Inverclyde Council

Local Heat and Energy Efficiency Strategy

April 2024

Local Heat & Energy Efficiency Strategy

Contents

Rev	Status	Originator	Approved	Date
1.0	Public Consultation	R. Smith	H. Waheed	01 February 2024
1.1	Updated from public consultation	R. Smith	H. Waheed	23 April 2024

1 Foreword

Inverclyde Council is delighted to introduce the first iteration of the Local Heat and Energy Efficiency Strategy (LHEES). This Strategy underpins the place-based approach to improving the energy efficiency and decarbonising the heat supply of all of Inverclyde.

The Strategy addresses the changes required to Inverclyde's buildings and infrastructure, including all domestic and non-domestic buildings, setting out how these works could be coordinated and undertaken to progress and achieve Scotland's Net Zero target. The Strategy will help steer interventions over the coming years aimed at making buildings in Inverclyde more energy efficient and migrating the heating of buildings away from fossil fuel-based solutions such as gas boilers to zero direct emissions solutions such as heat pumps and heat networks.

It is important to highlight how challenging these targets are, with nearly 90% of homes in Inverclyde connected to the gas grid. This will require large-scale activity from both the public and private sector, alongside commitment of significant resources. We aim to encourage and support businesses, owner/occupiers and wider partners throughout Inverclyde to join the journey to reduce emissions in line with wider net zero targets. This Strategy is being published at a time of great change, with the Heat in Buildings Strategy published in 2021, the Heat in Buildings Bill published in 2023, and the new Social Housing Net Zero standard out for consultation. Alongside this, funding mechanisms for retrofit and energy tariffs for both gas and electricity are all currently under review. These all spell major changes to the way we heat our homes and businesses, and this LHEES positions Inverclyde to not only adapt but take advantage of these shifts.

This Strategy is published in a challenging financial landscape, which is expected to continue, already resulting in 30% of Inverclyde's households considered to be fuel poor. As such, this document places the ambition to eliminating poor energy efficiency as a driver for fuel poverty front and centre.

The accompanying Delivery Plan for 2024 – 2028 has been prepared in conjunction with this Strategy. This proposes heat network zoning opportunities across Inverclyde, recognising the immense potential of building the next generation of infrastructure that brings jobs, investment, and skills to Inverclyde as well as drives decarbonisation at scale. Heat networks will also provide the benefit of reducing impact of volatile energy prices on residents and businesses, if we deliver these well. The Deliver Plan also highlights retrofitting delivery area opportunities of three different types. Firstly, areas with high prevalence of fuel poverty to focus energy efficiency improvement activity and funding to reduce bills. Secondly, areas with high fuel poverty where there is potential to undertake energy efficiency improvements as well as install heat pumps to decarbonise their fuel supply. Thirdly, areas with the potential for widespread roll-out of heat pumps to decarbonise the heat supply of homes at scale.

The council looks forward to working with many stakeholders to enable the delivery of the LHEES to reach net zero, tackle fuel poverty and, in doing so, bring many benefits to the area and its residents and businesses.

2 Executive Summary

This document is the Local Heat and Energy Strategy (LHEES) for Inverclyde Council, a place-based and locally led strategy covering the following aims:

- Improving the energy efficiency and decarbonising the heat supply of all of Inverclyde
- Reducing inequality by eliminating poor energy efficiency as a driver for fuel poverty.

These two aims are guided by the priority of a just transition to net zero in Inverclyde. This strategy will play a crucial role in helping the Council meet its 2045 Net Zero target. It addresses the changes required to Inverclyde's buildings and infrastructure, including all domestic and non-domestic buildings. Due to this, it is not just a plan for the Council but one shared by all owners and occupiers of buildings in Inverclyde, and these changes will be delivered by all of these people.

The Inverclyde LHEES has been prepared in line with the LHEES Guidance issued by the Scottish Government and LHEES methodology documents issued by Zero Waste Scotland. The methodology for preparing this LHEES covers:

- Setting out the necessary changes for each segment of Inverclyde's building stock to enable net zero carbon by 2045.
- Identifying strategic zones for decarbonisation of heat within Inverclyde, and setting out the pathway, and principal measures for reducing buildings emissions within each zone.
- Prioritising delivery areas for building-level energy efficiency measures and, where applicable, heat networks and communal heating systems.

Given that the LHEES affects everyone within Inverclyde, it is imperative to continue engagement with stakeholders such as Registered Social Landlords (RSLs), NHS, etc. The Council has taken steps throughout the drafting of this LHEES, including public consultation, to allow input and feedback on proposals.

Through analysis of the area, the LHEES found that Inverclyde has just over 40,000 homes, of which 92% have an EPC between C and E representing mass opportunity for improvement. Additionally, 28% of households are in fuel poverty showing the stark reality and need for improvements. There is known to be more than 2,400 non-domestic properties in Inverclyde however there is a lack of data in the sector, with many unknowns meaning few analyses can be undertaken.

The strategy aligns to national policies set out by Scottish Government as well as focussing on local priorities in Inverclyde; **maximise the potential for heat networks** and **addressing fuel poverty**.

Highlighted here are the highest indication of **fuel poverty** in Inverclyde, hence will be the focus of Inverclyde's retrofit journey through collaboration with the numerous RSLs in the area.

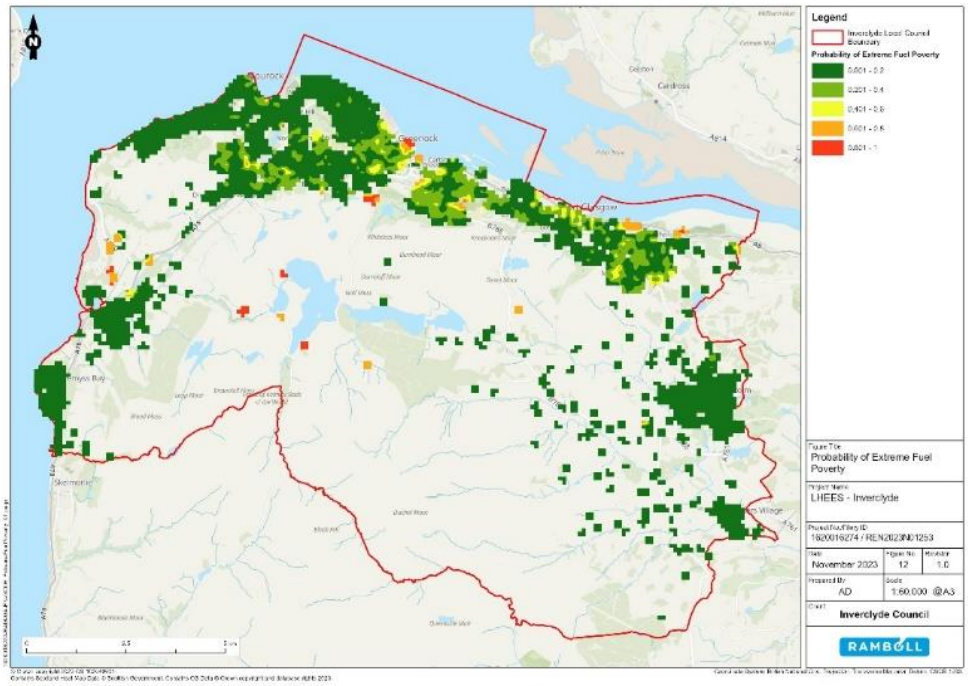

Figure 1 – Areas with a probability of high prevalence of Fuel Poverty

Due to the proximity of Inverclyde properties around the coast, there is significant opportunity for **heat networks**, recognising topography constraints. Shown left is the vast opportunity to install a 'heat highway' across most of the Inverclyde area.

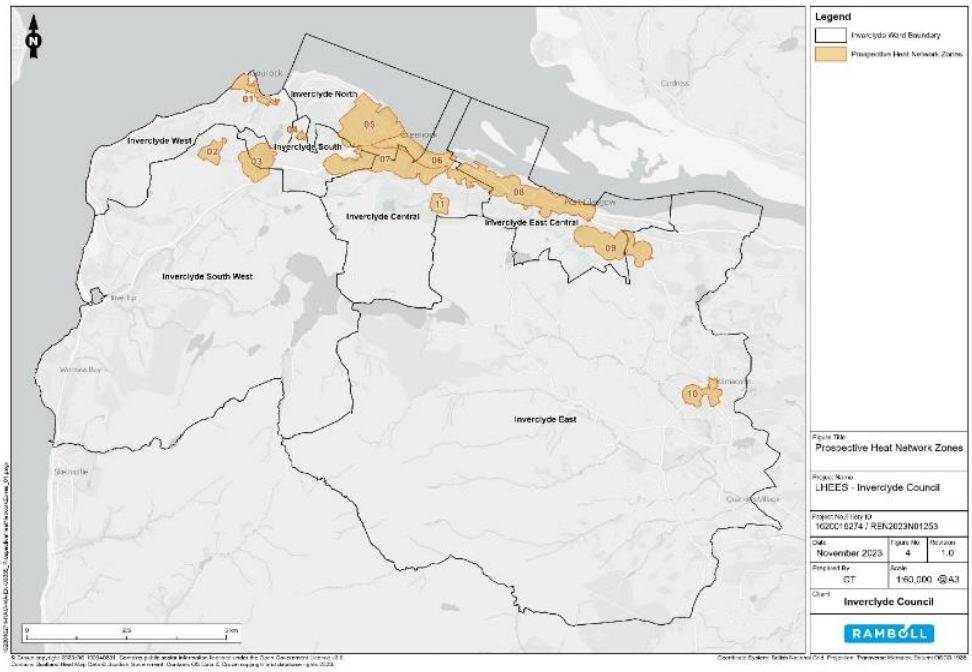

Figure 2 - Prospective Heat Network Zones

Inverclyde Council

3 Introduction

Setting the Scene

Net zero

During the United Nations Climate Change Conference (COP21), the global community, including the UK, reached a consensus under the 'UN Paris Agreement' to limit the global temperature rise to 2°C by the end of the century, striving to limit it further to 1.5°C. As the impacts of climate change became increasingly apparent through droughts, flooding, and intense weather events, the Scottish Government declared a climate emergency in 2019 and amended the Climate Change (Scotland) Act 2009, setting a target for Scotland to achieve 'net zero' greenhouse gas emissions by 2045. This goal includes an interim target of reducing emissions by 75% from 1990 levels by 2030. For the buildings sector, a critical area for decarbonisation, an interim target of 67% emissions reduction by 2030 is set. The pathway to achieve these objectives has been defined in the Scottish Government's Heat in Buildings Strategy and current Heating in Buildings Bill as well as the Heat Networks (Scotland) Act 2021. The Heat in Buildings Bills is at the forefront of this initiative, aiming to decarbonise heat supplied to over one million homes and approximately 50,000 non-domestic buildings on the gas network by 2030, as part of the journey to reach net-zero by 2045.

This ambitious target is recognised by Inverclyde, where efforts are underway to align with these national objectives. The council is actively working towards improving energy efficiency of domestic properties and transitioning to renewable energy sources as key steps in reducing the region's carbon footprint. These efforts are crucial for meeting both the national net zero target and Inverclyde's own sustainability goals.

Fuel Poverty

Fuel poverty is a significant concern in Scotland, with the 2019 Fuel Poverty (Targets, Definition and Strategy) (Scotland) Act setting ambitious targets for its reduction. In Scotland, fuel poverty is defined as households spending more than 10% of their income on fuel costs, where the remaining income is insufficient for an adequate standard of living. The Act aims to reduce the number of households in fuel poverty to no more than 5% and those in extreme fuel poverty to no more than 1% by 2040. In Inverclyde, addressing fuel poverty is intertwined with the drive for energy efficiency, as many homes lack adequate insulation, leading to higher energy consumption and costs.

Inverclyde Council is proactively participating in these national objectives through this Local Heat and Energy Efficiency Strategy (LHEES), which serves as a comprehensive long-term strategic plan to reduce energy needs and achieve heat decarbonisation for all buildings in the area. This aligns with the targeted area-based approach central to the Heat in Buildings Strategy and Bill, ensuring that local efforts are coherent with and contribute to Scotland's overarching goal of a net-zero nation by 2045.

Need for LHEES

LHEES Overview

This document is the Local Heat and Energy Strategy (LHEES) for Inverclyde. This and the accompanying Local Heat and Energy Efficiency Delivery Plan has been prepared in response to the Local Heat and Energy Efficiency Strategies (Scotland) Order 2022. This Order states that all Scottish local authorities are to publish an LHEES and an accompanying 5-year Delivery Plan in line with Guidance issued by the Scottish Government and thereafter update these documents every five years. This LHEES is a place-based and locally led strategy for Inverclyde covering the following aims:

- improving the energy efficiency of buildings
- decarbonising the heat supply of buildings via individual property-level, communal and district heating systems
- eliminating poor energy efficiency as a driver for fuel poverty

The LHEES is an area-wide approach, meaning it addresses all buildings in the Inverclyde area, not just the Council's own building stock. It covers all homes (whether owned by private landlords, owner-occupiers, or social landlords) and all non-domestic buildings (whether owned by the Council, other public bodies, businesses, or other bodies). The LHEES is not just a plan for the Council but one shared by all owners and occupiers of Inverclyde's buildings, and thus will be delivered by all of these people.

The scale of the challenge should not be underestimated. Achieving these goals will require greatly increasing the pace of deployment of energy efficiency measures, zero emissions heating systems and heat networks. The Scottish Government's Heat in Buildings Strategy has estimated that approximately £33 billion will need to be invested in transforming homes and buildings by 2045 to achieve Scotland's net zero target[1]. As an indication of the scale, Inverclyde has approximately 1.5% of Scotland's homes (~40,000 of 2.5 million). On a pro rata basis, this would indicate that roughly £500 million of investment is needed to transform Inverclyde's homes and buildings. This estimate represents the investment that all of Inverclyde's property owners will collectively need to make. Alongside public grants and loans, investments of this scale will necessitate a role for private capital which home and building owners can easily access to decarbonise their properties. Private capital will also play a pivotal role in the roll out of a large heat network across Inverclyde.

Through this LHEES, the Council has focused its resources on three roles:

- Targeting the currently limited funding on areas with the highest occurrence of fuel poverty.
- Decarbonising Council-owned building stock in line with national timescales.
- Supporting wider decarbonisation of Inverclyde within the funding and resources that are made available to the Council, beginning with a focus on facilitating a town-wide heat network.

Achieving the ambitions of LHEES will require partnership working across the public, private and third sectors. As such, the LHEES has been developed with input from key stakeholders and has been subject to an open public consultation. Through these engagements, the Council has sought to establish a foundation for area-wide joint action. The LHEES presents an opportunity for a holistic approach at the intersection of multiple policy areas. Inverclyde can capitalise on benefits wider than just net zero and fuel poverty, including economic growth, green employment and skills, just transition, and the development of a clean heat and retrofit supply chain benefitting owners across all tenures.

