Aberdeenshire COUNCIL

From mountain to sea

Local Heat and Energy Efficiency Strategy (LHEES) Aberdeenshire Council draft for comment

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Glossary

ABS	Area-Based Schemes
ASHP	Air Source Heat Pump
CHP	Combined Heat and Power technology
Decarbonisation	Reduction or elimination of carbon dioxide emissions from a process
DNO	Distribution Network Operator
ECO	Energy Company Obligation
EES: ABS	Energy Efficient Scotland: Area Based Schemes
EESSH	Energy Efficiency Standard for Social Housing
EPC	Energy Performance Certificate
EST	Energy Saving Trust
GIS	Geographic Information System
GSHP	Ground Source Heat Pump
HEEPS: ABS	Home Energy Efficiency Programmes for Scotland: Area Based Schemes
HES	Historic Environment Scotland
HiBS	Heat in Buildings Strategy
HNSU	Heat Network Support Unit
HNZ	Heat Network Zones
HVO	Hydrotreated vegetable oil
LA	Local Authority
LAEP	Local Area Energy Plan
LDP	Local Development Plan
LHEES	Local Heat and Energy Efficiency Strategy
Low regret measures	Relatively low-cost measures that provide relatively large benefit under predicted future climates
LPG	Liquefied Petroleum Gas
MCS	Microgeneration Certification Scheme
No regret measures	Cost effective measures now and under a range of predicted future climates that do not have hard trade-offs against other policy objectives
NPF4	National Planning Framework 4
PEAT	Portfolio Energy Analysis Tool
RSL	Registered Social Landlord
SAP	Standard Assessment Procedure
Solar PV	Solar Photovoltaic
UPRN	Unique Property Reference Number
Zero Carbon	Systems with lower operational carbon dioxide emissions
ZDEH	Zero Direct Emissions Heating
ZWS	Zero Waste Scotland

Overview

What is a Local Heat and Energy Efficiency Strategy? (LHEES)	A long-term, flexible strategy providing a local, tailored approach for an area. Their aim is to direct improvements in building energy efficiency and plan for changes to climate friendly heating of all buildings[1].
Why are the Council preparing a Local Heat and Energy Efficiency Strategy?	The Scottish Government's Local Heat and Energy Efficiency Strategies (Scotland) Order 2022 requires local authorities to publish a strategy and delivery plan. Increasing buildings' energy efficiency and changing to climate friendly heating will help Aberdeenshire, and Scotland, reduce greenhouse gas emissions while contributing to achieving reduction targets which will help address the climate emergency. Support from Scottish government will be required to action these aspirational solutions.
Focus of this Local Heat and Energy Efficiency Strategy?	The strategy and delivery plan will have some aspirational actions which could be delivered in the first few years to reduce climate change impacts. It will also identify where further work is needed. This includes actions on tackling key challenges to ensure we have a successful document which is useful for all stakeholders. The pace of change needs to increase if our nation is to reach the ambitious targets set. This strategy will provide focus to enable improvements to be rolled out. The strategy will also allow for new policies, targets, and data to be considered as and when required. We recognise that this document highlights the current situation and that achieving Government aspirations will require significant investment.
Call to Action	Making buildings greener and more environmentally friendly will help reduce greenhouse gas emissions and meet national targets. To achieve this, everyone will need to do their part to reduce greenhouse gases from buildings and improve energy efficiency. The Council, businesses, organisations, communities, tenants, and householders will all need to work together to make progress on this issue. Support and direction from Government will be key.
What is meant by a just transition?	Scottish Government defines a just transition as *"both the outcome – a fairer, greener future for all – and the process that must be undertaken in partnership with those impacted by the transition to net zero. Just transition is how we get to a net zero and climate resilient economy, in a way that delivers fairness and tackles inequality and injustice."*[2]
Who are stakeholders?	Stakeholders include all public, private and third sector organisations in Aberdeenshire, as well as people who live in Aberdeenshire and their communities.

[1] https://www.gov.scot/publications/local-heat-energy-efficiency-strategies-delivery-plans-guidance/
[2] National Just Transition Planning Framework - Just Transition - A Fairer, Greener Scotland: Scottish Government response - gov.scot (www.gov.scot)

Executive Summary

Introduction

The Local Heat and Energy Efficiency Strategy (LHEES) is the key element to the Scottish Government's place-based, locally led, tailored approach to heat decarbonisation and energy efficiency across the country.

The Heat in Buildings Strategy[3] presents the Scottish Government's vision for the future of heat in buildings. It sets out actions the Government is undertaking in the building sector to deliver their climate change commitments, while at the same time maximising economic opportunities and ensuring a just transition, including helping to address fuel poverty.

The key element of the approach to heat decarbonisation is the Local Heat and Energy Efficiency Strategy (LHEES). The aim of an LHEES is to set out a long-term plan for how each local authority will decarbonise the heat supply in buildings and improve their energy efficiency across the entire local authority area.

The Scottish parliament passed The Local Heat and Energy Efficiency Strategies (Scotland) Order 2022[4] which requires all local authorities to produce an LHEES strategy and delivery plan by December 2023 with these to be reviewed at five-yearly intervals. This is the first iteration of that document.

Reducing emissions from buildings represents one of the most critical and daunting tasks to combat Scotland's role in climate change. The transformation of our homes and workplaces is imperative to achieve greater comfort, efficiency, and environmental responsibility. Scotland has committed to ambitious targets, with the Scottish Parliament unanimously agreeing on "net zero" greenhouse gas emissions by 2045. Interim milestones include a 75% reduction by 2030 and 90% by 2040[5]. Around one-fifth of Scotland's total greenhouse gas emissions come from providing heat in buildings, improving their energy and performance becomes pivotal on our journey to net zero.

The rate of change required to reduce the climate impact of emissions means that as a society we must prioritise enhancing the infrastructure of our homes. In doing so, we can attain not only emission reductions but also various benefits, such as better heating efficiency, better comfort with health benefits and reduced energy expenses. Moreover, these efforts are hoped to help alleviate fuel poverty. Nevertheless, fabric improvements alone will not make us reach net-zero emissions from buildings. It is equally vital to transition from direct emissions heating systems like gas and oil boilers to zero direct emissions alternatives such as heat pumps and heat networks. By adopting these measures, we will curtail the energy consumption for heating in buildings, ensuring they no longer directly contribute to climate change.

The LHEES for Aberdeenshire was developed with input from key stakeholders and with the delivery plan, once developed in detail, will direct the changes required for the building stock across the area. It will identify various options for decarbonisation and inform where investment in infrastructure is needed to support mass change of heating across the area.

[3] Heat in Buildings Strategy - achieving net zero emissions in Scotland's buildings - gov.scot (www.gov.scot)
[4] The Local Heat and Energy Efficiency Strategies (Scotland) Order 2022 (legislation.gov.uk)
[5] Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 (legislation.gov.uk)

Further input in the consultation process and beyond would be welcomed from businesses, organisations, community groups and other stakeholders. One key takeaway should be that everyone will be affected in one way or another and for our area to succeed in a fair and just transition, we need to know what works best for those that will be living and working here.

