
Report To:	Environment & Regeneration Committee	Date:	18 January 2024
Report By:	Head of Physical Assets	Report No:	ENV010/24/EM
Contact Officer:	Eddie Montgomery	Contact No:	01475 712472
Subject:	Energy & Climate Change Update		

1.0 PURPOSE AND SUMMARY

- 1.1 For Decision For Information/Noting
- 1.2 The purpose of this report is to provide an update on Energy and Climate Change related activity and strategy documentation/action plans.
- 1.3 The report provides a summary of the progress on Net Zero Action Plan projects with a focus on Energy Use in Buildings and the Natural Environment. In addition, report provides a summary of the progress on Inverclyde's Local Heat and Energy Efficiency Strategy (LHEES) and its Delivery Plan including providing details of the Greenock Waterfront District Heating study and the potential next steps. Finally, it covers the Public Bodies Climate Change Duties report cover the period 2022-23.
- 1.4 The Local Heat and Energy Efficiency Strategy (LHEES) and delivery plan is a statutory piece of legislation designed to be used as a route map to decarbonise all of Inverclyde Council area from assigning energy efficiency and district heating zones. The report provides an update on the progress in respect to the Inverclyde Strategy, Delivery Plan and next steps.
- 1.5 The Greenock Waterfront District Heating study examines the feasibility of the implementation of a district heating scheme covering the Greenock Municipal Buildings, Waterfront Leisure Complex and potentially some other public sector buildings, potentially using a water or wastewater heat pump.
- 1.6 The report is to inform the Committee of the greenhouse gas emissions data that has been submitted to the Scottish Government with respect to climate change reporting required by the Climate Change (Scotland Act) 2009. Local authorities are required to report annually on their performance and action with respect to climate change. The data to be submitted shows that from the baseline year of 2012/13, the Council has been steadily reducing its carbon emissions. In 2012/13, the Council's total emissions were 19,104 tonnes while in 2022/23, they were 9,362 tonnes.

2.0 RECOMMENDATIONS

2.1 That the Committee

- notes the progress and update on Net Zero Action Plan items as summarised in Appendix 1;
- notes the progress and programme for the development of the Inverclyde LHEES and the next stage for public consultation with the draft strategy and delivery plan included as Appendices 2.1 and 2.2.
- agrees to seek Scottish Government funding of up to £150k, with a 10% council funding contribution from the Net Zero capital allocation, for strategic heat network support studies;
- notes the progress of the Greenock Waterfront District Heating study and agrees to seek Scottish Government funding of up to £50k, to develop the feasibility work to date through to Outline Business Case stage;
- note the Public Bodies Climate Change Report 2022/23 position, the re-baselining requirement for future years, and the summary Inverclyde emissions data included as Appendix 3.

Eddie Montgomery
Head of Physical Assets

3.0 BACKGROUND AND CONTEXT

Net Zero Action Plan

- 3.1 The Committee has previously approved the Net Zero Action Plan 2022/27 with the last full update presented to the June 2023 Committee and interim update to the November Committee. Progress continues to be made on a number of the areas of the plan in relation to Energy Use in Buildings and the Natural Environment. Refer to Appendix 1 for details.

Local Heat & Energy Efficiency Strategy (LHEES)

- 3.2 Local Heat and Energy Efficiency Strategies (LHEES) are at the heart of a place based, locally led and tailored approach to delivering the transition to climate-friendly, more energy efficient homes and non-domestic buildings. These local Strategies will set out the long-term plan for decarbonising heat in buildings and improving their energy efficiency across an entire local authority area
- 3.3 The Council appointed Turner and Townsend in August 2023 to complete the LHEES strategy and delivery plan with the first draft required by the end of December 2023 to comply with the legislative requirement. The draft strategy and delivery plan is included as Appendices 2.1 and 2.2.
- 3.4 Following approval from this Committee, it is then planned to progress the draft to public consultation in February before the final strategy and action plan is completed by the end of March 2024. Officers have been in regular communication with the Scottish Government as to where we are in this process.
- 3.5 The LHEES details potential Heat Network Zones across Inverclyde where there is the density of properties requiring heat that could make a heat network work in those areas. In addition, energy efficiency zones where fuel poverty is currently having the biggest impact have been detailed and those areas would be a priority for area-based schemes in Inverclyde and include Registered Social Landlord (RSL) properties. Finally, areas with good potential for either individual heat pumps or communal heat pumps have been identified and these are shown in the strategy and delivery plan.
- 3.6 To support Local Authorities development of a strategy for how Heat Network Zones from the LHEES will be assessed and developed, the Scottish Government's Heat Network Support Unit are offering funding of up to £150k, with a requirement for a local authority contribution of 10% of the overall cost. The committee is asked to approve the submission of an application for funding support in this area as part of the Council's implementation of LHEES.

Greenock Waterfront District Heating Feasibility

- 3.7 Following a pilot LHEES project for public sector buildings in 2018, a potential district heating network linking public sector buildings was identified. Consultant support was procured through hub West Scotland to look at a number of the buildings and produce a feasibility factoring in plant rooms and initial pipe route proposals.
- 3.8 Greenock Municipal Buildings, Waterfront Leisure Complex, James Watt Building, West College Scotland, Greenock Police Station and Beacon Arts Centre were surveyed for energy and cooling demand requirements. Potential heat sources such as the River Clyde and waste heat from Scottish Water's operation were also considered.

- 3.9 The next stage, pending committee approval, is to develop the feasibility study to a pre-commercial stage through engagement with the Scottish Government's Heat Network Support Unit (HNSU) and the submission of an application for funding support of up to £50k. This will complete an Outline Business Case and allow the project to be in a better position to potentially bid into the £300 million Scotland's Heat Network Fund (SHNF).

<https://www.gov.scot/publications/heat-network-fund-application-guidance/>

- 3.10 As part of the Scottish Government's work on District Heating, the HNSU has partnered with the Danish Board of District Heating to facilitate partnership working and mentoring of the development of local authorities district heating aspirations. The Head of Physical Assets and the Energy and Climate Change Team Leader are participating in this scheme which runs until Summer 2024.

Public Bodies Climate Change Report (PBCCR) 2022-23

- 3.11 In 2015 the Scottish Government brought into force powers in the Public Bodies Duties section of the Climate Change (Scotland) Act 2009 (PBCCR) to introduce mandatory annual reporting on climate change for 'major players' in the public sector, including local authorities.
- 3.12 In May 2019, the Committee on Climate Change, in a request from the Governments of the UK, Scotland and Wales, advised on reassessing the UK's long term greenhouse gas emissions targets. It advised on new emissions' targets for the UK of net zero by 2050 and in Scotland net zero by 2045. The targets in Scotland reflects its greater relative capacity to remove emissions than the UK as a whole. Following this, the Scottish Government declared a climate emergency and set a net zero target year for Scotland of 2045.
- 3.13 The Scottish Government considers the public sector as having a role in leading climate change action and from 2022 public bodies were required to include a target date for achieving net zero direct emissions in their annual reporting.
- 3.14 The climate change reporting data submitted by the Council (included as Appendix 3) shows that, from a baseline of 2012/13, the Council has been steadily reducing its carbon emissions. By 2022/23, the Council has reduced its greenhouse gas emissions from 19,104 tonnes in 2012/13 to 9,362 tonnes, a reduction of 51%. The Council has managed to reduce its emissions through a range of measures. In particular, its building rationalisation and new build/refurbishment programme has reduced the number of operational buildings and improved the energy efficiencies of a large proportion of its retained building portfolio. The Council has also replaced its streetlamps with LEDs that use around half the electricity of the previous lamps, and has introduced electric vehicles to its fleet. The decarbonisation of the electricity supply in the national grid has also had a significant impact on reducing emissions.
- 3.15 In comparing data used to produce this year's report with that of last year, there have been some significant increases and decreases. The most notable one is that fuel use for the Council's fleet increased by 22.7% between 2021/22 and 2022/23. This has been attributed to services having been fully restored following COVID-19. In regards utilities consumption, there were some significant decreases in 2022/23 from 2021/22. For example, Clydeview Academy, Gourrock Primary School and Hillend Childrens Centre saw reductions in electricity use of 15.3%, 17.6% and 24% respectively. This has been a result of upgrading lighting to LEDs and refurbishment incorporating new/upgraded plant and equipment. Other increases/decreases require further investigation, and it is planned to establish a project register with which to monitor impacts of projects and facilitate reporting through the regular updates on Net Zero Action Plan progress.

3.16 With the incorporation of Inverclyde Leisure’s energy supplies into Inverclyde Council’s contract with Scottish Procurement and the review of what is currently reported in terms of Scope 3 emissions compared to what other Scottish Local Authorities have been reporting on, the Committee is requested to note that there will be a requirement in future years to re-baseline in terms of comparison to an original 2012/13 baseline. The review of current reporting is also considering the addition of emissions associated with residual waste, rather than just internal waste, which will result in an increase within Scope 3 emissions. However, the overall position will be positively impacted through the proposed new residual waste arrangements.

4.0 PROPOSALS

- 4.1 Officers will continue to seek funding opportunities in relation to Net Zero and it should be noted that this will require to consider aligning existing Net Zero capital and elements of other capital programme funding resources to meet various percentage match funding requirements.
- 4.2 Officers will continue with the Local Heat and Energy Efficiency Strategy work stream to finalise the document for public consultation in February and completion by the end of March 2024.
- 4.3 Officers will engage, subject to Committee approval, with the Scottish Government Heat Network Support Unit to seek funding for Strategic Heat Network Zoning Feasibility works and the pre-capital feasibility study for the potential Greenock Waterfront District Heating network.

5.0 IMPLICATIONS

5.1 The table below shows whether risks and implications apply if the recommendation(s) is(are) agreed:

SUBJECT	YES	NO
Financial	x	
Legal/Risk	x	
Human Resources		x
Strategic (Partnership Plan/Council Plan)	x	
Equalities, Fairer Scotland Duty & Children/Young People’s Rights & Wellbeing	x	
Environmental & Sustainability	x	
Data Protection		x

5.2 Finance

One off Costs

Cost Centre	Budget Heading	Budget Years	Proposed Spend this Report £000	Virement From	Other Comments
LHEES					
Net Zero	E&R Capital	2024-25	15		10% contribution to facilitate HNSU £150k grant support (item 3.6)

Annually Recurring Costs/ (Savings)

Cost Centre	Budget Heading	With Effect from	Annual Net Impact	Virement From (If Applicable)	Other Comments
N/A					

5.3 Legal/Risk

The 'Local Heat and Energy Efficiency Strategies (Scotland) Order 2022' was passed by the Scottish Parliament and has now been made a Scottish Statutory Instrument, coming into force on 21st May 2022. The order places a duty on Local Authorities to prepare, publish and update:

- A local heat and energy efficiency strategy; and
- A local heat and energy efficiency delivery plan.

The first strategy and plan must be published on or before 31 December 2023 and thereafter must be kept under review and updated at intervals of no more than 5 years of the publication date.

The draft plan and delivery plan is being published for this committee in December ahead of the Committee meeting on the 18 January 2024 i.e. before the 31 December 2023.

5.4 Human Resources

No implications.

5.5 Strategic

A new strategy to comply with "The Local Heat and Energy Efficiency Strategies (Scotland) Order 2022" has been produced and an associated Delivery Plan.

5.6 Equalities, Fairer Scotland Duty & Children/Young People

(a) Equalities

This report has been considered under the Corporate Equalities Impact Assessment (EqIA) process with the following outcome:

X	YES – Assessed as relevant and an EqIA is required.
	NO – This report does not introduce a new policy, function or strategy or recommend a substantive change to an existing policy, function or strategy. Therefore, assessed as not relevant and no EqIA is required.

(b) Fairer Scotland Duty

If this report affects or proposes any major strategic decision:-

Has there been active consideration of how this report's recommendations reduce inequalities of outcome?

	YES – A written statement showing how this report’s recommendations reduce inequalities of outcome caused by socio-economic disadvantage has been completed.
X	NO – Assessed as not relevant under the Fairer Scotland Duty for the following reasons: Provide reasons why the report has been assessed as not relevant.

(c) Children and Young People

Has a Children’s Rights and Wellbeing Impact Assessment been carried out?

	YES – Assessed as relevant and a CRWIA is required.
X	NO – Assessed as not relevant as this report does not involve a new policy, function or strategy or recommends a substantive change to an existing policy, function or strategy which will have an impact on children’s rights.

5.7 Environmental/Sustainability

The LHEES underpins how Inverclyde area will develop over the next twenty years for energy and carbon efficiency in our own operations, but also how we work with RSL’s, private businesses and private homeowners.

Has a Strategic Environmental Assessment been carried out?

X	YES – assessed as relevant and a Strategic Environmental Assessment is required.
	NO – This report does not propose or seek approval for a plan, policy, programme, strategy or document which is like to have significant environmental effects, if implemented.

5.8 Data Protection

Has a Data Protection Impact Assessment been carried out?

	YES – This report involves data processing which may result in a high risk to the rights and freedoms of individuals.
X	NO – Assessed as not relevant as this report does not involve data processing which may result in a high risk to the rights and freedoms of individuals.

6.0 CONSULTATION

6.1 Relevant Officers within the Council and RSL’s were consulted and attended a stakeholder workshop for the LHEES strategy and action plan. For the PBCCR, Staff from relevant Council services were consulted in the preparation of the report to the Scottish Government on the Council’s greenhouse gas emissions.

7.0 BACKGROUND PAPERS

7.1 Net Zero Strategy 2021/2045 and Action Plan 2022/2027.

Item	Action	Update – December 2023
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1. Carbon Reduction Action Area: Governance

Funding

1.7	Work with our partners including the Scottish Government to focus specific funding, measures and resources to address Climate Change at local level	<p>The Councils Environment & Regeneration Capital programme reflects the allocation of resources approved by Inverclyde Council on 2nd March 2023 including £3.3m to address the progression of the agreed 2022/27 Net Zero Action Plan.</p> <p>Previous updates confirmed:</p> <ul style="list-style-type: none"> • £0.99m grant funding has been secured through the Low Carbon / Vacant & Derelict Land Investment Programme (VDLIP) to support the delivery of the Learning Disability Community Hub project including the low carbon design approach. • The £1.734m Port Glasgow Community Hub (refurbishment of King George VI building) funded through the Regeneration Capital Grants Fund (RCGF) also includes piloting a low carbon approach. • The Peatland Restoration proposals for Dowries and Hardridge Farms have been progressed with £768,705 Scottish Government Peatland Action Funding now secured for Hardridge and Dowries application also being considered; • Funding application made to Scottish Football Association (SFA) to address LED floodlighting upgrades across School and Leisure pitches (50% match funding required if successful); • Museums Galleries Scotland - Capital Resilience Fund 2023 (grants available between £5,000 and £60,000) and opportunity for energy efficiency works with officers putting together a bid for heating controls / partial LED lighting in the Watt Institute <p>Current update</p> <ul style="list-style-type: none"> • Peatland Restoration proposals have been progressed with a further £103,981 Scottish Government Peatland Action Funding now secured for Dowries; • Positive engagement continues with the Scottish Football Association (SFA) to address LED floodlighting upgrades across School and Leisure pitches (50% match funding required if successful); • Museums Galleries Scotland - Capital Resilience Fund 2023. Grant application submitted for the maximum £60,000 for heating controls / partial LED lighting in the Watt Institute. Outcome awaited. • Salix Public Sector Heat Decarbonisation Grant funding bid submitted addressing multiple sites aligning to existing Net Zero Action Plan projects. Outcome awaited; • Potential funding support opportunities in relation to heat network studies as detailed within main report.
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Item	Action	Update – December 2023
2. Carbon Reduction Action Area: Significant Carbon Emitters		
Energy Use in Buildings		
2.3	Prepare, publish and update a Local Heat and Energy Efficiency Strategy (LHEES) and Delivery Plan	Update included in main Committee report. Complementary studies on-going in relation to the feasibility of a district heating network project around the Greenock Waterfront area with current study included as appendix to report. The Council continues to participate in the Scottish Government District Heating Mentoring Programme which is a 12 month programme delivered through the Heat Network Support Unit (HNSU) designed to build capacity within Scottish Local Authorities through knowledge and experience sharing. Full update on activity within body of the report.
2.5	Continue to consider energy efficiency improvements and incorporation of low carbon technologies in Council owned buildings as part of capital programme maintenance and lifecycle replacement activity	<p>Previous updates confirmed:</p> <ul style="list-style-type: none"> • Further phase of window replacement (phase 6) completed at Greenock Municipal Buildings (double glazed from single, improved u-values); • Greenock Town Hall Re-Roofing and Window Replacement project at tender issue stage also includes improved elemental u-values i.e. increased roof insulation and windows (double glazed from single). • Cornalees Visitor Centre heating and ventilation upgrade being progressed as part of E&R Core Property condition related investment and will also include 21nr photovoltaic panels; • Re-roofing of Glenbrae Children’s Centre being planned / programmed as part of Education Capital Lifecycle programme and will also include 26nr integrated photovoltaic panels. <p>Current update:</p> <ul style="list-style-type: none"> • Greenock Town Hall project programmed to commence 1st Quarter 2024 (refer to capital report). • Cornalees Visitor Centre works now progressing on site; • Glenbrae Children’s Centre project programmed for summer 2024 to minimise disruption to Centre operation.
2.6	Continue to address upgrade to LED lighting and intelligent lighting controls in our buildings including grounds and outdoor sports facilities (all new assets specify LED as standard)	<p>Previous updates confirmed:</p> <ul style="list-style-type: none"> • Commission request issued for LED upgrade at Inverclyde Academy, consultant appointment being progressed; • Commission request issued for school pitch floodlight upgrade (3 secondary schools). • Main training pool area of Greenock Waterfront receiving lighting upgrade (LED) whilst moveable pool floor project is being progressed and pool empty; • Detailed feasibility studies progressed at 6 buildings aligning with Photovoltaic panel studies.

Appendix 1

Item	Action	Update – December 2023
		<p>Current update:</p> <ul style="list-style-type: none"> • As noted in Funding section above, floodlighting project above now superseded by potential wider project for floodlight upgrade at Education and Leisure Pitches subject to outcome of SFA funding bid. Consultant appointed with design progressing; • Greenock Waterfront Training Pool lighting upgrade (LED) complete;
2.7	Identify solar PV opportunities for public buildings where technically feasible and payback periods support investment	Detailed feasibility studies progressed at 6 buildings aligning with LED upgrade assessments noted above. Priority projects have been identified and included in Salix funding bid with next steps involving detail design and tender.
2.8	Identify opportunities for lower emission alternatives to fossil fuel boilers for public buildings where existing boilers are reaching end-of-life, where technically feasible and considering existing building fabric performance	Detailed feasibility studies progressed at 3 buildings. Priority projects have been identified and included in Salix funding bid with next steps involving detail design and tender.
2.14	Continue to investigate the implications of deep retrofit across the estate to identify potential solutions and associated capital costs including technical and logistical barriers to implementation	<p>Previous update:</p> <ul style="list-style-type: none"> • Two studies completed (Port Glasgow Municipal Buildings and St Joseph’s Primary School). Further studies commissioned including Greenock Municipal Buildings and Waterfront Leisure Centre with data gathering phase on-going. Further study of a primary school (Kings Oak PS) in process of being scoped. • Studies progressing towards completion for Greenock Municipal Buildings, Waterfront Leisure Centre and Kings Oak Primary School; • Officers working with hub West Scotland who are forming a Net Zero Collaboration Group and linking with BE-ST (Built Environment Smarter Transformation) to maximise knowledge sharing and pooling of resources around areas such as the retrofit challenge

Item	Action	Update – December 2023
		<p>Current update:</p> <ul style="list-style-type: none"> • Greenock Municipal Buildings and Waterfront Leisure Centre studies complete. Kings Oak Primary School study being finalised. Summary report will be subject of report to future committee; • hub West Scotland Net Zero Collaboration Group co-ordinated by BE-ST (Built Environment Smarter Transformation) continues to meet to enable knowledge sharing and pooling of resources around areas such as the retrofit challenge.
2.15	<p>Increase resources to assist in the development of net zero policy / Local Heat and Energy Efficiency Strategy and plans, including the monitoring, control and reduction of energy use in buildings</p>	<p>The recruitment of a Projects Officer remains a priority, however, response from activity to date has been limited.</p>

4. Carbon Reduction Action Area: Offsetting		
Natural Environment		
4.6	<p>Undertake projects to maximise carbon storage potential of land through peatland restoration and conservation.</p>	<p>Peatland projects at Hardridge and Dowries farms approved at June 2023 E&R Committee. Officers with support from the GCV Green Network Partnership have progressed projects with tenders issued, returned and evaluated. Formal acceptance pending confirmation of Peatland Action Fund grant support.</p> <ul style="list-style-type: none"> • Hardridge – Grant offer received. Project is over 3 seasons/years. Formal project acceptance issued with commencement on site early January 2024. • Dowries – Grant offer received. Project is over single season/year. Formal acceptance being prepared with commencement on site to be agreed but anticipated late January 2024.

December 2023

Local Heat & Energy Efficiency Strategy

Inverclyde Council

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Rev	Status	Originator	Approved	Date
1.1	Draft	E. Nicholson	R. Smith	15 November 2023
0.2	Committee Draft	Z. Saleem	R. Smith	7 December 2023

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1 Foreword

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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
- Eliminating poor energy efficiency as a driver for fuel poverty.

This strategy will play a crucial role in helping the Council meet its 2045 Net Zero target. 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**.

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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.

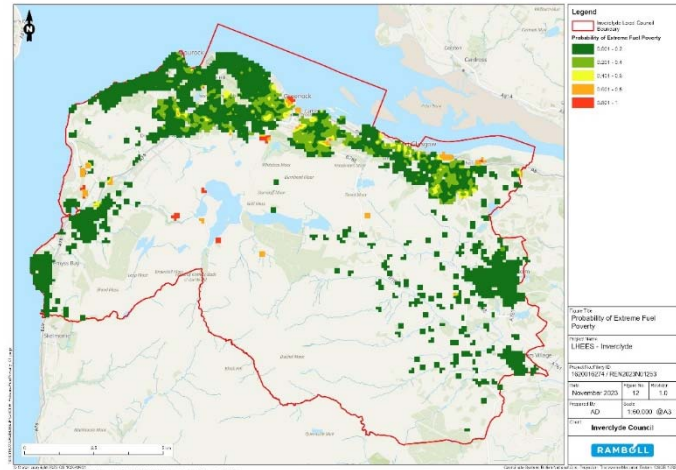


Figure 1 - Probability of Fuel Poverty Raster

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.