LHEES Scope & Structure

Scotland's homes and non-domestic buildings collectively account for approximately 20% of national emissions. Transforming our country's stock is a large, complex and multigenerational challenge which will require time and resources. The Council has been working in this area for over a decade, especially through its Area-Based Scheme funding for fuel poor homes, and this LHEES is a milestone which will set the agenda for the coming two decades to the net zero deadline in 2045. While we celebrate the success we have achieved thus far, we also recognise the better part of the

[1] The Scottish Government (7 October 2021) Heat in Buildings Strategy - achieving net zero emissions in Scotland's buildings

work to decarbonise our built environment has yet to come. This LHEES makes its contribution but with the following limitations which the Council will attempt to address with partners in due course:

- The datasets we use to understand and plan our work represents complex and rapidly shifting real circumstances. This can mean that sometimes the data available has gone out of date or is incomplete. The following have been the main limitations:
  - Fuel poverty and extreme fuel poverty have arisen to become acute and evolving issues at a national scale following the cost-of-living crisis, but the data is not entirely up to date with some of these major shifts.
  - Only 16% of Scotland's non-domestic buildings have an Energy Performance Certificate (EPC) and there is not a large amount that can be done with this partial dataset. Due to a lack of information, it has been difficult to plan decarbonisation pathways for non-domestic buildings in the way the council would have preferred.
- The LHEES covers a two-decade ambition to reach net zero which requires the Council to prioritise actions into shorter term goals. This version of the LHEES focuses on the immediate priorities and will evolve over time with updates as these priorities change.

This LHEES does not include plans for renewable generation opportunities such as solar farms, renewable potential for non-domestic properties, the deployment of other renewable, or electricity and heat storage options throughout the town centre. Furthermore, due to the limitations of the Council's resources, micro-grid systems, energy production strategies, and locally and communally-owned energy systems are not currently being reviewed by the Council. While out of the scope of the core LHEES Methodology, should the opportunity and resources be made available, the Council aspires to include this within future LHEES work. The delivery plan provides a strong basis for action for stakeholders, to help inform the selection of delivery areas and heat network proposals alongside insight into early, low regret measures for any possible quick wins to improve energy efficiency.

Improving the thermal efficiency of all segments of our built environment, in particular domestic properties, therefore holds compounded benefits. The imperative of tackling fuel poverty has become critical in the last three years. The impacts of recent global events have contributed to rising fuel costs for citizens with corresponding increases in fuel poverty rates. The current cost-of-living crisis, an umbrella term for the compounded impacts of these events, means that it is now essential that Inverclyde works to provide long term energy security through investment into local and net zero energy infrastructure.

Reflecting on successes, the Council's updated Net Zero Strategy helped create a shared internal acceptance that the council needs to act meaningfully, holistically, and most importantly – at pace. There is a target for Inverclyde to have a 73% reduction on emission from a 2012/13 baseline by 2030/31 and post 2030, Inverclyde will use innovation/partnership/collaboration activities to support the push to net zero with interim actions to ensure progress. While this Strategy focused mainly on the Council's own estate, it is an important lever to lead by example. Inverclyde has multiple policies where the issue of Climate Change has been addressed at the area-wide level. Inverclyde's Local Development Plan showcases the proactive policies including low and zero carbon energy generation technology alongside major development of the area's heat networks. Inverclyde Council is also updating the Local Housing Strategy to build on previous achievements. The council has invested £7.3 million in energy improvements work via Area-Based Schemes, supporting over 160 private homes per year to improve energy performance. Alongside housing improvements, the area has had an additional 742 renewable energy installations including solar PV, onshore wind and hydro. The progress made by Inverclyde to date will be incorporated and built upon during the implementation of this LHEES. Inverclyde's overarching climate strategy is

accompanied by an Action Plan which highlights area-wide priorities to drive net zero action across the local authority. This LHEES aligns to and supports this Action Plan.

4 LHEES Methodology

LHEES approach

The Council has produced the LHEES and Delivery Plan in line with the LHEES Guidance issued by the Scottish Government and LHEES Methodology issued by Zero Waste Scotland. Inverclyde would like to put emphasis on the fact this strategy is locally led therefore stakeholder feedback was paramount during the development of this LHEES.

The Guidance and Methodology outline eight stages to prepare the LHEES. The activity carried out in each stage is summarised in Table 1.

Stage	Tasks
Stage 1: Policy and strategy review	Identifying the national and local policies, targets, and strategies relating to the LHEES, as well as identifying resources and stakeholders key to the delivery of the LHEES.
Stage 2: Data and tools library	Identifying and maintaining a record of the data and tools required for the analysis underpinning the LHEES.
Stage 3: Strategic zoning and pathways	Assessing the present performance of Inverclyde's building stock in terms of energy efficiency and heat decarbonisation and setting out "Strategic Zones" and their decarbonisation pathways for each of the six LHEES considerations.
Stage 4: Generation of initial Delivery Area Opportunities	Setting out proposed "Delivery Areas" which are delivery-level projects for each of the LHEES considerations.
Stage 5: Building-level pathway assessment	Identifying detailed interventions to decarbonise buildings within each Delivery Area and quantifying the costs and benefits of these interventions.
Stage 6: Finalisation of delivery areas	Finalising the Delivery Areas identified at stage 4 based upon considerations such as existing programmes of work and priority areas for intervention.
Stage 7: LHEES Strategy	Assembling the outputs from Stages 1-6 into the LHEES itself – i.e. this document and its supporting materials.
Stage 8: LHEES Delivery Plan	Preparing a Delivery Plan setting out how the LHEES is to be implemented, with a focus on early, low-regrets actions over the first five years of the LHEES (2024 to 2028).

Table 1 - A summary of the eight stages of the LHEES Methodology

Consultation and engagement

As an area-wide plan which concerns everyone in Inverclyde, it is imperative that the LHEES has cross-stakeholder buy-in. While the LHEES is a data-driven and evidence-based strategy, it is also subject to interpretation and prioritisation which feed into the decisions taken. The Council has taken steps, including stakeholder workshops and continuous consultation with from stakeholders, as well as a public consultation, to ensure people can provide their input and feedback on proposals. This section describes the stakeholder consultation and engagement work undertaken to date.

Stage 1 – Policy and strategy review: Stage 1 saw internal engagement with Council staff to ensure all relevant policies were captured for alignment. In addition, this stage included a stakeholder mapping exercise which identified the key stakeholders to engage for each stage (e.g. for heat networks key stakeholders included Scottish Power Energy Networks (SPEN) and local housing associations such as River Clyde Homes among many others).

Stage 2 – Data and tools library: The Council identified and engaged with stakeholders responsible for datasets required to produce or add to the LHEES analysis. This primarily included Scottish Government (Scotland Heat Map); Energy Saving Trust (Home Analytics, Non-Domestic Analytics and PEAT data) and Scottish Power Energy Networks (Grid capacity data).

Stage 3 and 4 – Strategic zoning and generation of delivery areas: For stage 3 and 4 the Council invited numerous stakeholders to review the maps and other outputs in a workshop. Stakeholders helped to sense check emerging outputs and highlight any data that had been omitted, and to identify any indicators or areas that are considered to be strategically important for Inverclyde alongside challenges and opportunities, making use of crucial local knowledge. This workshop included inviting feedback on provisional heat network zones and building retrofit delivery areas where stakeholders advised on the scale of the ambition and fed back on boundaries of these.

Table 2 summarises the engagement activity which the Council led throughout the past year, following the LHEES Guidance which places emphasis on continuous stakeholder engagement. Overall, the public consultation and engagement form a key part of the methodology in that they provide the Council with wider input of ideas and critical feedback on plans before they are solidified.

Date	Tasks
November 2022	Discussions took place with staff across a number of services to discuss the development of Inverclyde's LHEES. Since November, many council teams have been consulted regularly.
August 2023	The Council conducted a survey of several key stakeholders such as housing association representatives, energy and utilities providers, public bodies and various local authority departments. The survey found that housing and estate stakeholders considered climate change in their operations and either had or were planning to develop net zero. All stakeholders were open to engaging and supporting the Council to feed into the LHEES, including to share energy consumption information.
October 2023	The Council ran a stakeholder engagement workshop with key stakeholders to showcase initial outputs. Attendees included housing

	associations representatives, energy and utilities providers and various local authority departments.
November 2023	The Council shared a pre-draft LHEES with key stakeholders following their attendance at the workshop to gain feedback and ensure all stakeholders have been considered within the LHEES
December 2023	The Council ran a stakeholder engagement session with local Registered Social Landlords (RSLs) to understand and consider key priority areas for the social housing in the Inverclyde LHEES.
December 2023	The Council submitted their draft LHEES to The Environment and Regeneration Committee for review, following which they submitted it to the Scottish Government to meet the statutory requirements of the LHEES Order.
January – April 2024	The Councils Environment and Regeneration Committee considered the submitted draft of the LHEES and public consultation. The public consultation stage lasted six weeks to ensure all feedback is captured.
Ongoing	The council are open to furthering engagement with the relevant stakeholder and parties that are directly and indirectly affected by the LHEES.

Table 2 - Key stakeholder engagement activities undertaken by the council throughout the past year.

Impact Assessments

The Council has considered it appropriate that the primary impact assessment relevant to this LHEES is the Equality Impact Assessment (EQIA). The EQIA is a legal requirement in Scotland, designed to systematically evaluate how proposed policies and regulations may impact equality and prevent discrimination. This assessment is particularly important when developing policies to ensure compliance with the Equality Act 2010, which mandates assessing the potential impact on different protected characteristics, such as age, gender, disability, race, and others, and making informed decisions to promote equality and prevent discrimination. Inverclyde Council prioritised the completion of this EQIA for this strategy which is attached in Appendix 1 – Equality Impact Assessment.

5 LHEES Context

LHEES Governance

This LHEES is a formal strategy of the Inverclyde Council in line with the Local Heat and Energy Efficiency Strategies (Scotland) Order 2022. The Inverclyde LHEES falls within the remit of the Council's Environment and Regeneration Committee. The Environment and Regeneration Committee will be responsible for the finalisation of the documents following consultation and subsequently hold overall responsibility for the delivery of the LHEES.

National Policy Landscape

The policy landscape for carbon reduction and energy efficiency in Scotland is complex with multiple relevant policies and rapidly evolving targets. National policies give rise to a series of ambitious goals around energy efficiency improvements and reductions in fuel poverty. These were all recorded and reviewed as part of "Stage 1: Policy and strategy review" to ensure the LHEES was aligned to national priorities. Table 3 summarises the primary policies among these which were central to LHEES development, and how they intersect with local policies.

Policy	Local Implication
Climate Change (Emissions Reduction Targets) (Scotland) Act 2019: Sets statutory targets for Scotland to achieve net-zero emissions by 2045, with interim reductions such as 75% by 2030.	**Inverclyde Net Zero Strategy 2021-2045:** Includes actions to drive the Council's estate to net zero such as identifying opportunities for lower emission alternatives to fossil fuel boilers (Action 2.8). **Net Zero 2022-2027 Action Plan**: Serving as an operational roadmap, this plan outlines specific actions for reducing greenhouse gas emissions within Inverclyde's operations. It supports the achievement of Scotland's interim target of a 75% reduction in emissions by 2030 through targeted local initiatives.
Climate Change Plan (2018, 2020): Outlines comprehensive policies for emissions reduction by 2032 across all sectors.	**Net Zero Action Plan 2022-2027**: Features actions such as identifying solar PV opportunities for public buildings (Action 2.7) and exploring lower emission heating alternatives (Action 2.8). **Local Housing Strategy 2023-2028**: Aims to improve housing conditions and energy efficiency to meet emission reduction targets.
Fuel Poverty (Targets, Definition and Strategy) (Scotland) Act 2019: Establishes targets for reducing fuel poverty in Scotland by 2040.	**Local Housing Strategy 2023-2028**: Addresses fuel poverty through housing condition improvements and energy efficiency initiatives; aims to reduce the overall energy demand and costs for residents, indirectly addressing one of the four drivers of fuel poverty —energy efficiency of the dwelling. **Net Zero Action Plan 2022-2027**: Includes measures for reducing household energy demands.
Heat in Buildings Bill (2023): Proposes updates and expansions to the	**Inverclyde Net Zero Strategy 2021-2045:** Supports the transition to non-polluting heating

existing framework to accelerate the roll-out of heat networks across the country. It includes a ban on polluting heating systems by 2045 and mandates minimum energy efficiency standards for homes by 2033 (owner-occupied) and 2028 (private rented homes), aiming to combat climate change and improve energy efficiency. **Heat in Buildings Strategy (2021)**: Aims for all buildings in Scotland to be energy efficient by 2035 and to use zero-emission heating and cooling systems by 2045. Aims for all buildings in Scotland to be energy efficient by 2035 and to use zero-emission heating and cooling systems by 2045. **Heat Networks (Scotland) Act 2021:** A framework for developing heat networks throughout Scotland and statutory target of heat networks supplying 2.6TWh of thermal energy by 2027 (equivalent to approx. 120,000 additional homes) and 6TWh by 2030 (equivalent to approx. 400,000 additional homes)	systems in line with the 2045 targets, while also aiming to meet the energy efficiency standards set for homes by the 2033/2028 deadlines. **Net Zero Action Plan 2022-2027**: Prioritizes enhancing building energy efficiency, including initiatives like solar PV installations (Action 2.7) and transitioning to renewable heating systems in public buildings (Action 2.8). **Local Housing Strategy 2023-2028**: implementation of retrofit programs and promoting the development of heat networks, which aligns with the Heat in Buildings Standard to enhance energy efficiency in homes by 2033/2028 and supports the expansion targets set by the Heat Networks (Scotland) Act 2021.

Table 3 - The key national policies and the local implication on Inverclyde polices.

Ongoing National Activity

It is imperative that the LHEES links to national plans and programmes led by the Scottish Government and other public bodies. This is important for many reasons, including statutory compliance, alignment with funding opportunities and contribution to national targets.

The Heat in Buildings Bill (2021) sets out how buildings in Scotland will be heated to meet greenhouse gas reduction targets whilst addressing fuel poverty. The Bill brings 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. The Bill follows the Heat in Buildings Strategy (2021) which sets out 107 actions and proposals that the Scottish Government will take to work towards target and aspirations. By 2030, over one million homes and over 50,000 non-domestic buildings are planned to convert to using zero or low emissions heating systems. The Bill takes forward these proposals, such as legislating the proposed a target for all public sector buildings in Scotland to have zero emission heating by 2038.

The Fuel Poverty (Targets, Definition and Strategy) (Scotland) Act 2019 establishes a revised definition of fuel poverty as well as setting statutory targets to be achieved by 2040: no more than 5% of households in Scotland in fuel poverty and no more than 1% of households in Scotland in extreme fuel poverty. Intermediary targets are also set for 2030 and 2035. The new definition of fuel poverty in Scotland is as follows: a household is in fuel poverty if the household's fuel costs (necessary to meet the requisite temperature and amount of hours as well as other reasonable fuel needs) are more than 10% of the household's adjusted net income and after deducting these fuel costs, benefits received for a care need or disability, childcare costs, the household's remaining income is not enough to maintain an acceptable standard of living.

