

# Local Heat and Energy Efficiency Strategy 2024 - 2029



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# Foreword

As the Portfolio Holder for Buildings, Housing and Environment in South Ayrshire, it is with great pride that I introduce the Local Heat and Energy Efficiency Strategy (LHEES) for our Council area. This strategy marks a pivotal step in our commitment to a sustainable and resilient future, aligning with our aspirations to achieve Net Zero by 2045.

Local authorities across Scotland bear a responsibility for the energy we consume and the emissions this creates, and South Ayrshire is no exception. Through this strategy, we embark on a journey to not only address our local climate challenges but also to contribute meaningfully to the global imperative of mitigating the impacts of the climate emergency.

Our priorities in South Ayrshire focus on our communities, ensuring people can thrive within a flourishing economy, with good quality, energy efficient housing, and an open and transparent, inclusive democracy. This strategy lays out our forthcoming initiatives, including the investigation into zero emissions heating systems and heat network potential, reinforcement of our dedication to providing affordable warmth to our most vulnerable citizens, and commitment to partnership working.

In our pursuit of Net Zero, a just transition is paramount. Communities across South Ayrshire are already feeling the effects of climate change, and our commitment is to ensure that they not only endure but prosper throughout this transition. We recognise the importance of co-creating solutions with our communities, placing them at the heart of our endeavours.

Building on our past achievements, including notable reductions in carbon emissions, we acknowledge that resting on our laurels is not an option. This LHEES document will work in tandem with our Ayrshire Energy Masterplan. This pan-Ayrshire initiative is designed to support investment and economic development across the three authorities,

in conjunction with the Ayrshire Growth Deal. By collaborating with our diverse stakeholders, we will turn these strategies into tangible progress, pushing closer to our vision of a Net Zero Carbon South Ayrshire.

This strategy represents a live document, an evolving piece of work that will adapt in line with wider changes in legislation, research, and technology and innovation. I extend an invitation to all residents, businesses, and stakeholders in South Ayrshire to stay engaged with this work and help to shape the future of our region towards one of sustainability and resilience.



Councillor Martin Kilbride,  
Portfolio Holder for Buildings, Housing and  
Environment

# 1. Overview

## 1.1 What is an LHEES?

The Local Heat and Energy Efficiency Strategy (LHEES) is a long-term strategic framework designed to support energy efficiency and sustainable heat delivery across all buildings in South Ayrshire. This includes council and privately owned buildings and spans domestic and non-domestic sectors. It serves as a roadmap towards achieving our commitment to Net Zero Carbon, eliminating fuel poverty, and working towards a more environmentally conscious and resilient community.

## 1.2 Why are we doing this?

As part of the Scottish Governments push for net zero by 2045, it is vital that our homes and buildings no longer contribute to climate change, while tackling fuel poverty within our communities.

Our LHEES will support the objectives within the South Ayrshire Council Plan, Scottish Government targets and objectives, and builds towards Scotland's place in the world.

## 1.3 What is the focus of this work?

In LHEES, we are looking at area wide approaches, which means focussing on equity, inclusion, and co-creation. Initial work on LHEES will look to build connections with stakeholders from council services and community planning partners, communities and residents, businesses, and the 3rd sector. We are working to build connections with areas of best practice, develop and connect existing areas of work, and further develop this long-term plan of how we reach our future targets.

In terms of tangible action, this means improving insulation and energy efficiency of all buildings, planning for where area-wide approaches are suitable for heat networks, and identifying what heat provisions are required to meet targets. Throughout this strategy you will find focus sections, these draw out information that will form the basis of delivery plan actions.

## 1.4 How can you get involved?

Active community engagement is crucial to the success of the LHEES. All stakeholders are encouraged to participate by providing feedback and insights.

We need to take an inclusive approach that ensures this strategy is not only well-informed, but reflective of the diverse needs and perspectives within South Ayrshire. Initial consultation included public consultations, community workshops, and other outreach initiatives, and our aim is to continue community engagement over the course of this strategy.

## 2. South Ayrshire Priorities

### Priority One Community and Sustainability

Supporting those most vulnerable within our communities is a cornerstone of South Ayrshire Council priorities, from our Council Plan to our Local Housing Strategy. Our LHEES will prioritise reduction of fuel poverty and associated health inequalities, enhancement of our natural environment, and the delivery of an equitable, just transition.



### Priority Two Economy and Opportunity

Delivering energy efficiency and developing low carbon technologies have the potential to support economic development, job creation, and foster closer engagement between stakeholders across South Ayrshire. Our LHEES will support the Ayrshire Energy Masterplan in delivering the benefits of a just transition to all of South Ayrshire.



### Priority Three Education and Skills

Supporting an energy transition is a cross-generation task, so we must look to support the skills available to deliver this now and in the future. We must look at fostering education and innovation in schools, further education, higher education, and within industry apprenticeships. Our LHEES will work to establish links across all age ranges, supporting a skills workforce to put South Ayrshire at the forefront of the move to Net Zero.



Throughout this document you will find challenge and focus sections, intended to highlight the key considerations, and build to form delivery plan actions. These will reference these priorities.

The connecting priority between these is to ensure open and transparent communication between stakeholders, partners, and communities.

### 3. LHEES Considerations

The LHEES guidance sets out the key considerations for this Strategy, shown in Table 1. These help to categorise building stock into groups that require similar interventions.

Table 1: LHEES Considerations

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

This LHEES has been developed in line with the Scottish Government methodology, with some adjustments to suit the specific context of the authority. For detail on the LHEES approach and methodology, please refer to Appendix A.

In this iteration of LHEES, South Ayrshire is focussing on:

- Improving energy efficiency and reducing fuel poverty,
  - o Including assessment of energy efficiency as a driver for ill-health and health inequalities
- Transitioning off gas buildings to low carbon heating,
- Buildings feasibility for heat networks where appropriate.



### 3.1 Interventions

There are a range of potential interventions, from energy efficiency measures to low and zero carbon heating systems, which will play a role in South Ayrshire’s LHEES. A full summary can be seen in Section 4.3 of the LHEES Strategy 2024-2029.

The Scottish Governments Heat in Buildings Strategy<sup>1</sup> (HIBS) states that for the period to 2030, focus must be on accelerating the deployment of tried and tested measures where they are known to be no or low regrets.

As noted, South Ayrshire’s focus with regard to technologies for this initial LHEES will look at improving energy efficiency for fuel poverty and health, transitioning off gas buildings to low carbon heating, and building feasibility for heat networks.

### 3.2 Consultation and Engagement

Consultation on the development of this LHEES was sought through our community planning partners, registered social landlords, economic development groups, third sector organisations, community groups and members of the public. Responses were thematically assessed, and key principles were integrated into this version of the LHEES. Analysis can be seen in Appendix D of the LHEES Strategy 2024-2029.