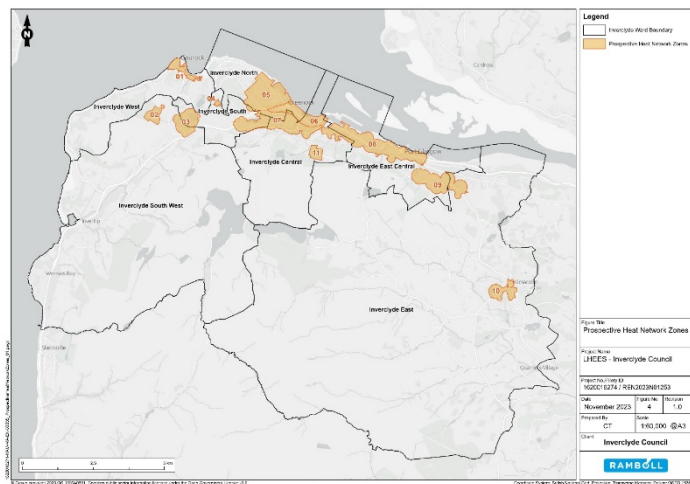


Figure 2 - Prospective Heat Network Zones

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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:

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- 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 target¹. 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 is 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](#)

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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. 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.

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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

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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 emergent 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

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	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 2024 (planned)	The Councils Environment and Regeneration Committee will consider the submitted draft of the LHEES and planned public consultation. The public consultation stage will last around 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.

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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
<p>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.</p>	<p>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.</p>
<p>Climate Change Plan (2018, 2020): Outlines comprehensive policies for emissions reduction by 2032 across all sectors.</p>	<p>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.</p>
<p>Fuel Poverty (Targets, Definition and Strategy) (Scotland) Act 2019: Establishes targets for reducing fuel poverty in Scotland by 2040.</p>	<p>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.</p>
<p>Heat in Buildings Bill (2023): Proposes updates and expansions to the</p>	<p>Inverclyde Net Zero Strategy 2021-2045: Supports the transition to non-polluting heating</p>

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<p>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)</p>	<p>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.</p>
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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.

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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. 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.

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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 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.

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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.

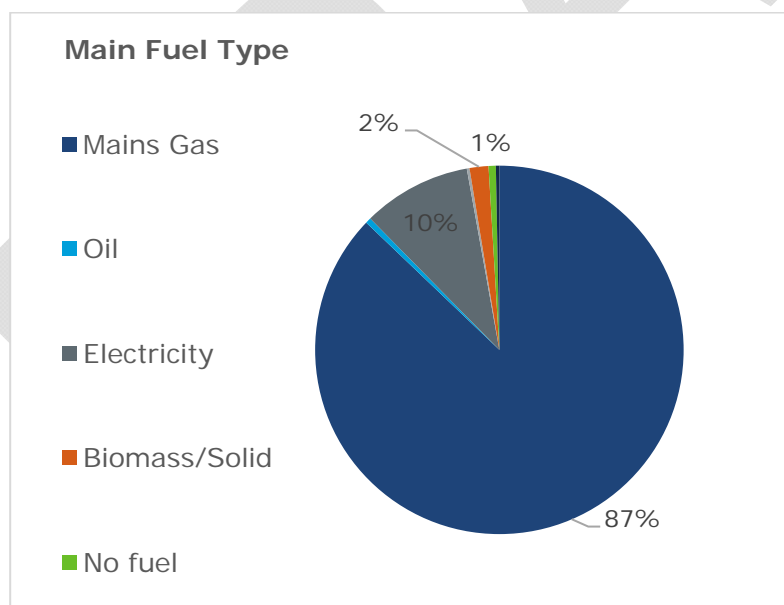


Figure 3 - Domestic Building Main Fuel Type

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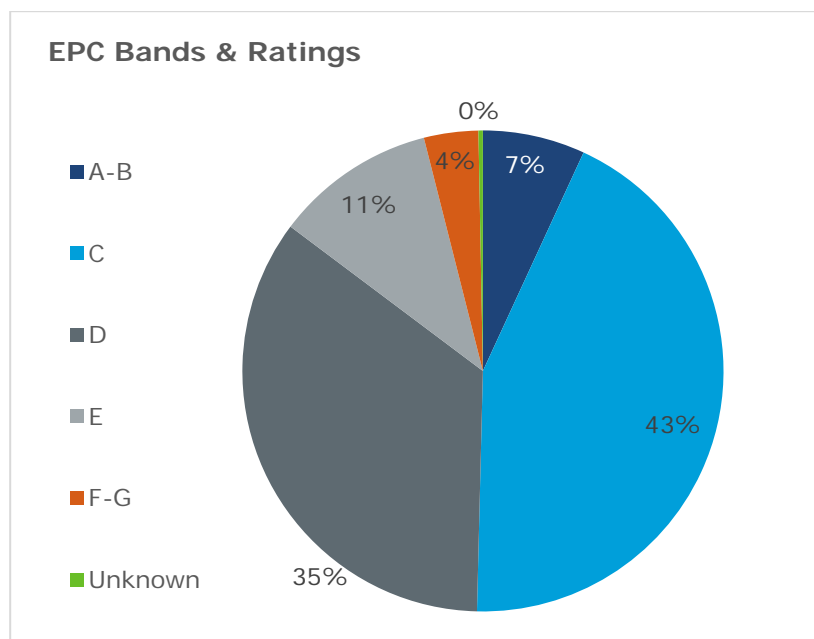


Figure 4 - Domestic Building EPC Bands & Ratings

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

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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

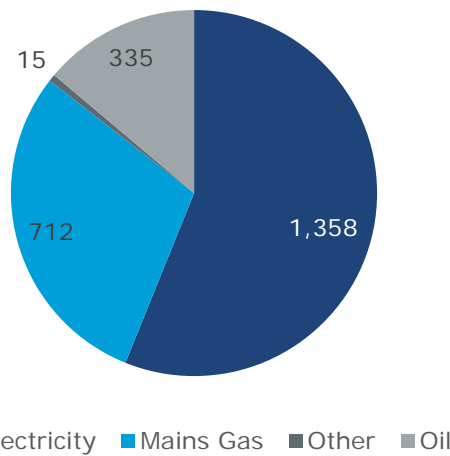


Figure 5 - Non-domestic property count by main fuel type.

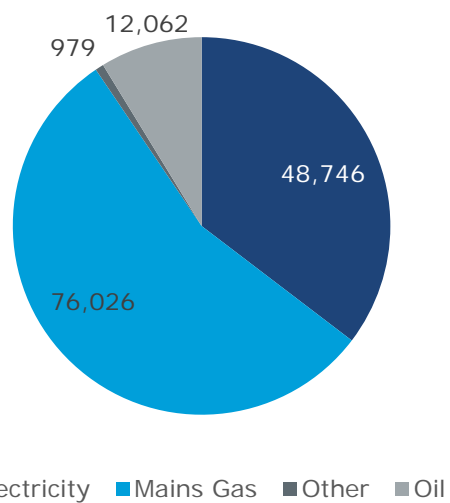


Figure 6 - Heat demand by main fuel type (MWh/yr)

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

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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 (ESSH2) 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 ESSH2 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 ESSH2 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 ave 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.

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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.

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 (EESH).

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.

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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.

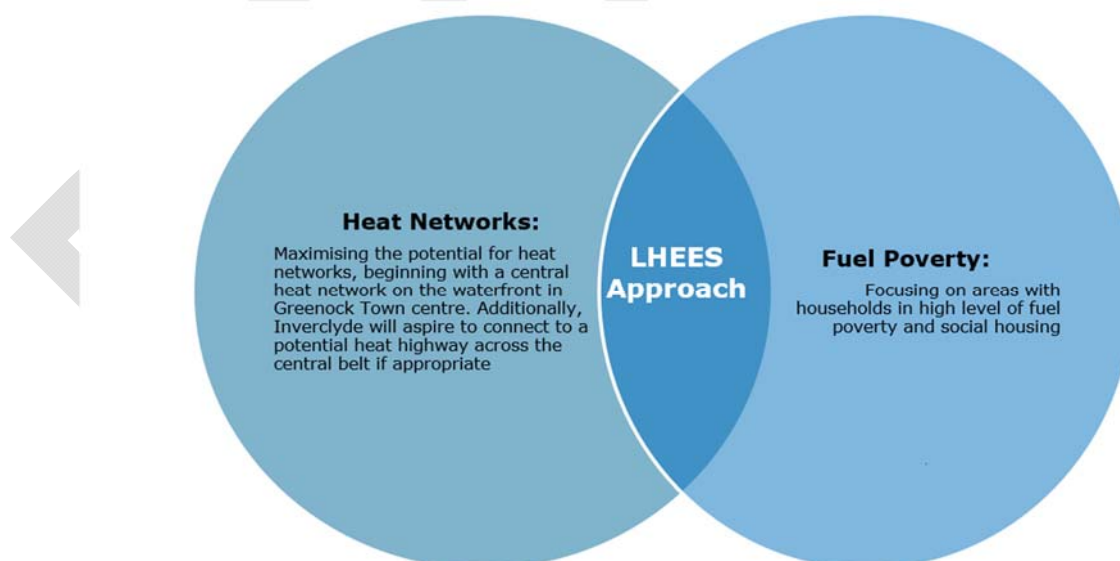


Figure 7: The LHEES will be driven via this approach.

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

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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. Efficiency should be improved as far as practically and economically viable and in line with industry best practice and appropriate standards.
- **Heat decarbonisation (individual):** 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-

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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.

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 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 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.

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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.

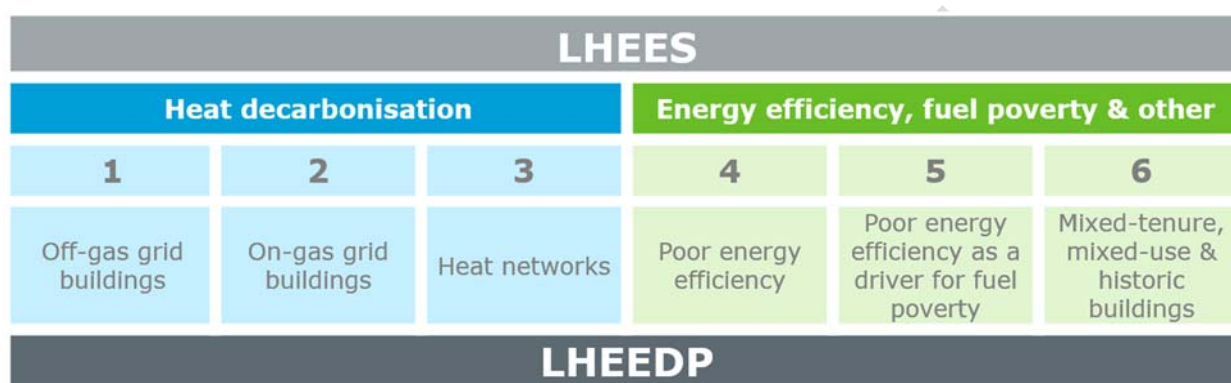


Figure 8: The six LHEES Considerations which formed the basis for analysis and decision-making throughout the 8 stages.

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	

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	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.

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- **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 Scotland⁴**: 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 Scotland⁵**: 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 Scheme⁷**: 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 Scotland⁸**: 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](#))

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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 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. The formation of prospective 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 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.

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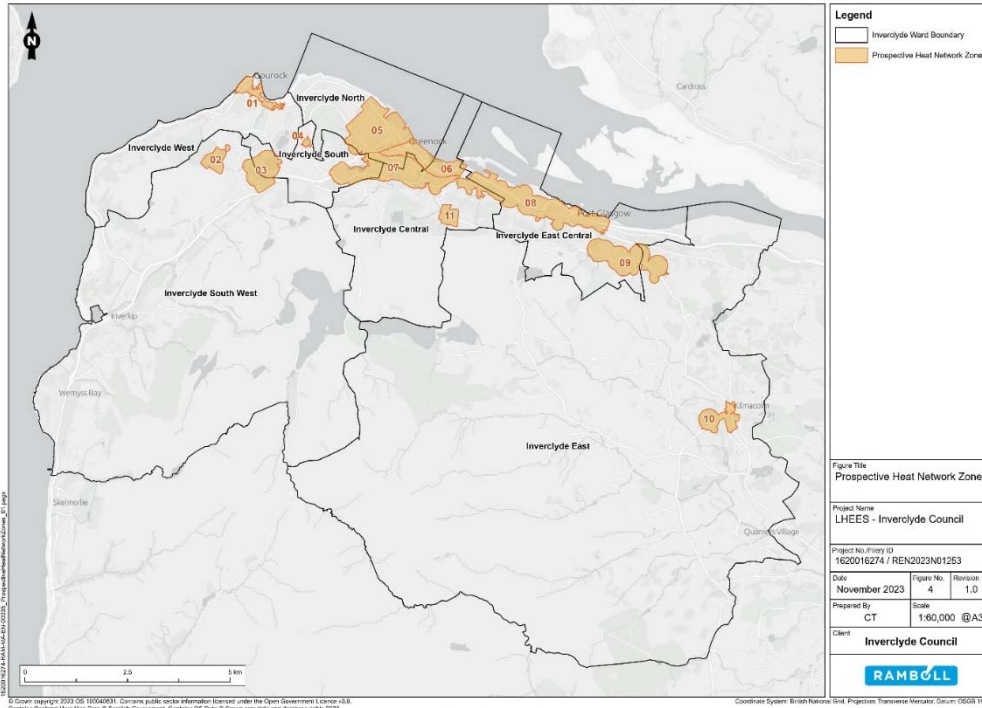


Figure 9- Prospective Heat Network Zones

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.

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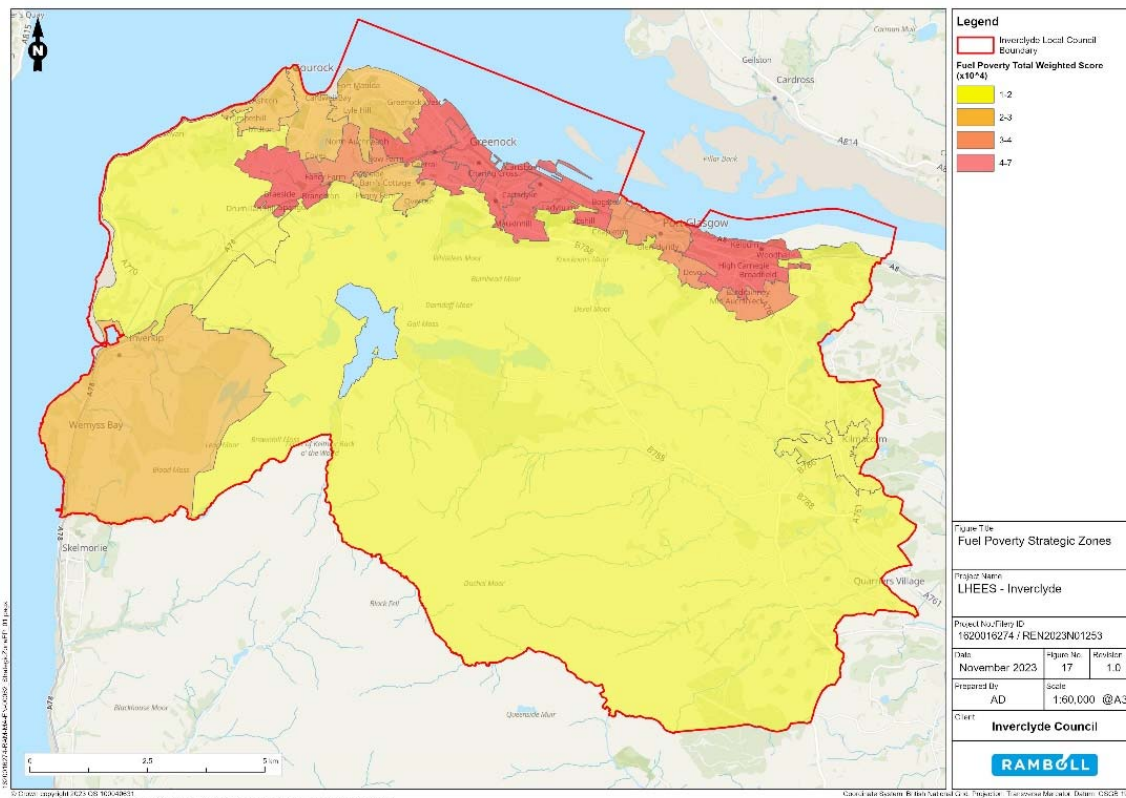


Figure 10 - Map of Intermediate Zones: Fuel Poverty as a Weighted Sum of Home Efficiency Factors

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.

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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.

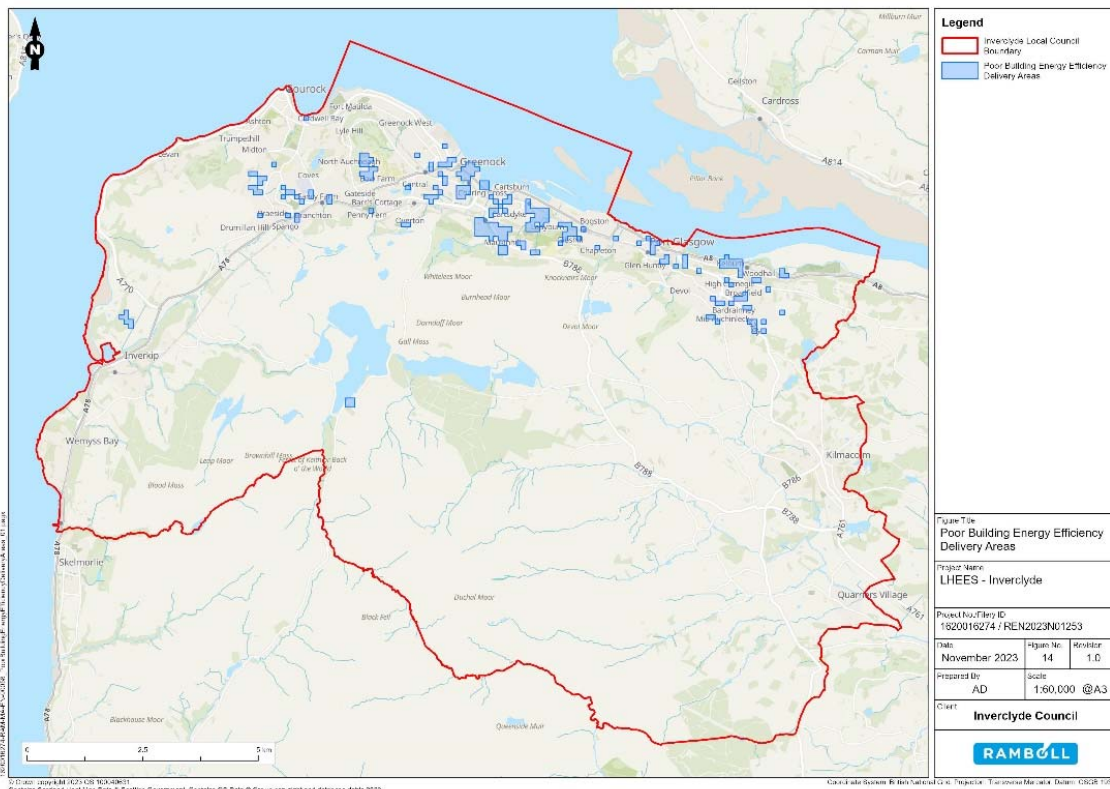


Figure 11 - Poor Building Energy Efficiency Delivery Areas

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

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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

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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.