The Heat Networks (Scotland) Act 2021 aims to encourage development of heat networks in Scotland through the introduction of a regulatory system. The Act, and the subsequent Heat Networks (Heat Network Zones and Building Assessment Reports) (Scotland) Regulations 2023, put in place regulations on heat networks, including introducing a consent and license regime; making provision for heat network zones and a permit system giving operators exclusivity; and giving licence-holders powers such as wayleaves. In particular, Building Assessment Reports (BARs) require all public sector organisations to report data to the council for all buildings above a certain annual heat demand threshold, including property type, ownership, heat details and additional details including building construction which will be considered when progressing plans. The Act aims to encourage consumer confidence through the improved regulatory system and ensure greater certainty for investors. The practical steps for implementing the regulatory regime and supporting the development of heat networks are outlined in the Scottish Government's Heat Networks Delivery Plan (2022).

The most recent Programme for Government (2022) sets out several actions linked to supporting heat and energy policy. Several targets are linked to reducing the effects of fuel poverty through financial support towards heating costs. This includes the £214 Child Winter Heating Assistance which supports families of severely disabled children and young people with their energy costs; the Winter Heating Payment which guarantees a £50 annual payment to around 400,000 low-income households; doubling the Fuel Insecurity Fund to £20 million to help households at risk of self-disconnection or self-rationing of energy use as the energy price cap rises from October; and expanding Home Energy Scotland advice centres. These will support LHEES by helping to reduce the impact of fuel poverty.

The Green Heat Finance Taskforce was established to build on the existing evidence to set out alternative methods of financing and funding heat decarbonisation. The taskforce has identified a suite of options for individual property owners to access funding for decarbonisation and retrofit. Part 1 of their report (2023) discusses various options including personal loans, green mortgages, equity release mechanisms, green leases/rental agreements, and property linked finance. The expansion of these products and services will be instrumental to the achievement of standards and meeting national targets.

The Council supports and awaits many of the above national actions, as without these the LHEES will only be partially effective. For example, without the appropriate standards, the Council is only able to encourage and inform homeowners and businesses to retrofit their properties after which it is their choice. Another example is that without widely available and easily accessible access to economically attractive finance, homes and businesses are unlikely to retrofit or be able to retrofit; the work of the Green Heat Finance Taskforce is required to unlock these avenues. The Council will continue to productively engage with the Scottish Government to feedback on proposals and understand the timelines and details of these developments.

Overview Of Local Policy

Net Zero Strategy 2021-2045:

Inverclyde Council's Net Zero Strategy outlines the ambitious plan to achieve net-zero greenhouse gas emissions by 2045 across the council estate. The strategy encompasses specific targets for carbon reduction, detailed implementation actions, awareness and behaviour change initiatives, a robust governance structure, and references. Notably, the Council has already made substantial progress in reducing carbon emissions, achieving a 51% reduction from 2012/13 to 2022/2023 with the goal to emulate this progress across the entirety of Inverclyde. The strategy primarily focuses on the Council's direct emissions, with individual actions for significant carbon emitters such as energy use in buildings, transport, streetlighting and waste It places a strong emphasis on raising awareness among employees and the community, fostering collaboration with partners,

aligning financial considerations and procurement decisions with sustainability goals, and monitoring progress through the Plan-Do-Check-Act improvement cycle.

Through this Strategy, Inverclyde Council is committed to demonstrate action and leading the way in emissions reduction. It is hoped that this action will support the LHEES by encouraging active participation from residents, businesses, and organizations in the pursuit of net zero. The strategy will unlock cross stakeholder collaboration and translate to Inverclyde's LHEES as a form of local leadership.

Net Zero 2022-2027 Action Plan:

The 2022-2027 Action Plan is a pivotal component of the overarching Net Zero Strategy. This plan is designed to have a substantial positive impact on the environment, focusing on direct and indirect greenhouse gas emission reductions. It is part of the Council's route map to achieving net-zero direct greenhouse gas emissions from operations by 2045. The plan delineates Key Priority Areas and Actions, targeting carbon reduction over a proposed five-year period, contingent on budget allocation. The Council concentrates on areas that have the most significant impact on their carbon footprint, including Energy Use in Buildings, Transport, Streetlighting, Water, and Waste. The Plan details which buildings have been selected for initiatives such as studies for deep retrofit, such as Port Glasgow Municipal Buildings and St Joseph's Primary School and, given the known tenure for schools, they are a focus in this plan The plan also emphasizes raising awareness about individual contributions to carbon footprints and climate change.

Local Housing Strategy 2023 – 2028:

The Local Housing Strategy (LHS) (2023-2028) builds on the progress made by the 2017-2022 LHS and has a vision to ensure that housing successfully contributes towards the area's repopulation, regeneration and economic growth objectives, to make Inverclyde a place where people want to live through the provision of quality and affordable housing. It also aims to ensure that people live in quality homes which are well connected to jobs and to thriving local communities which support positive health and wellbeing. The LHS has four outcomes noted that have been decided upon after collaboration across health, social care and social landlords alongside strong engagement with local communities in order to prioritise Inverclyde's housing needs.

- **LHS Outcome 1**: People in Inverclyde live in quality homes in connected communities.
- **LHS Outcome 2**: People in Inverclyde find it easier to access and sustain a home.
- **LHS Outcome 3**: People in Inverclyde are supported to live independently and well at home.
- **LHS Outcome 4**: People in Inverclyde live in good quality, carbon friendly and energy efficient homes which reduce fuel poverty.

The LHS is aligned with and informs this strategy, especially via outcome four which is closely related to the LHEES priorities. Inverclyde Council recognises the challenges in housing conditions, mixed tenure energy efficiency; with an action plan to improve this for residents' wellbeing. Among the actions is targeting fuel poor homes and ensure residents live in efficient homes. Other actions include working within the Glasgow City Region Deal as a partner to secure funding, develop design solutions to decarbonise homes and asset management reviews across social landlords to target areas for regeneration. This LHEES alongside Inverclyde's LHS will work together to improve housing conditions and residents' wellbeing.

6 Current Performance

Baseline Analysis

This section provides a thematic overview of Inverclyde's building stock in the context of heat decarbonisation and energy efficiency. It profiles characteristics such as energy performance; fuel type; tenure; type; and age. This information helps inform key decisions about the LHEES and its direction. The data is primarily sourced from the Home Analytics and Non-Domestic Analytics databases.

This provides a comprehensive summary of the current conditions of building stock and the current progress to date for the built environment in the entire Local Authority area. This will provide both a concise and visual overview of energy efficiency, insulation status, fuel types, renewable usage, and the heat demand of the area for both domestic and non-domestic building stock.

Domestic Building Stock

To provide an overview of Inverclyde Council's Domestic Baseline, the Energy Saving Trust's (EST) 'Home Analytics' was utilised for the core dataset with data preparation and analysis performed using the Domestic Baseline Excel tool. The Domestic Baseline tool required non-domestic data for analysis of mixed-tenure and mixed-use buildings with One Scotland Gazetteer being the data source. See Appendix 2 – Domestic Building Stock for analysis tables used. The key findings were:

- Inverclyde has just over 40,000 domestic properties
- Mains gas is the main fuel type accounting for 87% of all properties. Electricity is second with only 10% of homes where it is the main fuel type.
- 50% of all domestic properties have an EPC rating of D-G
- 63% of all homes are owner occupied.

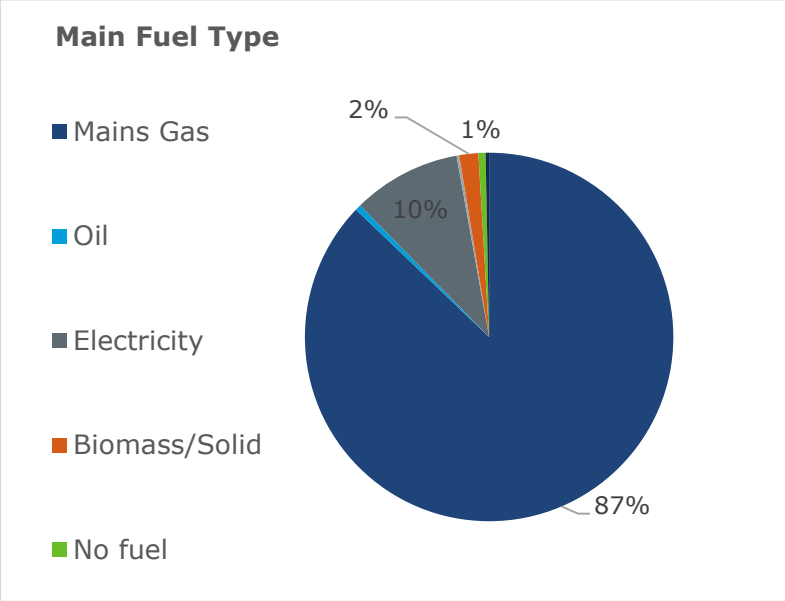

Figure 3 - Domestic Building Main Fuel Type

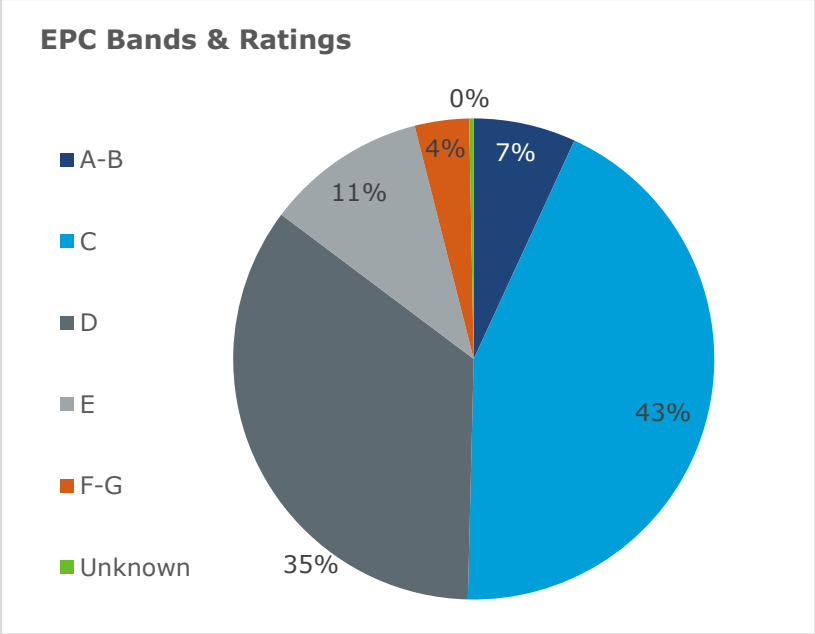

Figure 4 - Domestic Building EPC Bands & Ratings

Performance of housing stock

46% of the properties within Inverclyde have uninsulated walls, which is significant as the Energy Saving Trust estimates that uninsulated dwellings lose a third of their heat through walls and a quarter through the roof. This also contributes to fuel poverty through increased energy costs. Inverclyde has approximately half of its domestic properties in EPC bands A-C, which constitutes a reasonable energy efficiency standard and the other half in bands D-G which are of poor energy efficiency. This means that approximately 20,000 homes need to be brought up to standard.

	Percentage	Number of Properties
Estimate of households in fuel poverty (fuel bill>10% of income)	28.27%	11,455
Estimate of households in extreme fuel poverty (fuel bill>20% of income)	15.25%	6,179
Council Tax Band A-C	41.21%	16,696

Table 4- Domestic Baseline Tool: Fuel Poverty & Council tax band in Inverclyde

Non-domestic stock

To provide an overview of Inverclyde's Non-Domestic buildings, the Energy Saving Trust's (EST) 'Non-Domestic Analytics' was used as the core dataset. This data set is the non-domestic equivalent to "Home Analytics" and is built from non-domestic EPC records among other datasets with statistical and geospatial modelling employed to develop a round profile of non-domestic stock. The Scotland Heat Map was another key data set and provided geographical boundary information. Data preparation and analysis was performed using the Non-Domestic Baseline Excel tool. It is important to note that in Scotland there is a lack of high-resolution measured data to

inform the Non-Domestic Analytics model therefore the overall confidence of the model and information is not equal to that of the Domestic sector. The lack of detailed information and lower confidence may result in some variation of data such as heat demand.

Performance of non-domestic stock

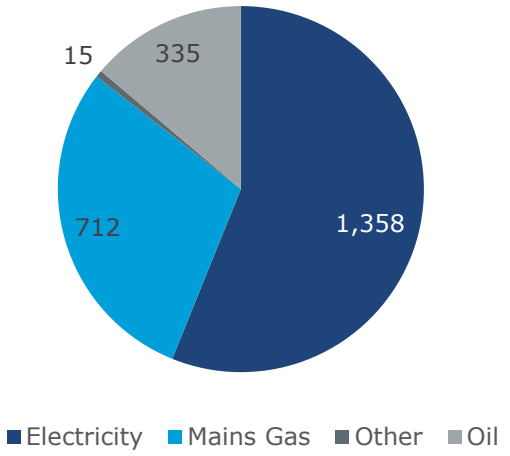

Figure 5 - Non-domestic property count by main fuel type.

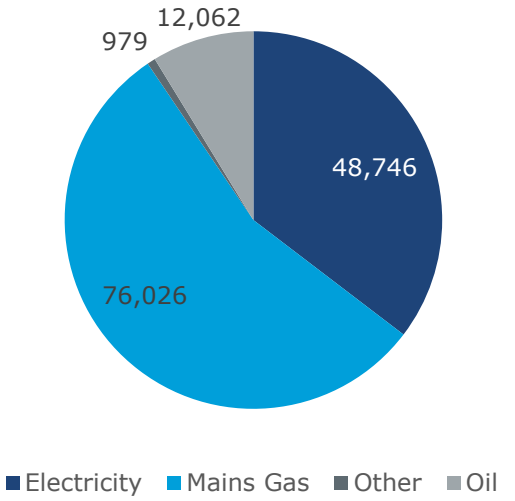

Figure 6 - Heat demand by main fuel type (MWh/yr)

A Large proportion of the properties have electricity as main fuel, but the mains gas provides the largest proportion of heat demand. This reflects the presence of several high gas users contributing to demand figures. These buildings will be a key consideration for heat network planning as they

can serve as anchor loads, improving the viability of a network. Since non-domestic buildings represent a large variety of buildings it is also challenging to understand the applicability of energy efficiency measures and heat decarbonisation options (especially with limited non-domestic building stock data).