Strategic Vision

The Heat in Buildings Strategy's[6] vision "*that by 2045 our buildings are cleaner, greener, and easy to heat, and no longer contributing to climate change, as part of the wider just transition to net zero*." is one that this LHEES and Aberdeenshire Council support. Our vision for this first Local Heat and Energy Efficiency Strategy is to:

> ***Provide a baseline for Aberdeenshire to begin the process of systematically improving the energy efficiency of the buildings in the area, alongside reducing the carbon intensity of the heat demand in a way that is accessible for all reducing both fuel poverty and carbon emissions within the area, minimising the contribution to climate change.***

Drivers

National and local policies which drive this LHEES are detailed in Section 3. Heating is the UKs biggest source of carbon emissions producing 37% of the UK total. Of that 37%, around 14% is attributable to heating (and cooling) domestic properties[7]. This is why it has become a target to reduce emissions from heating for governments in the UK.

Another driver which must be recognised is the current cost of living/energy crisis. Energy costs have soared for all from late 2021 and show little signs of coming down. With Aberdeenshire having high levels of properties without mains gas, this is exacerbated since oil or LPG heating is a more expensive way to heat buildings than mains gas.

The pathways suggested within this LHEES, if actioned, would reduce both the level of fuel poverty and carbon intensity of the heating across the area.

Opportunities

There are a few technologies which could offer low or zero carbon heating choices currently and some in development for the near future, but there is no single technology that will be able to achieve decarbonisation economically and effectively at the scale required. Electrification of heat or moving to zero direct emissions heat networks (where available) are considered the top two options.

Within the industry there is a focus on fabric first, dealing with the structure of the building prior to adjusting the heating technology. This is where insulation and basics such as double glazing and draught-proofing come in. The fabric first measures reduce the energy requirements of the building to achieve the same levels of comfort which also means that lower temperatures can be used which are more efficient than higher temperature systems and a common thread in renewable technologies.

Insulation, heat pumps and heat networks will all feature as key requirements for buildings. In the North East, we have long been a centre of excellence for oil and gas and are now developing as

[6] Heat in Buildings Strategy - achieving net zero emissions in Scotland's buildings - gov.scot (www.gov.scot)
[7] https://es.catapult.org.uk/guide/decarbonisation-heat/

an energy centre and that could extend to energy efficiency too. There a serious skills gap in the energy efficiency and decarbonisation industry, particularly in our region, which could compliment the transition phase away from oil and gas, utilising those skill sets for new purposes and expanding the employment opportunities which will benefit the area.

Challenges

Some potential challenges have been highlighted during the researching of this LHEES. Solutions to these issues will be required otherwise they could undermine the desired changes. These are detailed in Section 4.2 and relate to insulation issues, gap in skills, heat pump suitability and funding.

The challenges need to be addressed prior to implementation to ensure that undesired impacts do not occur. This would have issues for the affected building and occupant as well as having reputational damage to the recommended actions. To mitigate this, we will focus on the inclusion of measures that have a high certainty of success and positive impacts. We will avoid any recommendations that could cause damage to buildings or have a negative impact on fuel poverty of the occupants. This will mean that actions to resolve the potential issues must be included in the delivery plan.

Future potential

Some potential solutions are being trialled in areas of the UK and whether they become part of the decarbonisation solution will depend on government decisions and appropriateness. One example is Hydrotreated Vegetable Oil (HVO) liquid fuel which could replace kerosene in oil boilers as a slightly lower carbon alternative. HVO does raise some issues related to carbon footprint of supply and knock on effects of using the oil as a fuel, nevertheless, it could be a potential where other solutions cannot be used. Another example is hydrogen in the gas network which is to be decided upon by UK government from 2026. For now, neither of these will feature in the Aberdeenshire LHEES but policy around them will be tracked and incorporated in future iterations where appropriate.

Primary Priorities

This strategy has four primary priorities which will drive the delivery plan and be the initial areas of focus. These are expanded upon in chapter 6. These initial priorities are to drive change. There is a real sense of urgency to make changes that will reduce carbon emissions within the next 5 years, which is the timeframe for this first LHEES and delivery plan. The priorities are all interlinked, progress is required on them all.

Priority 1: improve building energy efficiency. This applies to all building types, in the UK and the North East in particular, we have a high percentage of inefficient, leaky buildings. We need to identify the actions that work for specific building type without unintended consequences.

Priority 2: increase uptake of low and zero-carbon heating technologies across the area. This priority relies on the properties in question being able to take on the identified solutions. Part of this is identifying areas that present good opportunities for potential heat networks.

Priority 3: drive reduction in fuel poverty across Aberdeenshire. This is a key priority which has some statutory targets and will be linked to the other priorities. Often poor energy efficiency of buildings can be a driver for fuel poverty, particularly in off gas grid locations.

Priority 4: increase awareness of available information relating to decarbonisation and energy efficiency. This one is key to engaging communities that we hope to support through the energy transition. There are some funding opportunities as well as building archetype guides to inform people as to the appropriate insulation methods for specific property types. Looking at the figures on uptake of financial support would suggest this information is not widely known.

LHEES Development

Methodology and guidance documents were supplied by Scottish Government to support the development of each local authority LHEES, these documents were used to develop this document, though the final version did not use the given template which was optional. In addition, Scottish Government partners, Zero Waste Scotland (ZWS), led development sessions to go through the various stages described in the methodology and to help deepen the knowledge of local authority LHEES officers. Prior to the statutory obligation to develop the LHEES, Scottish Government organised quarterly forums where local authority officers and some interested consultants could come together to raise questions on the initial methodology and anticipated process. All these were very useful in learning about the requirements as they developed. Separate to this, there was an LHEES officer group convened by the Improvement Service where officers could have useful conversations about any issues and findings that arose in a less formal manner. There was opportunity to give and receive guidance from the various experience levels present. Thanks are due to the knowledgeable voices on that group that supported the production of this strategy and delivery plan, in particular the LHEES team at Fife Council who shared the structure of their strategy to be used as a framework for Aberdeenshire. This alternative structure was easy to follow, logical and will support readers to understand the potential options for Aberdeenshire in a concise and clear manner. It will enable people from all groups in our region to appreciate what needs to be done to the buildings we own, rent, and use to reach the levels of improved energy efficiency and heat decarbonisation required to achieve net zero and fuel poverty targets which are the ultimate goal.

1. Introduction

1.1. Why are we producing a Local Heat and Energy Efficiency Strategy?

In May 2022 Scottish Government passed an order 'The Local Heat and Energy Efficiency Strategies (Scotland) Order 2022' which put a statutory duty on all local authorities to publish a strategy and delivery plan.[8].

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

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

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

For each local authority area, the Strategies should:

[8] https://www.legislation.gov.uk/ssi/2022/171/contents/made

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

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

LHEES are long term strategies to be developed for each local authority area, tailored to the region to improve the energy efficiency of buildings, and reduce the carbon impact of heating them. This supports the Scottish Government's Heat in Building Strategy vision[9]: "Our vision is that by 2045 our homes and buildings are cleaner, greener and easy to heat, with our homes and buildings no longer contributing to climate change, as part of the wider just transition to net zero".

The LHEES focusses on heating of buildings from domestic dwellings to multi-story business centres and everything in between. As a region, we need to address what changes across the building stock will be required to meet national and local targets and objectives in order to tackle climate change or at a minimum, stop the heating of these buildings from impacting on greenhouse gas emissions which could impact climate change further.

To achieve these aims will require input, collaboration, and support from everyone across Aberdeenshire including businesses, householders, tenants, organisations, and the Council supported by Scottish Government. Working together we can make Aberdeenshire cleaner and greener improving comfort and quality of life for everyone in a way which is fair and just, making sure that no-one is left behind.