<sup>1</sup>[Heat in Buildings Strategy - achieving net zero emissions in Scotland's buildings - gov.scot \(www.gov.scot\)](https://www.gov.scot/publications/heat-in-buildings-strategy-2021/pages/introduction.aspx)

## 4. Challenges and Opportunities

The scale of the change involved in decarbonising heat in South Ayrshire should not be understated. Energy transitions present huge challenges economically and socially; however, they do present opportunities as well.

### Opportunities

#### 4.1 Just Energy Transition

The concept of Just Transition originated in the 1980's and has gained traction in terms of sustainable development and energy transition. The International Labour Organisation (ILO) defines it as “**Greening the economy in a way that is as fair and inclusive as possible to everyone concerned, creating decent work opportunities and leaving no one behind.**”

This is a principle we seek to embed in the LHEES, improving equity and reducing inequality.

Every Scottish Local Authority must undertake an LHEES, and each will assess the level of interventions required to work towards heat decarbonisation. Combined with legislative drivers this transition to decarbonise heat in buildings has significant implications for supply chain development, reskilling and upskilling, and knowledge transfer.

Recent research has shown that **improved energy efficiency was responsible for almost 25% of all GDP growth in the UK since the 1970's<sup>2</sup>**, and that early planning and embedding of social equality can significantly improve outcomes<sup>3</sup>. In this way, ensuring a just energy transition in South Ayrshire not only supports the local economy to be at the forefront of this national change, but ensures that we are delivering on our commitment to protect those most vulnerable in our communities.

South Ayrshire Council is committed to embedding the principles of social equity and just transition in our decarbonisation journey and will work with key partners like Sustainable Scotland Network to develop deliverable actions towards this goal.

#### 4.2 Ayrshire Energy Masterplan

The Ayrshire Energy Masterplan represents a cross-authority approach to develop a strategic energy vision for the Ayrshire region. This will include socio- and techno-economic modelling to identify investment opportunities, areas of business growth, and skills and supply chain development areas. Strategic outcomes will link with LHEES through local energy and heat generation, decarbonisation, investment in local carbon technologies, and a just and inclusive energy transition.

The strategy is due to be released in 2024 and will link closely with the LHEES delivery planning.

#### 4.3 Engagement & Development

Although LHEES is developed by South Ayrshire Council, **this strategy is relevant to all stakeholders in South Ayrshire**. To deliver on our commitments, we will need to build and develop engagement routes across services, sectors, and communities.

Consultation on this document was sought through our **community planning partners, registered social landlords, economic development groups, third sector organisations, community groups and members of the public**. Responses were thematically assessed, and key principles were integrated into this version of the LHEES. Analysis can be seen in Appendix D.

<sup>2</sup> <https://ukerc.ac.uk/news/energy-efficiency-contributed-25-of-uk-economic-growth-since-1971/>

<sup>3</sup> <https://www.gov.scot/publications/transitions-comparative-perspective/pages/5/>

Implementing LHEES and associated actions will require continuation and extension of partnerships such as Ayrshire and Arran NHS Trust, Energy Agency, and Home Energy Scotland through the LHEES coordination group and Local Area Outcome Planning (LOIP) forums. The ongoing work of these organisations and other local partners highlight areas of best practice, show links between housing and health, and ensure that external funding for advice and measures is delivered effectively and at speed.

Public and community engagement will continue beyond the consultation period through LOIP forums and community councils. With the scale of the required transition, public communication is vital and arguably work beyond the scale of local authority intervention is required. Further internal development on engagement can be seen in Section 13: Governance, however a public engagement strategy will be required as part of the delivery plan actions.

#### 4.4 Community Wealth Building

Community wealth building is a people-centred approach to local economic development, which redirects wealth back into the local economy and the surrounding community. It can deliver more business growth, community owned assets, and improved resilience while building social and environmental justice. This can be done through local anchor organisations such as local councils, community groups, housing associations, or education facilities.

In the **Wallacetown Community Energy Project Proposal**, the local community association is working in partnership with South Ayrshire Council, seeking to install community owned PV panels onto the roofs of three school buildings in the Wallacetown neighbourhood of Ayr. The Council will purchase the power generated by the panels for use in the school buildings, with the surplus sold to the National Grid. The income earned, after costs, will go to create a new 'Wallacetown Benefit Fund' managed by the community, that will fund future education and wellbeing projects.

This project not only supports community ownership and wealth building in one of Scotland's most deprived areas, but builds connections between local residents, community groups, Strathclyde University, and council teams.

The association has a wider vision to make Wallacetown a NetZero Sustainable Village, drawing on partnership experience to support decarbonisation. An example of this was the MSc Group Project on an Urban District Heating feasibility study linking directly to Wallacetown and SACs LHEES strategy. Going forward the Council and the university will engage with the joint Energy Working Group to identify sustainability projects that will help jointly achieve the vision of making Wallacetown a NetZero Village, a model of good practice that can be shared.

### Focus

#### Priority 1

Embed the principles of Just Transition into LHEES development and delivery,

#### Priority 1 & 3

Support the development of the Wallacetown Community Energy Project & Net Zero Village,

#### Priority 3

Support the Ayrshire Energy Masterplan project to broaden commercial engagement,

#### Priority 3

Establish LHEES within existing consultation routes, and develop new routes where possible



## Challenges

The challenge of decarbonising heat on an area-wide basis is a massive challenge, which this iteration of LHEES seeks to take the first steps towards.

One of the main challenges in decarbonising heat in South Ayrshire is the age and energy efficiency of buildings across the authority. All LHEES work across Scotland is based on the Home Analytics (HA) and Non-domestic Analytics (NDA) datasets, which is managed by Home Energy Scotland on behalf of the Scottish Government. This data set gives property level information about property type, age of construction, EPC, and energy efficiency measures installed.



With the **majority of homes owner occupied**, this present significant challenge in direct Council-led intervention. Development of stakeholder engagement through partner organisations such as the Energy Agency and Home Energy Scotland can support homeowners with advice and funding where available.

The majority of the domestic building stock in South Ayrshire was constructed after 1950 (Figure 2) with 87 % of SAC's stock built before 1983. Housing association stock has a larger proportion of newer builds, reflected in a high percentage of properties reaching an EPC grade of C or better.

There are **4,636 domestic properties situated in conservation areas** in South Ayrshire. Listed buildings make up 2 % of the domestic building stock, with South Ayrshire Council owning 26.

As the LHEES seeks to support decarbonisation of not only buildings we own and manage, but domestic and commercial properties as well, engagement is required to inform and support building owners in this journey. Existing engagement routes such as tenant participation, registered social landlords, private landlord communications, economic development teams, and community support groups will be assessed and where appropriate representatives brought in to consult through the Coordination group. A main challenge of this LHEES will be coordination of messages across these groups, linking with their priorities and objectives in order to deliver on actions.

Data challenges are also a consideration, both in quality and variety of data. There is a need to **validate data sets** against Council information and enrich this through layering of other relevant data, such as substation headroom or health and equality information. The sharing and handling of this data will require **a joint working exercise between community planning partners**.