Ongoing Activity in Inverclyde

Social Housing

In 2007, Inverclyde Council transferred ownership of former council housing stock to River Clyde Homes (RCH), and Cloch Housing Association. The total number of social housing in is almost 10,000. The Energy Efficiency Standard for Social Housing 2 (EESSH2) set a milestone of all social housing in Scotland achieving an Energy Performance Certificate rating of 'B' or better or being "as energy efficient as practically possible", by the end of 2032 ("within the limits of cost, technology and necessary consent"). The EESSH2 further stated "no social housing below EPC Band D should be re-let from December 2025, subject to temporary specified exemptions. The new Social Housing Net Zero consultation replaces EESSH2 and is intended to set energy efficiency ratings measured in kWh/m2 /year as well as a requirement to decarbonise heat by 2045. The RSLs are developing plans to retrofit all of the existing social housing stock to address net zero which will work synergistically with the LHEES with the ambition of using this work to boost area-wide activity.

Council Non-domestic Estate

Inverclyde's Net Zero Strategy has set out targets to decarbonise the Council estates, which is being delivered with initiatives such as retrofitting the King George Building to the principles of the EnerPHit standard. By starting to retrofit the older and more 'difficult' buildings, the Council aims to establish a pathfinder to then springboard the retrofitting approach to the remaining estate reflecting their priorities, programme, and delivery plan and subject to available resources. The council has commissioned a number of retrofit studies and have been actively seeking Salix funding to help fund further projects. These initiatives will not only help meet the net zero targets but also provide learning, examples, and support for homes and businesses in the area for their own retrofits.

Area Based Schemes

Area Based Schemes (ABS) provide grant-in-aid for households at risk of fuel poverty, prioritising harder to treat homes that require solid wall insulation or complex cavity wall insulation. The aim of the scheme is to bring all homes up to EPC 'C' standard by 2030. ABS are funded by the Scottish Government and designed and procured by local authorities. The Inverclyde Council has received £1.4million of funding for 2022/23. ABS schemes may also draw on Energy Company Obligation (ECO) where homes meet a certain income and benefits eligibility criteria. Moving forward, the Area-Based Scheme and LHEES work will align.

Area Based Schemes (ABS) play a critical role in tackling fuel poverty and improving energy efficiency in Scottish households, exemplified by Inverclyde Council's implementation of these initiatives. ABS funding has supported investment in energy efficiency improvements across Inverclyde, with 441 households assisted over this period. Inverclyde is estimated to have between 47% and 53% of properties with an EPC rating of D or lower. These schemes, funded by the Scottish Government, are centred on delivering energy efficiency measures, especially External Wall Insulation (EWI), to private households vulnerable to fuel poverty, saving them energy and costs of heating. In the past three years, Inverclyde Council has received an average of approximately £1.4 million annually, totalling almost £17m since 2013. This funding has been crucial for the progression of EWI programs in accordance with ABS guidelines.

A notable shift in the ABS approach includes a focus on a 'zero carbon first' strategy. This involves integrating heating solutions and microgeneration technologies to further alleviate fuel poverty. In Inverclyde's EWI program, households are also provided the option of Solar PV installations, with efforts made to minimize customer contributions, particularly for those in extreme fuel poverty. The Scottish Government assists homeowners in affording these contributions through interest-free loans.

Inverclyde Council have and continue to work with partner organisations (RSL's) and home-owners to achieve area based improvements to energy efficiency. There are barriers to getting this work done including the construction type, the criteria for accessing funding related to SIMD designation, tenure balance in common properties where some owners (owner occupiers and private landlords) cannot afford to or refuse to engage in the schemes despite the Scottish Government subsidy. This inevitably does lead to something of a pepper potting of Energy Efficiency Works.

Many properties are entirely privately owned and of course the responsibility falls to the co-owners to maintain. There has been a private sector house condition survey completed; the results of which have provided, in conjunction with RSLs, good data about the condition of the housing stock locally examining and making informed use this info is included in one of our LHS actions

The selection of properties for EWI in Inverclyde is based on data from the Energy Savings Trust's 'Home Analytics'. The targeted areas are usually those falling within the lowest 25% of the Scottish Index of Multiple Deprivation (SIMD) and within council tax bands A-C.

Inverclyde Council's strategy also includes a cost consideration for implementing EWI. For instance, the average cost for retrofitting a semi-detached home in the current program is approximately £22,500, although this figure can vary depending on the size and type of the property. This approach aligns with the Scottish Government's broader objectives of enhancing energy efficiency and reducing fuel poverty across Scotland.

Inverclyde Heat Networks

The Council is actively supporting the development of heat network projects in Inverclyde, reflecting a strong commitment to sustainable energy practices and decarbonization. Of the 17 heat network projects being supported by the Scottish Government through its Heat Network Support Unit as of March 2023, 2 are located in Inverclyde. Data from the Scotland Heat Map indicates that there were 8 heat networks and communal heating systems in Inverclyde as of 2023.

Among these proposals, the potential Greenock Waterfront Heat Network stands out as a flagship project which is part of Inverclyde Council's broader strategy to reduce emissions and transition to low-carbon heat sources. Inverclyde is assessing the feasibility of a Heat Network that will connect various buildings across the Greenock Waterfront area to a central heat source with zero direct emissions. The Council's feasibility report is highlighting the success of similar projects such as Queens Quay heat network, further up the river Clyde which provides heating via water source heat pumps to extract heat from the Clyde to supply hot water via a district heating network. Furthermore, the Greenock Waterfront Heat Network aims to utilize environmental heat sources, including air, ground, and water, which aligns with the regional shift towards innovative renewable energy solutions.

In 2018, River Clyde Homes undertook a pioneering initiative to enhance energy efficiency and sustainability in social housing by installing one of Scotland's first Air Source Heat Pumps (ASHPs) in a social rented tower block. The project was executed at Kilblain Court in Greenock, which consists of 61 flats. This strategic move was part of a broader decision made in 2016 to replace gas boilers with low-carbon communal systems across their properties to not only improve safety but also to reduce emissions and meet the Energy Efficiency Standard for Social Housing (EESSH).

The selection of the ASHPs was the outcome of a comprehensive options appraisal process, which included active customer involvement, ensuring the solution met the residents' needs and preferences. The switch from traditional mains gas to renewable technology resulted in a modest increase in energy efficiency and a significant improvement in the Environmental Impact Rating, which soared from 81 to an impressive 95 out of a potential 96.

This transition has been met with positive feedback from the residents of Kilblain Court, who now enjoy the dual benefits of warmer homes and reduced energy costs, exemplifying the tangible benefits of adopting renewable energy solutions in social housing settings.

7 LHEES Priorities

Since the LHEES covers a 20-year journey to decarbonisation to display the Council's long-term vision alongside 5-year delivery plans, it is imperative to be selective about the highest priorities which the Council should bring forward. Taking account of national and local priorities, the following priorities have been identified:

1. Maximising the potential for heat networks, beginning with a central heat network in Greenock Town Centre (Waterfront Heat Network), potentially expanding further to the additional heat networks zones identified in this LHEES and linking with existing heat networks. Additionally, aspire to connect to a potential 'heat highway' across the central belt if appropriate.
2. Focusing on areas with households in high level of fuel poverty and social housing

The LHEES is a collective plan for Inverclyde to lower the carbon emissions from the council's buildings, including the Council's own buildings, social housing, other public sector buildings, privately rented homes, owner-occupied homes, and all privately owned non-domestic buildings and public ones. The Council has a vital role in facilitating and managing this effort, but it also requires the support and involvement of all other parties. This involves the Scottish Government, the property owners, the investors, the public bodies, the service providers, the supply chain, the district network operators, and many others who are committed to the goal of the LHEES. The Council and all other parties need to work collectively equally consider and respect their roles into successfully delivering the ambitions of LHEES. With this combined effort, the council hopes to encourage a behaviour change around sustainability, including carbon emissions, waste, and energy efficiency.

It is important for all of these stakeholders to have a clear sense of the current and future role of the Council, so they have certainty to invest and act. Figure 7 summarises the approach the Council will take.

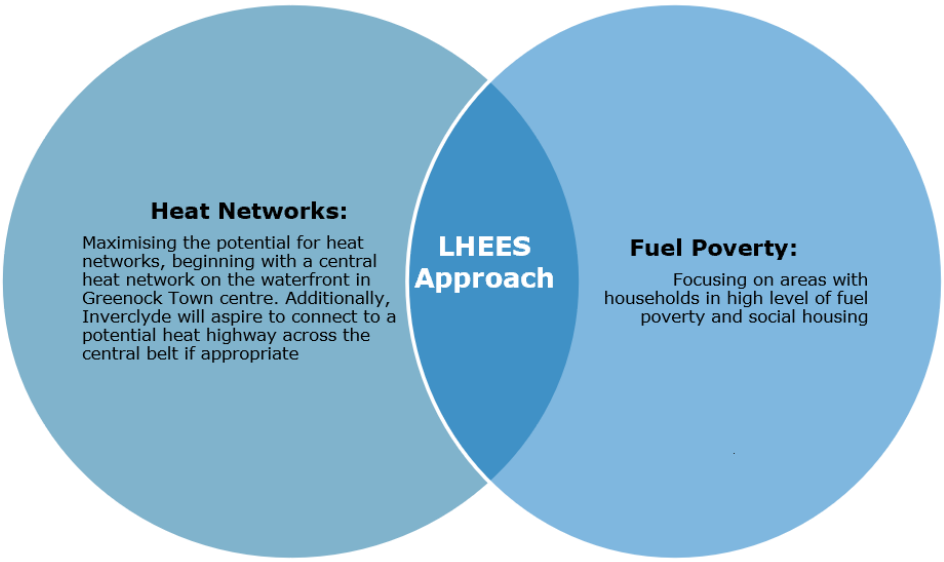

Figure 7: The LHEES will be driven via this approach.

Fuel Poverty: The Council will maintain its efforts on improving energy efficiency to tackle fuel poverty. It will prioritise areas with the most households in fuel poverty and expand the current activities where possible and funded. The Council will utilise its existing partnerships and relationships, and form new ones where beneficial, to deliver this LHEES work. The Scottish Government has a deadline of no more than 5% of households to be in fuel poverty by 2040 and to reach net zero emissions by 2045, making it one of the most complex and urgent challenges for Inverclyde.

Heat Networks: LHEES covers energy efficiency and decarbonisation measures and heat networks for the whole area and various tenures, types and ages of buildings. Inverclyde aspire to set an example as a Scottish council without a city that can install and run an effective interconnected heat network. Therefore, it is crucial to adopt a programmatic approach for delivering the LHEES, considering the many factors that need to be aligned for success, such as a reliable supply chain and efficient procurement methods, funding and financing to support property owners, and clear communication on best practice and the help available. The Delivery Plan provides the foundation for this approach, which the Council would seek to build on when the Scottish Government makes more LHEES delivery resources available.

Technologies and measures

The Council takes a technology-agnostic approach to decarbonising Inverclyde's stock. The role of the LHEES is to make the space and provide the direction and opportunities for people to decarbonise their properties in the best way they see fit. Where the Council needs to take direct decisions about energy efficiency and heat decarbonisation technologies (such as for retrofit of its own stock or to aid households in fuel poverty) these will be taken based on capital and operating costs, practicality, infrastructure constraints and other considerations deemed appropriate by Council officers. For the most part, the Council sees the following primary approaches that are relevant to almost all property owners:

- Energy efficiency: the first priority should be to maximise the energy efficiency of buildings, led by a fabric-first approach and including draught-proofing, LED lighting, optimised heating and building control and other technologies. Recognising older buildings, especially

listed buildings, will represent a greater challenge due to challenges associated with their retrofit. A single rule cannot be applied for all buildings and costs for retrofit will vary significantly, however, it is thought that through close engagement with planning departments, these too can be addressed. Efficiency should be improved as far as practically and economically viable and in line with industry best practice and appropriate standards.

- Heat decarbonisation (individual): although gas heating is the most widely utilise method of heating in the country, the carbon intensity of the fuel is considerable, and a low carbon alternative must be established. Heat pumps are the most viable solution to decarbonise individual properties or a small number of properties (via arrays or communal systems). Heat pumps use electricity to capture heat from the environment such as from the air, water bodies or underground aquifers and uses a heat exchanger to supply this to a building. Heat pumps work best in well insulated buildings and thus important to couple these with a fabric first approach. Currently, approximately 3,000 to 4,000 domestic heat pumps are installed in Scotland annually, with the vast majority being air source heat pumps. The Scottish Government has set a target of increasing annual heat pump installations to 170,000 by 2030. However, heat pumps are not the only option for heat decarbonisation and at times unfeasible. For example, electric storage heating may be the preferred option in properties without wet central heating systems. Our work in the analysis for LHEES has considered these aspects and we will reflect this within our approach to delivery.
- Heat networks: it is the Council's view that, as an area with a relatively high density of heat demand, heat networks should play a central role in the decarbonisation of Inverclyde's buildings. There are significant benefits to large-scale rollout of heat networks, including an opportunity to decarbonise buildings at scale, offering occupiers with access to an affordable source of thermal energy, creating high-skilled jobs, creating valuable infrastructure that will serve the towns throughout the century and beyond, unlocking investment opportunities, and boosting economic growth. It is therefore an ambition of the Council that, with support from the Scottish Government and other partners, Inverclyde hosts a town-wide heat network belt preferably covering as much of the northern coastal area as can be made possible, along with multiple heat network opportunities in the other areas of Inverclyde. The Council will take a technology agnostic approach to heat sources for the network, allowing further detailed feasibilities and business cases to guide the developments toward the best possible solution. The Delivery Plan provides more detail on the Council's intended ambitions to facilitating the development of heat networks.
- Renewable generation: forms of renewable generation such as solar PV are a tried and tested technology, with Inverclyde having 742 renewable energy installations including solar PV, onshore wind and hydro. The Council will consider all forms of renewable generation while being cognisant of Inverclyde's historic dam & aqueduct technology in future LHEES work. Due to the nature of solar generating energy in daytime, there may be surplus generation and as such, these installations could be linked to battery storage solutions to make better use of the generated energy. Battery storage solutions tend to provide greater value for money for much larger installations such as solar farms and while out of the scope of the core LHEES Methodology, should the opportunity and resources be made available, the Council aspires to include this within future LHEES work.

While property owners are free to explore other routes to decarbonising their properties, the above technologies are well-established, low-risk and offer the most economical and practical route.

Areas of Strategic Importance

Inverclyde Council

Inverclyde Council has strategically pinpointed key areas within the region that are pivotal to the Local Heat and Energy Efficiency Strategy (LHEES). These areas have been carefully selected for their roles in the overarching strategy for energy efficiency and sustainable development:

Infrastructure Development Areas: This category captures regions earmarked for significant infrastructure enhancements, including areas awaiting essential retrofitting. These developments are crucial for modernising local facilities and utilities, paving the way for future-proofed, resilient communities.

Residential and Community Wealth Areas: These areas have been identified for their potential to bolster community wealth through housing improvements and the integration of social housing projects. The focus here is not only on uplifting living standards but also on driving down carbon emissions through energy-efficient housing solutions.

Economic and Efficiency Improvement Areas: Encompassing key economic zones, such as business districts and industrial parks, this classification emphasizes the dual goals of stimulating economic vitality and promoting energy efficiency within commercial and operational buildings.