1.2. Strategic Vision and desired outcomes

Aberdeenshire Council supports the Heat in Buildings Strategy's[10] vision "*that by 2045 our buildings are cleaner, greener, easy to heat, and no longer contributing to climate change, as part of the wider, just transition to net zero*."

Using key supporting documents, local data analysis and working with key stakeholders within Aberdeenshire Council and in the wider community, the following vision statement for our first Local Heat and Energy Efficiency Strategy is to:

> ***Produce a strategy with guided focus for Aberdeenshire to improve the energy efficiency of all building types across the area, with affordable warmth provided by decarbonised heat sources, ensuring that buildings are no longer responsible for contributing to climate change and support us to meet statutory and aspirational targets.***

[9] https://www.gov.scot/publications/heat-buildings-strategy-achieving-net-zero-emissions-scotlands-buildings/

[10] Heat in Buildings Strategy - achieving net zero emissions in Scotland's buildings - gov.scot (www.gov.scot)

We will aim to align with the key targets and aspirations from the National and Local policies. Our delivery plan will focus on this and specifically on buildings of high influence, aiming to pave the way for others to follow our lead.

Our key priorities form the foundation of this strategy and delivery plan. These were developed from national and local policies and strategies, working with internal and external stakeholders and data analysis.

Focussing on key priorities for the first iteration of the LHEES aims to accelerate the journey to improve energy efficiency and decarbonise the heat provided in buildings. These aims go hand in hand with reducing fuel poverty and improving quality of life for people in Aberdeenshire.

Priority 1: improve building energy efficiency.
Priority 2: increase uptake of low and zero-carbon heating technologies across the area.
Priority 3: drive reduction in fuel poverty across Aberdeenshire.
Priority 4: increase awareness of available information relating to decarbonisation and energy efficiency.

The above targets take into account requirements of the Heat in Building strategy, The Council plan and information given by stakeholders in LHEES workshops. The priorities are discussed in further detail in Chapter 7.

2. Structure and Function

2.1. Structure

The Local Heat and Energy Efficiency Strategies (Scotland) Order 2022 came about after considerable engagement and participation in pilot programmes with all 32 local authorities in Scotland.

The resulting LHEES framework has a two-part structure:

- The strategy is a long-term strategic framework for the improvement of the energy efficiency of buildings in the local authority's area, and the reduction of greenhouse gas emissions resulting from the heating of such buildings.
- The delivery plan is a document setting out how a local authority proposes to support implementation of its local heat and energy efficiency strategy. This will require input and action by building owners and residents across Aberdeenshire.

2.2. Function

Energy for heating buildings (including water heating) is responsible for around a fifth of carbon emissions in Scotland. Around 50% of all Scottish energy demand is for heating[11]. This needs to be addressed to reduce energy consumption and reach the various Net Zero Carbon commitments across Aberdeenshire.

The LHEES strategy and delivery plan guidance gives a framework of six considerations[12] which have been used to develop our strategy and delivery plan.

[11] https://scotland.shinyapps.io/sg-scottish-energy-statistics/?Section=WholeSystem&Chart=EnConsumption

[12] https://www.gov.scot/publications/local-heat-energy-efficiency-strategies-delivery-plans-guidance/pages/2/

Table 1: LHEES considerations

	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, mixed-use buildings, listed buildings, and buildings in conservation areas

(Visual to be replaced with clearer version)

- 'Low regrets' heat decarbonisation. This is identifying off-gas mains areas that will transition primarily from heating oil and LPG, and potentially viable heat networks in more densely populated areas. This is particularly relevant in Aberdeenshire as we have a large percentage of properties that cannot access the gas grid.

- On-gas grid heat decarbonisation. To meet our emissions targets, we must reduce significantly, and eventually phase out entirely, our use of natural gas. By 2030 at least 1 million homes across Scotland will need to have switched to zero emissions heat, away from high carbon heating such as gas. This consideration will identify on-gas areas that will transition to zero carbon heating. It should be noted that currently the LHEES methodology does not identify where hydrogen or other decarbonised alternatives to gas could be used.
- Secondary outcomes include identifying areas in which:

    - there are mixed-tenure, mixed-use and historic buildings. For mixed-tenure and mixed-use, building level intervention is likely to be the most effective way to reduce emissions caused by heating. For historic buildings (including those in conservation areas and listed buildings), these are categories that may require established alternative approaches to the installation of low carbon heat and energy efficiency solutions, or where specific advice and support might be available. Identifying such areas would enable the public sector to coordinate or regulate to achieve this outcome;

    - poor building energy efficiency is prevalent leading to higher fuel use and where it acts as a driver of fuel poverty. This would enable the Scottish Government to continue to ensure that the area-based energy efficiency and heat decarbonisation projects through the HEEPS: ABS (Home Energy Efficiency Programmes for Scotland: Area Based Schemes) programme will be effective in reducing fuel poverty, as well as highlighting where extreme fuel poverty is prevalent and further measures may be needed.

For Aberdeenshire, our strategy and delivery plan will use the data analysis to identify and prioritise future actions.

At a strategic level, this is identifying the possibilities for certain zones or property types across the area. This will give an idea of the scale of potential solutions and highlight initial areas of focus for the first LHEES delivery plan as well as identify where further analysis is required.

3. Policy and Drivers

3.1. Summary of policy landscape

Many national and local policies and strategies guide the direction of this LHEES. Principally Scottish Government's Heat in Buildings Strategy[13], The Climate Change (emissions reduction targets) Scotland Act 2019[14], Heat Networks (Scotland) Act 2021[15] and Fuel poverty Act 2019[16].

3.2. National policy and strategy

The following table takes highlights from the key national policy and strategies related to energy efficiency and heat decarbonisation. The priorities, actions, and targets within these, support the framing of the LHEES for the local authority. These will continue to be monitored with the ongoing development of the LHEES Strategy and delivery plan as changes may influence the direction and urgency of specific areas of change.

The full list of related policies and drivers for the LHEES are noted in Appendix 1.

Table 2: Highlights from National policies and strategies related to Energy Efficiency and Decarbonisation.

National Policy /Strategy	Description	Priorities/ targets/ actions
Climate Change (Emissions Reduction Targets) (Scotland) Act 2019	Targets to reduce Scotland's emissions of all GHGs (Greenhouse gases) to net-zero.	Net-zero by 2045; 56% by 2020; 75% by 2030; 90% by 2040.
Updated Climate Change Plan	This update to Scotland's 2018-2032 Climate Change Plan sets out the Scottish Government's pathway to new and ambitious targets set by the Climate Change Act 2019. It is a key strategic document on our green recovery from COVID-19.	See Heat in Buildings Strategy.