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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

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	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

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11 **Appendix 1 – Equality Impact Assessment**

Please refer to attached, completed Equality Impact Assessment

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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

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		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%

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	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

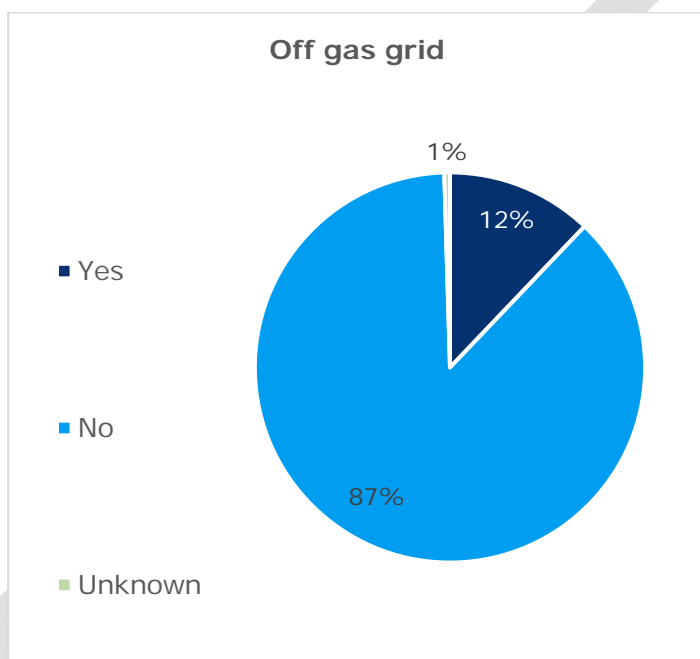


Figure 12 - Domestic Baseline Tool: Gas Grid Property Data

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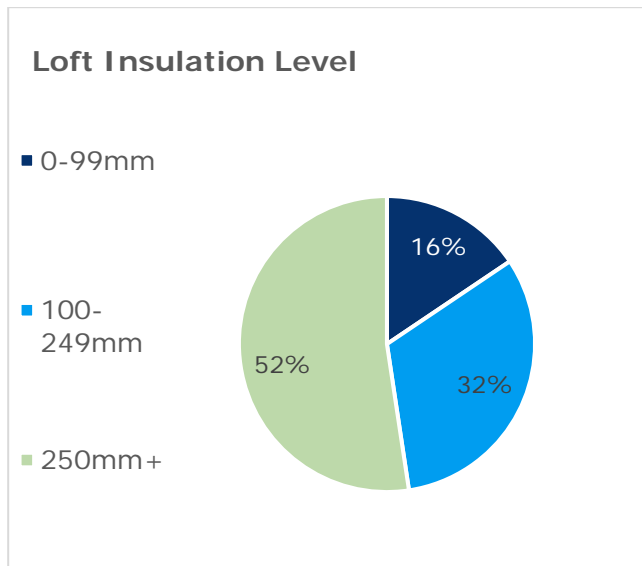


Figure 13 - Domestic Baseline Tool: Loft Insulation Data

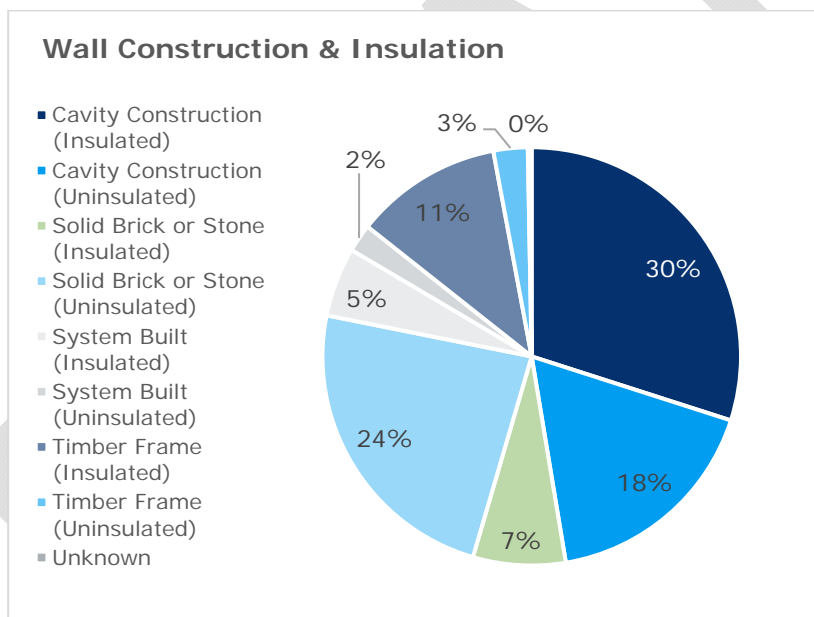


Figure 14 - Domestic Baseline Tool: Wall Construction & Insulation Data

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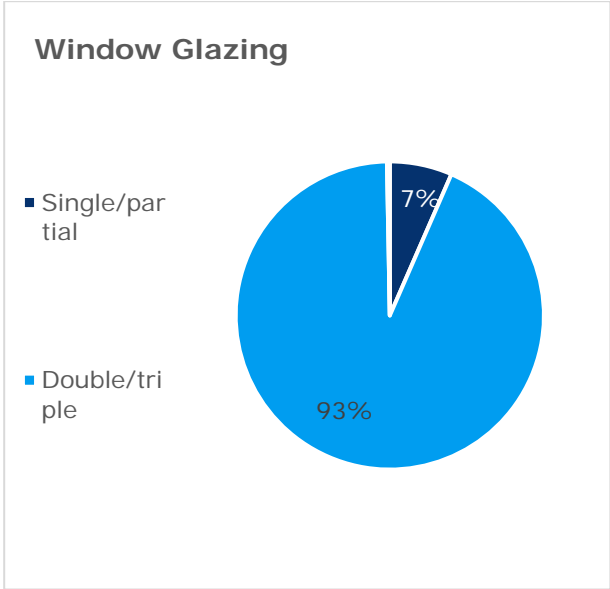


Figure 15 - Domestic Baseline Tool: Window Glazing Data

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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

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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 Home Data	River Clyde Home
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 heat network zones.

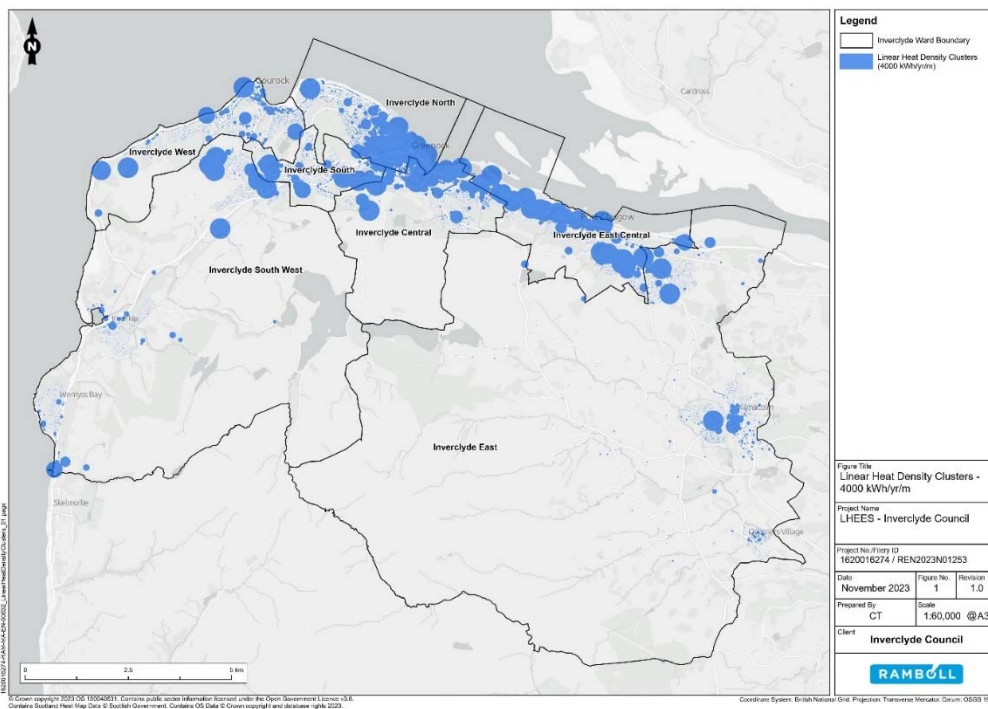


Figure 16 - Linear Heat Density 4000kWh/m/y buffer zones

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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.

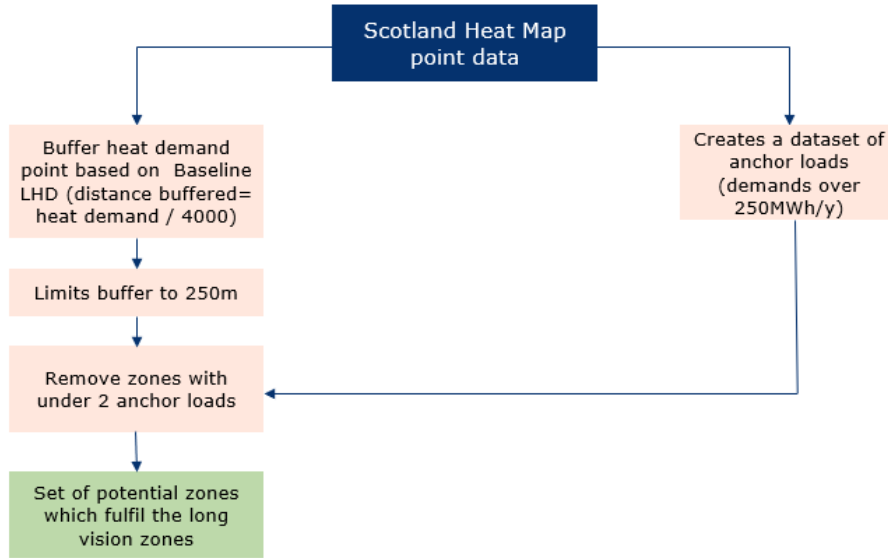


Figure 17 - Process for the Prioritisation of Potential Zones

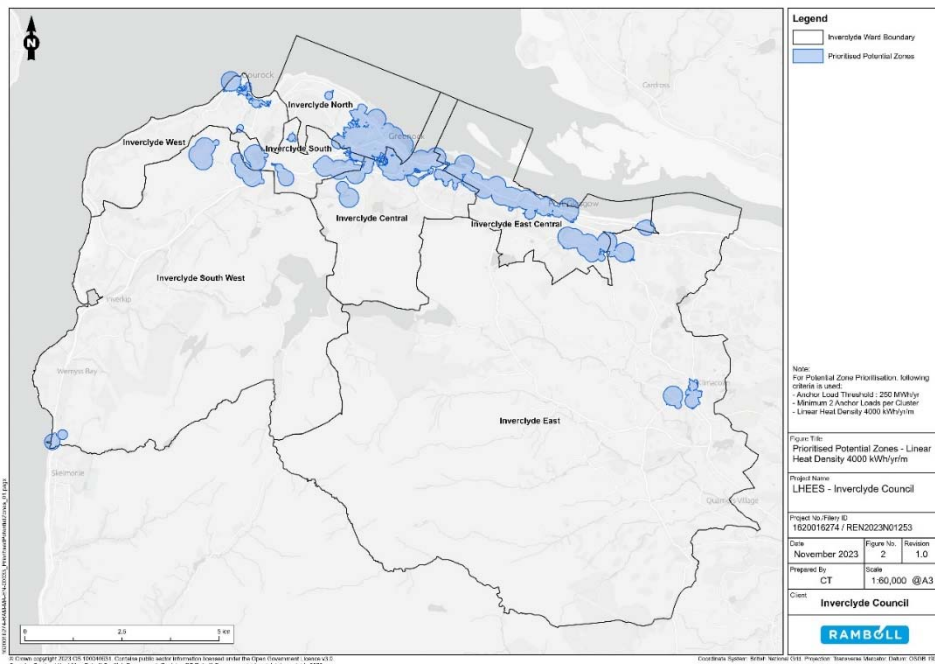


Figure 18 - Prioritised Potential Zones

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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.

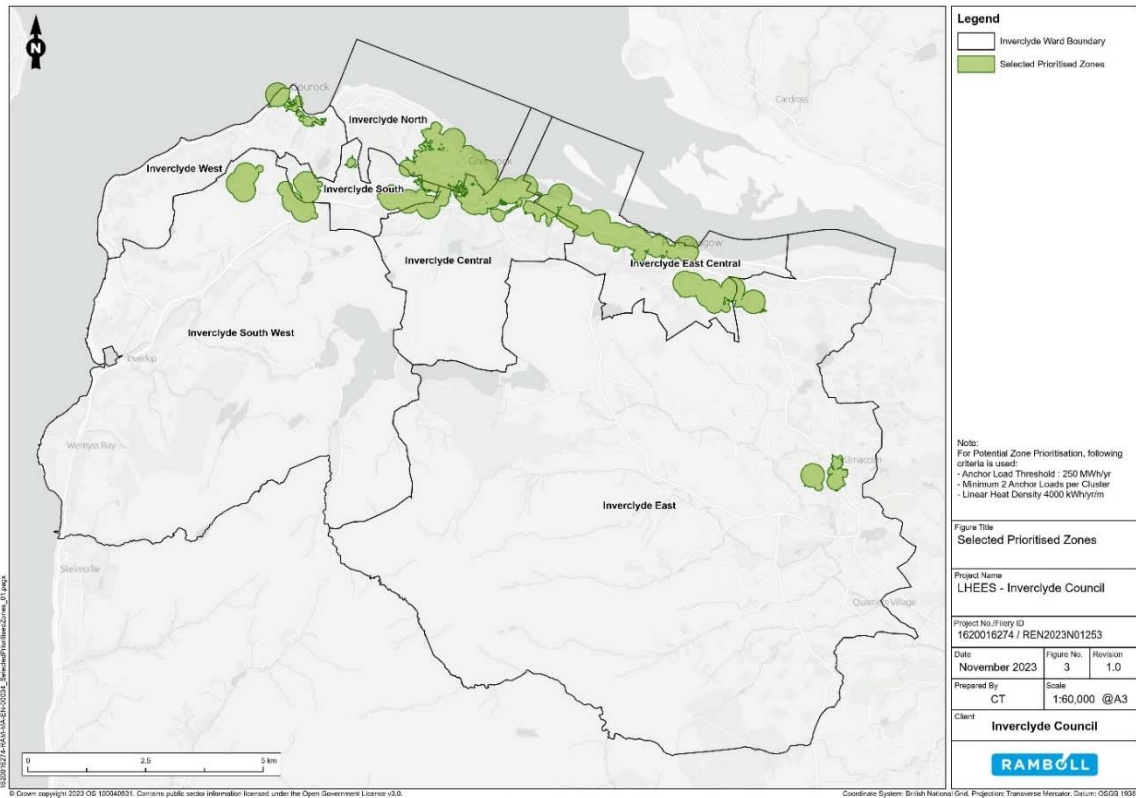


Figure 19 - Selected Prioritised Zones

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 heat network zones.

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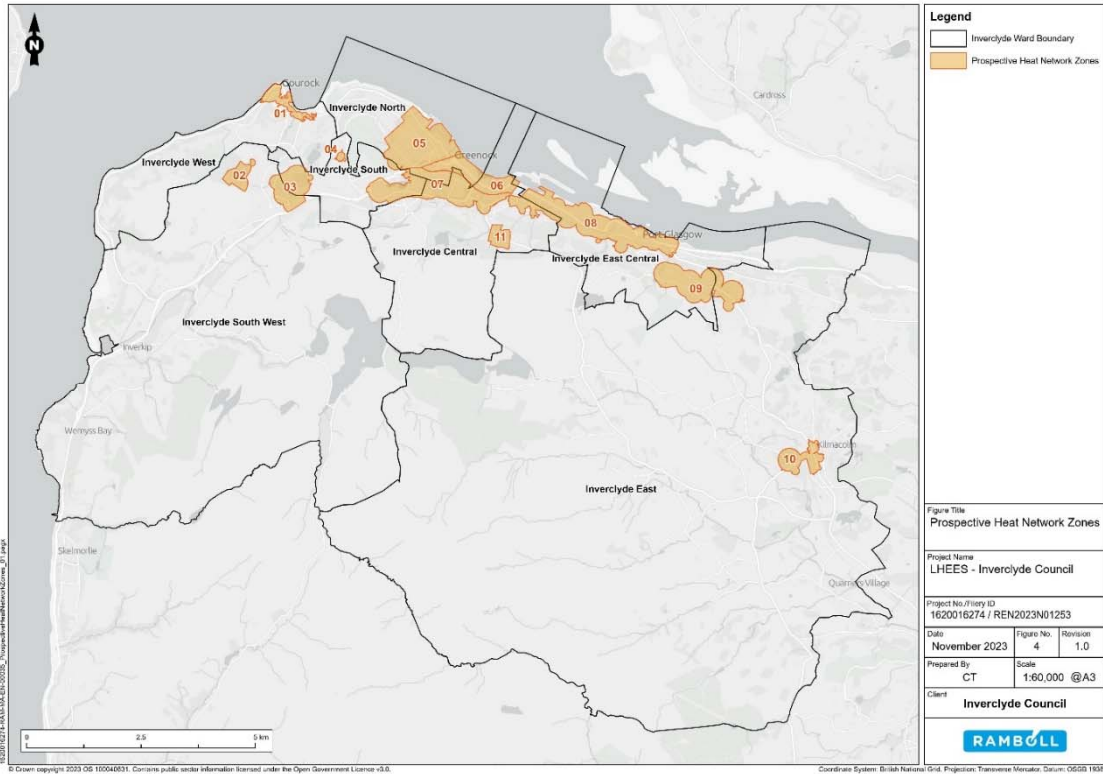


Figure 20 - Prospective Heat Network Zones

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 heat network zones and understanding the environmental and infrastructural considerations that influence their formation.

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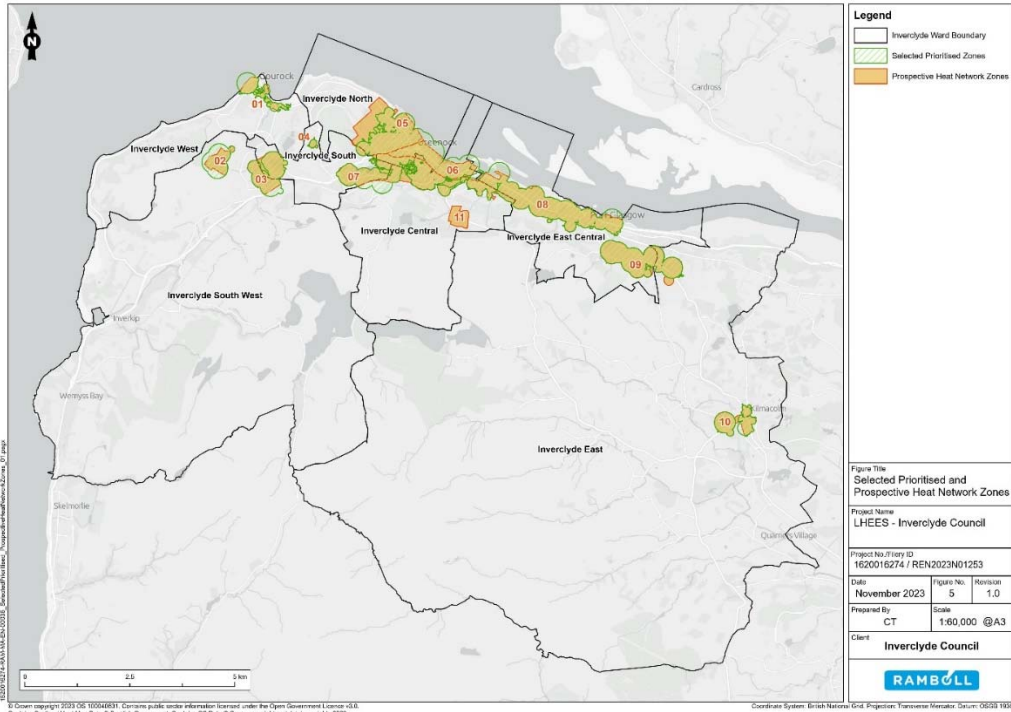


Figure 21 - LHEES data used in analysis Local Authority Wide Map including prospective heat network zones and selected prioritised heat network zones.

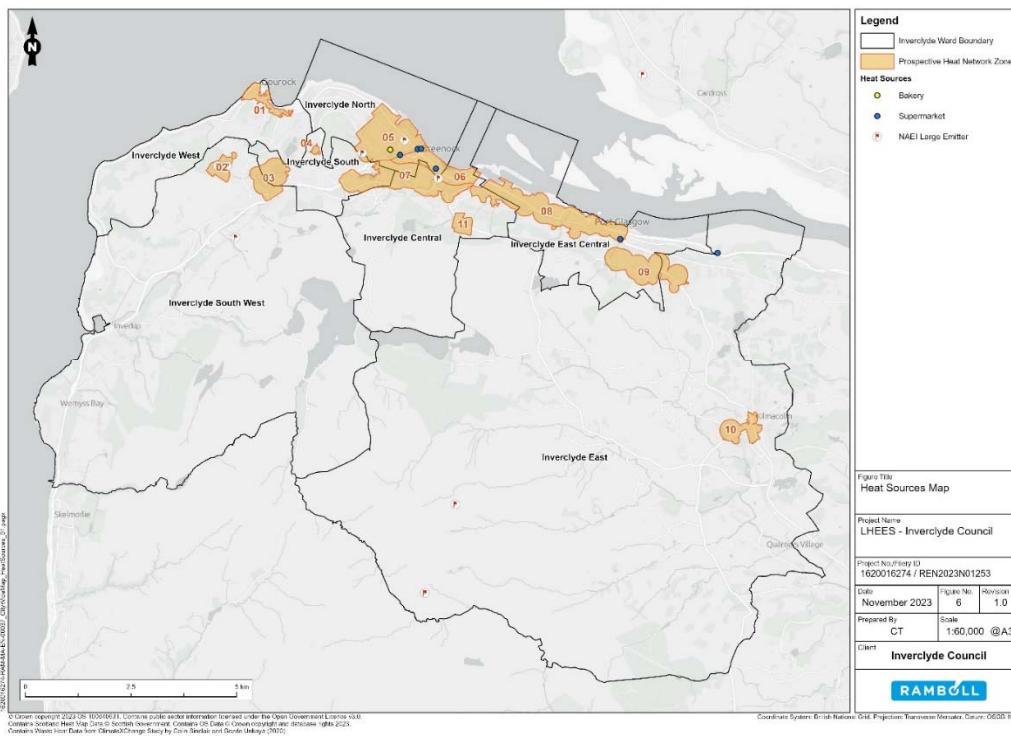


Figure 22 - Council wide map including prospective heat network zones with potential waste heat sources.

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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

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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

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

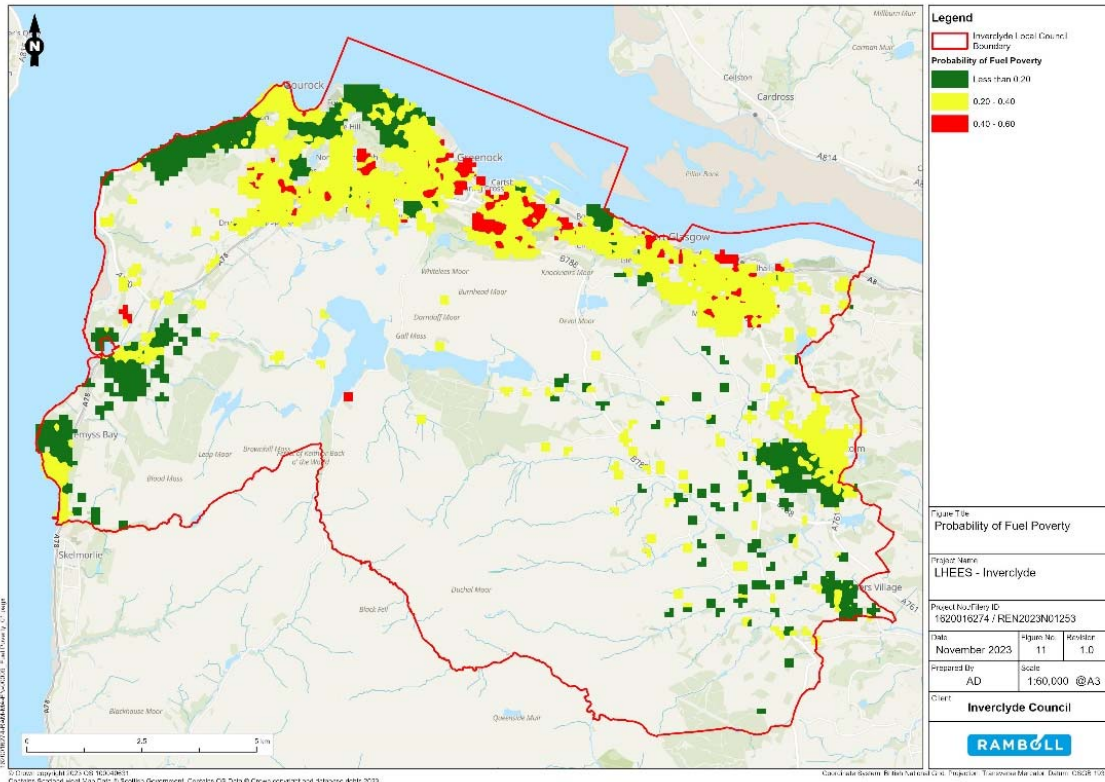


Figure 23- Poor Building Energy Efficiency: Probability of Fuel Poverty Raster



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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

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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

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December 2023

Local Heat & Energy Efficiency Delivery Plan 2024 – 2028

Inverclyde Council

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Rev	Status	Originator	Approved	Date
0.1	Committee Draft	E. Nicholson	R. Smith	7 December 2023
0.2	Updated with council comments	E. Nicholson	R. Smith	15 December 2023
0.3	Updated with priority delivery areas	E. Nicholson	R. Smith	18 December 2023

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1 Foreword

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2 Executive Summary

This document is the Local Heat and Energy Efficiency Delivery Plan (LHEEDP or 'Delivery Plan') for Inverclyde which accompanies the Local Heat and Energy Efficiency Strategy (LHEES). Developed in line with guidance from the Scottish Government, it will help implement the LHEES vision set out by Inverclyde over the next five years (2023-2028).