These strategic areas are geographically represented by the following locations that are critical to the LHEES's successful implementation:

- **Eastern Gateway**
- **Central Port Glasgow**
- **Greenock Town Centre**

Each of these areas will play a prominent role the Council's commitment to targeted improvements and sustainable growth. They are instrumental in shaping the future direction of LHEES: reducing fuel poverty, influencing the creation of provisional heat network zones, and setting the stage for the integration of energy-efficient practices across Inverclyde. As the Council moves ahead, the intent is to capitalize on these areas' unique attributes, enhancing coordination across policy and project initiatives, to ensure optimal use of public resources. This integration aims to support a unified approach to accelerating community development and fostering a sustainable energy landscape in Inverclyde.

LHEES Considerations

The LHEES Guidance issued by the Scottish Government recommends that the LHEES should be framed around six "LHEES Considerations". The LHEES Considerations are set out in Figure 8. These form the basis for understanding, interpreting, and developing the pathways to decarbonisation. They cover the overarching priorities at the national level which should apply to each local authority, though in different ways and to different degrees. One of the main ways to view the LHEES is as a tool to fulfil each of these considerations.

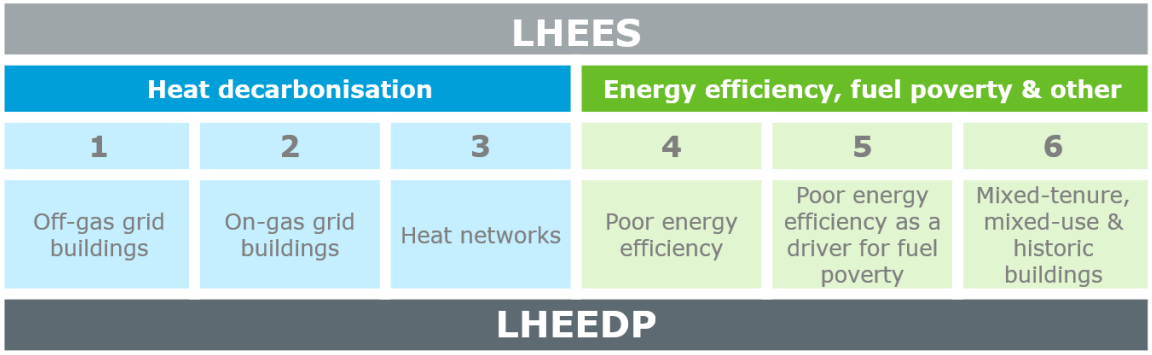

Figure 8: The six LHEES Considerations which formed the basis for analysis and decision-making throughout the 8 stages.

To focus its limited resources, the Council has opted to prioritise on aspects of these Considerations for this LHEES, and further action will be taken on each Considerations. These are provided in Table 5.

Consideration	Priorities
Off-gas grid buildings	The Council will focus initially on category 1 on-gas properties. These are properties suitable for a zero-emission heating system (e.g. a heat pump). This will help build momentum with less complicated retrofits
On-gas grid buildings	
Heat networks	Heat networks present a major opportunity for Inverclyde to decarbonise at scale and provide homes and businesses with access to affordable energy. Inverclyde is well placed to reap the benefits of a town-wide heat network.
Poor energy efficiency	Inverclyde has a significant number of buildings with poor energy efficiency. However, these must be targeted to arrive at a more manageable volume for the short-mid-term. These should be homes where poor energy efficiency is a driver for fuel poverty since
Poor energy efficiency as a driver of fuel poverty	

	these homes are in most urgent need of support.
Mixed-tenure, mixed-use and historic buildings	There is a large volume of these building types in Inverclyde. The Council has an existing programme of supporting retrofit of mixed-tenure and mixed-use buildings focused on areas with high fuel poverty. This is currently limited in scale due to the complexities of dealing with these properties. This work will be used as the basis for learning and future expansion.

Table 5 - This table provides the rationale for prioritising specific LHEES considerations.

The topography of Inverclyde poses a challenge to the potential interconnectivity of a heat network as they must be built around steep hills. Effective community engagement and detailed technical feasibilities will be key to progress work in this area.

Alongside the LHEES considerations there are local constraints to be factored into the development of this strategy. Inverclyde has a similar number of older properties when compared to national averages however the makeup of the building stock is highly different. 53% of Inverclyde's properties are flats which is significantly higher than the Scotland average of 36%. Having this makeup of stock brings constraints to LHEES which will have to be considered. Having high proportions of flats brings issues of mixed tenure when proposing to carry out communal works which highlights the importance of community engagement when developing and implementing this strategy.

Another constraint to factor into the implementation of this LHEES is the building condition of current stock in Inverclyde. 36% of Inverclyde dwellings are in urgent disrepair which invites the debate of retrofit versus demolition where the final social, economic, and environmental benefits will need to be weighed in order to conclude how best to approach this stock. It is the Council's view that, wherever possible, retrofit should take precedence. However, in situations where the longevity of a building is under question, there is limited or no heritage value, or the financial viability of retrofit is beyond reason the Council may consider that rebuilding may present a better option.

Resources and support

There are a range of existing initiatives that can support private building owners with improving energy efficiency and decarbonising heat. Home Energy Scotland, Business Energy Scotland and Local Energy Scotland are services funded by the Scottish Government and managed by the Energy Saving Trust. They provide households, businesses and community groups with advice and support on saving energy, decarbonising their properties, and generating renewable energy. They also administer various grant and loan schemes to help owners with retrofit costs. The Council will continue to raise these opportunities with property owners and explore ways to target communication during Delivery Area implementation.

The Scottish Government manages multiple schemes, targeted largely at public bodies (though with exceptions). These include funds and support to retrofit non-domestic public buildings, registered social landlord housing and private and owner-occupied housing in fuel poverty.

- **Scotland's Heat Network Support Unit (HNSU)**[2]: The Scottish Government leads the Heat Network Support Unit which provides support and administers funds to facilitate heat network developments from inception to delivery. The Heat Network Support Unit (HNSU) can be accessed whereby they can offer advisory and funding services that address key challenges in the pre-capital stages of heat network development and building capacity across the public sector to deliver successful projects. £300million from the Scottish Government has been made available through **Scotland's Heat Network Fund** [3] for the development and installation of heat networks across Scotland, managed by the HNSU. The Government's ambitions with the introduction of this fund include accelerating zero direct emissions heat network opportunities, ensure poor energy efficiency is not a driver for fuel poverty and to create high value, local, sustainable jobs.

- **Home Energy Scotland**[4]: Funded by the Scottish Government, this advice and funding service provides owner-occupiers and private landlords with support to improve the energy efficiency of their properties. It includes grant and loan support as well as advice services to help owners fund energy efficiency, zero emission heating and renewable energy installations.

- **Warmer Homes Scotland**[5]: This Scottish Government programme offers funding and support to households struggling to stay warm and manage energy bills by carrying out property assessments and installing a range of energy saving improvement which can include insulation, heating, and renewable measures. Eligibility for this programme includes private homeowners and tenants of a private-sector landlord.

- **Area-based Schemes (ABS)**[6]**:** Funded by the Scottish Government and delivered by local authorities, ABS are place-based energy efficiency schemes targeted mainly at improving fabric efficiency of homes in areas with high levels of fuel poverty. ABS funding can also be complemented with funding from UK Government's Energy Company Obligation (ECO) scheme. Inverclyde Council delivers the ABS scheme across the local area in close partnership with registered social landlords.

- **Scottish Public Sector Energy Efficiency Loan Scheme**[7]**:** Salix Finance is offering zero-interest loans to eligible public bodies to facilitate energy efficiency improvement projects that result in financial and carbon savings whilst contributing towards net-zero aspirations. Salix has invested over £75million in Scottish energy efficiency projects to date.

- **Business Energy Scotland**[8]: This Scottish Government programme offers advice and funding for small and medium enterprises through advisors to help save energy, money and create greener businesses. Businesses can choose from various options including lighting assessments, solar PV assessments and energy efficiency assessments which includes renewable heat technologies, insulation, and window glazing. This programme has identified over £200million in savings to date for businesses.

[2] Heat Network Support Unit, Scottish Government (link)
[3] Scotland's Heat Network Fund, Scottish Government (link)
[4] Home Energy Scotland, Scottish Government (link)
[5] Warmer Homes Scotland, Scottish Government (link)
[6] Area-Based Schemes, Scottish Government (link)
[7] Salix, Scottish Government (link)
[8] Business Energy Scotland (link)

8 Generation of Strategic Zones & Pathways

Overview

This section sets out Strategic Zones for the primary LHEES Considerations, identifying what needs to be done at a strategic level to adapt buildings and the relevant infrastructure in Inverclyde over the next two decades to achieve the central aims of the LHEES. This analysis sets a starting point for the generation of, and prioritisation, of Heat Network and Delivery Areas opportunities.

Through stakeholder engagement and the LHEES data analysis method, the Council has identified two priority areas of focus:

- Heat networks
- Fuel poverty and social housing

This section will provide an overview of the methodologies used to define the provisional heat network zones and delivery areas opportunities, alongside maps.

Heat Network Opportunities

The formation of potential areas for the development of heat networks is a key task in achieving energy efficiency and carbon reduction goals as it could unlock a supply of low carbon, high efficiency heat at a local level. The formation of provisional heat network zones began with the identification of zones based on specific criteria, such as linear heat density and anchor load thresholds. The process involved refining these zones, considering local constraints such as rivers, highways, and railways, which could impact the feasibility of developing a single, cohesive heat network in certain areas. The result of this meticulous process was a series of refined zones, tailored to the unique geographical and infrastructural characteristics of Inverclyde. These zones were further reviewed and adjusted, leading to decisions to combine certain areas, expand the boundaries of others to encompass nearby opportunities, or split zones where development challenges were identified. This comprehensive approach resulted in a finalized map of provisional heat network zone opportunities across Inverclyde, which illustrates the potential layout and scope of heat networks across the region (Figure 9). Refer to Appendix 3 – Heat Network Opportunity Methodology for full methodology.

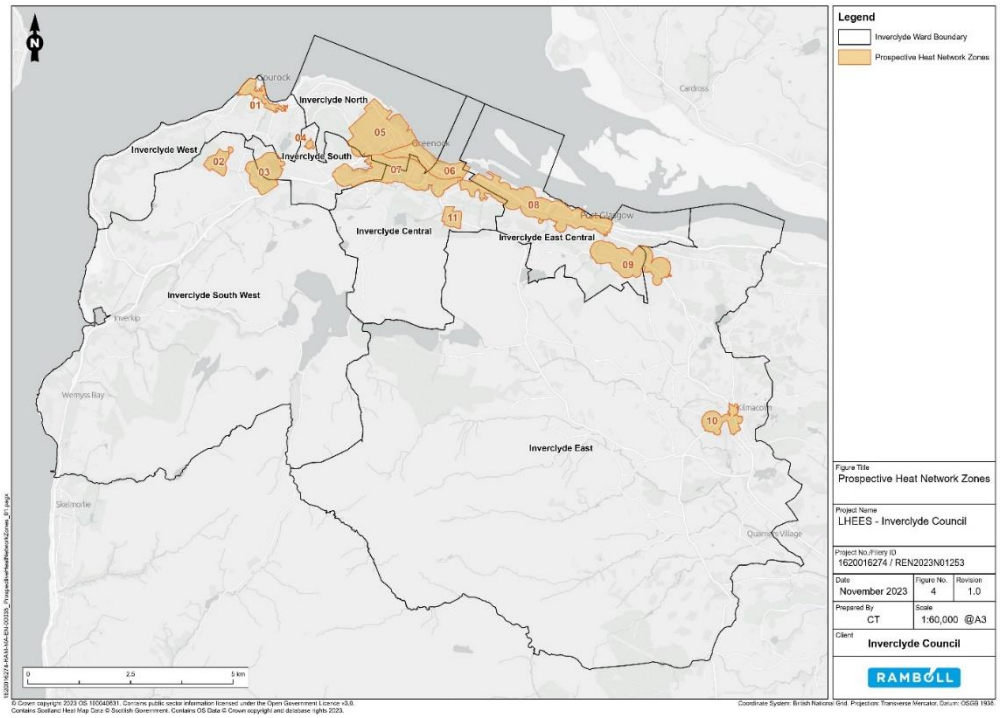

Figure 9- Prospective Heat Network Zones

Delivery Area Opportunities

In Inverclyde, the commitment to improving the energy efficiency and decarbonizing the building stock is realized through a strategic methodology. This comprehensive approach integrates strategic zoning, the establishment of initial delivery areas, and detailed building-level assessments. These steps collectively form a robust framework for identifying and leveraging delivery area opportunities, aligning with Inverclyde Council's priority for tackling fuel poverty.

Strategic Zoning

Strategic zoning serves as the foundational phase of this process. This step involves visualizing potential pathways for improving energy efficiency and decarbonizing building stock at a local authority level, using predefined geographical areas, or Intermediate Zones. A weighted system is applied to various factors, including building energy efficiency and fuel poverty. This results in a ranking of areas within Inverclyde (See Appendix 4 – Ranking of Intermediate Zones for ranking table & individual factor maps), identified through spatial representation in ARCGIS PRO, based on the Domestic Baseline Tool outputs. The map below displays the intermediate zones which represent different levels of fuel poverty as calculated by the weighted system, with the probability of fuel poverty shown in Appendix 6 - Poor Building Energy Efficiency: Probability of Fuel Poverty Raster. It highlights that the northern coastal areas are a priority for targeting retrofit interventions.