## Challenges

- Higher than Scottish average owner-occupier (58%) and lower than average socially rented (23%) means less direct action available to SAC,
- Greater levels of heat demand in private rental and owner occupier properties with minimal scope of direct intervention
- Higher than average pre-1919 building stock (18%),
- Data quality and variety



### 4.6 Non-domestic Buildings

The Non-Domestic Baseline Tool utilises data derived from Non-Domestic Analytics data sets. This analysis is based on the best available data, but **there are gaps in reliability and coverage**. Nevertheless, the data has been used for the baselining step of the LHEES process to get a flavour of the building stock.

This data will be **supported through the Ayrshire Energy Masterplan (AEM)**; an ongoing project across the three Ayrshire's which looks to identify investment and development opportunities in heat and energy decarbonisation. The introduction of Building Assessment Reports (**BAR**) from Scottish Government will further develop this picture in the near future.

The assessment identifies 4,135 non-domestic buildings. Together, these have an **estimated total heat demand of 150,000 MWh/y**. An analysis of these properties can be seen the full LHEES release

**Gas is the biggest source of heat**, with electricity and oil representing the largest proportion of smaller buildings. Smaller building types account for almost half of the total heat demand, therefore converting small oil systems to heat pump or heat network connection could be a priority. Further work is needed to identify existing heat pumps within electrically heated properties.

**A large proportion of buildings are pre-1919** with a high heat demand and this group of properties may be a target for energy efficiency measures. The data lists 55 % of these pre-1919 buildings as being retail or financial and 79 % as being in towns, making up most high street retailers.

Generally, non-domestic heating energy demand is dominated by the retail and finance sector.

## Challenges

- Data availability and reliability,
- Varied challenges with heat demand depending on business type,
- Traditional build high streets with hard-to-treat properties.

## Focus

### Priority 2

Existing work through AEM to support engagement with non-domestic owners,

### Priority 2

Support Building Assessment Report (BAR) process and integrate data,

### Priority 2 & 3

Explore co-working opportunities with Economic Development and community planning partners



## 5. Strategic Zones and Baseline

This section illustrates how we have set out Strategic Zones and developed pathways for each. In this section the approach to selecting Strategic Zones is described, as well as the attributes for each which affect the strategic options. Weighted scores are used to assess energy efficiency and factors affecting the development pathways. A higher score is representative of poorer energy efficiency. Full details on the weighting and calculations are available in the full technical report in Appendix C, D and I.

### 5.1 Local Development Plan Areas as LHEES Strategic Zones

Through our LHEES work, “intermediate” geographical zones have been generated to show priority areas to target interventions, the analysis and indicators used can be seen in the [full technical report](#), Appendix A, and I. In addition to this standard methodology, data was mapped against SACs Local Development Planning boundaries.

Table 2: Domestic properties in the Strategic Zones

Zone	Total domestic properties	Tenure				Mixed tenure in parent building
		SAC	Housing Association	Private Rental	Owner Occupied	
Carrick	3,800	470	170	660	2,500	214
Kyle	8,100	1,050	320	800	5,930	409
Ayr	24,200	4,210	1,150	2,940	15,900	5,232
Girvan	3,400	700	170	330	2,200	414
Maybole	2,300	520	110	240	1,450	311
Prestwick	7,400	680	210	770	5,740	908
Troon	8,000	930	210	940	5,920	1,647

Table 3: Domestic energy efficiency weighted scores by strategic zone

Strategic Zone	Number of interventions required				Percentage of housing stock				Total Weighted Score
	Loft Ins.	Glazing Upgrade	Wall Ins.	All	Loft Ins.	Glazing Upgrade	Wall Ins.	All	
Carrick	819	373	2,159	3,351	21%	10%	56%	87%	29
Kyle	801	375	2,500	3,676	10%	5%	31%	45%	15
Ayr	2,147	1,488	8,552	12,187	9%	6%	35%	50%	17
Girvan	497	191	1,418	2,106	14%	6%	41%	61%	20
Maybole	250	133	954	1,337	11%	6%	42%	58%	20
Prestwick	955	310	3,278	4,543	13%	4%	44%	61%	20
Troon	709	290	3,225	4,224	9%	4%	40 %	53%	18
<b>Total</b>	<b>6,178</b>	<b>3,160</b>	<b>22,086</b>	<b>31,242</b>					

## 5.2 Domestic Energy Efficiency and Fuel Poverty

The Weighted scores for fuel poverty as a results of poor energy efficiency for the strategic zones, using the default weightings have been calculated for the Strategic Zones. These are mapped against the data zone levels the LHEES Strategy 2024-2029. Carrick and Girvan stand out above the others.

Table 4: Domestic fuel poverty scores by strategic zone

Strategic Zone	Households with energy bills > 10% of income after housing costs	Households with energy bills > 20% of income after housing costs	Total Weighted Score
Carrick	34 %	43 %	31
Kyle	21 %	7 %	18
Ayr	22 %	9 %	19
Girvan	33 %	21 %	27
Maybole	27 %	15 %	23
Prestwick	18 %	4 %	19
Troon	19 %	4 %	18



The assessment via strategic zones gives several broad considerations for this and future LHEES work:

## Loft insulation

There should be limited barriers to installing loft insulation to owner occupied and privately rented homes, since it is both cheap and usually easy to install.

## Enhancing Dataset

HA data is comprehensive, however will require to be crosschecked with local knowledge and Council datasets to improve targeting. Layering of data with health information to assess energy efficiency as a driver for health inequalities could provide more contextual targeting of interventions.

## Local Authority and Housing Association

Local authority housing stock represents the most easily accessible interventions, generally covered through rolling maintenance programs. As such, Council properties with single glazing and substandard loft insulation will be assessed against Council records as it is likely these are cloned records.

## Carrick

Carrick stands out with respect to the weighted scores, with the highest percentage of interventions required in each category.

## Wall insulation

Wall insulation is the largest required intervention area with an average of 41% of properties requiring some level of improvement. While there is a proportion of homes with solid walls which are hard to insulate, the most common construction type in every strategic zone is cavity walls which should not hinder improved insulation.

## Private Sector

The private sector represents the largest proportion of each intervention area. Additionally, 1,069 homes with single glazing are either listed or sit in conservation areas and, consequently, barriers to interventions may be more than just financial. Partnership working with Energy Agency and Home Energy Scotland will be essential to support intervention in this area.

### Challenges

- Data reliability is good for domestic, but there is a need for localised knowledge, engagement, and layering of datasets to deliver successful interventions,
- Scale of intervention required,
- Current funding streams are not adequate to meet scale of challenge.



### Focus

- **Priority 1**  
Prioritise areas and interventions highlighted through the baseline work,
- **Priority 1 & 2**  
Continue Locality Planning and Community Council engagement sessions to build understanding and engagement,
- **Priority 1, 2 & 3**  
Assess funding and capacity issues around delivery of measures.