[13] Heat in Buildings Strategy - achieving net zero emissions in Scotland's buildings - gov.scot (www.gov.scot)

[14] https://www.legislation.gov.uk/asp/2019/15/enacted

[15] https://www.legislation.gov.uk/asp/2021/9/2021-03-31

[16] https://www.legislation.gov.uk/asp/2019/10/enacted

Heat in Buildings Strategy	Updates the Energy Efficient Scotland route map and commits to putting in place standards and regulation for heat and energy efficiency to ensure that all buildings are energy efficient by 2035 and use zero emission heating and cooling systems by 2045.	The strategy contains 111 actions, some of the key figures are: • Private rented homes to reach Energy Performance Certificate (EPC) grade C by 2028. • 68% reduction in emissions by 2030 against a 2020 baseline. • 1 million homes and 50,000 non-domestic buildings zero or low emissions heating systems by 2030. • Heat Networks Target: the combined supply of thermal energy by heat networks to reach 2.6 TWh of output by 2027 and 6 TWh of output by 2030. • All homes to reach EPC C by 2033. • All fuel poor homes to reach EPC B by 2040. • Buildings no longer contribute to climate change by 2045. • The Heat in Buildings Bill is currently out for consultation and will result in other actions and requirements.
Heat Networks (Scotland) Act 2021	The aim of the Act is to encourage greater use of heat networks in Scotland. Only the identification of potential heat network zones is part of the LHEES requirements. Further investigation would be required to gauge which sites are viable.	The Act puts in place rules and regulations on heat networks, including: •making applications. • identifying exemptions. • granting licenses. • identifying potential heat network zones / setting up heat network zones.
Fuel Poverty (Targets, Definition and Strategy) (Scotland) Act	The Bill sets out a new target relating to the eradication of fuel poverty, as well as providing a revised definition of fuel poverty.	By 2040: no more than 5% of households in Scotland are in fuel poverty (FP); no more than 1% of households in Scotland are in extreme fuel poverty (EFP). By 2030: 15% (FP); 5% (EFP) and by 2035: 10% (FP); 3% (EFP).
NPF4	Scotland's national spatial strategy sets out spatial principles, regional priorities, national developments and national planning policy – our area is North East which encompasses Aberdeen City, Shire and links to neighbouring authority areas.	To deliver sustainable places, Regional Spatial Strategies and Local Development Plans in this area should plan infrastructure and investment to support the transition from oil and gas to net zero, whilst protecting and enhancing blue and green infrastructure and decarbonising connectivity. With a focus on growing the renewable sector here and promoting the energy transition, skills already in the area can be utilised for the emerging technologies required to transform the building sector.

As well as the key strategies noted in the previous table, the EESSH2 (Energy Efficiency for Scottish Social Housing 2) programme, which is currently suspended pending review, is a standard for social housing which plays a significant part in improving the energy rating of these properties while alleviating potential fuel poverty for the residents. There is a proposed Scottish Government replacement called the Social Housing Net Zero Standard which would require landlords to replace fossil fuel heating systems by 2045 and reach EPC rating of B by 2040.

National policies will drive development and change across Scotland and support development of local policies which focus on the specific requirements for Aberdeenshire. The national policies noted above have a focus upon reducing the carbon impact of heating, reduction of fuel poverty and increase in heat networks, or highlighting of areas to investigate further to confirm viability. The North East as a whole is known for oil and gas expertise and while there will be a required program of development to move away from this dependency, the skills in the area being able to transition over to low carbon technologies and infrastructure will be pivotal for ensuring the skills gap is closed for these emerging technologies.

3.3. Local policy and strategy, and linkages

Aberdeenshire Council have 6 strategic priorities: Climate change, Infrastructure & public assets, Resilient communities, Economic growth, Health & wellbeing and Learning for life. These are a reflection of current challenges, all of which the LHEES can influence and be influenced by.

There are multiple local strategies, policies and plans that support the achievement of the 6 strategic priorities and that have some influence or overlap with the LHEES. Local policies tend not to have specific targets but confirm the way we are heading or need to go. The key policies are noted below with the full list in Appendix 2.

Table 3: Highlights from Local Strategies and Policies

Local Strategy / Policy/ plans	Description	Priorities/ actions
Local Outcome Improvement Plan	This Plan provides a vision and focus, based on agreed local priorities, to which partners work systematically and collaboratively to meet the needs and aspirations of local communities in Aberdeenshire. Identifies four key priorities, each with their own action plans, only one of which is relevant for LHEES (see Reducing Poverty Action Plan below)	Priority 1: Reducing Child Poverty in Aberdeenshire (broadened to “Reducing Poverty” in 2020) - see detailed actions in reducing poverty plan below.

Reducing Poverty Action Plan (September 2021 Update)	Identified 17 key actions for reducing poverty across Aberdeenshire	Action 5. Reducing home energy and fuel costs. Outcome is reduced living costs. Key focus is minority ethnic groups. KPIs: Increase the number of families that receive support to reduce fuel costs. Increase the number of funded energy efficiency measures installed in the private sector, via Scottish Government schemes. Decrease the number of families in both private and social sector housing living in fuel poverty. Action 10: Increase support for those who are financially vulnerable. KPI: Increase household income of low-income families by developing and implementing a comprehensive benefit take-up campaign i.e. fuel poverty voucher scheme/winter warm scheme.
The Council Plan[17]	Sets the strategic aims and outcomes that drive the council's work.	Three key pillars: Our People (Learning for life, Health and wellbeing), Our Environment (Climate change, Resilient communities) and Our Economy (Economic growth, Infrastructure and public assets). Key relevant council priorities: Health & Wellbeing: • Enable and deliver the provision of good quality, energy efficient and accessible housing. Climate Change: • Reach a 75% reduction in emissions by 2030 and Net Zero by 2045, with the Council showing leadership. Resilient communities: • Develop and implement a Place Strategy that considers the current and future needs of communities. • Support communities to help themselves and encourage and assist in the delivery of community priorities. • Improve the life chances of people at risk of falling into poverty, or already living in poverty. • Promote greater participation by communities in decisions that impact them.

[17] https://www.aberdeenshire.gov.uk/council-and-democracy/council-plan/

		Economic Growth: • Enabling community organisations and businesses to access project funding • Stimulate and nurture a culture of entrepreneurship within the region • Support new and existing businesses to thrive, creating competitive advantage and providing fair work opportunities • Develop our key sectors and secure inward investment to sustain economic growth Infrastructure and Public Assets: • Create and sustain a Council Estate that is fit for purpose to provide modern public services that meet the current and future needs of our communities.
The Local Housing Strategy	The Local Housing Strategy sets out Aberdeenshire's key housing plans over a five-year period. Also covers fuel poverty and energy efficiency priorities for the Council (no separate plans for these)	Priority 2: Energy Efficiency, Fuel Poverty and Sustainability. • Improve the energy efficiency of housing across all tenures. • Assist households to maximise their income. • Reduce fuel costs for households across all tenures. • Change behaviours. KPIs (no quantitative targets set): • Energy efficiency measures installed in private sector housing. • Energy efficiency measures installed in social sector housing. • Households receiving in-house, in-depth energy efficiency advice. • Households provided with social tariff referrals. • Households assisted to maximise their income. Priority 6: Private sector. • The quality of private sector housing is maintained and improved to promote health and wellbeing by addressing disrepair and enhancing energy efficiency. • The private rented sector provides high management standards that inspires consumer confidence and encourages growth through attracting increased investment. KPIs: • Number of households assisted in order to address BTS (below tolerable standards) elements or prevent properties falling BTS.