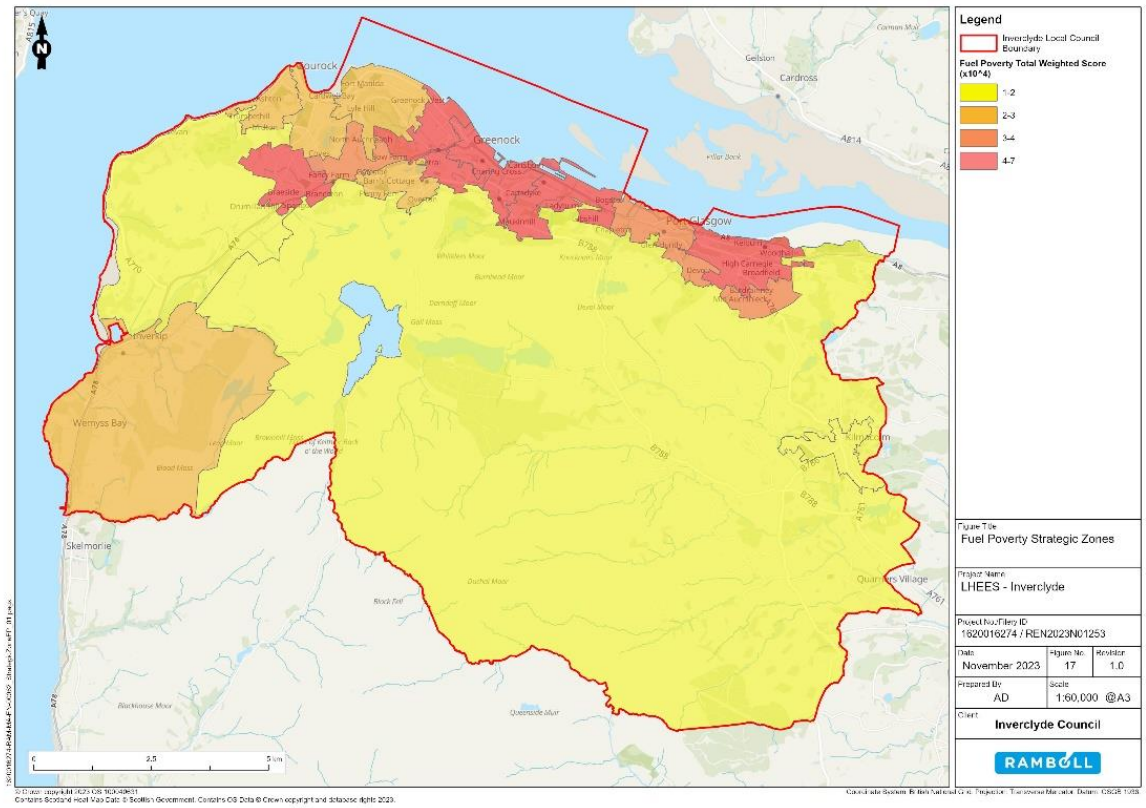

Figure 10 - Map of Intermediate Zones: Fuel Poverty as a Weighted Sum of Home Efficiency Factors

Initial Delivery Area Opportunities

In Inverclyde's strategy for decarbonizing building stock, the identification of initial delivery areas is essential. These areas provide a more detailed focus than broader strategic zones, pinpointing specific clusters of buildings within these zones or across the entire local authority area. The approach is crucial for identifying exact locations to implement a range of sustainable energy projects and actions, tailored to the needs of the community.

The process of establishing these delivery areas involves a thorough analysis of key datasets, primarily using EST's 'Home Analytics' and the Scotland Heat Map. This analysis not only defines geographical boundaries but also considers important factors such as on and off gas networks and mixed tenure properties. The inclusion of these factors ensures a comprehensive understanding of each area's energy infrastructure and housing diversity, which is vital for tailoring energy efficiency and decarbonization efforts effectively. In particular, the distinction between on and off gas areas allows for the identification of properties that may have different energy needs and opportunities for efficiency improvements. Similarly, understanding mixed tenure patterns within these areas helps in planning interventions that are inclusive and considerate of various housing types and ownership models.

This nuanced approach leads to the identification of areas with significant potential for projects, focusing efforts where they are most impactful (Figure 9). The final delivery areas, determined through this process, set the stage for targeted energy efficiency initiatives in Inverclyde.

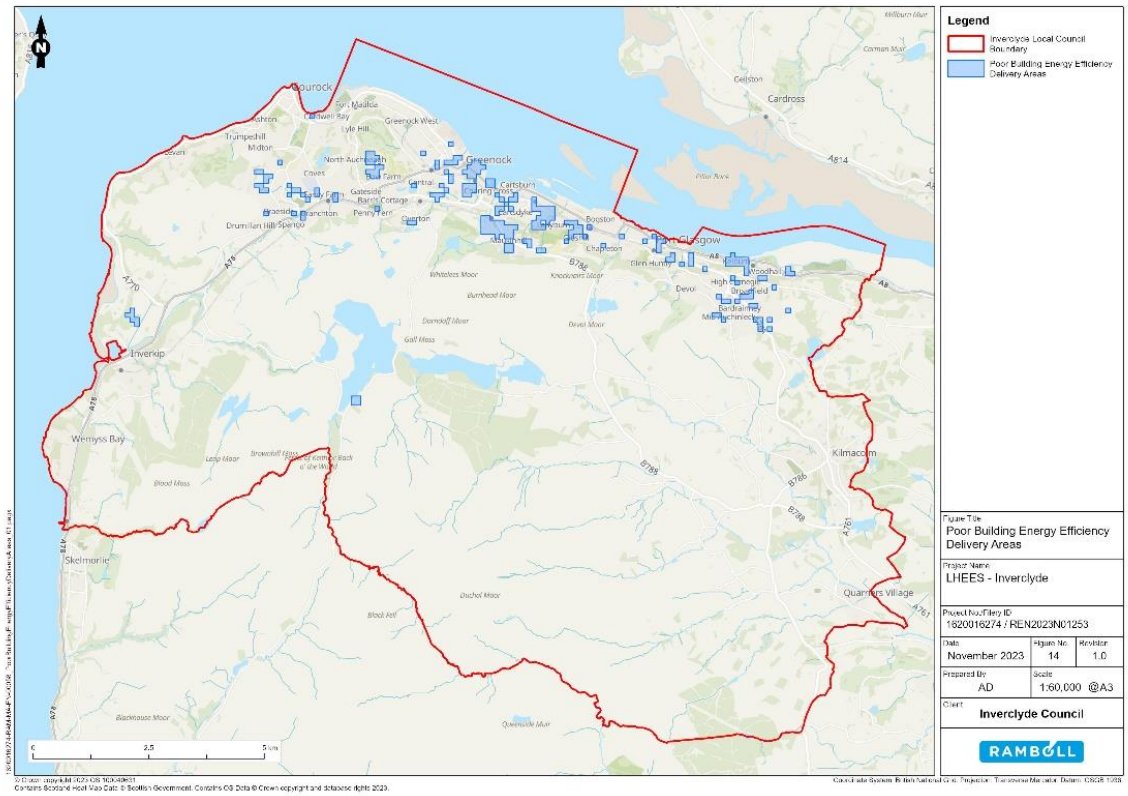

Figure 11 - Poor Building Energy Efficiency Delivery Areas

Building-Level Pathway Assessment

A key phase of this strategy has involved conducting comprehensive building-level assessments within identified delivery areas, informed by collaboration with stakeholders such as Registered Social Landlords (RSLs) and technical experts. The assessments have addressed pressing issues of fuel poverty and high carbon fuel usage, setting the stage for transformative energy solutions.

Utilizing the Portfolio Energy Analysis Tool (PEAT) and its expanded version, PEAT-OR, the assessments have categorized buildings by their energy supply status—distinguishing between On Gas and Off Gas—and by economic factors such as identifying those that are Fuel Poor. ARCGIS PRO was used to extract detailed property data, which has provided the foundation for these informed assessments.

The findings from the building-level assessments have highlighted Greenock Town Centre and East Central have emerged as high-priority areas for intervention, with other areas such as Greenock East and Port Glasgow Mid East also identified as needing focused attention to combat energy inefficiency and fuel poverty.

Financial projections suggest that the average cost for the proposed energy efficiency measures is approximately £14,717 per property, though this includes a range of costs depending on property type and condition. These measures, which span a range of efficiency improvements, are expected

to achieve significant energy savings and reductions in CO2 emissions, providing a cost-effective route to achieving an EPC C rating.

The strategy anticipates considerable energy savings across various wards, for example, a reduction of 3,036 kWh in the Central ward, alongside measurable bill savings. Moreover, the deployment of decarbonization technologies such as air source heat pumps and photovoltaic panels is expected to lead to further energy cost reductions and carbon savings, reinforcing Inverclyde's commitment to a sustainable and economically beneficial energy future. See table 6 below for an overview of the savings calculated by this assessment.

In conclusion, the LHEES has laid out a clear, actionable plan based on detailed building assessments, charting a course towards a more energy-efficient Inverclyde with reduced carbon footprints and improved economic outcomes for residents. The next steps involve implementing the outlined measures, monitoring their effectiveness, and engaging the community in the transition toward a low-carbon future.

Inverclyde Council Wards	Measures		Average Cost per Property	Average Outcome per Property		
	ASHP	PV		Energy Saving kWh	Energy Bill Saving	$kgCO_2$ Carbon Saving
Central	837	689	£26,059	10,758	£1,248	2,457
East	801	493	£25,254	12,527	£1,187	2,881
East Central	1061	642	£24,983	10,455	£1,147	2,355
North	121	82	£26,307	15,150	£1,167	3,336
South	872	731	£25,846	11,060	£1,240	2,527
South-West	886	676	£26,117	11,640	£1,192	2,630
West	95	50	£24,707	10,959	£956	2,487

Table 6 - PEAT Output: Decarbonisation Measures

9 LHEES Findings & Next Steps

Summary of Inverclyde LHEES findings

The Local Heat & Energy Efficiency Strategy (LHEES) for Inverclyde has surfaced key insights into improving the energy efficiency and decarbonizing the local building stock. Strategic zoning has helped to visualize the path forward. More granular delivery area opportunities have been pinpointed, setting the stage for targeted energy interventions. Building-level assessments have highlighted the urgency of addressing fuel poverty and the reliance on high carbon fuels. Notably, the findings include the identification of significant potential for energy and cost savings, aided by the deployment of various efficiency measures and decarbonization technologies, across different wards.

Inverclyde LHEES principles

The principles guiding Inverclyde's LHEES reflect a commitment to a robust and equitable energy future:

- A data-driven approach underpins the strategy, with comprehensive datasets informing the identification of strategic zones and delivery areas.
- Equity and inclusivity are central, acknowledging the unique needs of areas with and without gas network access and the complexities of mixed tenure housing.
- Collaboration with stakeholders is vital, ensuring that the proposed measures resonate with the capabilities and competencies of government and local partners.
- A focus on sustainable outcomes ensures that immediate interventions contribute to long-term environmental and fiscal health.

Next steps

The path ahead for Inverclyde's LHEES includes:

- Finalizing delivery areas with a firm grounding in the detailed building-level assessments and informed by robust stakeholder dialogue.
- Beginning the implementation of the Delivery Plan which identifies and defines a clear pathway for the LHEES.
- Establishing a framework for the ongoing monitoring and evaluation of interventions, with an emphasis on adaptive management to refine and scale strategies.
- Engaging the community to foster broad participation in Inverclyde's transition to a low-carbon future, ensuring that businesses and residents are informed, involved, and supportive of the sustainability initiatives.

In conclusion, Inverclyde's LHEES presents an actionable roadmap towards a more energy-efficient and low-carbon community, designed to adapt, and evolve in response to the successes and learnings from its initial steps.

10 Glossary of Terms

Term	Description
Anchor Load	A building with a large, dependable, and long-term demand for heat which can help make a heat network commercially viable.
Baselining	Purpose of understanding, at local authority or strategic level, the current status of the buildings against the LHEES Considerations, Targets and Indicators.
Delivery Area	Zones set out clusters of buildings that identify potential solutions, a starting point for identifying projects and actions.
Delivery Plan	The LHEES Delivery Plan is a document setting out how a local authority proposes to support implementation of its local heat and energy efficiency strategy.
Energy efficiency	The amount of energy required to heat a building (given its size) and the building's ability to retain that heat. The most common way to measure energy efficiency is through an Energy Performance Certificate (EPC), which provides a simple rating of energy efficiency of the building.
Fuel poverty	A household spending more than 10% of its income on fuel costs where the remaining household income is insufficient to maintain an adequate standard of living.
GIS	Geographic Information System
Heat decarbonisation	Reducing or eliminating the carbon produced as a negative by-product of heating buildings.
Heat networks	Heating system that works on the principle of distributing heat generated at one or more

	central sources to users rather than generating heat using systems in individual properties.
Heat pumps	Devices that heat buildings through capturing existing heat in the environment (usually from the air or water).
Net Zero Carbon	A target of completely negating the amount of greenhouse gases produced by human activity, to be achieved primarily by reducing emissions.
Passivhaus	A construction standard where buildings attain elevated levels of energy efficiency and user comfort.
Raster	A matrix of squares, or grid, used as a method of data analysis in GIS.
Strategic Zone	Visualisation of the potential pathways to decarbonise the building stock at a local authority level

Table 7 - Glossary of Terms

11 Appendix 1 – Equality Impact Assessment

Please refer to attached, completed Equality Impact Assessment

12 Appendix 2 – Domestic Building Stock Analysis Tables

	Percentage	Number of properties
Uninsulated walls	45.82%	18,562
Loft insulation <100mm	10.35%	4,193
Single glazed windows	6.56%	2,656

Table 8 - Domestic Baseline Tool: Insulation Overview

Inverclyde Council

		Scotland	Inverclyde
Gas Grid Coverage	On Gas	88.0%	87.0%
	Off Gas	12.0%	12.0%
	Unknown	N/A	1.0%
EPC Rating	A-B	5.0%	7.0%
	C	47.0%	43.0%
	D	35.0%	35.0%
	E	10.0%	11.0%
	F-G	3.0%	4.0%
Primary Fuel	Mains Gas	80.0%	87.0%
	Electricity	11.0%	10.0%
Fuel Poverty	Fuel Poverty	19.6%	28.7%
	Extreme Fuel Poverty	9.5%	15.3%
Council Tax Band	A-C	59.0%	41.2%
Tenure Type	Owner Occupied	66.2%	63.0%
	Privately Rented	13.3%	11.0%
	Housing Association	8.7%	26.0%

	Local Authority	11.80%	0.0%
Property Type	Detached	30.4%	12.0%
	Semi-Detached	19.8%	18.0%
	Terraced	18.7%	20.0%
	Flats	31.1%	50.0%