The Council has two key themes to guide the development of the Delivery Plan;

1. Maximising the potential for heat networks, beginning with a central heat network on the Waterfront in Greenock Town Centre, expanding that to the remainder of the heat networks zones identified in this LHEES and linking it to existing heat networks. Additionally, Inverclyde will aspire to connect to a potential heat highway across the central belt if appropriate.
2. Focusing on areas with social housing households that have high levels of fuel poverty.

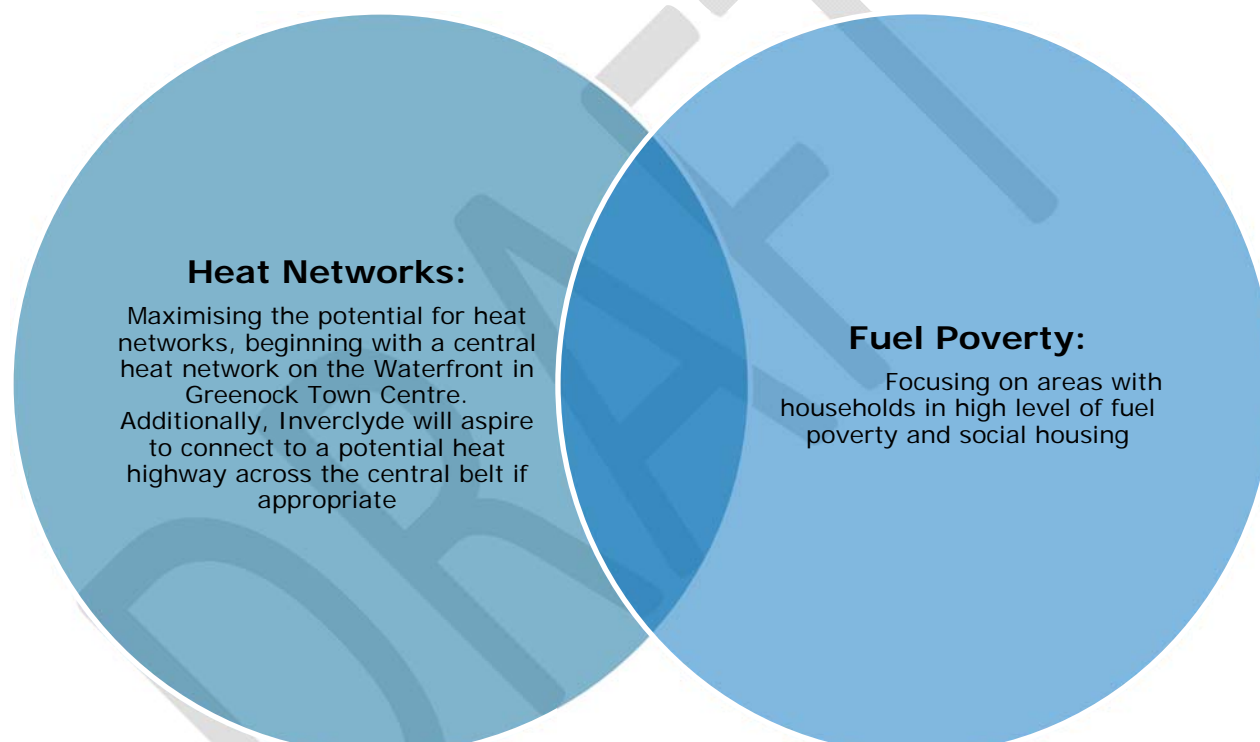


Figure 1 - Diagram illustrating the LHEES priorities

The LHEES and Delivery Plan fall within the remit of Inverclyde Council's Climate Change Working Group, who will align efforts and prioritise actions as part of a cohesive LHEES programme. The LHEES programme includes initiatives and actions beyond the current capacity of the working group, in anticipation of potential further resource being made available by the Scottish Government to deliver LHEES.

Given that the LHEES affects everyone within Inverclyde, it is imperative to continue engagement with stakeholders such as Registered Social Landlords (RSLs), NHS, etc. Therefore, the group will work with external and internal stakeholders most appropriate to the LHEES programme, as the aim for Inverclyde's LHEES is to have a collaborative approach across all relevant stakeholders, ensuring a cohesive approach.

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Following the LHEES methodology, the Council has identified 11 heat network zone opportunities and five delivery area opportunities using heat demand data, local constraints, and fuel poverty data.

The map below highlights these 11 Heat Network Zone Opportunities alongside the five Delivery Area Opportunities. These Delivery Areas target either heat pump ready properties, fuel poverty, or a combination of both.

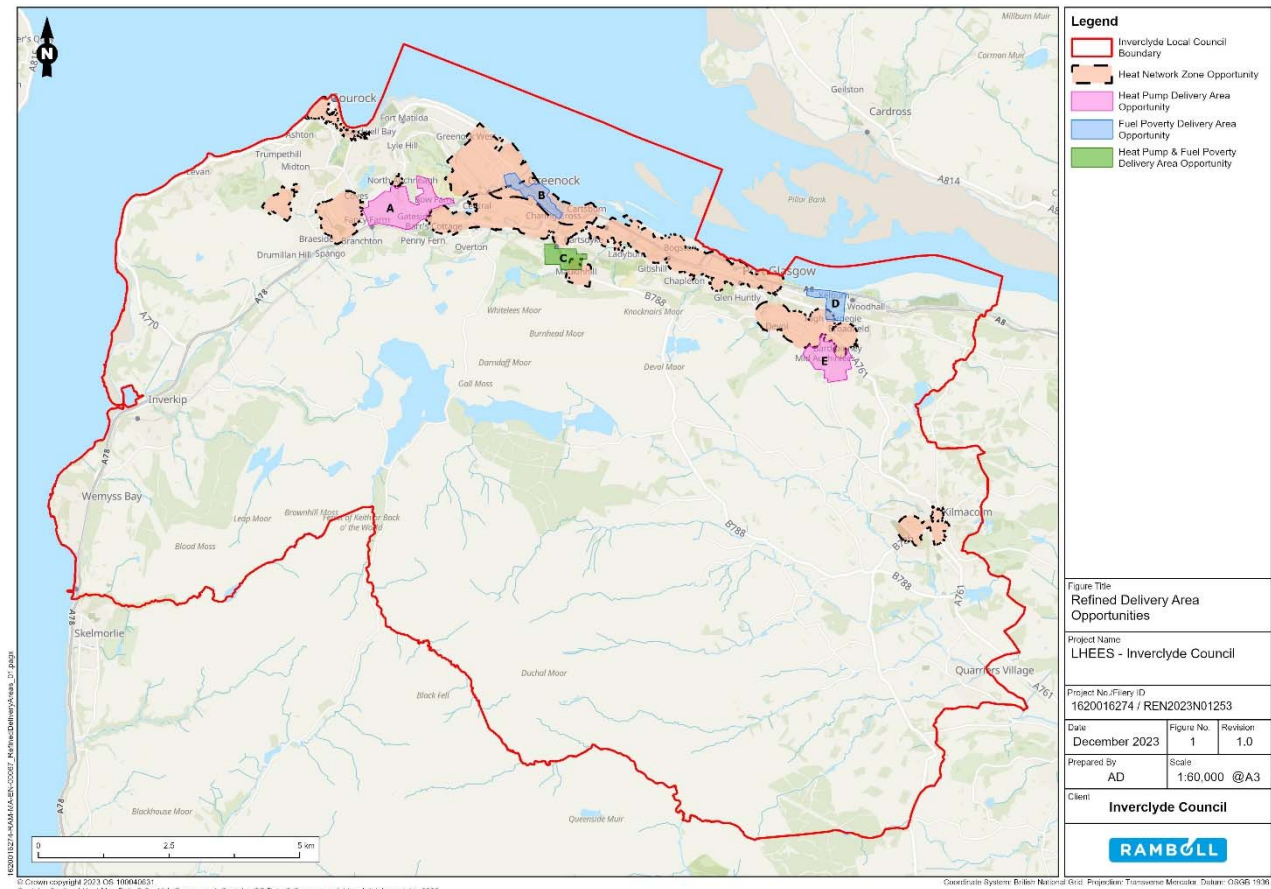


Figure 2 - Inverclyde Heat Network Zones & Priority Delivery Areas

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3 Introduction to the Delivery Plan

This document is the Local Heat and Energy Efficiency Delivery Plan (LHEEDP or 'Delivery Plan') for Inverclyde and accompanies the Local Heat and Energy Efficiency Strategy (LHEES). This Delivery Plan will help to implement the LHEES vision set out by Inverclyde over the next five years (2023-2028). It has been developed in line with guidance from the Scottish Government and provides details on how the LHEES will be delivered. This Delivery Plan draws from, both, a data-led process which involved an analysis of regional needs and local building performance as well as a strategy-led process which informed the analysis with LHEES priorities identified via stakeholder engagement or national and local policies.

The Delivery Plan is intended to guide energy efficiency improvements and decarbonisation of heat in buildings while prioritising the key themes: developing a proficient heat network programme to provide the Inverclyde area with cleaner heat and addressing poor energy efficiency as a driver for fuel poverty. Inverclyde will consistently consult with key stakeholders through the implementation of this delivery plan including RSLs and other relevant stakeholders to ensure alignment of efforts.

4 Approach to Delivery Plan

4.1 LHEES Priorities

The purpose of this Delivery Plan is to detail the specific opportunities and delivery mechanisms for Inverclyde to develop their heat network portfolio with new developments and install building level measures. This covers short and medium goals within a 5-year timeframe and longer-term aspirational actions; thus the plan focuses on opportunities and approaches for this first phase of the LHEES, with the next Delivery Plan scheduled to be published no later than December 2028.

4.2 Inverclyde's Priorities

There are two key themes the Council has considered to guide the development of this Delivery Plan. These are intended to maximise the effectiveness of LHEES delivery as they are the two main priorities identified via the LHEES Strategy:

1. Maximising the potential for heat networks, beginning with a central heat network on the Waterfront in Greenock Town Centre, expanding that to the remainder of the heat networks zones identified in this LHEES and linking it to existing heat networks. Additionally, Inverclyde will aspire to connect to a potential heat highway across the central belt if appropriate.
2. Focusing on areas with social housing households that have high levels of fuel poverty.

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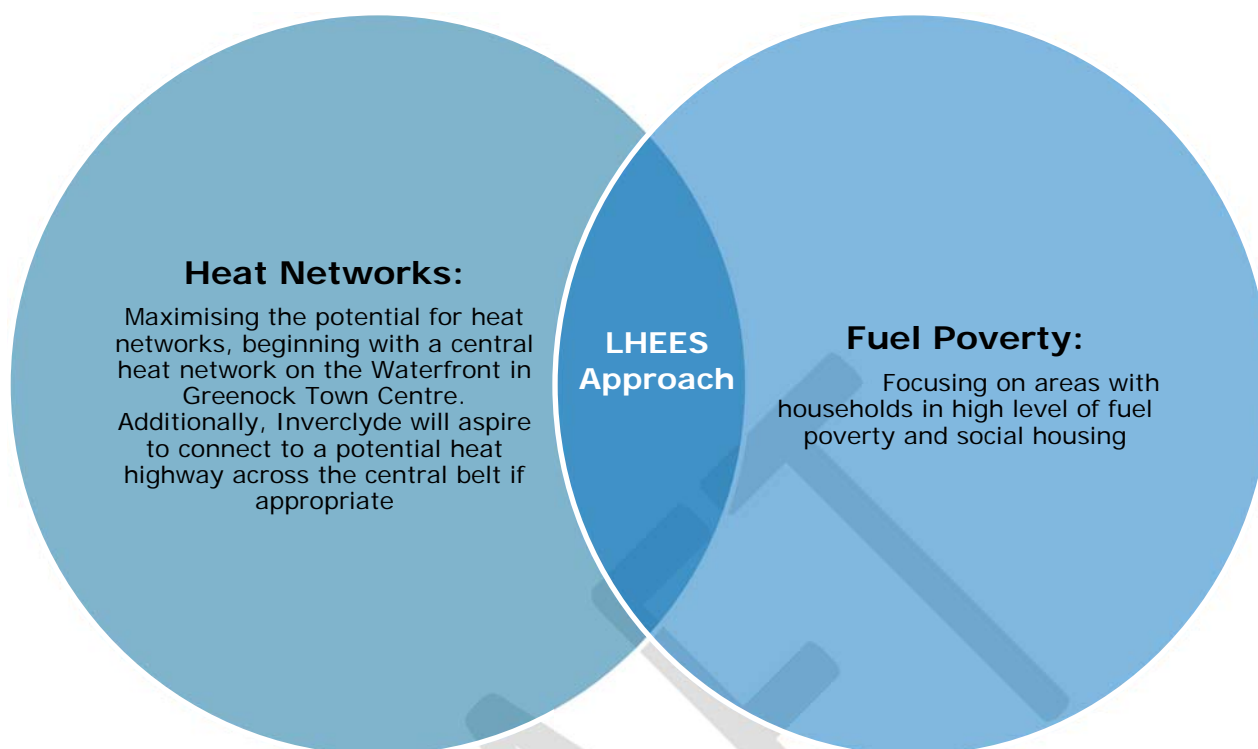


Figure 3 - Diagram illustrating the LHEES priorities

As shown in Figure 3 the core priorities for Inverclyde's LHEES are centred around heat networks and fuel poverty. These goals are mutual to decarbonising heat and eradicating poor energy efficiency as a driver for fuel poverty. Heat networks bring the opportunity for consumers to access heat at a lower cost than individual heating systems and can also offer protection from volatile energy price spikes. In addition, they also minimise the burden of maintenance from residents. Inverclyde's LHEES shows that many areas with high levels of fuel poverty are also those which fall into a potential heat network zone opportunity. Thus, heat networks are a major avenue for Inverclyde to address fuel poverty, alongside improving building fabric.

This Delivery Plan is based on a programmatic approach to implementing the LHEES. This will allow the limited council resources to be planned and deployed most efficiently across these dual priorities. The LHEES programme outlines the initiatives of an internal LHEES delivery team, a heat network programme, and a focus on areas with high levels of fuel poverty and social housing, especially where these coincide.

4.3 An LHEES Programme

Inverclyde Council currently has a Climate Change Working Group consisting of staff with a main or partial role in energy, environment, and climate change. The LHEES and Delivery Plan fall within the remit of this group. With its limited membership and resources, it will be important for the working group to align efforts and prioritise actions as part of a cohesive LHEES programme. This will be an effective method in which all contributors can find common goals, collaborate, track progress, share action and progress updates, and resolve issues together as a cross-departmental team working across several policy areas. This LHEES programme will enable the working group to implement the delivery plan insofar as resource is available.

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However, the LHEES Programme also includes initiatives and actions beyond the current capacity of the working group. This is in the anticipation of potential further resource being made available by the Scottish Government to deliver LHEES, recognising that as a far more resource intensive and complicated challenge than the development of the Strategy and Delivery Plan documents.

The aim for Inverclyde's LHEES is to have a collaborative approach across all relevant stakeholders, internal and external where they can feed into the implementation process and ensure it is a cohesive approach. Therefore, the group will also work with external stakeholders most appropriate to the LHEES programme.

The relevant initiatives of the LHEES Programme (sections 4.3.1 to 4.3.7) detailed below are a means of leveraging the most out of the resource available to unlock progress in heat network zones and retrofit delivery areas:

- The relevant council teams will need to align their efforts such as tasks, order of operation, roles, and timelines.
- External stakeholders will need to be identified and engaged to develop clearly-defined actions and joint objectives.
- Priorities for each area will need to be agreed and communicated with all stakeholders.
- Building level-pathways, heat network feasibilities and other infrastructure upgrades will need to be assessed and planned. This will include pathways for Council assets present in the area to lead by example with relevant actions (energy efficiency measures, zero carbon heat sources or connection to a heat network).
- The supply chain will need to be engaged to understand availability, shortfall and realistic delivery timings.
- Property owners will need clear and consistent communication leading toward an action. This may include incentives such as participation in an aggregated procurement exercise for a lower-cost and high-quality assured retrofit, or the availability of funding and finance schemes (e.g. those identified by the Green Heat Finance Taskforce) making retrofit financially more appealing.
- A host of other factors will need to be considered and planned to enable the most productive programme of activity.

These are some initial considerations, but the Council will build on these through existing learning and experience from Area-Based Schemes as well as further pilots, tests and ongoing programme of improvement. Ultimately, the Council will aim to specialise in project execution to the point it is able to scale its work in line with the level of change required to meet the LHEES strategy targets.

4.3.1 Governance and Leadership

Inverclyde will establish a subgroup of officers from the Climate Change Group that will form the LHEES Delivery Team. The responsibilities of this group will be to meet regularly to discuss progress of Inverclyde's LHEES and to implement actions.

LHEES Delivery team Governance:

- The Council will establish a clear cross-departmental operating model with roles and responsibilities of staff in the LHEES Delivery Team as well as collaborators.
- The Council will identify LHEES Champions across various teams who will enable smooth dissemination of information, joint decision-making, and collaboration across programmes.

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- Overall responsibility of LHEES will be allocated to the LHEES Delivery Team, ultimately falling within the remit of the Environment & Regeneration Directorate and reporting to the Council's Environment and Regeneration Committee.
- The LHEES delivery team will also manage the datasets and amend maps or plans as appropriate.

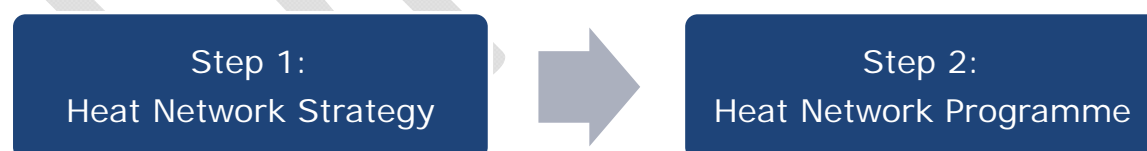
4.3.2 Heat Network Programme

Inverclyde aspires to demonstrate national leadership as a local authority area without a major city or hubs but with a major heat network presence. The council has taken initiative to seek out opportunities through feasibility studies to utilise the River Clyde as a potential heat source for heat network expansion throughout a northern coastal 'heat belt'. The goal of this development is to contribute to the decarbonisation of the council area. In due course, this could also contribute to a 'heat highway' stretching across the central belt and create future opportunities for interconnectivity across the council areas.

The council has developed a feasibility for a waterfront heat network using the River Clyde. The feasibility study identified multiple heat sources and multiple technologies alongside potential locations for energy centres. The council also looked into additional heat sources in the event that the original malfunctions or the heat demand peaks and additional energy is required. All heat networks will utilise zero direct emission sources as an unnegotiable policy decision, following Inverclyde's commitment to decarbonising its heat supply. The waterfront heat network will potentially be the basis of a more expansive network beginning from Greenock Town Centre and with an aspiration of achieving the goal of a 'heat belt' across the northern coast of Inverclyde.

River Clyde Homes (RCH), the largest social landlord in Inverclyde, operates a number of locations with a heat network or some form of communal heating. As such RCH are a key stakeholder in ensuring existing and future heat networks are integrated into the heat belt where technically and financially feasible.

The council will endeavour to develop a heat network programme to progress work on this priority. This will consolidate and expand on the work completed to date at a more strategic and planned level.



The **first step** will involve the development of a Heat Network Strategy. The council will seek funding and advice from the Scottish Government's Heat Network Support Unit to develop an overall vision and approach for the systematic rollout of the heat belt. A Heat Network Strategy will provide the council and stakeholders with a clear and investible path to deliver heat networks at pace and scale. It will include the following objectives:

- A detailed options appraisal of the delivery vehicles, including an assessment of the council's own role with respect to various types of delivery models. This will include stakeholder engagement to understand the role of other organisations (especially other public bodies and social housing) and the private sector, leading to recommendation for a final decision.

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- An assessment of the council's statutory obligations and a statutory compliance framework which uses the regulations in the Heat Network (Scotland) Act as well as proposals in the Heat Network Delivery Plan to guide the council toward obligation. This will also highlight the opportunities and powers at the disposal of the council (e.g. via the licencing and permitting regime).
- The council will upskill its internal teams and appropriate stakeholders via detailed workshops on the economic, environmental, social, commercial, technical, and other aspects of heat networks. This will, firstly, help the council make informed decisions about the strategy and, secondly, prepare staff for the leading role which they will be required to take in the rollout of the heat belt (regardless of the delivery vehicle). This upskilling will begin with a gap analysis and maturity assessment (acknowledging the council's participation the Heat Network Mentoring Scheme), which will then be utilised to select options for bridging the gap.
- A business case which covers the following dimensions: strategic case, commercial case and management case. This business case will provide the specific operating model for the delivery vehicle which is decided by the options appraisal. It will also include the level of investment, routes to market, governance structures and a host of other short-, medium- and long-term considerations to enable the rollout of the heat belt at the greatest possible pace and scale.
- A customer charter which defines how heat networks must operate, including a set of best practice principles that any customer in Inverclyde connected to a heat network should be able to expect (including heat tariffs, connection and disconnection rules and other aspects).
- The LHEES has made significant headway in helping to define heat network zone opportunities. However, a more in-depth analysis will be carried out to understand heat demand via real-world data on energy use in the zones (e.g. via engagement with stakeholders), real-world data on waste heat, the current stage of the cycle of heating systems for key potential customers, future demand profile modelling using future energy scenarios, grid constraints and timelines (e.g. engagement with SPEN), topographical and technical constraints, renewable and energy storage opportunities, and other aspects which impact the feasibility of the interconnectivity of the heat belt.
- Where particular zone opportunities arise as attractive opportunities, the strategy will establish precedence, information and the council's approach and timeline for these to be designated as heat network zones in line with the requirements of the Heat Network (Scotland) Act.