## 6. Technology

### 6.1 Options

There is no single solution to decarbonisation of heat, certainly not on the scale that LHEES is working from. Currently the most viable options from Table 2 for low carbon heat sources are: Heat pumps | Heat networks | Electric heating.

Each property owner will make decisions on which route of change and technology is most suitable for them and their property, at this stage of the LHEES work we seek to outline the most suitable technologies for different properties.

In recent research heat pumps have been shown to be broadly suitable to most property types in the UK, and the LHEES identifies 28,445 properties that could be suitable for heat pumps. However, there are significant challenges with localised and wide scale roll out, including network restrictions, potential internal modifications, upfront costs, and comparable cost of electricity to gas.

As such, consideration for heat pump deployment will be taken on a case-by-case basis to ensure fuel poverty is not adversely impacted.

#### Challenges

- **Poor installation or incorrect measures risk increasing energy costs and making fuel poverty worse,**
- **Grid capacity may constrain large scale roll out of heat pumps,**
- **High installation costs**

#### Focus

##### Priority 1 & 2

**Prioritising no/low regret options**

##### Priority 2

**Monitoring energy costs and funding availability**

##### Priority 2

**Engagement with Scottish Power Energy Networks in developing area wide approaches.**

### 6.2 Mixed Tenure, Mixed use and Historic

#### Listed buildings and conservation areas

Listed buildings can be challenging with respect to energy efficiency improvements, the siting of, for example, air source heat pumps external to the building, and the connection to new district heating pipework.

There are around 1,350 listed domestic properties (data for non-domestic has not been provided). Only 19 % have EPCs rated C or better, with 14 % being F or G.

Like listed buildings, conservation areas represent a particular challenge regarding the introduction of energy efficiency measures and low carbon heat measures. For example, conservation areas are excluded from certain permitted development rights. This can result in properties requiring permission for works that may not have required planning permission in a different area.

Conservation areas are more likely to include traditional building types for which energy efficiency measures and low carbon heat sources tend to be more time consuming, challenging or costly to install, if they are possible at all.

There are a little over 4,600 domestic properties in conservation areas (around 8 % of the homes in South Ayrshire), with the vast majority being owner occupied.

## 6.3 Electric Heating

Electric heating can include a series of different solutions, the most prominent of which is high-efficiency storage heaters. These store heat generated overnight while electricity is cheaper and release it gradually over the course of the day. These systems require a cheaper off-peak electricity tariff to heat the home. Fuel poverty research by Scottish Government in 2020 cited mixed views with storage heating, varying from no significant issues, to challenges with affordability, tariff and operation confusion, and difficulties with price comparison and switching<sup>4</sup>.

High-efficiency systems can offer a more cost-effective solution compared to conventional storage systems or direct radiant panels. Research suggests that of the 1.7m homes in the UK heated with electric storage heaters, 63% of which are over 12 years old, upgrading and correctly specifying system sizes can reduce bills and positively impacts of fuel poverty<sup>5</sup>.

### Mixed use buildings

Around 1,700 domestic properties (3 %) of total are recorded as flats in mixed use buildings. The potential energy efficiency interventions for these properties are laid out in Figure 17, section 7.8 of the **full technical report**. Almost all of these properties are owner occupied or privately rented. As with the general stock, wall insulation appears to be a big target for this typology.

### Challenges

- Limited direct influence on energy efficiency or heat type,
- Unique and challenging building types,
- Increased cost and challenge for interventions,
- Incorrect installation or operation of technologies can exacerbate fuel poverty.

### Focus

- Priority 1 & 2  
Prioritising no/low regret options,
- Priority 2 & 3  
Engagement with local and national groups and industry experts to monitor best practice,
- Priority 2 & 3  
Identify and exemplify existing best practice within South Ayrshire.



<sup>4</sup>[Lived experience of fuel poverty. Scottish Government. 03/09/2022](#)

<sup>5</sup>[The role of off peak electric heating in reducing fuel poverty. 2017](#)



## 7. Heat Networks

Heat networks, often referred to as district heating systems, are area wide approaches to heating, and combined with sustainable heat sources will play a crucial role in decarbonising heat for our homes and businesses. Unlike traditional heating methods that rely on individual property heating, heat networks operate by sending heat from a central source to multiple buildings through a network of insulated pipes. Globally, 9% of final heat demand is met by heat networks, with European leaders such as Denmark, connecting to 65% of domestic properties.

One of the key advantages of heat networks is the option to use different sources of heat, such as large-scale heat pumps using water, ground, or waste as heat sources, geothermal, and waste heat from industrial processes.

Scottish Government has identified heat networks as a key technology in meeting our climate change duty and assigned output targets through the Heat Networks (Scotland) Act 2021, the first of which is in 2027.

### 7.1 Overview

An analysis of the potential for heat network zones indicates that there are broadly two areas where heat networks may be viable – within Ayr and an industrial cluster near Girvan.

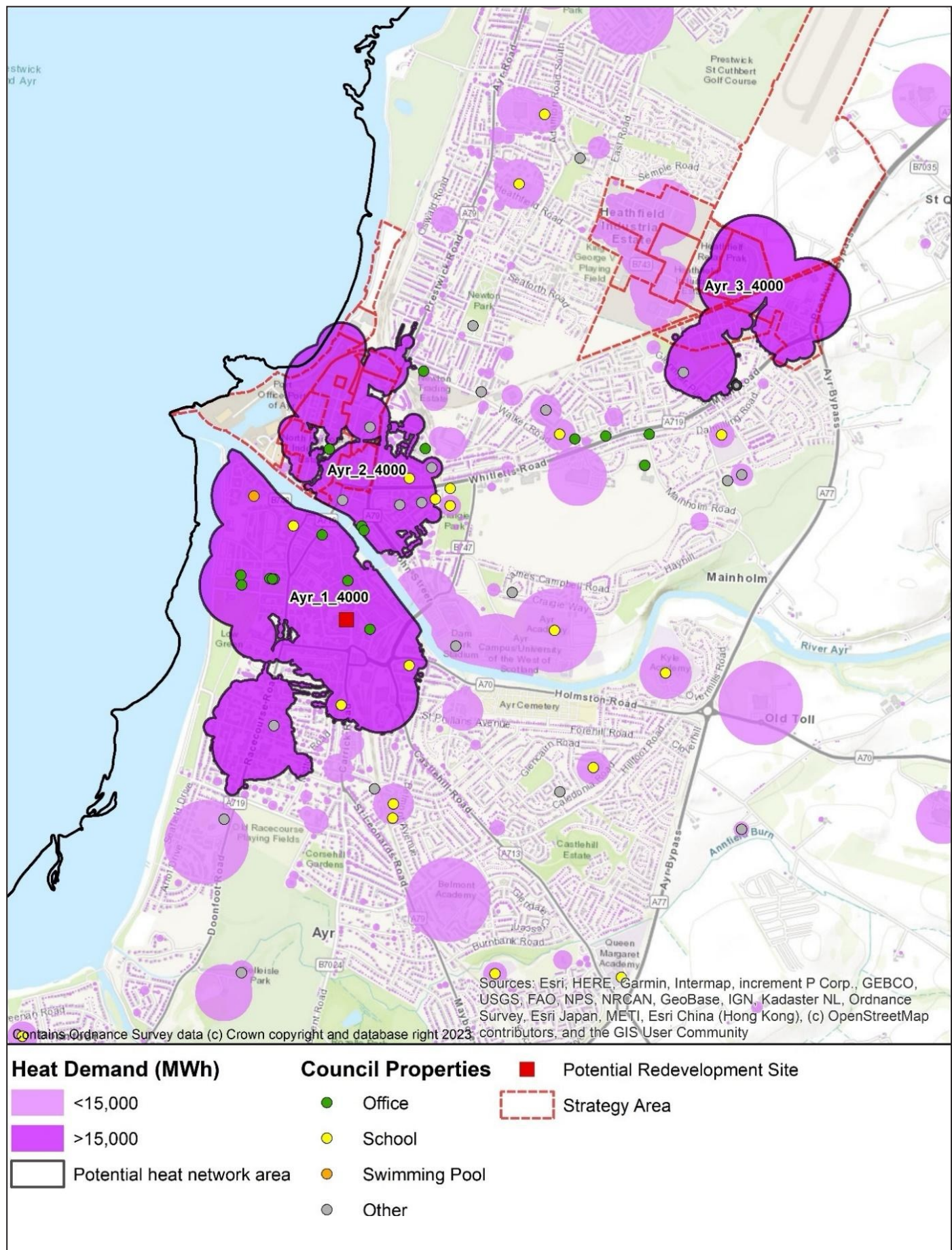
Within Ayr there are three separate zones identified, however, this strategy considers them in the context of a single heat network strategy for Ayr rather than considering them three discrete opportunities.