Local Development Plan	Informs and advises developers and communities on the principles that built development should follow and where it should be located.	Our current LDP was developed just prior to the issue of NPF4. There are links to the LHEES in being mindful of potential heat network zoning and what this could mean for future development areas and potentially locating key infrastructure.
Climate Change Declaration	Aberdeenshire Council recognises that the world faces a climate challenge, and our responsibility is to provide leadership in order to move to a more sustainable and low carbon future.	Sets out a commitment to working towards a carbon free society by reducing our emissions by 75% (against our 2010/11 baseline) by 2030 and become Net Zero by 2045.
Carbon budget	An annual carbon budget figure is set each year to keep the council on track for its commitment to reduce emissions by 75% by 2030 and Net Zero by 2045 using 2010/11 as a baseline year.	Each annual carbon budget report contains projects across the Council which will reduce emissions – this includes work being carried out in relation to energy efficiency and heat decarbonisation across the Council's owned non-domestic building stock.
Route Map 2030 (and beyond)	The Route Map to 2030 (and beyond) has been developed to identify what must happen across the authority in order to meet a 75% reduction in its own emissions by the end of the decade. A key aspect of the Route map is the creation of a toolkit which supports a cost-abatement curve and demonstrates which projects give us the most carbon savings for the least financial outlay so we can prioritise projects that give best value carbon reduction initially,	1: Set up a central steering group. 2: Define accountabilities, clear roles, responsibilities across the Authority for delivering the Route Map 2030. 3. Supply Chain Capacity and Capability Gap Analysis: 4: Set targets for reducing Direct and Indirect emissions 5: Delivery of the Feasibility studies at operational buildings, to support definition of future Carbon Budgets 6. EV/H2 Fleet assessment 7. Develop Hydrogen strategy 8.1 Electrification risk / resilience study. 8.2 Embed zero carbon standard for both new build and retrofit initiatives. 9.1 Residual Emission Action Plan including an organisational carbon footprint scope and target review. 9.2 Resilience / Adaptation assessment 9.3 Develop LHEES 9.4 Develop Re-use business case. 10. Central assurance and reporting:

	moving to the harder to reach projects as we progress.	11. Communications to support and implement the change and generate buy-in of the people and Directorates at all levels.
Regional Economic Strategy	20-year plan to deliver a range of activities that maintain and grow the economy, period covered is 2015-2035.	This is in development following the awarding of Investment Zone to the North East region. A draft was presented prior to this to Full Council last year: Agenda for Aberdeenshire Council on Thursday, 29th June, 2023, 10.15 am – Aberdeenshire Council (moderngov.co.uk) Key themes include: •To establish the North East as a pioneer of the energy transition, by delivering an 80% reduction in carbon emissions per head. • Maintain a healthy, sustainable, working age population through increasing economic participation rates • Protect and enhance the natural capital of the region by aligning to national ambitions to manage 30% of the region for people and nature by 2030

3.4. Other Drivers

In 2021, just over half of energy consumed, split by sector, was for heating[18] with related greenhouse gas emissions of 20%. Energy use for transportation and electricity make up most of the remaining 50%. With consumption and emissions related to heat so significant, Scottish Government set a target to have 50% of energy from renewable sources by 2030,[19]. To support this, the Scottish Government committed:

- £2.8 billion of investment over the current parliament[20] (to 2026).
- At least £200 million of investment in the public sector estate to improve and reduce energy use and install zero emissions heating systems[21].
- £479.6M for energy in the 2023-4 budget[22], of which £231.1 million is for tackling fuel poverty and improving energy efficiency.

The Scottish Government have also indicated Local Heat and Energy Efficiency Strategies will considered when allocating funding, there is no further detail on what this could mean.

Locally, the oil industry passed the production peak in the late 90's. Though the industry is still a key player in Aberdeen City and Shire, to keep those people employed in the area, we need to become a centre of excellence for energy in addition to oil and gas. Alongside this, there is a definite skills gap for installers of retrofit products and insulation which could be an answer to falling employment levels within the oil industry.

[18] Scottish Energy Statistics Hub (shinyapps.io)
[19] Scottish Energy Statistics hub.
[20] https://www.gov.scot/publications/heat-buildings-strategy-achieving-net-zero-emissions-scotlands-buildings/documents/
[21] https://www.gov.scot/publications/heat-buildings-strategy-achieving-net-zero-emissions-scotlands-buildings/ & https://www.gov.scot/publications/heat-networks-delivery-plan/
[22] https://www.gov.scot/publications/scottish-budget-2023-24/pages/10/

4. Opportunities, Challenges and Barriers

4.1. Opportunities

Although many of the proposed technologies are not new, some are still considered alternative here in Scotland, as such, local expertise, and knowledge on some of the heating solutions is limited. This could be seen as both a challenge and an opportunity.

A fabric first approach is key, dealing with any building inefficiencies prior to making any changes to the heat source. These range from small DIY jobs to large scale wall insulation.

Energy efficiency[23]
Insulation and draught proofing improve the capacity of a building to retain heat. Insulation can be fitted in loft spaces, under the floor, in and on the walls (depending on construction type) as well as on the pipework and water cylinders. Ensuring doors and windows are draught proof as well as fitting energy efficient doors and windows all help keep the heat in.

Decarbonised heating[24]
A heat pump extracts heat from the outside air, ground or a nearby water source using an electrically powered compressor. The quantity of heat delivered into your home is much greater than the quantity of electricity used to power the system. They are zero direct emissions technologies. There are 'air to air' systems which operate like an air conditioner, the most common heat pumps systems in the UK include wet heating systems similar to a standard gas boiler configuration. Direct electric heating such as storage heaters or electric boiler systems are also zero direct emission heating (ZDEH), though they are less efficient than heat pump technologies.

Heat Networks[25]
Heat Networks, also known as district heating, use one heat source and feed this heat round multiple properties. Across mainland Europe they are much more common than in the UK. The source of heat can be a single or series of heat sources such as combined heat and power (CHP) systems, gas boilers, heat pumps, or waste heat sources. Being part of a heat network removes the requirement for individual boilers or heaters in each property. However, heat networks require careful regulation, planning and significant capital investment before proceeding with development.

4.2. Challenges

The requirement to reduce building heating requirements using a fabric first approach and simultaneously decarbonise the heat sources across Scotland (and further afield) is a large-scale issue. Some funding is available if appropriately certified installers are used, the numbers of certified installers in Aberdeenshire is

[23] Measures to help reduce home heat loss - Energy Saving Trust
[24] In-depth guide to heat pumps - Energy Saving Trust
[25] Heat networks - Renewable and low carbon energy - gov.scot (www.gov.scot)

very low and as such, this limits the potential for residents to apply for and claim funding towards the fabric improvements. Further issues arise in continued maintenance of systems, sometimes the installation is done by companies further afield as it is a financially viable opportunity, however a routine service or call back for an arising issue is less so. The maintenance issue also arises where installers have travelled from out with the area to install as part of a funded package (for example ECO scheme installers). Recipients of the systems as funded packages can be left for longer periods with breakdowns due to the distance from the installers base location.

Similarly, certified installers of low carbon technologies are few. Some funding is available towards installation of heat pumps but again, the MCS accredited installation is a prerequisite. Even where contact is made with appropriately certified installers, they can be located quite remotely from Aberdeenshire which can cause delays to resolution should any problems arise. Scottish Government is aware of the skills gap. Supporting growth in this area could be a substantial opportunity to ensure a just energy transition, providing jobs, skills, and growing the market for export of Scottish zero emissions heating technology[26].