Through these elements, the Heat Network Strategy will provide a clear and actionable route for the council and its stakeholders. It will also shape the Heat Network Programme.

Step 2 will involve the development and launch of a Heat Network Programme as a major initiative within the overall LHEES Programme. The nature and scope of the Heat Network Programme will become clearer once the strategy has been developed. However, there are certain elements which are likely to form part of this programme.

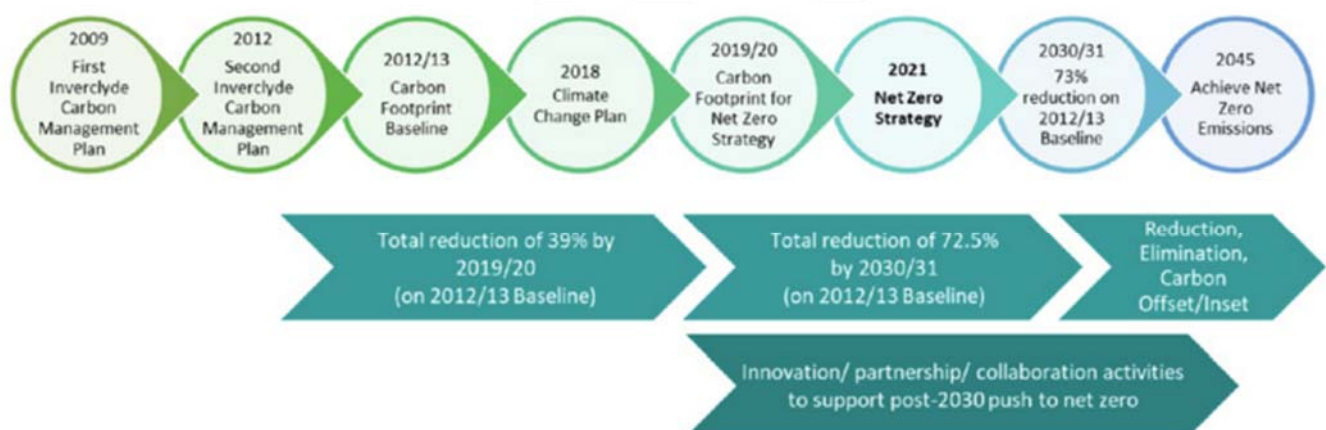
- The Heat Network Programme will house the responsibilities, skills and resources to execute the heat belt vision as well as handle all aspects of heat networks and communal heating systems across Inverclyde where there is a role for the council.

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- It will engage with stakeholders and hold key relationships with appropriate internal and external stakeholders. The programme will work synergistically with the overall LHEES programme to align priorities and remain focused on the LHEES priorities.
- It will be responsible for leading feasibility studies for individual heat networks, supporting business cases, and any pre-capital and commercial works to prepare the heat network for investment.
- Depending on the delivery vehicle model defined by the strategy, the programme will enable and facilitate the council's role with respect to this.
- Fulfil the council's statutory responsibilities and any regulatory functions with respect to the Heat Networks (Scotland) Act, including management of Building Assessment Reports (BARs), formal designation of heat network zones, administering consents and permits if/where this authority has been sought by the council from the Scottish Government.

4.3.3 Council non-domestic retrofit leadership

Inverclyde Council wish to lead by example when it comes to retrofitting, decarbonising via heat pumps or connection to a heat network, and making Inverclyde's buildings future proof. It is the council's view that, while the LHEES is an area-wide approach with action needed by all respective property operators, the LHEES will benefit if the council not only plays its part but does so in a way which inspires, helps and encourages others. The council's Net Zero Strategy is at the centre of the drive to making the council's estate net zero. This strategy follows an ambitious timeline to net zero and therefore is already an ideal opportunity to align to this delivery plan.



- The council will align this Delivery Plan with its Net Zero Strategy and related Net Zero Action Plan to leverage decarbonisation opportunities to deliver wider benefits.
- The council will use its non-domestic retrofit projects identified by the Net Zero Action Plan as pathfinders to learn and inform future projects for its estate as well as to transfer this to others in the area. An example of good practice is the deep retrofit of one of the oldest buildings in Inverclyde, the King George VI building, situated in Port Glasgow and dating back to the 1700s. The council recognises the importance of maintaining the building stock whilst making it air and watertight before retrofitting it, actions being implemented on this building. There may also be a potential role for the council to improve the feasibility of delivery area and heat network projects where it could use its own stock in the area as a lever to catalyse activity or unlock an opportunity. This could include commitment to

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connect council buildings to encourage investment into a heat network or retrofitting in a delivery area to inspire, encourage and engage others to join.

- A retrofit intervention must be identified, surveyed, designed, procured and then verified and monitored in line with best practice standards and procedures. It is this process that will be emulated in the delivery of LHEES across other organisations, including public bodies, private organisations and social housing. Understanding and recognising how to develop and deliver a retrofit programme will be critical for all property operators. If the council is able to secure additional resource, it will use this to support organisations through this process via advice, signposting, collaboration on procurement, and aligning initiatives across delivery areas and heat network zones to enable a wider business opportunity.

4.3.4 Social housing leadership

All social housing in Inverclyde is provided by registered social landlords (RSLs) which are independent of the council (the council transferred its domestic stock to providers in 2007). The largest social housing provider is River Clyde Homes followed by Cloch Housing Association, and both have been consulted as part of developing this LHEES. This was a crucial factor for the development of delivery area retrofit plans and heat network zones, as approximately 25% of the domestic stock is social housing. Due to these considerations, it is important to reflect collaboration with and leadership of social housing in the LHEES Programme.

Significant progress has been made to plan large scale transformation of Inverclyde's housing stock with the recent updates to Inverclyde's Local Housing Strategy (LHS) along with this LHEES. Social housing retrofit has been identified as a major way in which this momentum can be preserved and grown into implementation. The development of this LHEES involved engagement with RSLs, who have been encouraged to take a leading role in the retrofit of stocks and participation in heat network schemes. Delivery areas for property-level interventions have been identified with consideration to these stakeholders' goals along with the LHEES priority to focus on fuel poverty and social housing (which largely coincide). As such, implementation will also see RSLs lead activity, with the council's support, to encourage and promote retrofit in the identified areas.

This arrangement will promote a collaborative approach placing the fuel poor residents of Inverclyde at the centre to ensure their needs are met through LHEES actions. This collaboration will eventually become imperative for RSLs as the upcoming Social Housing Net Zero Standard (currently under consultation) will require minimum energy efficiency thresholds and heat decarbonisation or connection to a heat network. These requirements will make their participation in delivery area activity all the more critical. The council will drive this collaboration by:

- Using strategic government funding across various streams to ensure retrofit can be carried out on a larger scale in the future than current levels. Area-based schemes will align to LHEES delivery areas, and RSLs will be requested to support the focus areas which have been selected.
- Aligning retrofit projects to further a collaborative approach and ensure the retrofit projects are prioritised according to fuel poverty, building stock condition, funding opportunities and other factors.
- Understanding and sharing an archetype approach across the sector. This means that a number of property types will be identified by RSLs (with support from the council if there is resource to do so) along with their most effective retrofit and heat solutions and costs. This information will then be shared with others across the region. This collaborative thinking and knowledge sharing will be a major way in which LHEES can drive benefits for the residents of Inverclyde.

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- Utilising organisations and individuals with social housing experience and how best to navigate constraints that may arise will prove this LHEES to be more effective. Issues that bodies external to the council may be well versed in include blending funding streams, mixed tenure and tenants blocking retrofit works from being completed.
- Exploring the scope for joint procurement activities to reduce costs and open access to a larger number of property owners. This will also build confidence in the supply chain, promote quality and improved monitoring and verification, and reduce the procurement and administrative burden.

4.3.5 Awareness Raising and Stakeholder Engagement

As part of the LHEES Methodology, the council identified stakeholders relevant to delivery areas and heat network opportunities. The stakeholders are based on the relevance and influence they have on the delivery and/or the impact of delivery on them. Multiple engagements across stages of the development of this LHEES were conducted to ensure Inverclyde had an area-wide approach taking into consideration effects this LHEES would have. This was to ensure the interests of businesses, residents and the council's interests were all considered alongside the sustainability aspects that this LHEES will bring. The success of the LHEES programme will depend on ongoing engagement with key permanent stakeholders.

- RSLs such as River Clyde Homes and Cloch Housing Association
- Public bodies such as the NHS
- Scottish Power Energy Networks (SPEN) as a critical partner to investigate grid capacity/constraints, and upgrades required. The council will engage closely with the local 'strategic optimiser' to advise on heat network, communal heating, large-scale heat pump, renewable and energy/heat storage deployment.
- Scottish Government LHEES team and the HNSU as key advisors, enablers and funders of the LHEES activity.

These stakeholders will be key in enabling the LHEES, and without their involvement it is unlikely targets will be realised. Therefore, the council's stakeholder engagement initiative will:

- Establish clear working relationships with key external stakeholders, including setting up relevant data sharing agreements, forums, decision-making processes and responsibilities. Many of these relations exist but some may not be well-defined or be a productive relationship in relation to LHEES.
- An engagement plan including timeframes, content and objectives, all linked to the relevant location and stakeholders (based on the delivery area and/or heat network zone location). This will allow the LHEES Programme to align priorities of all stakeholders, synergise efforts and promote investment. Additionally, it will ensure all stakeholders impacted are informed and updated with current and upcoming plans and progress.

The council will also retain and engage with a wider set of stakeholder groups, including charitable bodies, homeowners, private landlords, non-domestic building owners (real estate companies, supermarkets, and other large estate owners). However, this engagement will be contingent on the specific delivery area or heat network opportunity.

Awareness raising is also an important aspect of the LHEES, as without knowing or understanding about these local priorities homeowners and businesses are unlikely to be inspired. The awareness raising must highlight, both, the benefits (of comfort, net zero and bill savings) as well as upcoming regulations which will mandate action (as per the Heat in Buildings Bill). The council has

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a portfolio of engagement with communities and community groups to promote collaborative thinking and transparency. Members of the Climate Change working group are involved in Climate Beacons, a legacy initiative from COP26 delivered through libraries, community garden centres and art centres in Inverclyde. This is centred around education, awareness, and participation on climate change topics. This existing asset will be utilised for community engagement around LHEES, to promote a collaborative approach, communicate and educate about retrofit delivery areas and heat network zones.

The ambition of Inverclyde is to enable all relevant stakeholders to be involved in the delivery of LHEES and promote the achievement of its targets. The stakeholder engagement and awareness raising activity will be imperative to implementing a fully inclusive and mutually beneficial LHEES for the area. Throughout the implementation of Inverclyde's LHEES, the council will ensure the dual priorities of heat networks, and social housing and fuel poverty retrofit are at the core of the agenda.

4.3.6 Town and Village Centre Regeneration

Inverclyde will align its ongoing work on regenerating towns and villages through the implementation of this LHEES. These regeneration priorities, as referenced in the Net Zero Action Plan, have been considered as part of prioritising heat network zone and delivery area opportunities. Works to develop heat networks will be linked to regeneration efforts, providing crosscutting benefits to promote wellbeing of town and village residents. The LHEES implementation will be considered alongside the regenerative actions to develop and enhance these locations, including road services, economic development, and strategic investments.

4.3.7 Funding

The council's primary activity around provision of funding is leading and administering the Energy Efficient Scotland: Area Based Schemes (EES:ABS) projects. Inverclyde's Net Zero Action Plan details that the council will work with partners including the Scottish Government to focus specific funding, measures and resources to address climate change at a local level. However, this initiative will go further by bringing about collaborative thinking as to how to prioritise areas of this delivery plan whilst delivering a wide spectrum of building level measures, energy efficiency upgrades and heat network and energy infrastructure development. This initiative will be crucial in the delivery of this LHEES as the council will need to work with the plethora of stakeholders to channel funding strategically to maximise retrofit across the delivery areas and heat belt.

The council has a focus on fuel poverty and social housing, and launching a heat network programme which creates the conditions for high levels of interconnectivity across the area. The council will work with stakeholders and partners to maximise the use of funding schemes for these priorities. It will include leveraging and supporting others to gain the following funds:

- **Scotland's Heat Network Support Unit (HNSU)**¹: 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**² for the development and installation of heat networks across Scotland. 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.

¹ Heat Network Support Unit, Scottish Government ([link](#))

² Scotland's Heat Network Fund, Scottish Government ([link](#))

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- **Home Energy Scotland³**: 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 Scotland⁴**: 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 tenant of a private-sector landlord.
- **Area-based Schemes (ABS)⁵**: 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 Scheme⁶**: 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 Inverclyde's net-zero aspirations. Salix has invested over £75million in Scottish energy efficiency projects to date.
- **Scotland's Public Sector Heat Decarbonisation Fund**: The Scottish Government has made £20 million grant funding available within this financial year under Scotland's Public Sector Heat Decarbonisation Fund for projects to decarbonise their heating systems by replacing them with zero direct emissions systems, and for retrofit energy efficiency measures to support the overall decarbonisation of heat in buildings.
- **Business Energy Scotland⁷**: This Scottish Government programme offers advice and funding for SMEs 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.

The Council understands the importance of these funds for delivering LHEES alongside strong stakeholder engagement and collective efforts from these parties. The Council's LHEES vision set out in the LHEES strategy will come to fruition through the management of these funds coinciding with consistent engagement on progress.

The LHEES delivery team will communicate the available funding streams to the appropriate bodies and ensure they are made aware of the availability and criteria. This will be delivered through strong communication channels to ensure the LHEES actions are delivered sector and area wide where possible. This will be communicated to relevant council bodies and RSLs.

³ Home Energy Scotland, Scottish Government ([link](#))

⁴ Warmer Homes Scotland, Scottish Government ([link](#))

⁵ Area-Based Schemes, Scottish Government ([link](#))

⁶ Salix, Scottish Government ([link](#))

⁷ Business Energy Scotland ([link](#))

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5 Prospective Heat Network Zones & Delivery Areas

This section is based on two types of areas:

1. Heat network zone opportunities, which define areas where heat networks present the best potential for heat decarbonisation at scale. Not all properties may be suitable for connection, but it is likely that many will be able to connect, making it an attractive opportunity to invest into building one.
2. Delivery area opportunities, which define areas where there is a potential for a large proportion of properties to be retrofitted and which meet the LHEES priorities (e.g. areas with large numbers of properties where poor energy efficiency is a driver for fuel poverty). There are three main types of delivery areas. The council has included multiple types of areas to ensure there is a spectrum of delivery methods to reach the LHEES goals and that there is not a sole area targeted. Rather, an area-wide approach is being taken to reach the priority residents across multiple areas initially.
 - Areas with **energy efficiency upgrades** as a focus. These are areas with properties with poor energy efficiency as a driver for fuel poverty but the heat decarbonisation is not a priority. This is because many properties may need a fabric upgrade before they are ready to be considered for heat decarbonisation. It may also be because some of these properties already use zero direct emission heating (e.g. electric heating) or are present in a heat network zone which is preferable over heat pump installation.
 - **Heat pump ready homes**. These are areas where properties typically have a reasonable or good level of energy efficiency, making them suitable for an individual or communal heat pump installation (with little or no energy efficiency improvements). Heat pumps are a priority in this area because they do not have sufficient heat demand density to make a heat network viable.
 - **Heat pump ready homes alongside energy efficiency upgrades**. These are areas which have a good mix of both of the above types of properties.

Based on the LHEES methodology, the Council has identified eleven heat network zone opportunities and five delivery area opportunities using heat demand data, local constraints, and fuel poverty data. These were formed after analysing Inverclyde area as a whole and then further analysis and engagement was undertaken to ensure the five delivery areas and eleven heat network zones have the greatest potential to contribute to the LHEES priorities, national and local targets, and best align with existing schemes. These areas have been selected as the priority for this Delivery Plan (2024-2028) and thus will be the immediate focus for the LHEES Programme, which will leverage its initiatives to promote activity in each area/zone.

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5.1 Overview of the Heat Network Opportunities

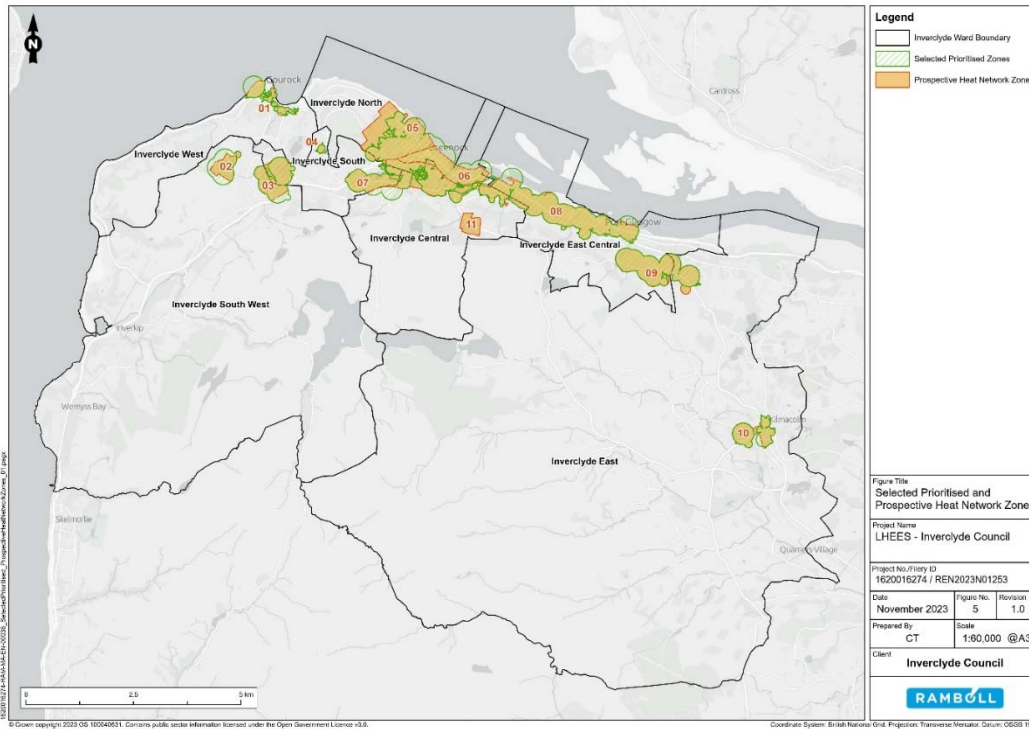


Figure 4 - Local Authority Wide Map including prospective heat network zones and selected prioritised heat network zones. This forms a 'heat belt' across the northern coastline with some additional priority areas separated from the belt due to a lack of heat demand density.

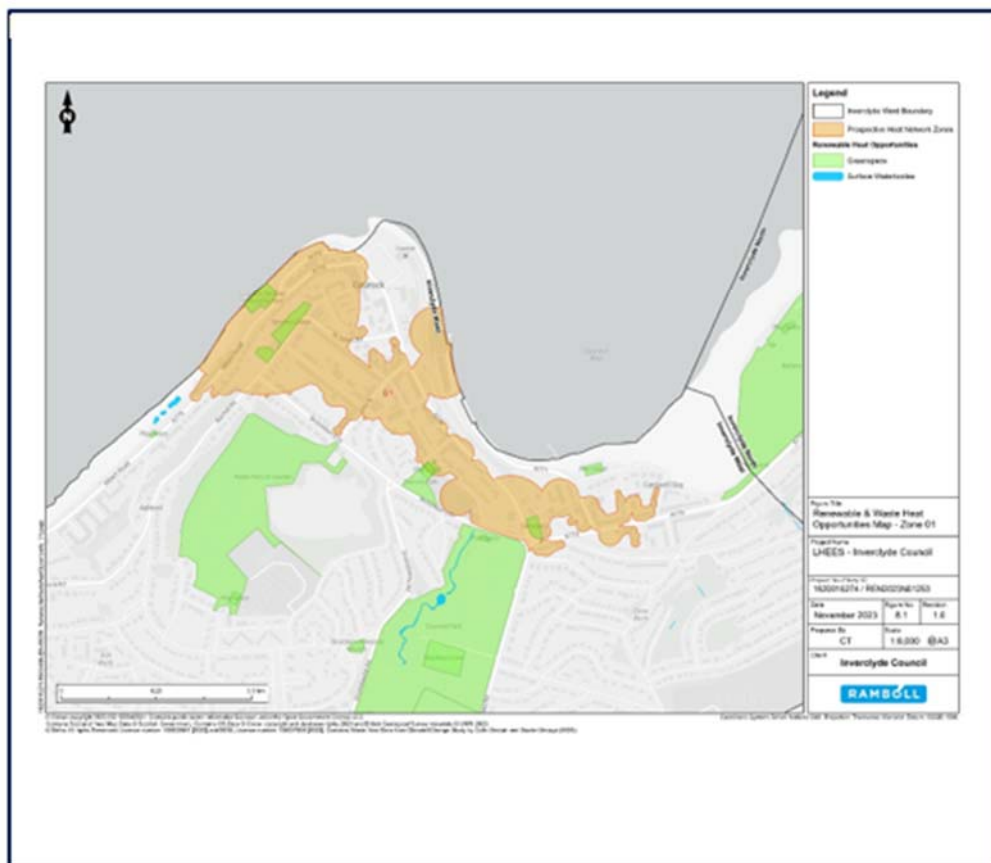
The heat network opportunities shown in Figure 4 were a result of following the LHEES Methodology, along with local priorities as well as technical and physical constraints such as roads and railway tracks. A stakeholder workshop took place with key stakeholders such as RSLs, the Scottish Government, and Scottish Power Energy Networks where local and national goals were noted to ensure that the heat network opportunities were aligned with these. Inverclyde has identified heat network led approach to this LHEES due to ample opportunities and work to date.