The Girvan cluster highlights potential waste heat use from commercial operations. An existing feasibility study was undertaken at this site, however at that point in time, it was deemed to be not financially viable. This will be revisited as the market in Scotland develops.

A further potential network is in development near Dailly, using mine water geothermal as a heat source. The Council are engaging with the partners involved to support delivery where possible.



Figure 1: Ayr heat network opportunity – Baseline





Work is continuing on South Ayrshire's latest Local Development Plan (LDP3), guided by the National Planning Framework 4 (NPF4). This iteration will encapsulate South Ayrshire Council's commitment to heat network delivery by:

- coordinating work with LHEES delivery plan actions,
- Requiring new development areas to consider heat network viability,
- Requiring proposals within or adjacent to an existing Heat Network to be designed to connect to the heat network, or allow for future connection to a planned heat network,

## Challenges

- Relatively low levels of heat density in South Ayrshire resulting in 3 potential heat network zones,
- Engagement and feasibility are still at an early stage,
- Capital costs and delivery models.

## Focus

### Priority 3

Coordinate with LDP3 development

### Priority 3

Coordination with AEM work to build feasibility studies for identified Heat Network zones,

### Priority 3

Redevelopment of Girvan Heat Network feasibility,

### Priority 2

Continued skills development in SAC through engagement with other local authorities, industry, and international mentoring programs.

## 8. Delivery Areas

In this section we set out potential routes to approach interventions, looking at how we identify and prioritise areas for action.

These approaches will use the data developed from the LHEES methodology to show where interventions can be delivered in a way that creates the most positive impact for the funding available.

Delivery areas have been developed for both a spatial and for technology-led approaches.



### 8.1 Spatial approach

Through the spatial approach, characteristics of buildings have been considered and compared on an area-wide basis with respect to the LHEES considerations.

This type of analysis allows locations to be identified for area-based funding and focuses action to where it could deliver the greatest benefit.

#### **Energy efficiency as a driver of fuel poverty**

Weighted scores in this section are distributed unevenly across South Ayrshire, with higher scores indicating a greater risk that families are experiencing fuel poverty as a result of poor energy efficiency. There are a small number of zones with significantly worse scores, suggesting that there is value in addressing energy efficiency measures in specific geographical areas.

Fuel poverty is a hugely complex challenge; one that is intrinsically linked to physical infrastructure. As the primary driver for action, all delivery areas will be considered against, and linked to fuel poverty metrics.

#### **Domestic energy efficiency**

Weighted scores for domestic energy efficiency are distributed unevenly across South Ayrshire with higher scores indicating poorer energy efficiency and a greater potential for demand reduction. There are a small number of zones with significantly worse scores, showing value in addressing measures in specific geographical areas.

Areas with the highest scores are considered within the priority listings, however this data must be considered against wider factors to be most effective as discussed in 10.2.2.

Amongst the top scorers most homes are in the private sector. This points to a need to address the problems both by spatial zoning and by targeting properties by tenure and technical intervention; for example, a lack of wall insulation is the biggest contributing factor to the weighted score in each top delivery area.



### **Mixed tenure, mixed use, and conservation areas**

Mixed-tenure and mixed-use properties have unique challenges for the implementation of interventions as they have multiple stakeholders to engage that may have conflicting interests. Mixed-tenure buildings are those which have multiple properties of the same use but differing ownership type, whereas mixed-use buildings will have multiple properties in the same buildings that have different use profiles and are not all residential, such as a shop with a flat above it.

Due to the large number of stakeholders and challenges in this area, a dedicated working group is seen as the best course of action for delivery in mixed use and tenure areas.

Relatively few data zones have homes within conservation areas. The top three zones in Ayr South Harbour and Town Centre are amongst the worst performing zones according to energy efficiency scores and so some conservation areas will be priorities in this stage of LHEES. Additional strategic assessment is required early in the LHEES delivery period to work towards decarbonisation in this area, prioritising where fuel poverty can be positively impacted.

The top data zones for listed domestic properties are Ayr South Harbour and town centre, Troon and Carrick north. These are also some of the poorer performers from the point of view of energy efficiency. Consequently, as in the conservation areas, further strategic assessment for this building type will be developed early in the LHEES delivery phase.

## **Challenges**

- **Mixed tenure, mixed use, conservation areas and listed buildings present significant challenges in area-wide decarbonisation,**
- **Traditional high street buildings present increased challenge.**

## **Focus**

### **Priority 1**

**Ensure that all LHEES delivery area prioritisation considers fuel poverty metrics,**

### **Priority 2**

**Creation of working group to ensure mixed use and tenure buildings are considered within area wide approaches,**

### **Priority 2 & 3**

**Monitor nation landscape and connect and build on current internal capacity for further strategic assessment of conservation and listed building decarbonisation.**

## 8.2 Fuel Poverty

The fuel poverty analysis was undertaken using the information in the home analytics data set and supporting indicators against 2023 fuel costs. This building-level analysis was aggregated and provides an indication of how affordable it is to heat houses in each area.