Table 9 - Domestic Baseline Tool: Scotland vs Inverclyde Comparison

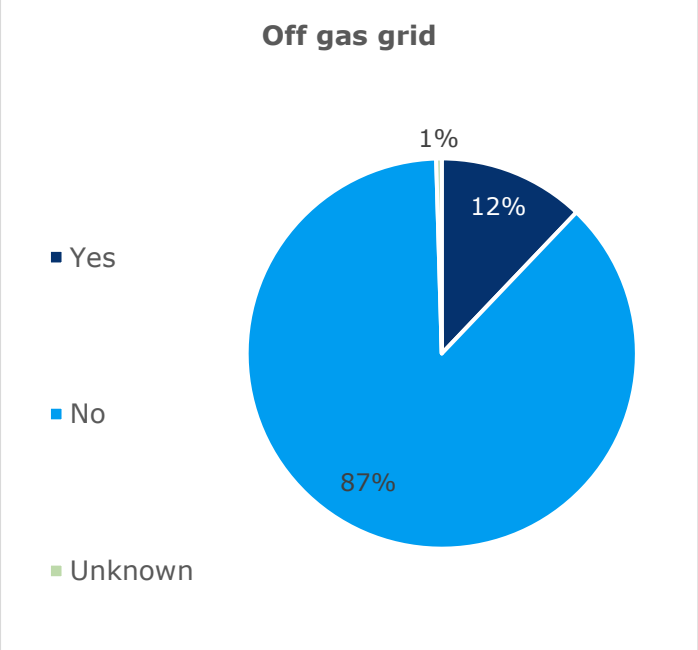

Figure 12 - Domestic Baseline Tool: Gas Grid Property Data

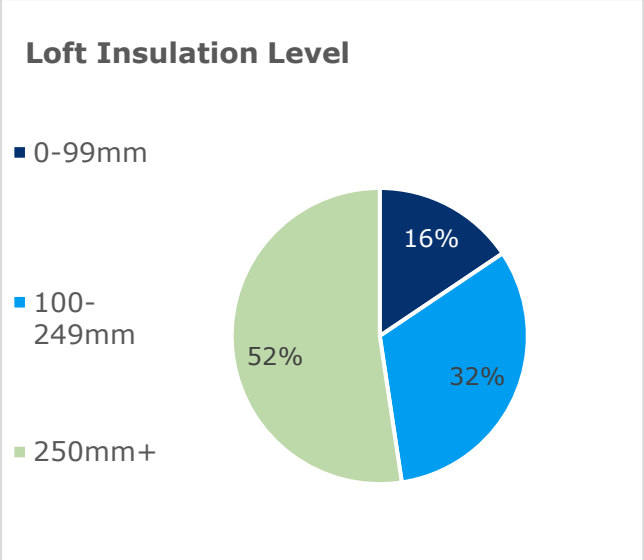

Figure 13 - Domestic Baseline Tool: Loft Insulation Data

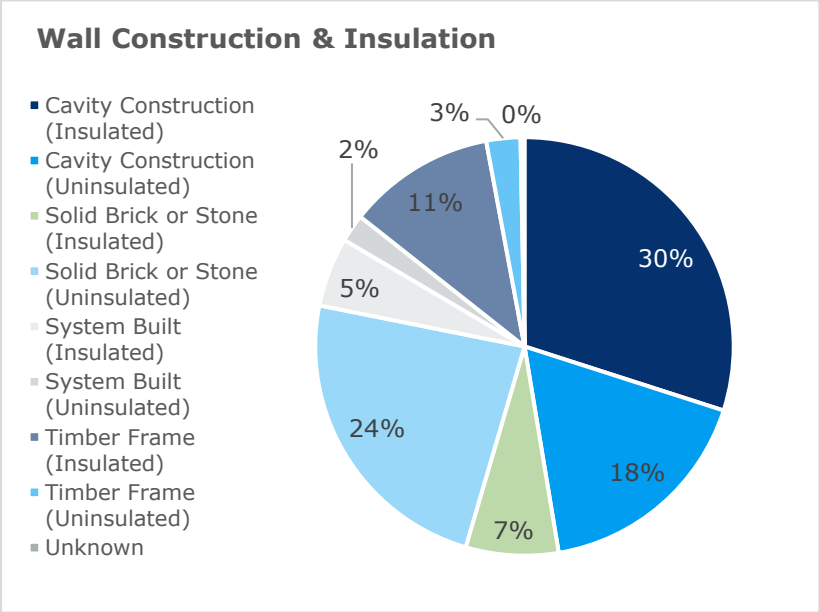

Figure 14 - Domestic Baseline Tool: Wall Construction & Insulation Data

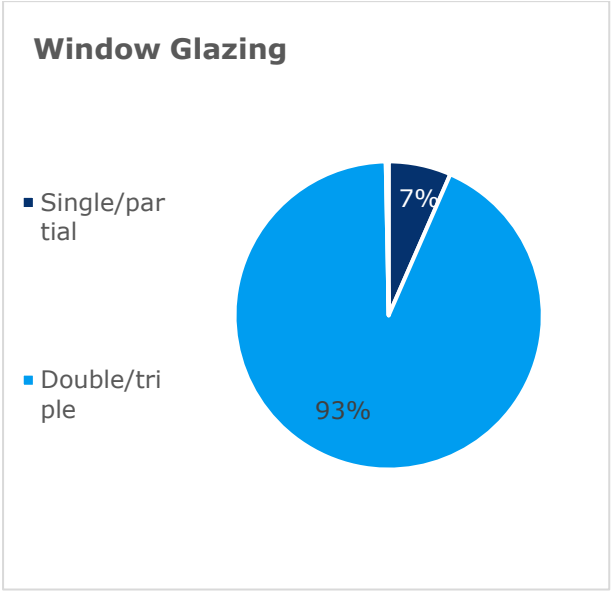

Figure 15 - Domestic Baseline Tool: Window Glazing Data

13 Appendix 3 – Heat Network Opportunity Methodology

The process begins with the Data Collection and Preparation phase, where essential datasets are gathered and refined for analysis (See Table 10 - Datasets used to inform the LHEES). A key component of this phase is the utilization of the Scotland Heat Map dataset, provided by the Scottish government. This dataset, along with others, is prepared for Geographic Information System (GIS) mapping, laying the groundwork for identifying potential opportunities and constraints for heat network development.

Dataset	Source
Heat Demands	Scotland Heat Map
Heat Density Raster	Scotland Heat Map
Existing Heat Networks – (HeatNetworksData)	Scotland Heat Map
Local Development Plan Sites	Scottish Government
NAEI Large Point Emitters	National Atmospheric Emissions Inventory
SEPA Waste Sites	Scottish Environmental Protection Agency
Energy Supply Points	Scotland Heat Map
Process Loads - Supermarkets, Bakeries, Breweries, Distilleries, Laundries, Paper and Pulp Sites - CXC_Waste_Heat Dataset	Inverclyde Council
Primary Substation	Scottish Power Energy Networks
Grid Supply Point	Scottish Power Energy Networks
OS Greenspace	Ordnance Survey
River and Waterbodies - OS OpenMap Local	Ordnance Survey
BGS Hydrogeology 625k	British Geological Survey

GeoTH_Hot_Sed_Aquifer_prospects	Scotland Heat Map
Coal Mining Reporting Area - The Coal Authority Interactive Map	British Geological Survey and Coal Authority
Coal Authority Discharge Points	British Geological Survey and Coal Authority
Road, Railway Track, Road/Railway Tunnel - OS OpenMap Local	Ordnance Survey
River Clyde Homes Data	River Clyde Homes
Cloch Housing Association Data	Cloch Housing Association
Oak Tree Housing Association Data	Oak Tree Housing Association
Blackwood Housing Association Data	Blackwood Housing Association
Link Housing Association Data	Link Housing Association
Home Analytics (HA)	Energy Saving Trust

Table 10 - Datasets used to inform the LHEES analysis.

Next is the Potential Zone Identification stage, which employs Linear Heat Density (LHD) benchmarks to determine viable zones for heat networks (See Appendix 7). LHD is calculated by dividing the total annual heat demand by the network's total length, providing an insight into the financial viability of potential provisional heat network zones.

Inverclyde Council

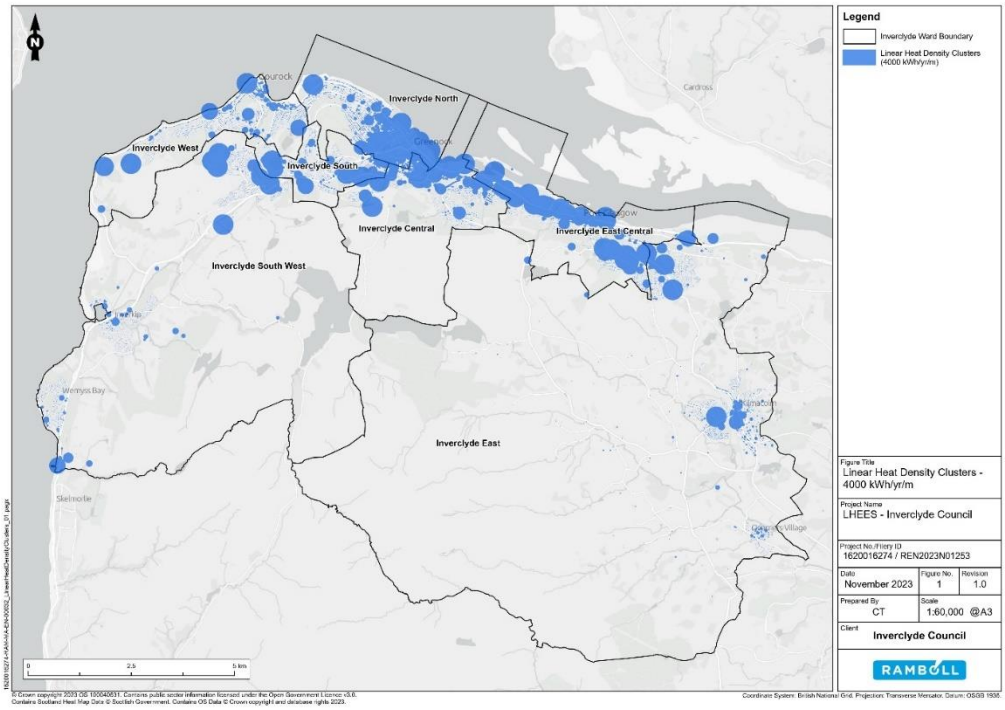

Figure 16 - Linear Heat Density 4000kWh/m/y buffer zones

The third phase, Potential Zone Prioritisation, focuses on evaluating these zones based on anchor loads (See Figure 17 & Figure 18). Anchor loads are identified as buildings with significant heat demands, which can support the financial viability of a heat network. The prioritization process involves setting specific thresholds for these anchor loads to filter out the most viable zones.

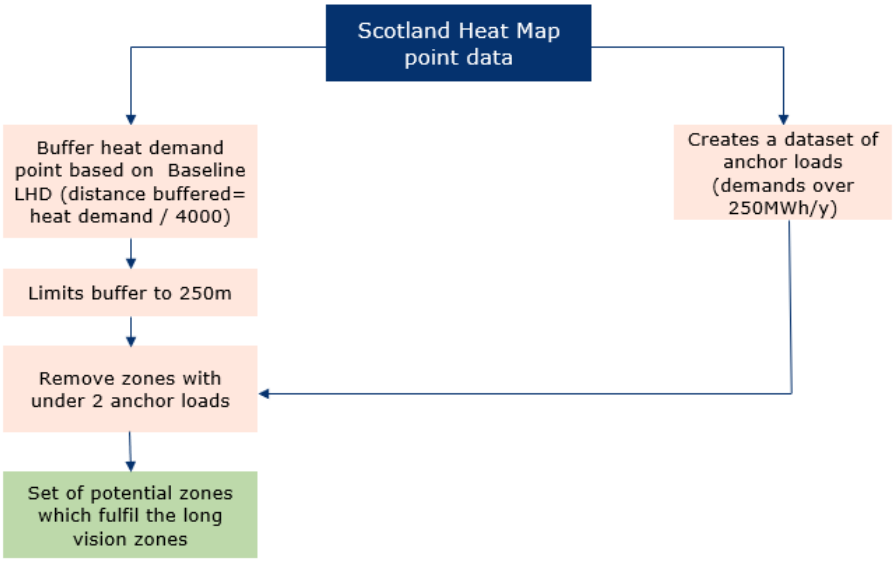

Figure 17 - Process for the Prioritisation of Potential Zones

Inverclyde Council

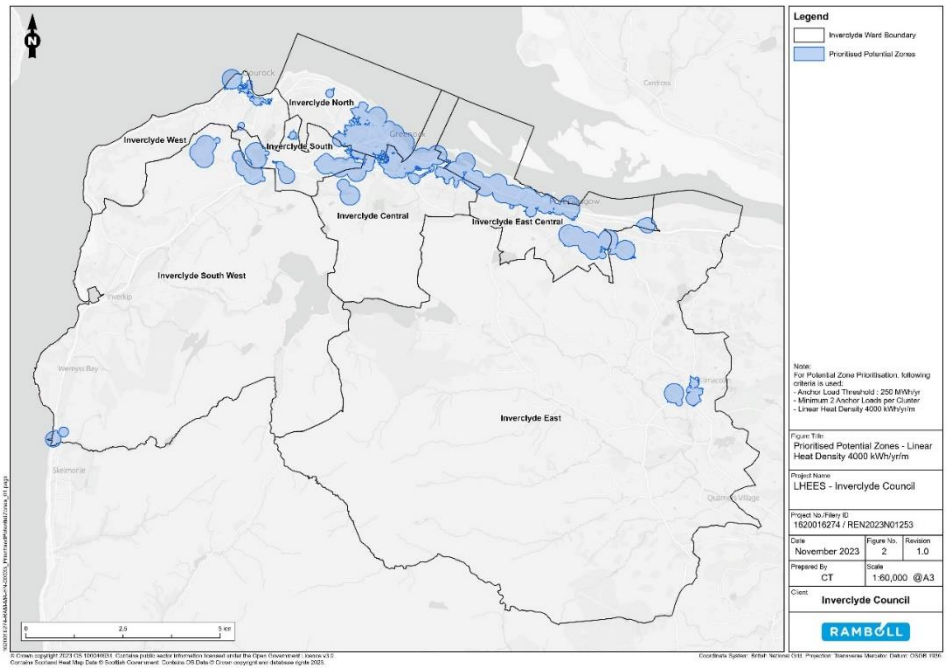

Figure 18 - Prioritised Potential Zones

Following this, the Potential Zone Selection phase involves a manual selection of zones, drawing from the previously prioritized zones (See Figure 19). This step determines the scale and boundaries of potential heat network areas.

Inverclyde Council

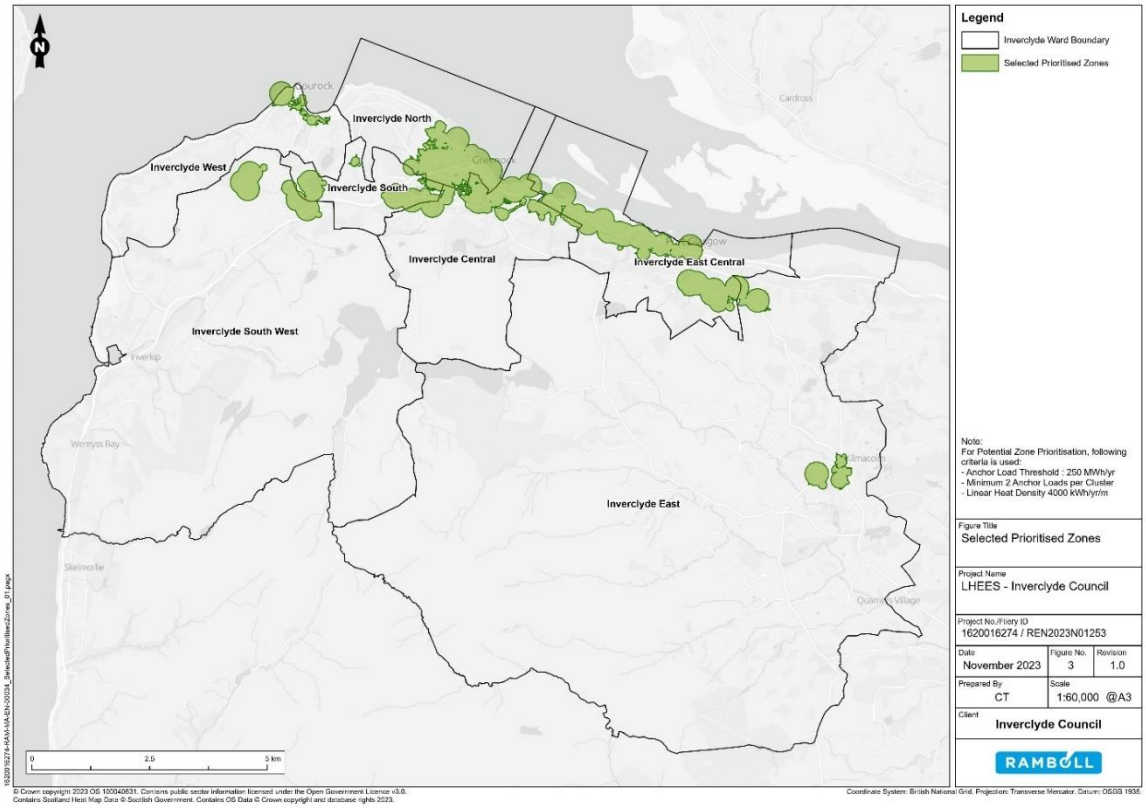

Figure 19 - Selected Prioritised Zones

The final phase, Prospective Heat Network Zones, refines the boundaries of the potential zones. This refinement incorporates additional data analyses, such as heat density metrics to include areas with high heat density and identifying significant physical constraints like rivers and highways (See Figure 20). These factors are crucial in determining the final layout and scope of the provisional heat network zones.