5.2 Individual Heat Network Opportunities

The individual heat networks zone opportunities are presented in this section. The analysis presented here is based on metrics such as linear heat density, anchor load threshold criteria, gridded heat density and local knowledge.

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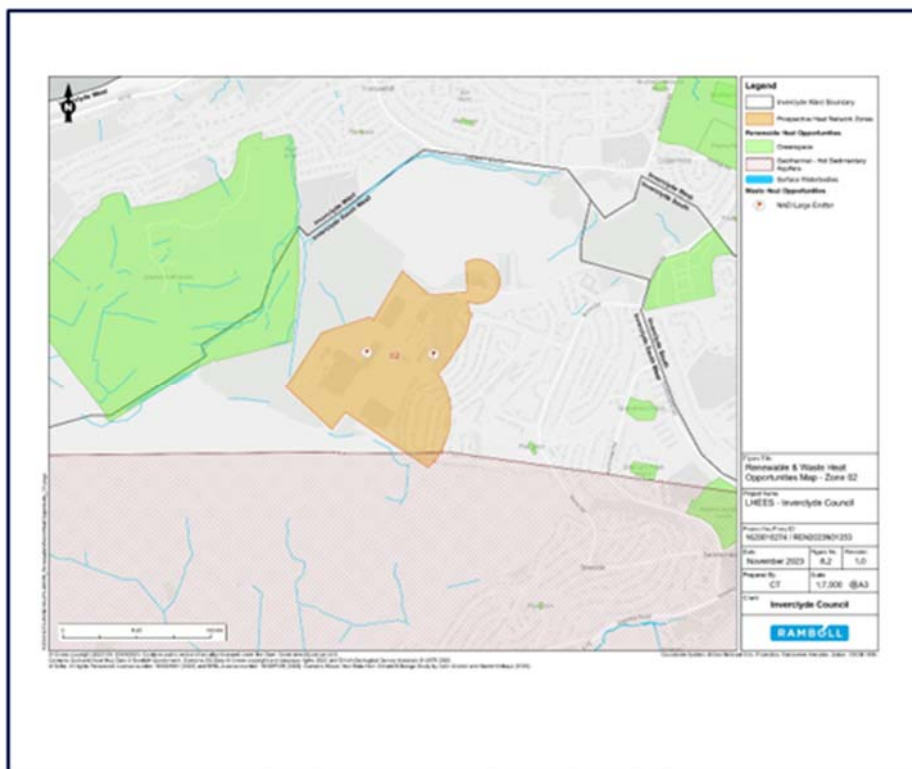
5.2.1 Zone 1



Zone Ward	Inverclyde West
Zone Area	26.6
Estimated Zone Heat Demand	21,783MWh/y
Potential Heat Sources	Green Spaces Surface Water
Fuel Poverty (percentage of households)	27.8%
Extreme Fuel Poverty (percentage of households)	14.1%
Proportion of Domestic Buildings	82%

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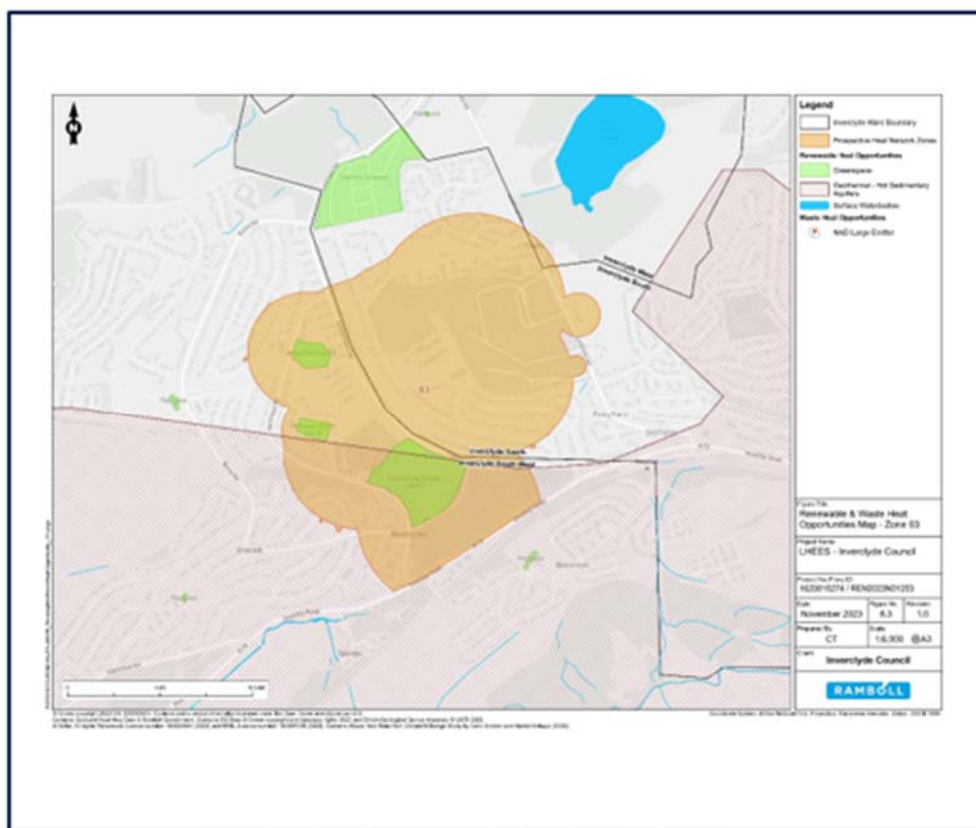
5.2.2 Zone 2



Zone Ward	Inverclyde South West
Zone Area	23.9
Estimated Zone Heat Demand	11,669MWh/y
Potential Heat Sources	Cooling Tower (Larkfield Industrial Estate) NAEI Large Emitter Geothermal
Fuel Poverty (percentage of households)	31.6%
Extreme Fuel Poverty (percentage of households)	18.1%
Proportion of Domestic Buildings	79%

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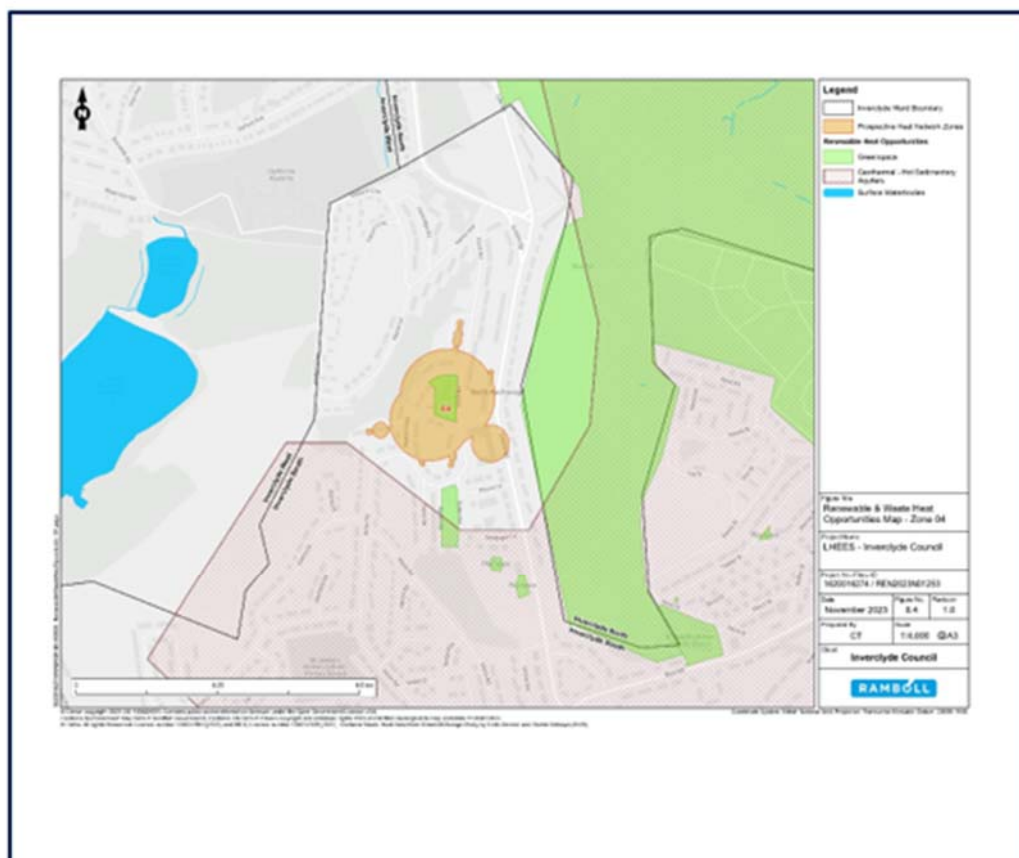
5.2.3 Zone 3



Zone Ward	Inverclyde South/ Inverclyde South West
Zone Area	61.1
Estimated Zone Heat Demand	25,979 MWh/y
Potential Heat Sources	Green Spaces Geothermal
Fuel Poverty (percentage of households)	30.1%
Extreme Fuel Poverty (percentage of households)	19.1%
Proportion of Domestic Buildings	95%

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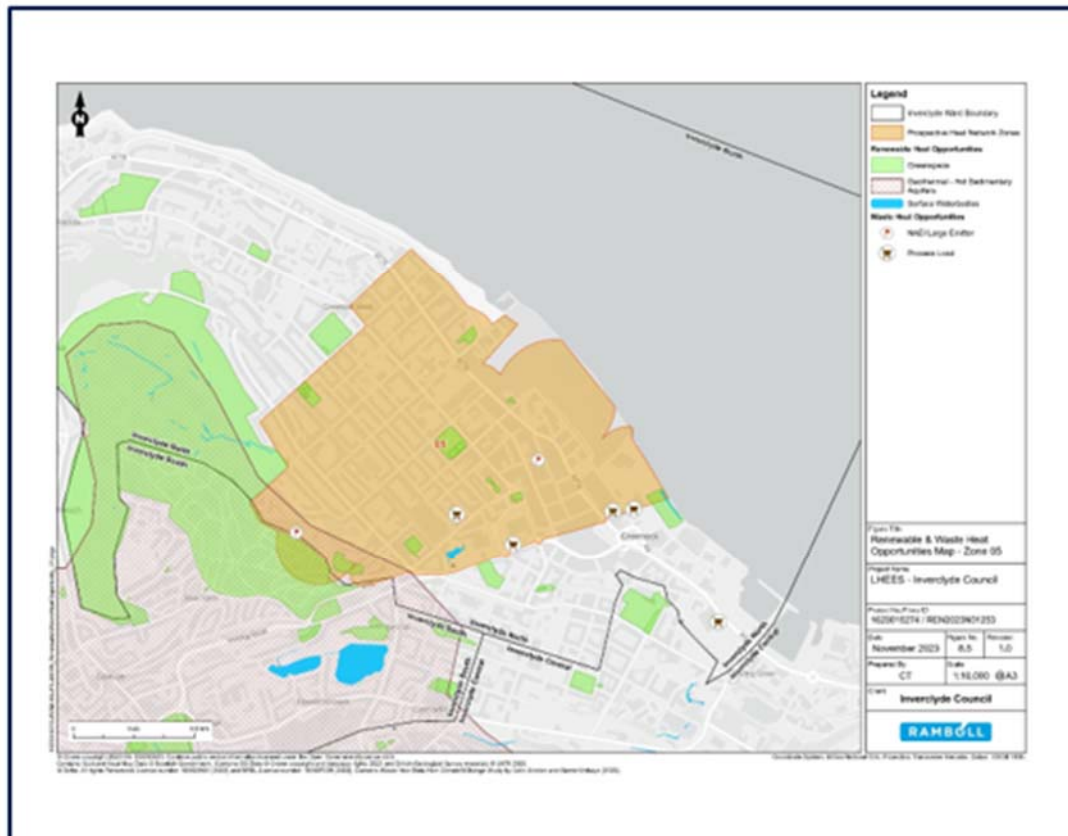
5.2.4 Zone 4



Zone Ward	Inverclyde South/ Inverclyde South-West
Zone Area	3.2
Estimated Zone Heat Demand	2,126 MWh/y
Potential Heat Sources	Green Space
Fuel Poverty (percentage of households)	32.5%
Extreme Fuel Poverty (percentage of households)	20.3%
Proportion of Domestic Buildings	93%

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5.2.5 Zone 5

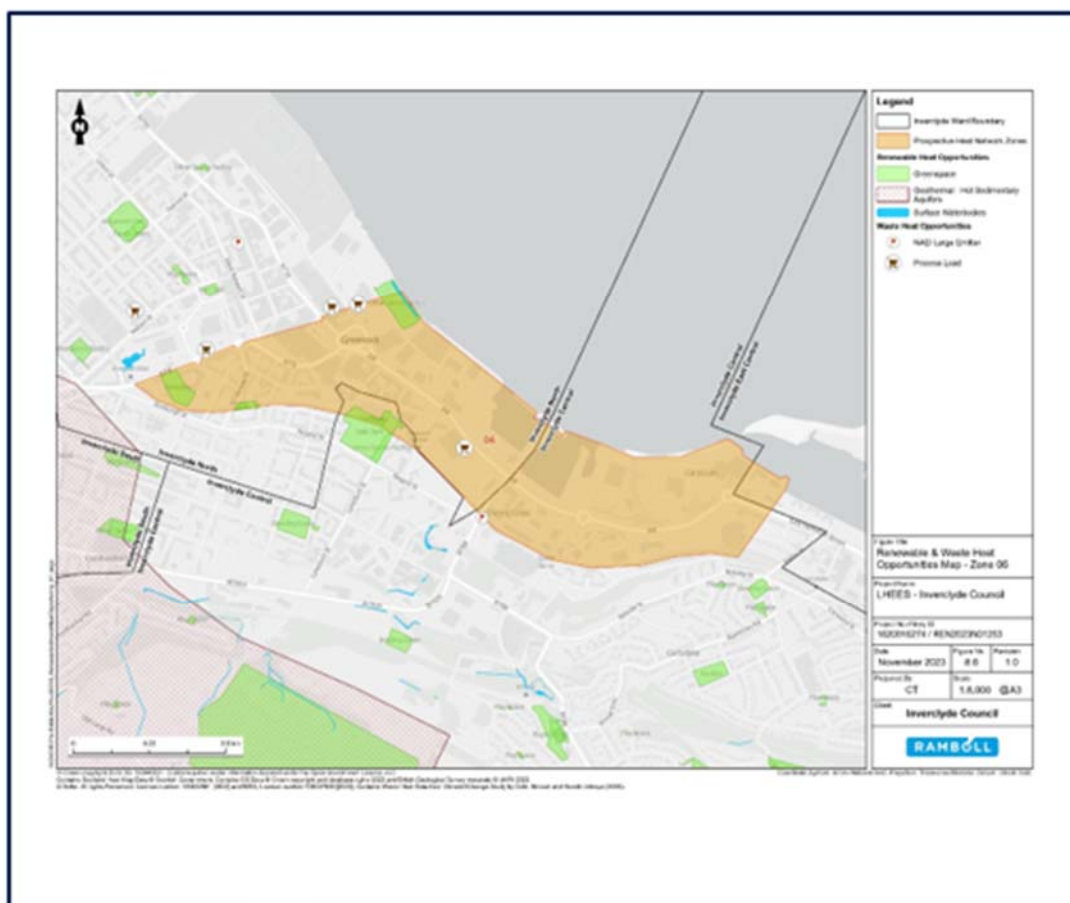


Zone Ward	
Zone Area	23.9
Estimated Zone Heat Demand	103,519 MWh/y
Potential Heat Sources	Green Spaces Process Loads (3No. Supermarkets, 1No Bakery) Surface Waterbodies NAEL Large Emitter Geothermal

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Fuel Poverty (percentage of households)	28.1%
Extreme Fuel Poverty (percentage of households)	13.1%
Proportion of Domestic Buildings	80%

5.2.6 Zone 6

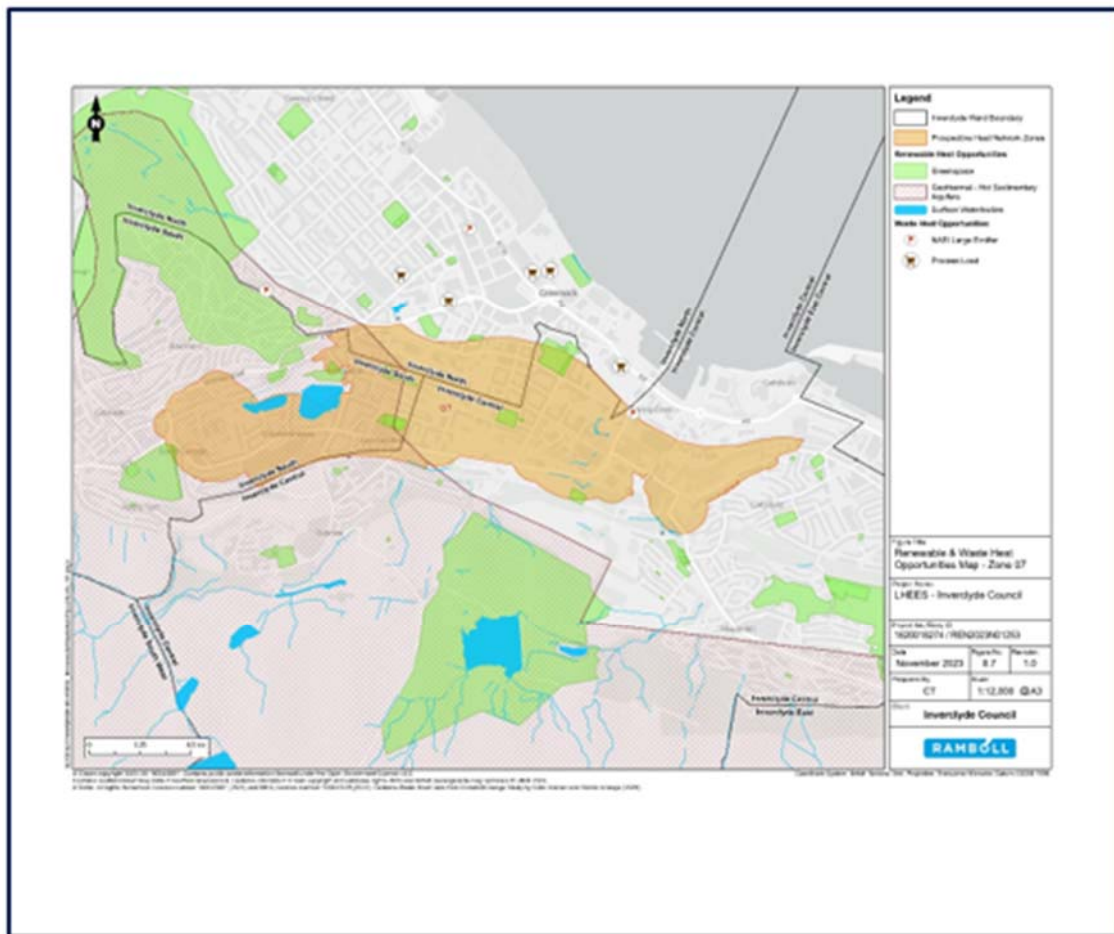


Zone Ward	Inverclyde North/ Inverclyde Central
Zone Area	69.7
Estimated Heat Zone Demand	37,256 MWh/y

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Potential Heat Sources	Green Spaces Surface Waterbodies Process Load (1No. Supermarket)
Fuel Poverty (percentage of households)	35.6%
Extreme Fuel Poverty (percentage of households)	28.8%
Proportion of Domestic Buildings	70%

5.2.7 Zone 7

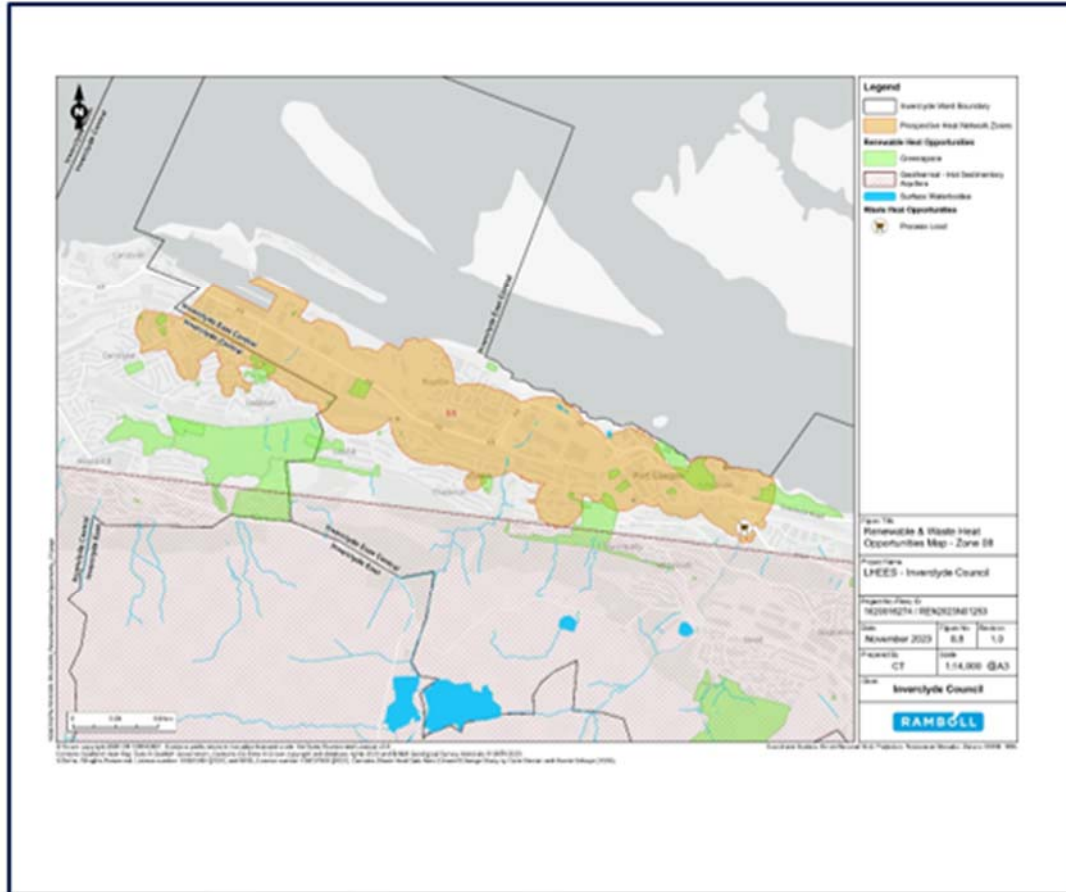


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Zone Name	Inverclyde North/ Inverclyde Central/ Inverclyde South
Zone Area	146.1
Estimated Zone Heat Demand	68,852 MWh/y
Potential Heat Sources	Green Spaces NAEI Large Emitter Surface Waterbodies Geothermal
Fuel Poverty (percentage of households)	35.1%
Extreme Fuel Poverty (percentage of households)	26.7%
Proportion of Domestic Buildings	87%

