSLs, social housing and shared equity properties. Susan specifically works with the affordable housing plan and Natalie works with the private sector properties. LHEES Specific: Firstly interested in Housing associations and what they will have to do. A lot of talk about possibilities. It is worth noting that HA have stricter policy and often more funding, so often they are ahead of the curve in relation to energy efficiency. Registered social landlords (RSLs, social housing and shared equity properties are all within the scope.	Engage Regularly	<p>LHS - Local Housing Strategy 2017 - 2022 (falkirk.gov.uk)</p> <p>EESH: Home energy and fuel poverty: Energy efficiency in social housing - gov.scot (www.gov.scot)</p> <p>SHIP- Policies & strategies - Local Housing Strategy Falkirk Council</p>	
Economic Development	2	Medium	High	Overview: Laura works with both the council internally regarding economic development and external through the Falkirk Investment zone which is a partnership with the council. Focuses include Tax Incremental Financing Scheme (TIF) and the Growth Deal. The team are working with a roadmap for the next 10 years. It will help us measure progress and it will provide the tools to help achieve the growth in businesses, jobs and prosperity required to meet the aspirations of the local community. Development of sustainable business and energy efficiency processes. Promotion of new renewable energy infrastructure generation capacity and supply. Ensure the council has leadership on net zero to become a 'Greener, Smarter, More Sustainable Falkirk' LHEES Specific: Would like an understanding of what the council is <u>actually doing</u> . Economic development have a lot of power. Would like us to show political will and management support. Leadership and information at this stage.	Keep informed	<p>Business plan - viewSelectedDocument.asp (falkirk.gov.uk)</p>	
Development Planning	1	High	High	Sets out planning policies guiding future development across the Council area. It indicates how our town centres and greenspaces should develop, and how our natural and historic environment should be protected and enhanced. Energy & Climate change have their own section with the focus being the move towards a low carbon economy. The use of low carbon energy and heat is deemed as 'necessary' within the LDP2 report. The team focus on new and potential developments and <u>landuse</u> . Do a lot of planning for potential district eating in new developments but no so much retrofitting. They look at a mixture of housing and business developments – each have requirements through the Climate Change Act for net zero and this is <u>really well</u> established but hard to monitor. Thoughts on LHEES: the team are very interested and keen to be involved. Currently they feel as though they don't have much power over developers, guidance policy is a bit poor/wishy-washy so not much is happening. There is potential for low carbon heat but the team need a robust framework that is	Engage Regularly	<p>LDP2 - Falkirk Local Development Plan 2</p> <p>NPF4 - Policy paper overview: National Planning Policy Framework - GOV.UK (www.gov.uk)</p>	
<p>Priority 1: Core project stakeholder, can make key project decisions, can affect outcomes of key project decisions</p> <p>Priority 2: Involvement with project, consulted on <u>case by case</u> basis, would not affect key project decisions</p> <p>Priority 3: Minimal input into the project, would not affect nor make key project decisions</p>							

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- Spend less time in the shower - Keeping your shower time to just 4 minutes could save a typical household £70 a year on their energy bills.

FURTHER INFORMATION: WWW.HOMEENERGYSCOTLAND.ORG