Inverclyde Council

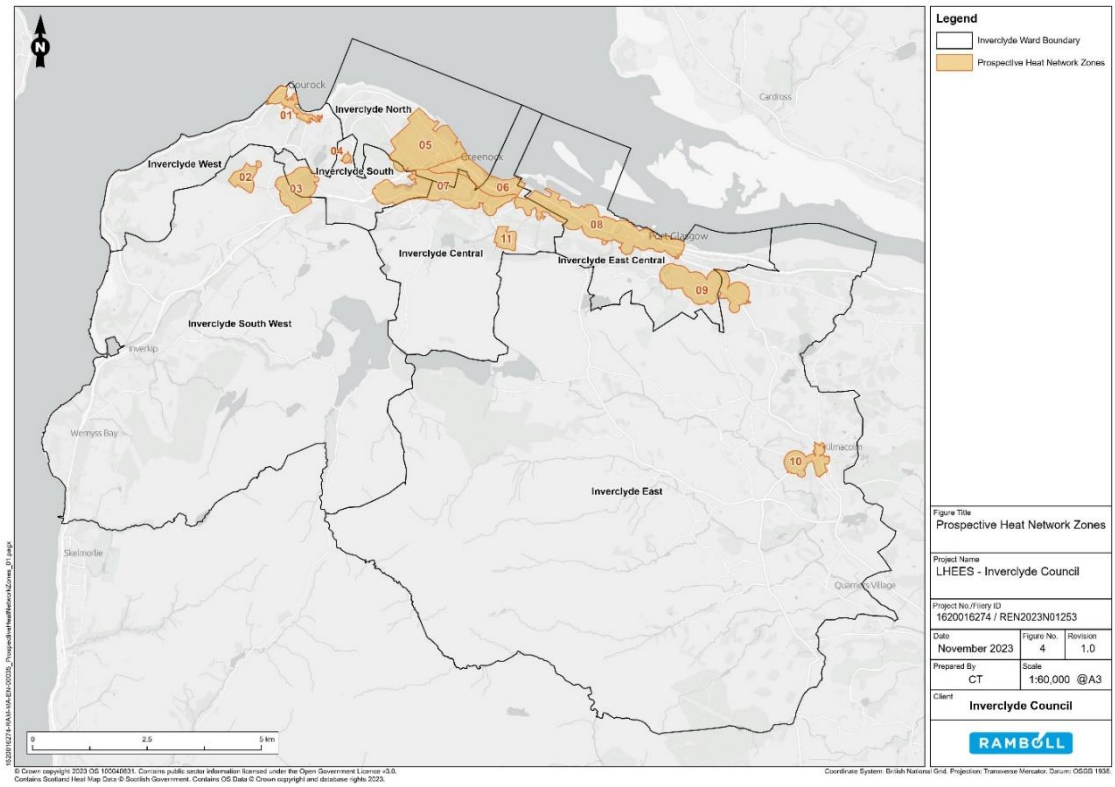

Figure 20 - Prospective Heat Network Zones

Additionally, the methodology includes an overlay analysis of the Prospective Heat Network Zones with various layers (See Appendix 12 & 13). These layers, including background information, potential heat sources, and significant constraints, are critical in visualizing the complex process behind the construction of the provisional heat network zones and understanding the environmental and infrastructural considerations that influence their formation.

Inverclyde Council

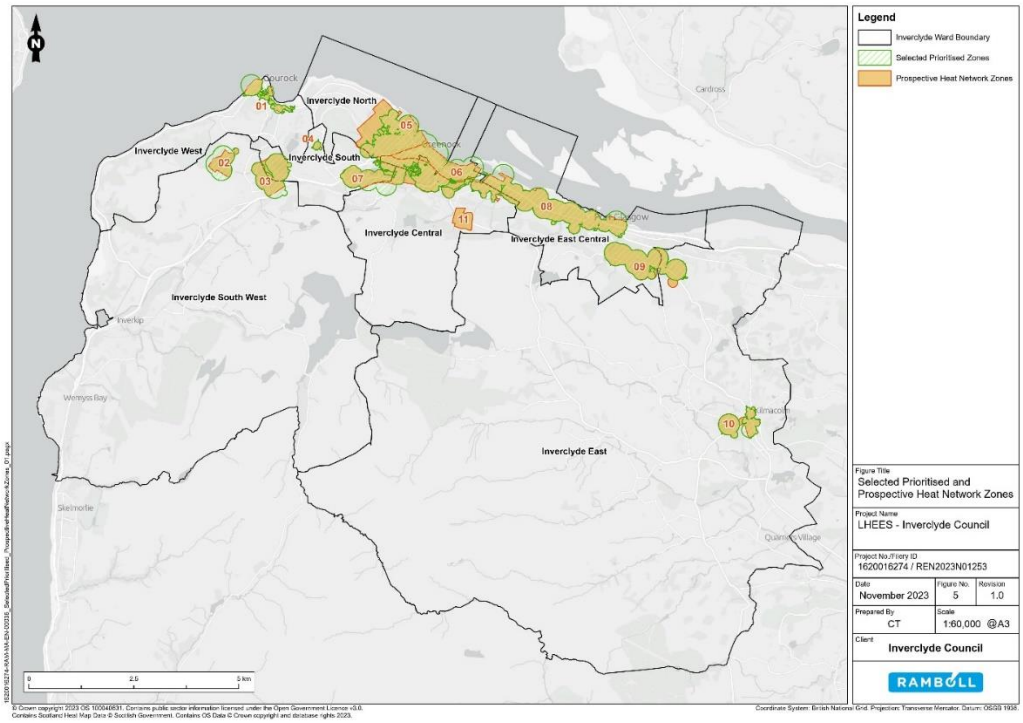

Figure 21 - LHEES data used in analysis Local Authority Wide Map including prospective heat network zones and selected prioritised heat network zones.

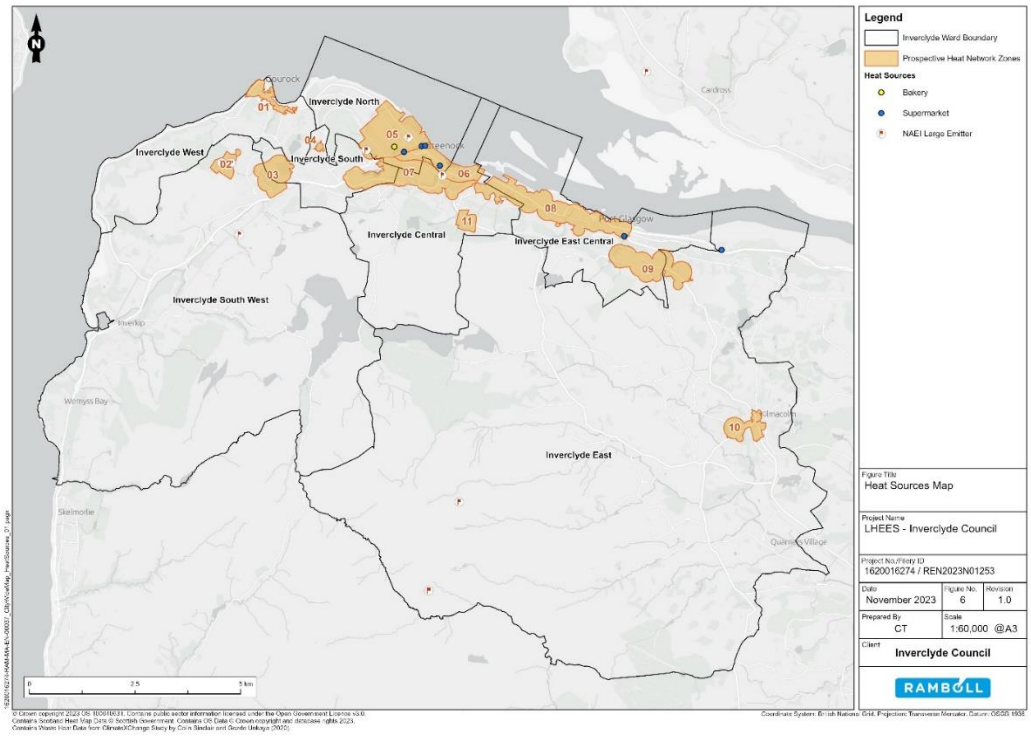

Figure 22 - Council wide map including prospective heat network zones with potential waste heat sources.

14 Appendix 4 – Ranking of Intermediate Zones

Ranking	Zones with Highest Weighted Score
1	Greenock Town Centre and East Central
2	Greenock East
3	Port Glasgow Mid, East and Central
4	Greenock Upper Central
5	Greenock West and Central
6	Braeside, Branchton, Lower Larkfield and Ravenscraig
7	Port Glasgow Upper, West and Central
8	Lower Bow and Larkfield, Fancy Farm, Mallard Bowl
9	Port Glasgow Upper East
10	Gourock Central, Upper East and IRH
11	Bow Farm, Barrs Cottage, Cowdenknowes and Overton
12	Gourock Upper and West Central and Upper Larkfield

Table 11 - Ranking of Intermediate Zones based on Weighted Efficiency Measures

15 Appendix 5 - Property Categories

Category	Requirements
0	Communal heating system
1	Not Category 0
	Property not listed
	Property not in conservation area
	Insulated walls
	Double/triple glazed windows
	Loft insulation > 99mm
2	Not Category 0 or 1
	Property is insulated solid brick or stone, system built or a timber frame construction.
	No risk of narrow hard to insulate cavity

Table 12 - Property Categories

16 Appendix 6 - Poor Building Energy Efficiency: Probability of Fuel Poverty Raster

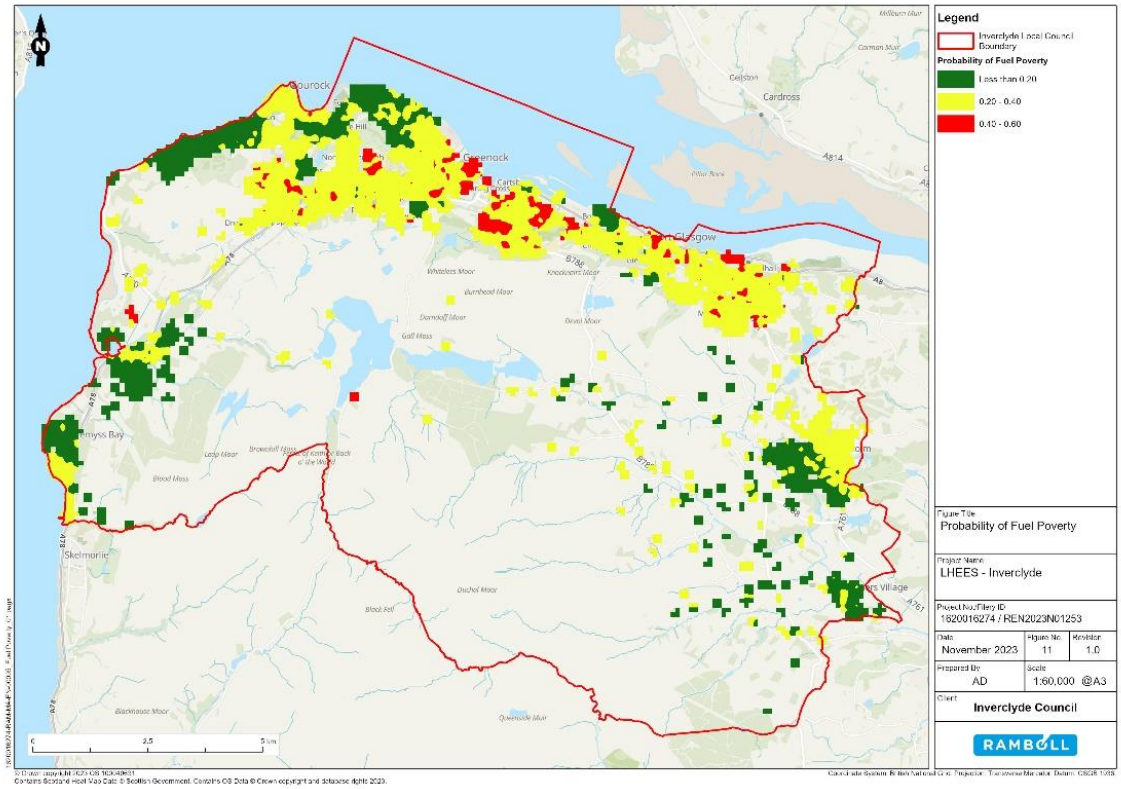

Figure 23- Poor Building Energy Efficiency: Probability of Fuel Poverty Raster

17 Appendix 7 – PEAT Outputs

EPC	SAP	Before	After
B	81-91	8%	8%
C	69-80	58%	78%
D	55-68	24%	11%
E	39-54	7%	2%
F	21-38	3%	0%
G	1-20	0%	0%

Table 13 - EPC Comparison Before/After

Inverclyde Council Ward	Energy Saving (kWh)	Energy Bill Saving	$KgCO_2$ Saving
Central	3,348	£440	557
East	3,778	£483	687
East Central	3,794	£637	656
North	3,311	£504	589
South	3,241	£369	576
South-West	4,182	£610	725
West	1,461	£217	200

Table 14 - Energy and Carbon Savings per Ward

Number of Measures	Number of Properties	Average Cost per Property
1	59	£1,001
2	638	£6,200
3	646	£12,717
4	284	£16,930
5	58	£20,567

Table 15 - No. of Properties per Measure and associated Costs