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5.2.8 Zone 8

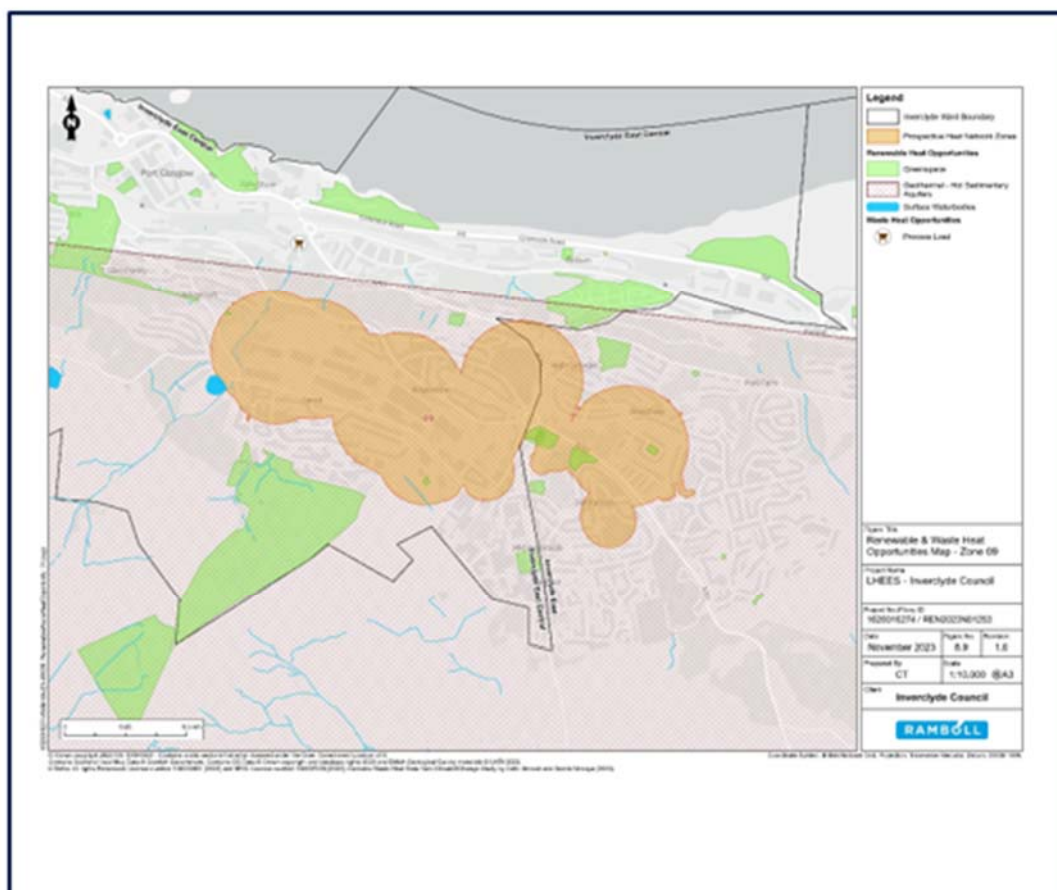


Zone Ward	Inverclyde East Central/ Inverclyde Central
Zone Area	173.6
Estimated Zone Heat Demand	68,895 MWh/y
Potential Heat Sources	Green Spaces Surface Waterbodies Process Load (1No. Supermarket) Geothermal

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Fuel Poverty (percentage of households)	32.4%
Extreme Fuel Poverty (percentage of households)	23.4%
Proportion of Domestic Buildings	82%

5.2.9 Zone 9

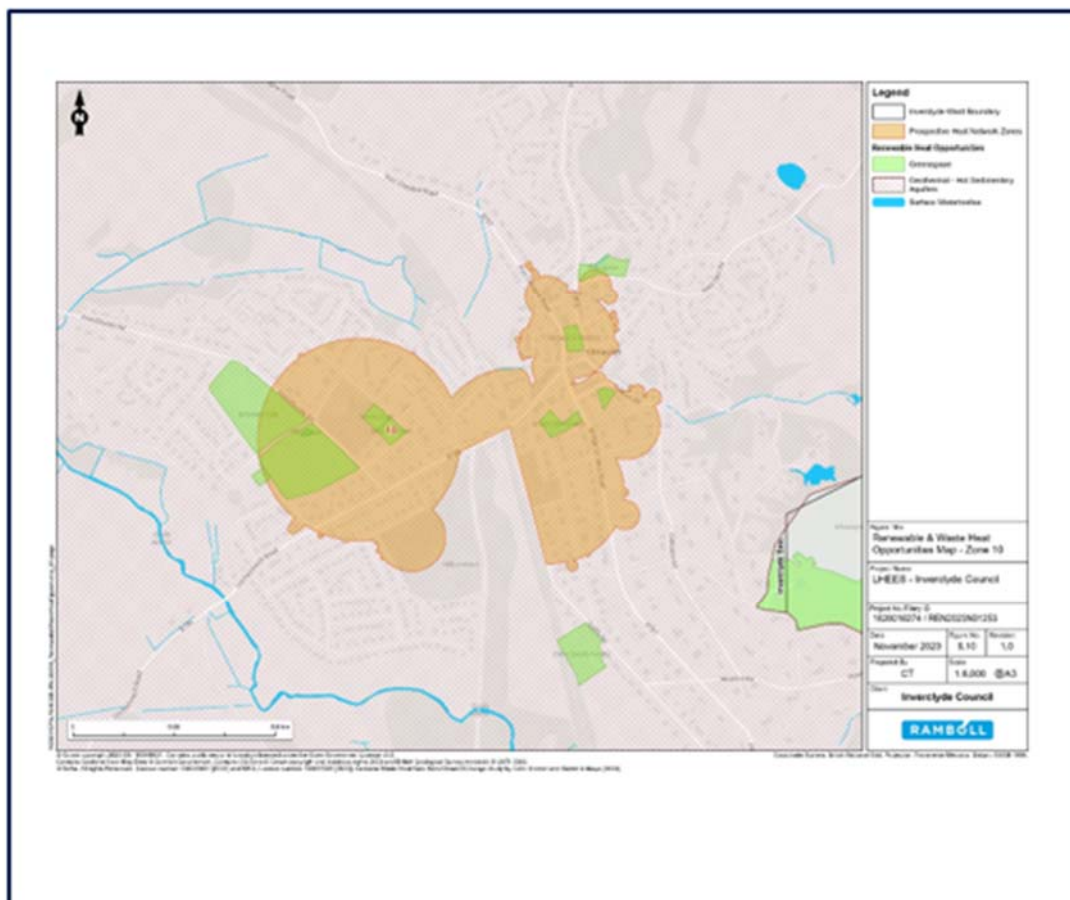


Zone Ward	Inverclyde East Central/ Inverclyde East
Zone Area	108.2
Estimated Zone Heat Demand	50,167 MWh/y

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Potential Heat Sources	Green Spaces Geothermal Surface Waterbodies
Fuel Poverty (percentage of households)	31.4%
Extreme Fuel Poverty (percentage of households)	19%
Proportion of Domestic Buildings	93%

5.2.10 Zone 10



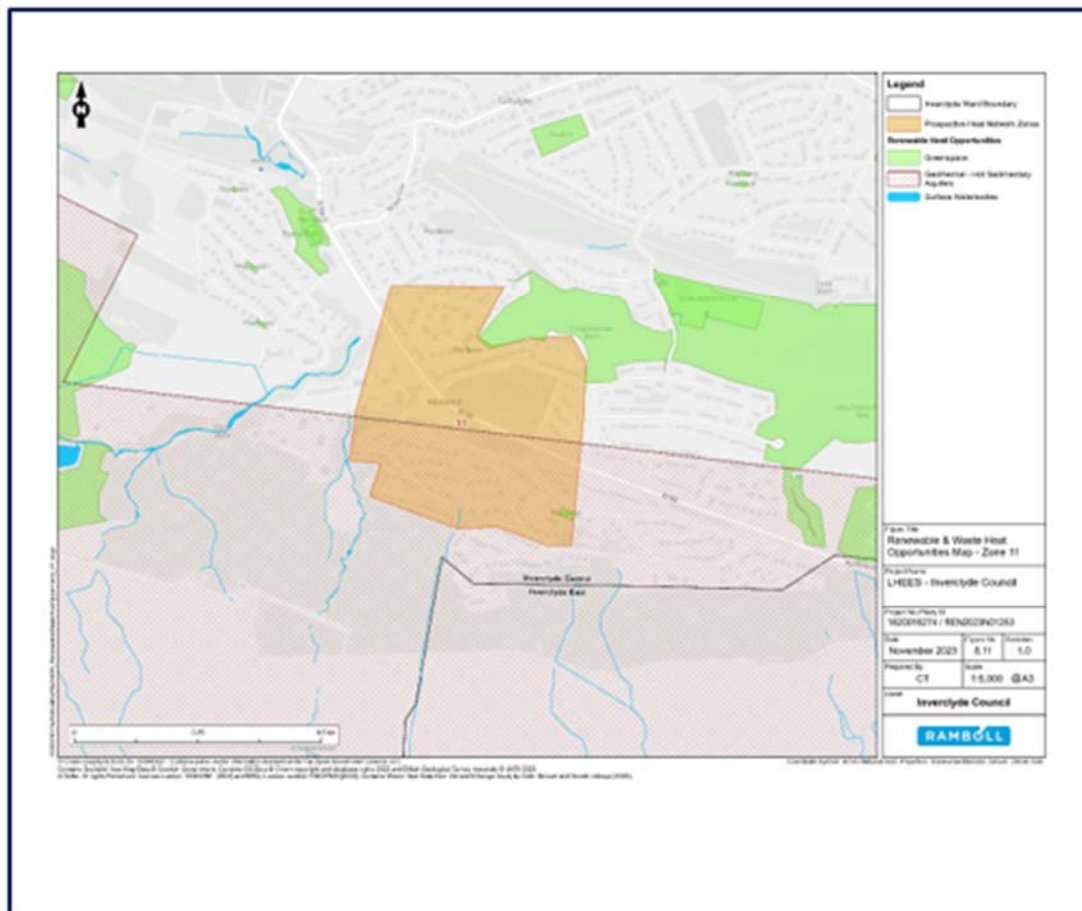
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Zone Ward	Inverclyde East
Zone Area	41.1
Estimated Zone Heat Demand	18,374 MWh/y
Potential Heat Sources	Green Spaces Geothermal Surface Waterbodies
Fuel Poverty (percentage of households)	21.1%
Extreme Fuel Poverty (percentage of households)	1.2%
Proportion of Domestic Buildings	83%

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5.2.11 Zone 11



Zone Ward	Inverclyde East
Zone Area	18.7
Estimated Zone Heat Demand	5,566 MWh/y
Potential Heat Sources	Green Spaces Geothermal Surface Waterbodies
Fuel Poverty (percentage of households)	37%

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Extreme Fuel Poverty (percentage of households)	25.5%
Proportion of Domestic Buildings	97%

5.3 Overview of the Delivery Area Opportunities

Using the LHEES methodology, the Council has identified a significant amount of potential delivery area opportunities. This used domestic stock analysis to identify areas where poor energy efficiency is a driver for fuel poverty. To achieve this, the data for probability of fuel poverty (Figure 5) was used as the basis of identifying hotspots. This was then blended with data which provided information on levels of energy efficiency. The result of the analysis was the identification of hotspots where there is a high indication of fuel poverty and high levels of poor energy efficiency (Figure 6).

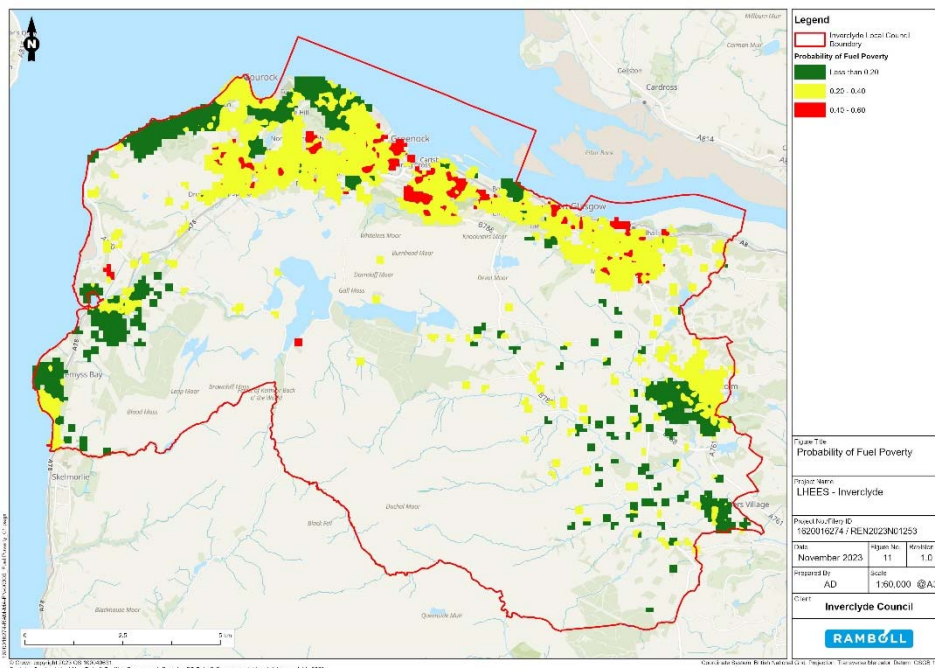


Figure 5 - Poor Building Energy Efficiency: Probability of Fuel Poverty Raster

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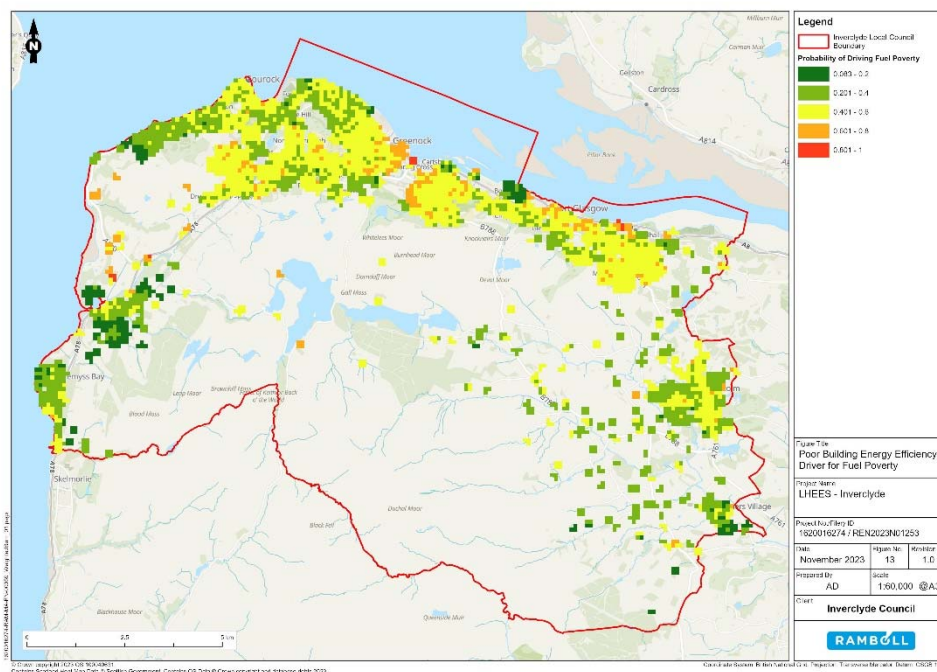


Figure 6 - Poor Building Energy Efficiency: Weighted Sum of Home Efficiency Factors Raster

In addition to this analysis, the council also assessed areas with a high concentration of heat pump ready properties which could be decarbonised with relative ease. These are properties with a reasonable or good level of energy efficiency and can have an individual or communal heat pump installed (sometimes with low-disruption and low-cost installations such as loft insulation or glazing). The council focused the analysis on on-gas properties as those are the most prevalent types of homes in Inverclyde. The requirements of these properties are:

- Not Category 0
- Property not listed
- Property not in conservation area
- Insulated walls
- Double/triple glazed windows
- Loft insulation > 99mm

The council reduced and combined these opportunities to five priority delivery area opportunities where they coincide with existing work Inverclyde and stakeholders are conducting or align with local and national targets for energy efficiency, fuel poverty and heat decarbonisation.

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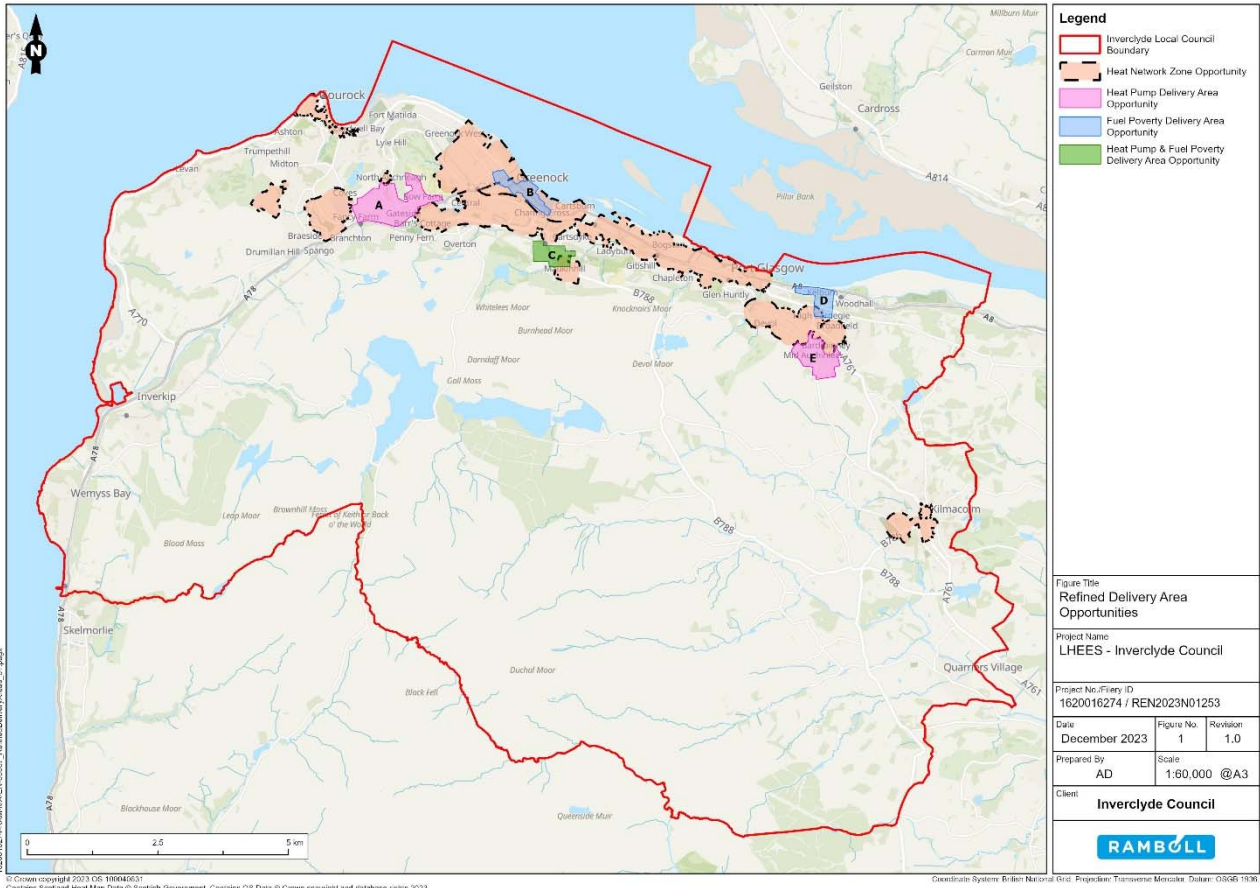


Figure 7 Map showing five priority delivery area opportunities alongside heat network zone opportunities

Once these areas were identified, the council analysed the individual property-level energy efficiency and decarbonisation pathways. This approach set a target SAP score of 69 (equivalent to EPC C) for each property. This target was chosen in line with the Scottish Government’s Heat in Buildings strategy for residential properties, where it states that wherever technically and legally feasible, properties require a minimum EPC rating of C by 2033. The measures made available for the PEAT tool included all insulation, glazing, and draught proofing measures.

Table 1 displays PEAT outputs for EPC before and after measures have been applied. There is a significant increase to EPC C across all delivery areas. The PEAT tool was applied using the same measures across all opportunity delivery areas to address Fuel Poverty for areas B, C, and D and to improve EPC for those properties in areas A, C, and E prior to ASHP and PV measures.

EPC	SAP	Area A		Area B		Area C		Area D		Area E	
		Before	After	Before	After	Before	After	Before	After	Before	After
B	81-91	8%	8%	1%	1%	0%	0%	0%	0%	10%	10%
C	69-80	49%	79%	46%	81%	72%	96%	41%	66%	42%	68%
D	55-68	35%	12%	36%	12%	26%	4%	35%	25%	35%	18%
E	39-54	6%	1%	10%	6%	2%	0%	14%	9%	9%	4%
F	21-38	2%	0%	6%	0%	1%	0%	9%	0%	3%	1%
G	1-20	0%	0%	1%	0%	0%	0%	1%	0%	1%	0%

Table 1 - PEAT Output: EPC Comparison for Refined Delivery Areas

Table 2 displays a range of savings associated with the implementation of energy efficiency measures. There is a relatively equal balance between all delivery areas, with Area C standing out as having the lowest values for all three saving types. Area C is an area of combined delivery opportunities.