### 8.2.1 Social Impact of Multiple Deprivation

The LHEES and Delivery plan consider fuel poverty where it can be reduced through energy efficiency measures. Understanding which locations have higher rates of overall deprivation as well as specifically income deprivation, can inform decisions on areas of focus.

### 8.2.2 Overlaying Multiple Considerations

The analysis has generated various rankings for the purpose of determining where to start with interventions. The Weighted Energy Efficiency Score and Fuel Poverty rankings are, thanks to the latter being based on the former, very highly correlated and can be used interchangeably with similar outcomes. However, SIMD and income ranks are not correlated with the Weighted Energy Efficiency Score. Data zones with the worst energy performance are found to be ones which are relatively affluent, so **addressing funding towards fuel consumption reductions would not address the issue of real-world fuel poverty**. However, since there are likely to be income poor households in areas which are more affluent on average, the poor energy efficiency of those properties or the relative lack of energy efficient properties does still warrant targeted investigation and intervention. This will be developed within the time frame of this iteration of LHEES.

### Health Inequalities

The impacts of fuel poverty are not only financial but have significant consequences for health and wellbeing. Poor property repair, dampness, and low temperatures all impact physical and mental health, leading to increases in respiratory illness, increased risk of heart disease, worsening conditions like arthritis, and increased levels of anxiety and depression. In 2023 it was estimated that the NHS spends £1.4 billion annually treating illness associated with living in cold or damp housing<sup>6</sup>.

Partnership working between NHS A&A and SAC will look at assess the viability of identifying households at risk of health effects from cold homes, allowing more granular assessment for delivery of interventions. Combining this with characteristics such as single parents or pensioners, or pre-payment meters, could further refine areas of focus where available.

## Challenges

- 60% of homes in decile 5 and lower
- SIMD and income ranks are not correlated with the Weighted Energy Efficiency Score
- Multiple factor assessment required

## Focus

### Priority 1

Integration of SIMD ratings in intervention targeting,

### Priority 1

Investigation into further overlaid datasets and considerations,

### Priority 2

Cross departmental and partnership working to ensure LHEES actions connect to other strategy, policy and projects.

# 9. Pathways for all of South Ayrshire

## 9.1 Decarbonisation of Heat Pathway

The journey to the decarbonisation of each domestic property in South Ayrshire is shown in Figure 15.

The first column shows the proportions of properties which begin with each fuel source.

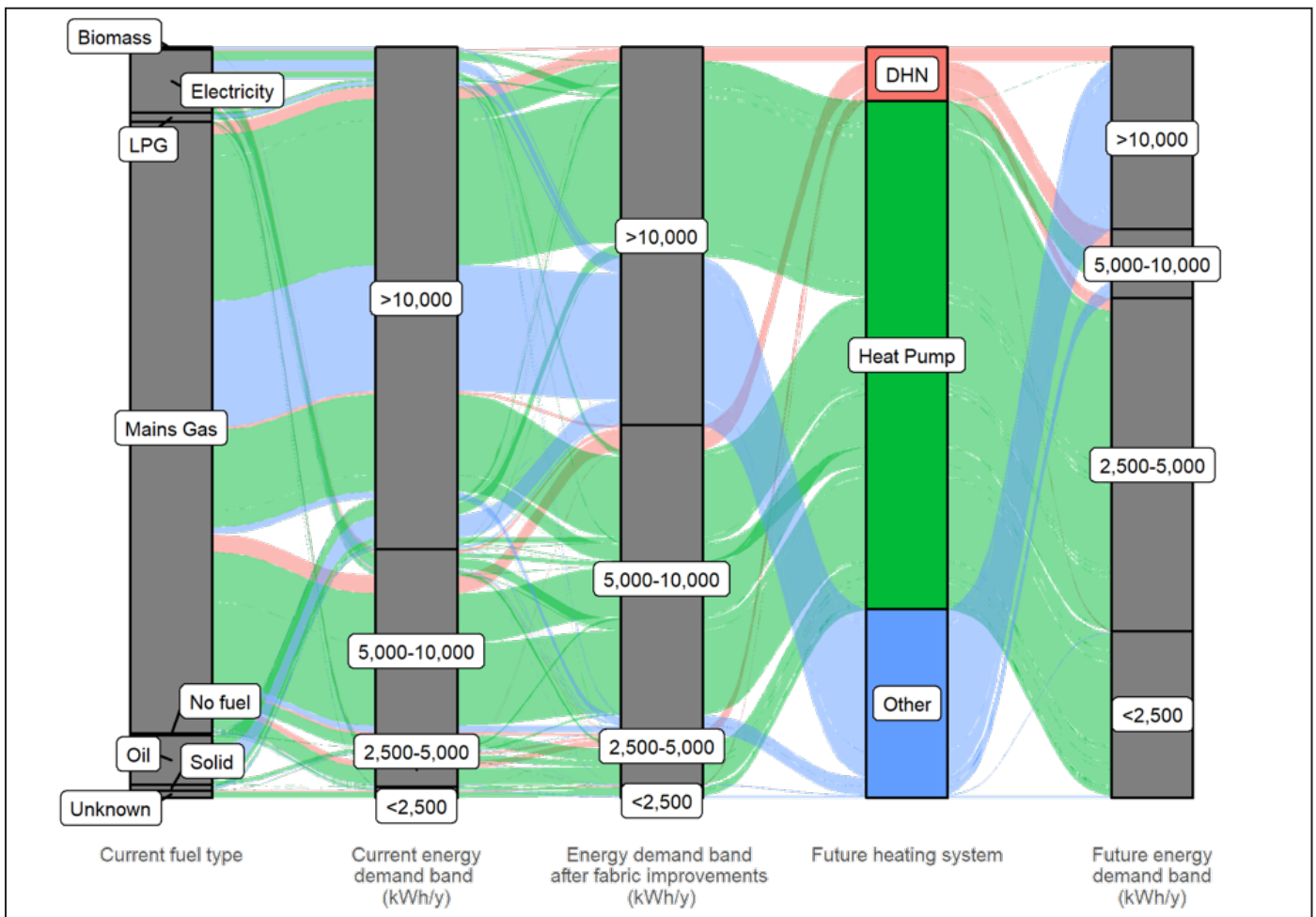
The second groups the properties by their current total heat demand in kWh/year.

The third column show changes to heat demand once reasonable energy efficiency measures have been applied.

The fourth column shows how suitable each property is for each of the low carbon heat measures. This assumes all listed heat network zones are developed but doesn't consider further expansion

Finally, the column on the right shows the final future heat demand.

Figure 2: Decarbonisation and energy efficiency pathway



## Challenges

- Pathways represent long term ambitions and commitment,
- Skills and supply chain shortfalls are a national challenge,
- Poor quality or inappropriate interventions can make fuel poverty worse.