The 'heat' sector is only part of the drive to Net Zero and as such there will be competing priorities, particularly in areas of constrained electricity supply. Widespread rollout of technologies like heat pumps, batteries or solar panels need the grid to be robust enough to cope with the additional load. There will be some sectors of the economy that will continue to emit carbon which will need to be offset, as such, heating targets need to be tough, effectively zero carbon in most buildings. Currently there are under 3% of domestic properties in Aberdeenshire that are heated with zero carbon technologies which shows the scale of work to be done in our area.

There is no 'silver bullet' solution to resolve this issue, some locations will be better suited to heat networks where they become a viable option, others may lean towards individual property solutions such as heat pumps. A decision on hydrogen and any potential future use in heating will be made by UK Government in 2026.

Some properties require retrofitting of energy efficiency measures to ensure that any heat supplied in the property is not lost. Insulation and draught proofing requirements will depend upon the property construction and any previous work done.

Awareness of energy efficiency and the benefits of applying them to buildings has increased, particularly as a consequence of the recent energy crisis, however, awareness of incentives and support is not at the level it needs to be to encourage widespread adoption of zero carbon measures.

4.3. Barriers

Driving net zero emission heating systems is not the only challenge facing us in Scotland and Aberdeenshire. Transport is another huge hurdle which needs to be tackled to reach net zero. Transport Scotland are driving change in this area

[26] https://www.gov.scot/publications/heat-buildings-supply-chains-delivery-plan-towards-industry-green-heat/

investing their efforts to improve charging infrastructure across Scotland to enable people to switch to electric vehicles, in urban and rural locations so they can travel in the knowledge that they will be able to top up the battery along the route. Although transport is not part of the scope of LHEES, improvements to support greener travel options will also put demand on the electricity grid. Currently there is not a local area energy plan for Aberdeenshire, but this needs to be considered to ensure that the DNOs have the full picture of plans for the area that may affect their network. Unfortunately, not every home in Aberdeenshire will be heat pump ready. As most heat pumps use a lower temperature of heat, building energy efficiency and air tightness needs to be good. For some building types, the cost of getting to this stage is currently prohibitive.

Poorly completed works, either insulation or new heating systems can lead to dissatisfaction, higher energy costs and ultimately damage confidence in the steps this strategy will suggest. Having a quality assurance system such as the MCS process for installers can help alleviate this and gives assurance to those making the changes. Other potential approaches could involve air tightness testing and thermal imaging of properties to ensure any fabric measures have been carried out to the required standard prior to installation of low temperature systems.

Building fabric issues such as damp, mould and condensation can be highlighted upon the installation of insulation. This can be noticeable immediately or be a long-term issue that can degrade the building fabric over decades.

Possibly the largest of barriers is the potential cost. It has been mooted that the total cost to decarbonise Scotland's buildings will around £33billion between now and 2045[27]. This is both for the retrofitting of energy efficiency measures and replacement low carbon heating systems. As well as being a potential barrier, ensuring the appropriate skills and experience are in the local area will bring economic benefits and improve employment opportunities for the region.

To avoid some of the issues noted above, the Aberdeenshire LHEES will focus on measures which have a higher certainty of successful outcomes. Actions which will support the progression of other measures will be part of the detailed delivery plan.

5. The bigger picture

5.1. Whole area energy planning

This strategy is focussed on heat within buildings. We need to be aware of the wider area plans and requirements for energy that will also support the goal of a net zero economy such as electric vehicle charging and power storage. These other requirements and more will require grid supply and connection and may impact on possibilities for heat solutions in any one area.

The LHEES and delivery plan will provide information on likely scenarios which can be used to drive education, upskilling and potential investment in the area. The LHEES will feed into the next Local Development Plan to support plans for properties

[27] Chapter 1: Policy Context - Towards an Industry for Green Heat: heat in buildings supply chains delivery plan - gov.scot (www.gov.scot)

to link into the proposed actions in the delivery plan and potential heat network zones. Furthermore, should there be future industrial processes within the region that have heat that can be utilised, this will be considered in revisions of the delivery plan.

To ensure that plans and processes are not working against each other, it would be beneficial for this LHEES to feed into a comprehensive area or region wide energy plan.

5.2. Employment benefits

There is an identified skills gap in Aberdeenshire and the wider North East with respect to the required skills to improve property energy efficiency as well competent installers for carbon zero heating (including maintenance). This needs to change to enable building energy efficiency improvements and wide scale adoption of zero carbon heating systems.

To improve the building stock and reduce carbon emissions related to heat in Aberdeenshire will require significant investment. The PEAT domestic analysis for Aberdeenshire suggests costs of around £2billion to achieve just over 308,000 measures across nearly 116,000 properties. This does not consider any costs related to Heat Networks in the area which is another significant way heat can be decarbonised and fuel poverty reduced.

Employment linked to the oil and gas industry has been reducing in recent years. Having held the position of centre of excellence for oil and gas, the region is well placed to benefit from the transition to a low-carbon economy. There are already a number of innovative businesses in the renewables sector in the city and Aberdeenshire. Some former oil or gas energy personnel in the region could transition to energy efficiency or renewable energy which could help stave off unemployment in the area. This would occur over the coming decades as there will still need to be expertise retained in the oil and gas industry right through the transition.

5.3. Natural assets

Part of the investment costs noted above would relate to installation of air source heat pumps (ASHP) within appropriate properties which makes use of existing heat in the outdoor air to heat the property. This can be successful and is commonplace in parts of Europe that experience far harsher winters than we do in Scotland.

Alongside ASHP (or GSHP where suitable) there are other opportunities in our rural area that can be tapped into to heat our properties. Heat Networks can be developed to utilise various heat sources from using heat pump technology such as ground or water source heat pumps or using waste heat from wastewater systems or some industrial processes. There could be opportunity to utilise and amplify waste heat from industry across the region. Much of Aberdeenshire sits over geothermal granite ‘hot rock’ deposits. Though limited data exists on the potential within them for our area, there are successful examples worldwide of tapping into hot rocks for

energy production and associated heat which can power district heating in many countries including in the South of England.

5.4. Stakeholder input

As this strategy will cover all buildings across the area, it is crucial to engage with stakeholders from all sectors. In development, we have engaged with key internal department officers, RSLs, our DNO, local community representatives and a few business organisations that have expressed interest in this strategy. For this document to become fully embedded and useful for all, we will continue to reach out to gather input to finalise the initial version but also to further refine the delivery plan now and for future iterations. The delivery plan will be a fluid, live document that can be adapted to recognise local needs and opportunities that arise.

Some of the points raised by stakeholder engagement to date have been noted in this document. They include risks such as substandard insulation, due to lack of skilled workforce, which could mean properties affected are not as energy efficient as planned following installation. This will impact suitability for fitting low temperature zero carbon heating or the performance of such systems. Linked to this is the potential of increased fuel bills where measures are installed to inappropriate buildings causing high electricity usage. Stakeholder comments and input will be considered in development of the detailed delivery plan.

For Aberdeenshire, we will initially focus on measures that have a high chance of successful outcome, limiting potential damage to buildings and securing the reputation of climate friendly measures. This is likely to mean we begin with the easier to implement interventions such as glazing improvement and loft insulation.