Delivery Area Opportunity	Energy Saving (kWh)	Energy Bill Saving	KgCO _{2e} Saving
Area A	3,390	£455	715
Area B	3,363	£564	593
Area C	2,802	£336	492
Area D	3,538	£545	615
Area E	3,326	£432	600

Table 2 - PEAT Output: Energy and Carbon Savings per Property per Delivery Area Opportunity

Table 3 displays properties by number of applied PEAT measures and their average cost per property. The variation between number of properties is not directly representative of needs in the area due to varying number of properties per area.

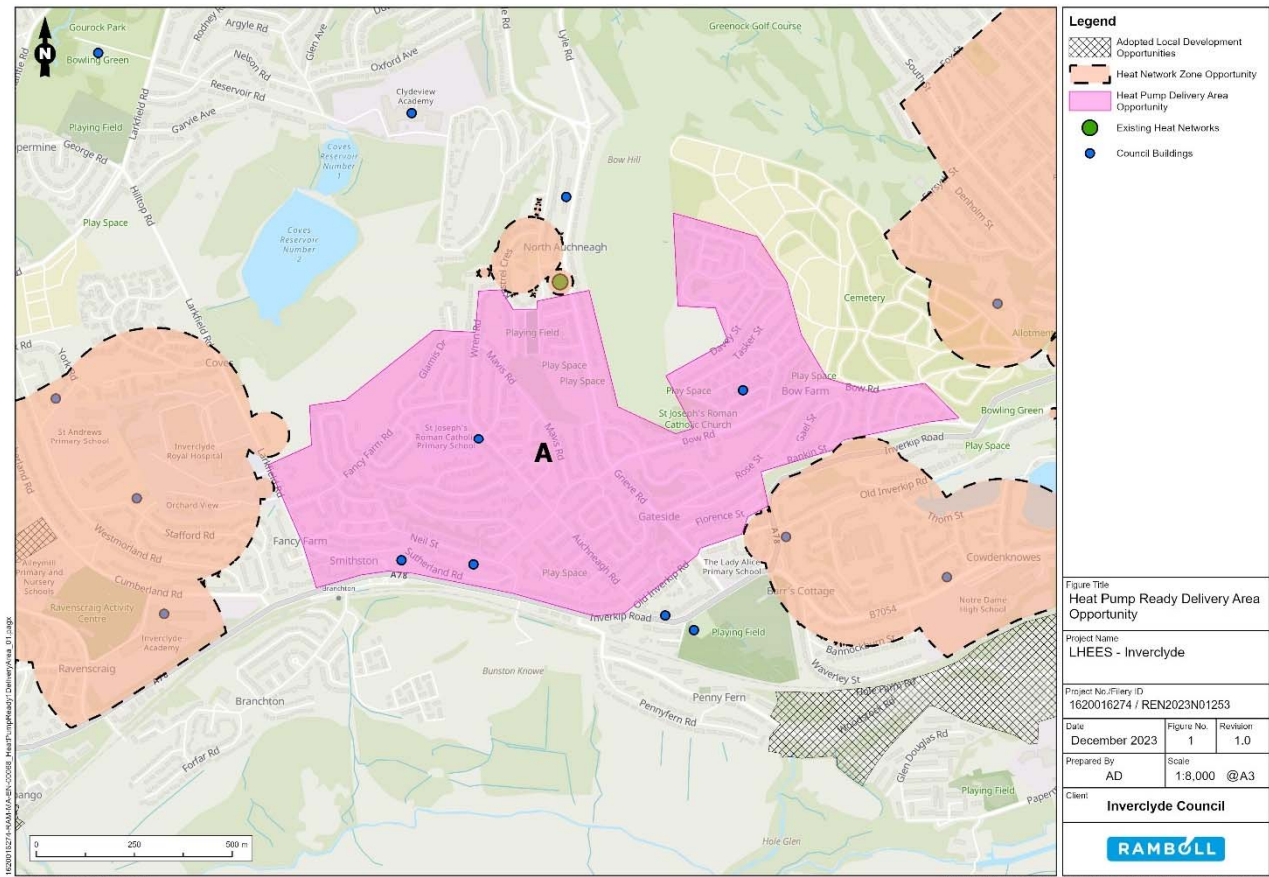
Measures	Area A		Area B		Area C		Area D		Area E	
	Property Count	Avg Cost	Property Count	Avg Cost	Property Count	Avg Cost	Property Count	Avg Cost	Property Count	Avg Cost
1	36	£915	1	£766	5	£532	9	£1,106	40	£1,290
2	284	£6,527	83	£3,339	38	£4,848	80	£9,220	145	£9,143
3	303	£13,829	56	£10,834	75	£15,420	77	£13,392	312	£16,478
4	249	£17,278	35	£14,022	22	£17,358	11	£17,836	149	£18,522
5	97	£22,666	12	£15,411	4	£21,263	N/A	N/A	10	£19,130

Table 3 - PEAT Output: Number of Measures per Opportunity Delivery Area with Average Cost per Property

5.4 Individual Delivery Areas Opportunities

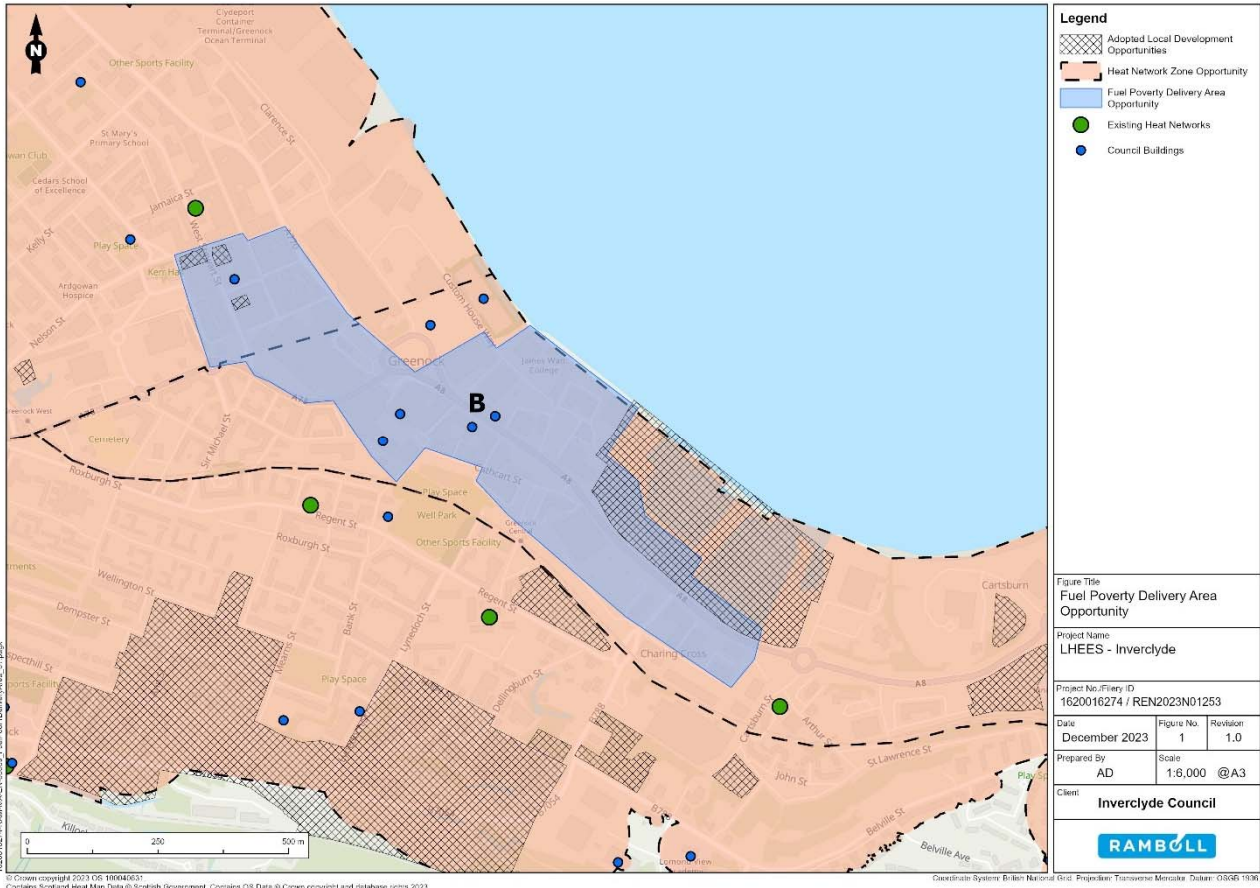
The individual delivery areas are presented in this section. The analysis is based on outputs of the PEAT-OR tool which draws from EPC data along with modelled data where there are gaps.

5.4.1 Heat Pump Ready Delivery Areas Opportunity A



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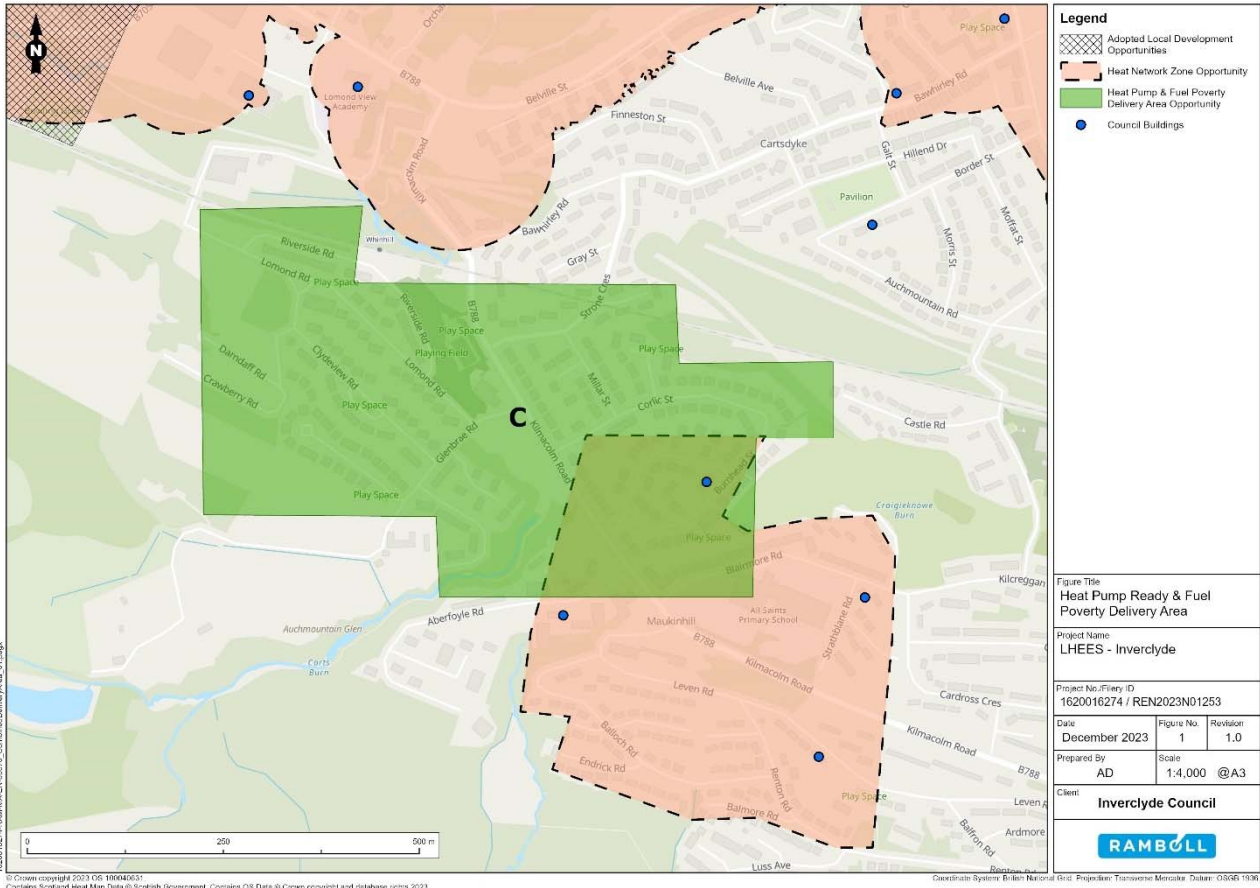
5.4.2 Fuel Poverty Delivery Area Opportunity B



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5.4.3 Heat Pump Ready and Fuel Poverty Delivery Area Opportunity C



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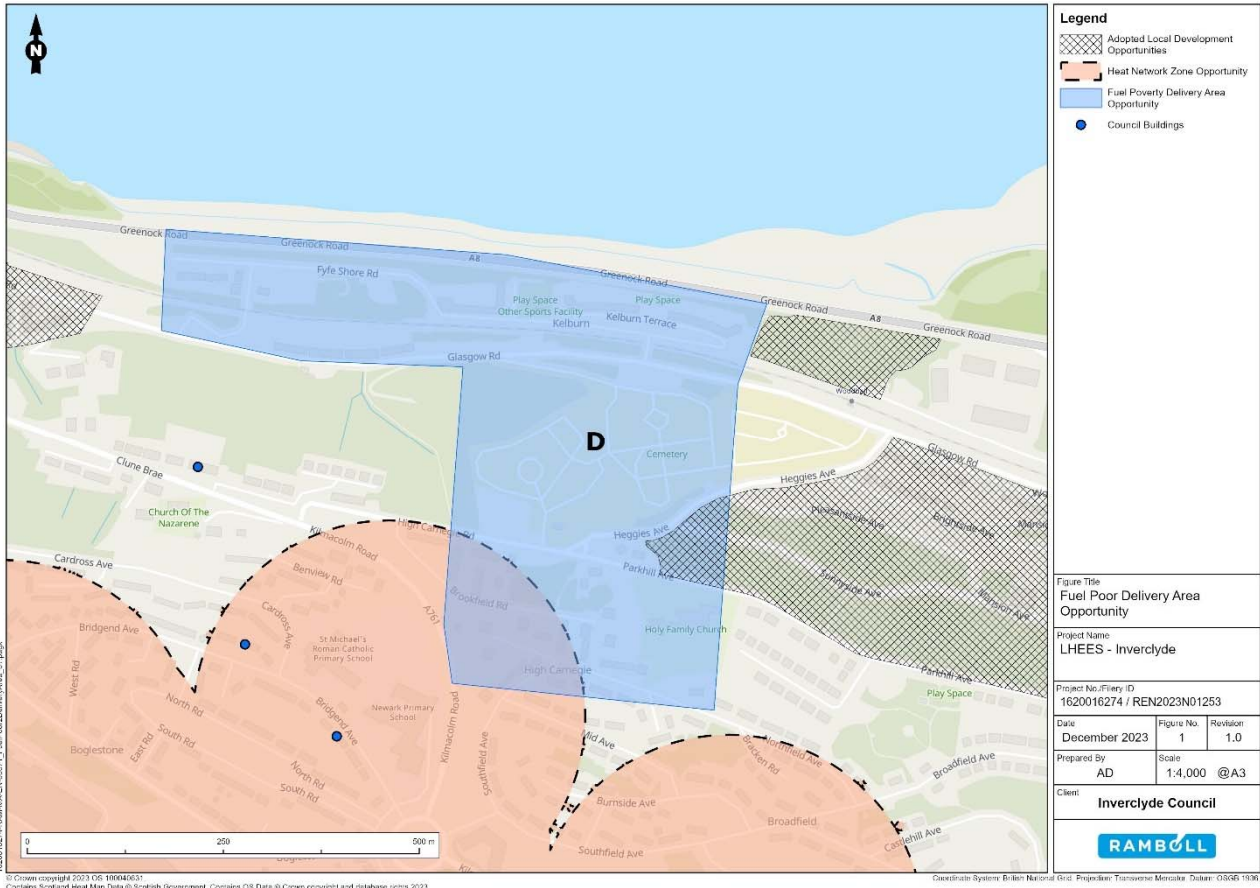
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Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.



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5.4.4 Fuel Poverty Delivery Area Opportunity D



Inverclyde Council

5.4.5 Heat Pump Ready Delivery Areas Opportunity E

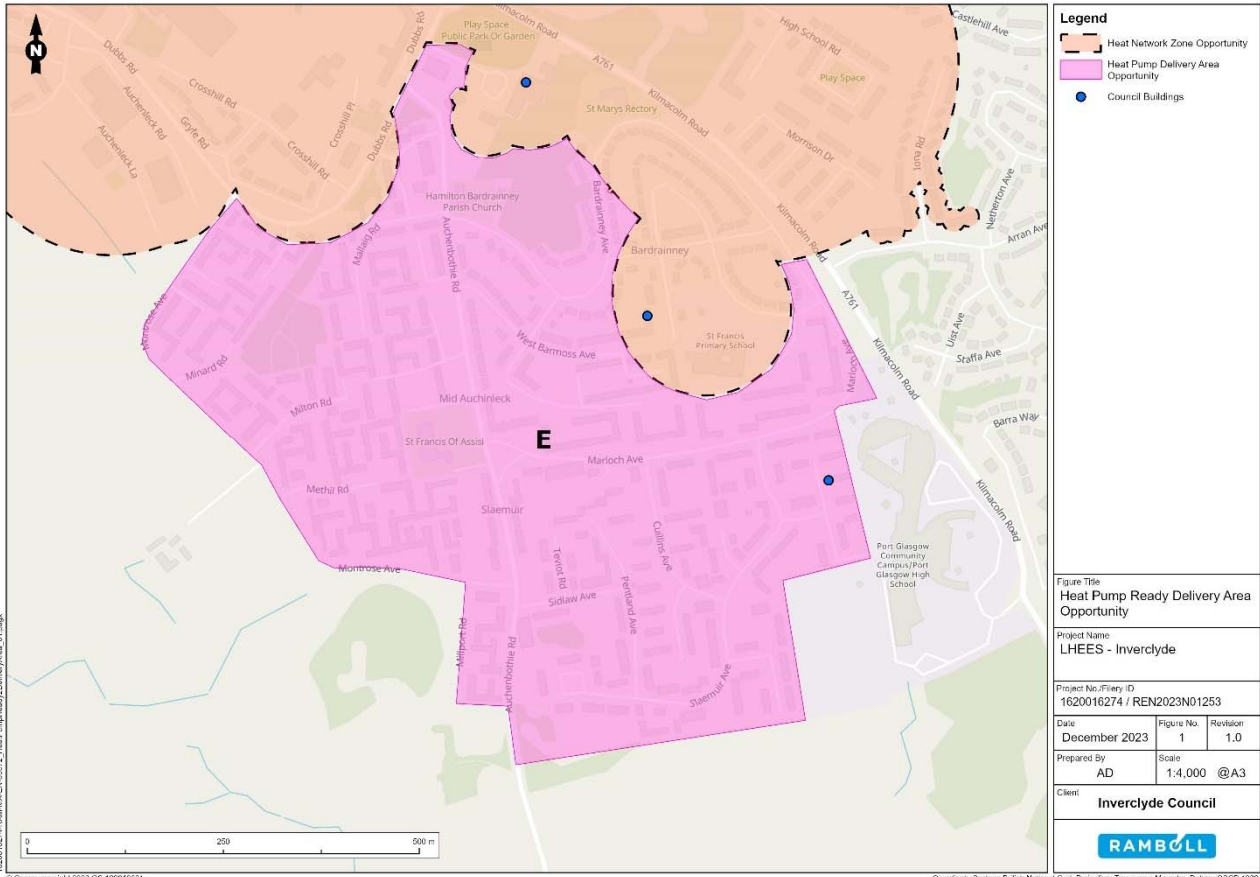


Table 1: Council Emissions

Reference year	Year	Scope 1	Scope 2	Scope 3	Total	Units
Baseline Year	2012/13	8,532	9,487	1,085	19,104	tonnes
Year 1 carbon footprint	2013/14	7,504	8,301	1,699	17,504	tonnes
Year 2 carbon footprint	2014/15	6,071	8,594	1,549	16,214	tonnes
Year 3 carbon footprint	2015/16	6,459	7,104	1,245	14,808	tonnes
Year 4 carbon footprint	2016/17	6,280	6,816	1,361	14,457	tonnes
Year 5 carbon footprint	2017/18	6,383	5,330	1,064	12,777	tonnes
Year 6 carbon footprint	2018/19	6,025	4,024	879	10,928	tonnes
Year 7 carbon footprint	2019/20	5,952	3,234	1,026	10,212	tonnes
Year 8 carbon footprint	2020/21	5,694	2,548	2,322	10,564	tonnes
Year 9 carbon footprint	2021/22	6,066	2,684	2,955	11,705	tonnes
Year 10 carbon footprint	2022/23	5,737	2,259	1,366	9,362	tonnes

Note:

- (i) **'tonnes'** refers to tonnes of carbon dioxide equivalent, which incorporate all greenhouse gases but calculated in terms of tonnes of carbon.
- (ii) **Scope 1** refers to 'direct' emissions, which are those from activities owned or controlled by an organisation. For example, combustion of natural gas in owned or controlled gas boilers.
- (iii) **Scope 2** refers to 'energy indirect' emissions, which are those that are a consequence of an organisation's energy use but occur at sources it does not own or control. For example, use of purchased electricity.
- (iv) **Scope 3** refers to 'other indirect' emissions, which are those that are a consequence of an organisation's actions but occur at sources it does not own or control and are not classed as Scope 2 emissions. For example, business travel in vehicles not owned or controlled by an organisation.
- (v) Year 10 figures do not include 'Well To Tank' emissions.

Table 2: Breakdown of Council Emissions 2022/23

Emission source	Scope	Consumption data	Units	Emissions (tonnes)
Grid electricity use	Scope 2	11,681,219	kilowatt hour	2,259
Grid electricity (transmission & distribution losses)	Scope 3	11,681,219	kilowatt hour	207
Natural gas use	Scope 1	26,404,698	kilowatt hour	4,820
Biomass (wood pellets) use	Scope 1	27.2	tonnes	1.4
Internal waste to landfill	Scope 3	1,046	tonnes	489
Recycling of internal waste	Scope 3	82	tonnes	1.7
Composting of internal waste	Scope 3	184	tonnes	1.6
Diesel use	Scope 1	357,168	litres	914
Petrol Use	Scope 1	467	litres	1
Water use	Scope 3	107,480	cubic metres	16
Wastewater treatment	Scope 3	102,106	cubic metres	28
Business travel using employee owned vehicles	Scope 3	903,315	miles	244
Homeworking	Scope 3	1,111,809	FTE Working Hour	379