## Focus

### Priority 1

Ensure multi-level assessment on interventions to prevent adverse effects on fuel poverty,

### Priority 2

Engagement with further and higher education organisations on potential industry and skills development

### Priority 2

Undertake local skills assessment and identify shortfalls,

### Priority 3

Maintain engagement with UK and Scottish Government's industry regulation on heat network development.





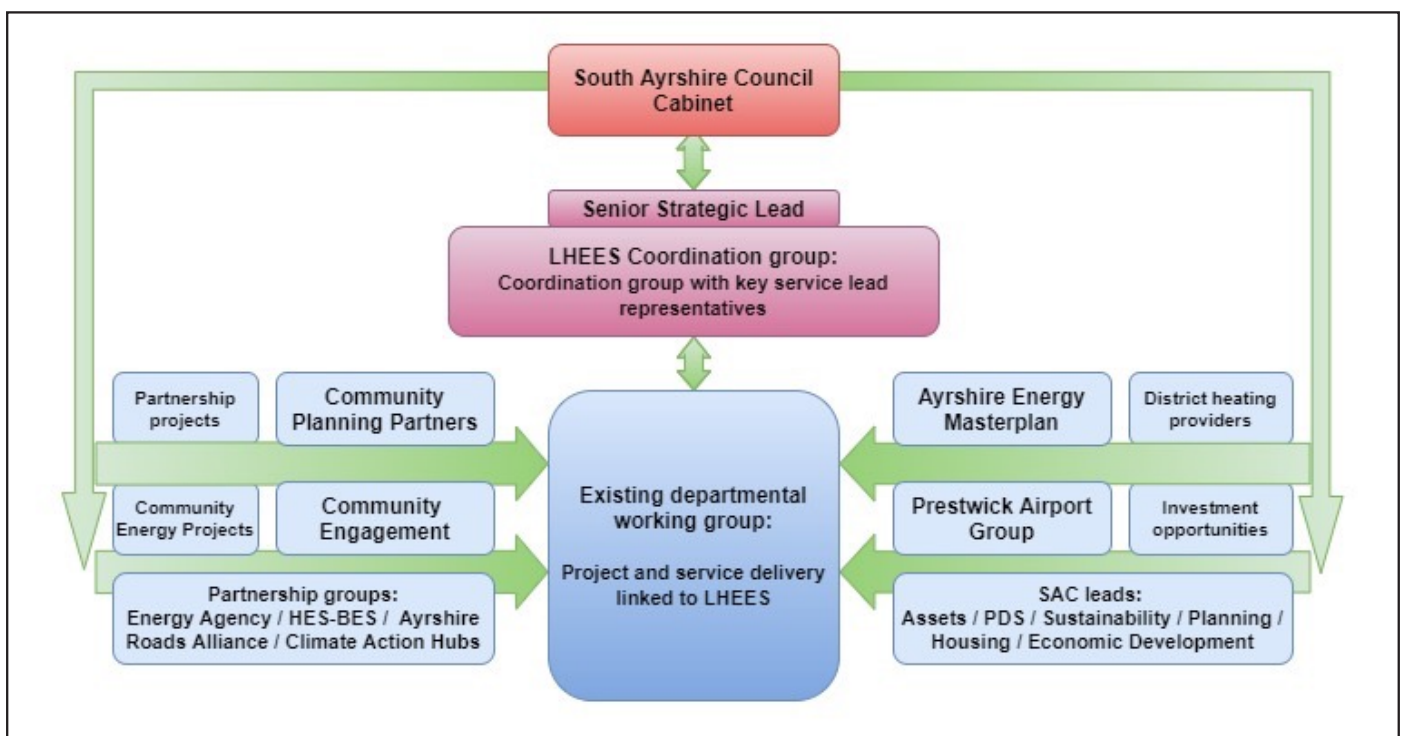
## 10. Governance

This LHEES provides a first step towards decarbonising heat and reducing fuel poverty in South Ayrshire. In improving energy efficiency and prioritising low carbon solutions in areas where they can have the greatest impact, this strategy can support council and commercial investment, community engagement and wealth building, and an equitable energy transition. The delivery plan proposals are built from the data from the LHEES methodology and provide a series of potential projects from the challenges identified.

These challenges cannot be delivered in isolation by a single department, or by the Council alone. As such it is vital that a governance structure be put in place to ensure collaboration between internal and external stakeholders.

Figure 3 provides a structural overview for governance in this area.

Figure 3: Outline LHEES Governance model



The LHEES Coordination group will provide strategic oversight and guidance for the development and implementation of the Council's LHEES strategy and delivery plan. Each member of the group will provide insight from their area of expertise to support existing delivery plan actions and refine new and existing areas of intervention, with support from the LHEES officer. They will also ensure decisions made by the group are adhered to by services.

The group will provide information and scrutiny on:

- Development and attribution of LHEES delivery plan actions,
- Development of heat network projects,
- Risk and issue identification,
- Wider stakeholder identification and engagement,
- Dissemination of information,
- Benefits realisation and reporting.

## Group responsibilities

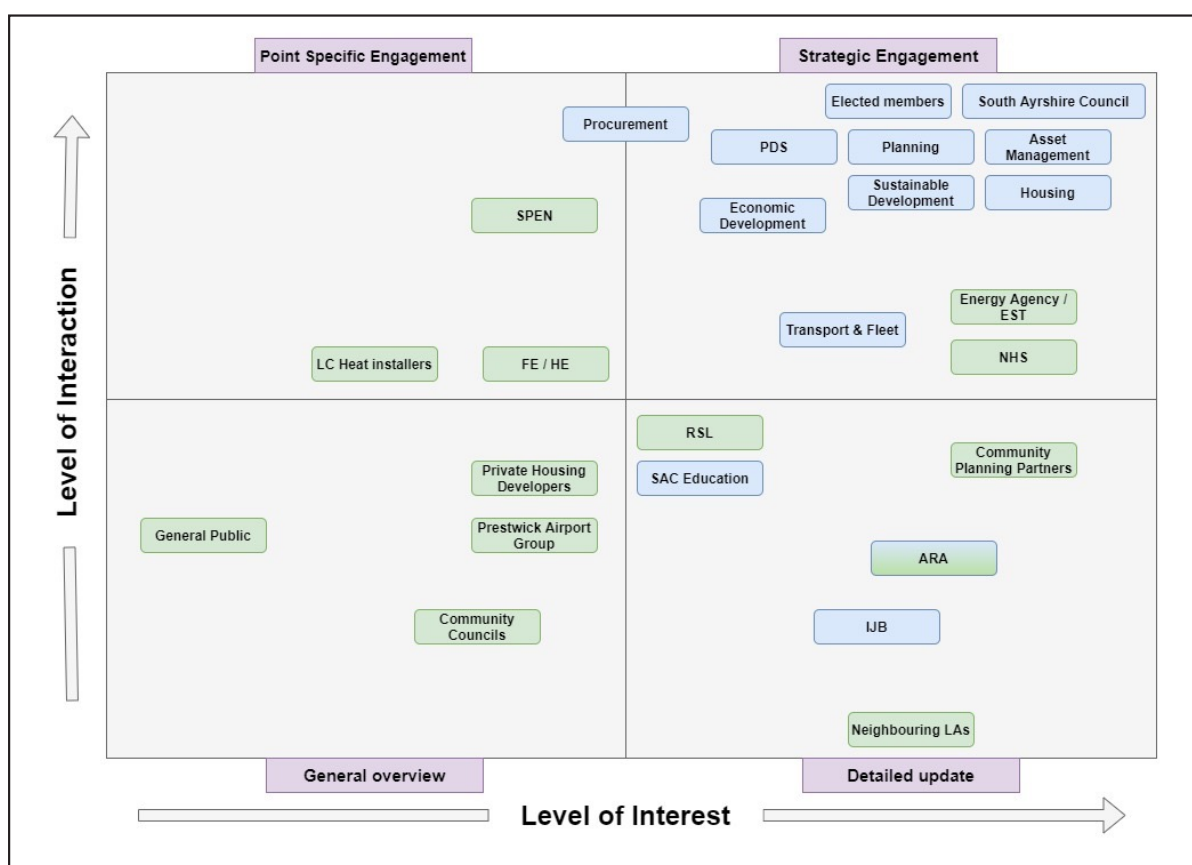
Each group member would be responsible for service level identification of:

- Existing or potential projects relevant to LHEES,
- Co-working opportunities,
- Relevant legislative changes and consultations,
- Alignment of service level projects with strategic priorities,
- Attribution and implementation of service specific delivery plan actions.

## Membership

The LHEES Coordination group membership is identified below as those with high levels of interaction and interest in the strategy and delivery plan.

Figure 4: LHEES engagement matrix



From this, we derive 4 levels of interaction with associated groups:

- **Strategic engagement** – membership of the governance group.
- **Point specific engagement** – engaged with on specific projects rather than the strategy as a whole.
- **Detailed updates** – detailed information on strategy and project progress shared regularly to assess synergies.
- **General overview** – general information about overall progress shared periodically.

As such, the following departments and officers have been identified to participate in the governance group



## Tracking and Reporting

The group will track and report progress through a series of routes:

**Feedback to Portfolio Holder: Buildings, Housing and Environment** by Service Lead Asset Management. Where appropriate membership officers will report actions back through in-service routes to respective portfolio holders to expand engagement.

**Local Outcome Improvement Planning** – As Energy is one of the four identified Community Planning Partnership areas, relevant six-monthly/quarterly progress reports will be provided to the board.

**Annual Cabinet report & Members Briefing** – with the annual review of the delivery plan actions, progress on existing actions and proposed actions for the year ahead will be delivered to cabinet annually, with an accompanying members brief on progress and intent for the year ahead.

## Focus

### Priority 1, 2, & 3

Convene quarterly meetings of the LHEES Coordination group, ensuring actions are tracked through the Council's performance monitoring systems, and where appropriate partner organisations own development routes.

Initial meetings will review and assign delivery plan objectives to services and other responsible attendees.

## 11. Delivery Plan Proposals

As part of the LHEES process, a delivery plan has been prepared to support and direct actions. This is a live document, updated regularly to reflect changes in national and local circumstance. As such, the proposals below are an initial overview of potential actions, that are likely to evolve over the course of the next year.

The delivery plan actions will be attributed to services through the LHEES Coordination group and monitored on an annual basis.

Table 4: Proposed Delivery Plan Actions

Action No.	Action	Timescale
1	Ensure sufficient dissemination of SAC LHEES delivery plan to all key internal and external stakeholders.	2024
2	Set up the working groups highlighted for: - LHEES Coordination governance group, - Specific issue areas such as mixed use/tenure and historic buildings	2024-25
3	Establish governance structure and agree meeting schedules	2024
4	Engage with other LA's, Universities, NHS trusts and other large public sector organisations to learn from their experience of decarbonisation and LHEES considerations on large estates.	2024-25
5	Engage with the public using educational material on energy efficiency, technologies, funding opportunities, methods to reduce heating bills, and suitable tariffs to encourage early adopters of heat pumps.	2024-29
6	Engage with the public on heat network potentials and technologies	2025-29
7	Create a shared forum for lessons learnt from early adopters on heat pump operational best practices.	2025
8	Create ongoing case studies of SAC decarbonisation and fuel poverty reduction implementations, and learn from other case studies, to create a live up to date lessons learnt document. Including contacting MCS/Ofgem/Scottish Government/UK Government about current heat pump performance and how to make sure high COP and a good experience is achieved.	2024-25
9	Set up a working group with SPEN to monitor network constraints to coordinate transition work.	2024-25
10	Engage with other local authorities, local colleges, and local installers to assess skills gaps in heat pump delivery.	2024-26
11	Assess potential routes for the long-term investment required for the interventions.	2025-29
12	Engage with supply chains to allow the visibility of secure pipeline of work for several years to come, to encourage growth of local skills and reduce the risk of local skill shortage.	2025-29
13	Complete pre-feasibility studies on proposed heat network zones.	2025-27
14	Coordinate with Planning on LDP3 on Heat Network zone development and routes to support development	2024-26
15	Annual monitoring/report of gas prices compared to typical cost of heat from heat networks to ensure potential heat networks do not worsen fuel poverty.	Ongoing

16	Commence development of business cases in all heat networks deemed feasible.	2027-29
17	Assess loft insulation upgrades in the top third of LHEES data zones for SAC owned dwellings.	2025-26
18	Assess cavity wall insulations interventions in the top third of data LHEES zones for SAC owned dwellings, record ongoing progress.	2025-26
19	Assess hot water cylinder insulation upgrades in the top third of LHEES data zones for SAC owned dwellings.	2025-26
20	Assess internal or external wall insulation upgrades in the top third of LHEES data zones for SAC owned dwellings.	2026-27
21	Assess single to double glazing window upgrades in the top third of LHEES data zones for SAC owned dwellings.	2027-28
22	Assess with partner organisations and national groups any pilot studies / demonstration projects / field trials on heat pump deployment and operational best practises.	Ongoing
23	Assess heat pumps potential on case-by-case basis in properties that are currently using LPG/Oil/Solid fuels. Focus on the top third of data zones that are SAC owned.	2025-29
24	Assess heat pumps potential in properties that are currently using direct electric heating. Focus on the top third of data zones that are SAC owned, where they can be made suitable for heat pumps	2025-29
25	Coordinate with Scottish Government and collect improved datasets for 5 yearly LHEES update.	Ongoing
26	5 yearly update of LHEES.	2029

## Challenges

- Wide range of potential actions and areas, cross-cutting multiple council departments, organisations, groups,
- Technology and legislation will develop over the course of this action plan.

## Focus

Maintain focus on identified LHEES priorities,  
Development and service level attribution of actions through LHEES Coordination group.

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