Potential Issues and solutions:

Topic	Challenge	Possible Solution
Uncertainty of measures	Improving thermal efficiency of buildings is a key requirement prior to installing low temperature zero carbon heat solutions. However, poor installation can exacerbate issues, even causing side effects such as damp within the building or within the frame or cause high fuel costs. Archetype specific measures to be clarified.	• Focus on low regret measures that do not present potential issues. • Include an action to develop archetype specific measures in collaboration with others to identify reliable actions to undertake.
Energy Performance Certificate data	EPC analysis will often reflect visible measures but revert to building age and apply assumed measures. Current scoring methods do not lean to encouraging zero carbon heating.	• The EPC process has been consulted upon and is expected to resolve issues raised. • Changes to the system may require revisions to the strategy.

Heat pumps	Poorly insulated buildings and a lack of dedicated and knowledgeable installers impacts the effectiveness, cost and efficiency of heat pumps. This can increase the likelihood of fuel poverty for occupants. This is also a risk to the effectiveness of a strategy that will recommend their implementation as people are more likely to hear about poor installs than good ones.	• Building specific suitability needs to be identified before instal. • Upskilling of the workforce on heat pump specific issues and ongoing maintenance, needs to be coordinated. • Reliable, easy to access advice on heat pump use to be developed nationally.
Skills and supply chain	There is a significant skills gap for the installation of energy efficiency and heat decarbonisation measures. This is likely to affect the implementation of delivery plan actions. Incorrect installation (insulation or heat pump) may cause issues for the occupant. Due to a delay in the roll out of zero carbon measures, there is likely to be a bottleneck of demand for heat pumps when regulatory deadlines are near.	• There needs to be a nationally driven upskilling of the workforce, local efforts will ensure skills are available in the region too. • An increase in required workforce will become evident with the publishing across Scotland of LHEES and delivery plans giving job certainty (and investment assurance). • Supply chain should be made aware of forthcoming investment in heat pumps to enable them to keep up with demand.
Ensuring funding to deliver	The strategy and delivery plan will provide the framework for delivery of capital projects across the area. However, to be able to deliver the actions and further required analysis will require significant levels of additional funding and support. Local Authorities are struggling to balance their finances already and it is unlikely that there will be resources there to tap into. The cost for individual building owners (occupiers and landlords) may also be significant. This needs	• Some analysis can be done in-house to reduce costs. • Engage with Scottish Government on funding needs. • Be aware of any new funding opportunities and work with the support mechanisms within Scottish Government such as HNSU (Heat Network Support Unit).

	to be considered when making funding streams available to avoid any knock-on effect in the rental market.	

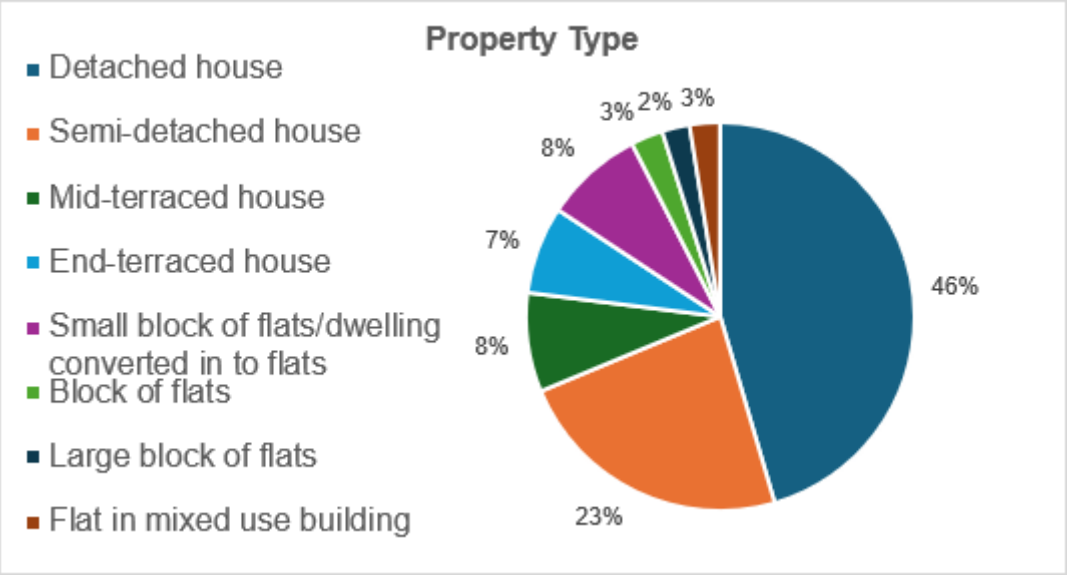
6. Aberdeenshire building stock baseline

6.1. Domestic

Aberdeenshire has approximately 123,000 domestic homes[28] with a population of around 264,000 (2022 census). The average heat demand per property in the region is 16,741kWh per annum. The whole heat demand for the area sits at around 205,000,000KWh/yr (or 205,000MWh/yr).

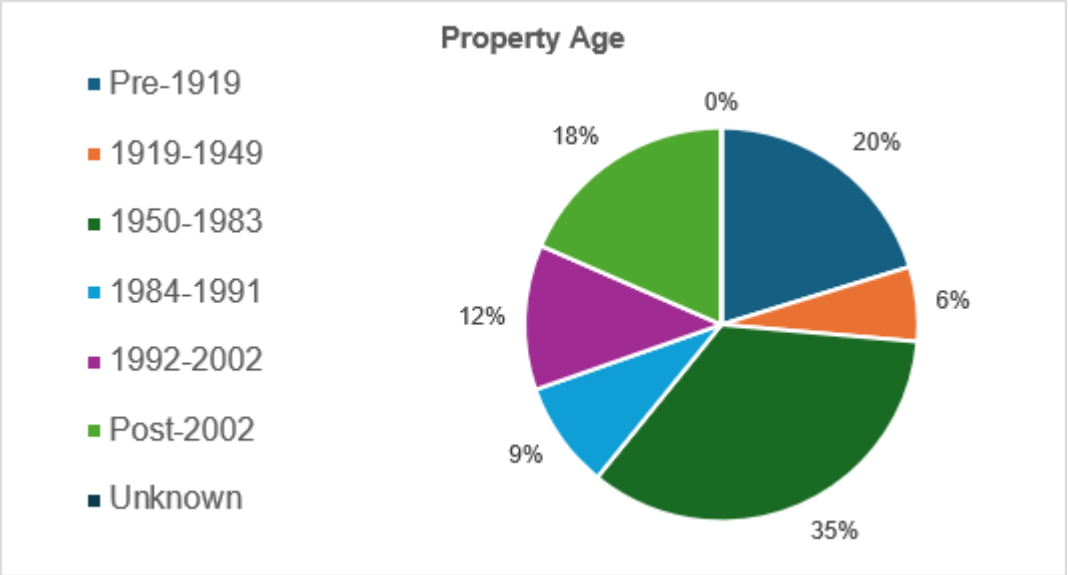
Age, Type and tenure
From our LHEES domestic baseline tool, we found that around 70% of the domestic stock was built before 1984, with 20% being pre-1919. Solid granite wall properties are commonplace around the North East in many of the traditional fishing villages and old towns. The total percentage of solid wall construction is 40% for the area. Solid walls are the most costly and technical to insulate.

The data showed that 94% of the domestic properties in Aberdeenshire would benefit from one or more measures to improve energy efficiency or decarbonise the heating system, that equates to 115,975 properties. If all the measures were carried out, at current costs (per energy savings trust Version 3.7.2) would be around £2billion, resulting in carbon savings of 370,000 tonnes per annum and running cost savings averaging £948 per household receiving at least one measure.



Domestic property type percentages.

[28] 123,048 listed in Local Heat & Energy Efficiency Strategy Domestic Baseline Tool



Domestic property age percentages

In Aberdeenshire, only 16% of dwellings are flats which is much lower than the national average of 40%. This weighting towards houses is typical of rural areas and smaller towns and villages.

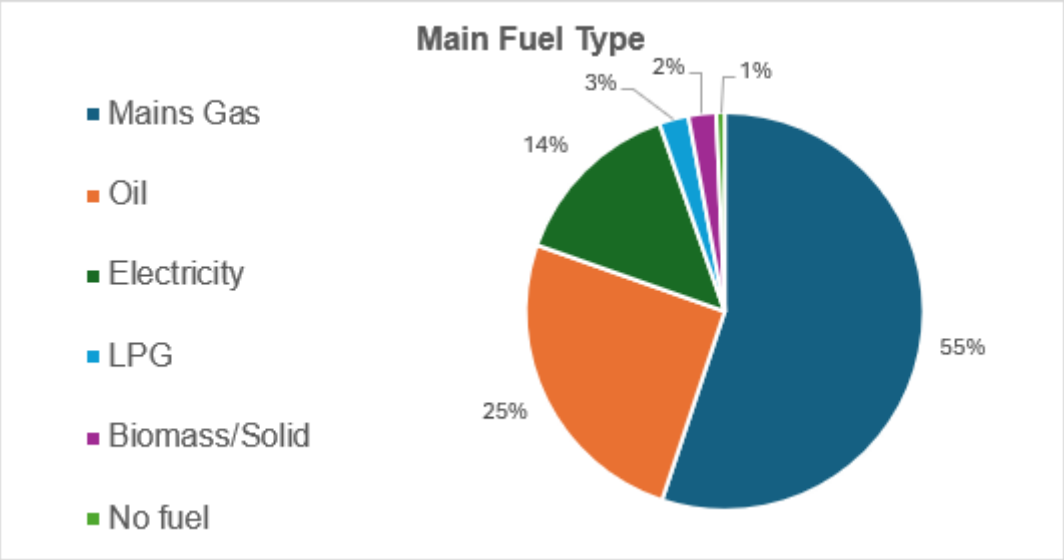
The tenure profile shows 71% of homes are owner-occupied, a 18% social housing, and 11% privately rented. The targets for achieving certain energy efficiencies for properties is dependent on this tenure, with social housing leading the way, followed by private rented, then owner occupied targets.

7% of our homes are in conservation areas, which is slightly lower than the national average of 10%[29]. 2% categorised as listed[30] in categories A, B or C.

Fuel types
As a large, rural authority there are 45% of properties that are not served by the gas grid. This is known as 'off-gas'. This is significantly higher than the national figure of 19%.

Oil heating features highly with those that are off the gas grid with electrical heating systems being the next most popular and only 3% use LPG and 2% biomass/solid fuels. 1% have no fuel and less than 1% unknown. To decarbonise in the off-gas areas, all those on oil and LPG as well as any on coal (part of the solid fuel 2%) would need to change to zero emission heat sources. Those currently using electricity can be counted as zero emission already, though some direct electric heating can be very expensive to run and cause fuel poverty issues or be slow to respond such as storage heating. Consideration should be given to ensuring the properties are as energy efficient as possible and potentially consider high efficiency systems such as heat pumps or heat networks where and when they are an option.

[29] Heat In Buildings Strategy: Achieving Net Zero Emissions in Scotland's Buildings (www.gov.scot)
[30] Historic Scotland categorises listed buildings based on their level of importance; Category A is assigned to buildings of national importance, Category B for buildings of regional importance, and Category C for buildings of local importance.



Domestic main fuel type percentages

Fuel poverty

Fuel poverty driven by high energy costs is exacerbated in off-gas grid areas due to the higher relative cost of heating oil, solid fuels or LPG compared with mains gas. That said, there are significant areas which are on-gas grid in Aberdeenshire that score as being at a greater risk of fuel poverty around Peterhead and Fraserburgh which are on-gas areas.

According to the Scottish House Condition Survey (SHCS), the percentage of households likely to be in fuel poverty in Aberdeenshire is 25% which is in line with the Scottish average. The percentage anticipated to be in extreme fuel poverty is 15% which is a little above the Scottish average of 12%.

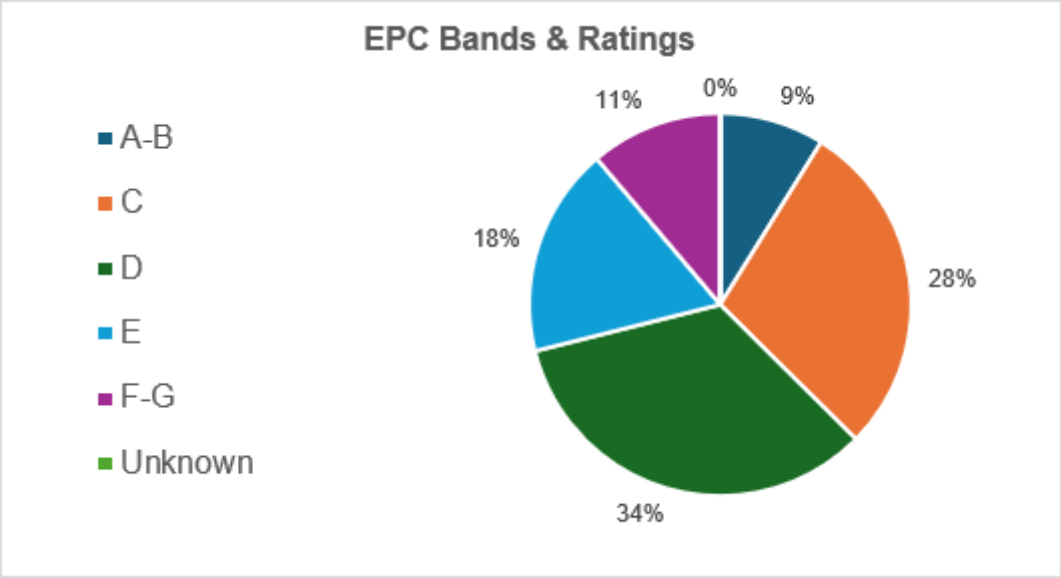
Since the data was gathered to reflect risk of fuel poverty, energy prices have soared, and it is likely that there are more households experiencing fuel poverty than before. Addressing building fabric to improve energy efficiency will provide some resilience against rising energy costs.

Fuel poverty is when after housing costs, 10% or more of the household income is required to maintain satisfactory heat levels in the property.
Extreme Fuel poverty is when is when more than 20% of the household income after housing costs is spent on fuel costs. Both definitions state that the remaining income left is not sufficient to maintain an acceptable standard of living.

Energy Efficiency

Around 63% of properties in Aberdeenshire have energy performance certificate (EPC) of D to G which is considerably more than the national average of 51% of properties in these brackets. 84% of homes in Aberdeenshire are detached, semi-detached or end of terraced. These will cost more to treat due to the greater external surface area to be insulated. 51% of domestic properties in Aberdeenshire have uninsulated walls which is above the national average of 41%. All this means

that the building stock in Aberdeenshire requires significant upgrading to provide warmer homes which hold on to the heat provided, giving more affordable warmth to occupants.



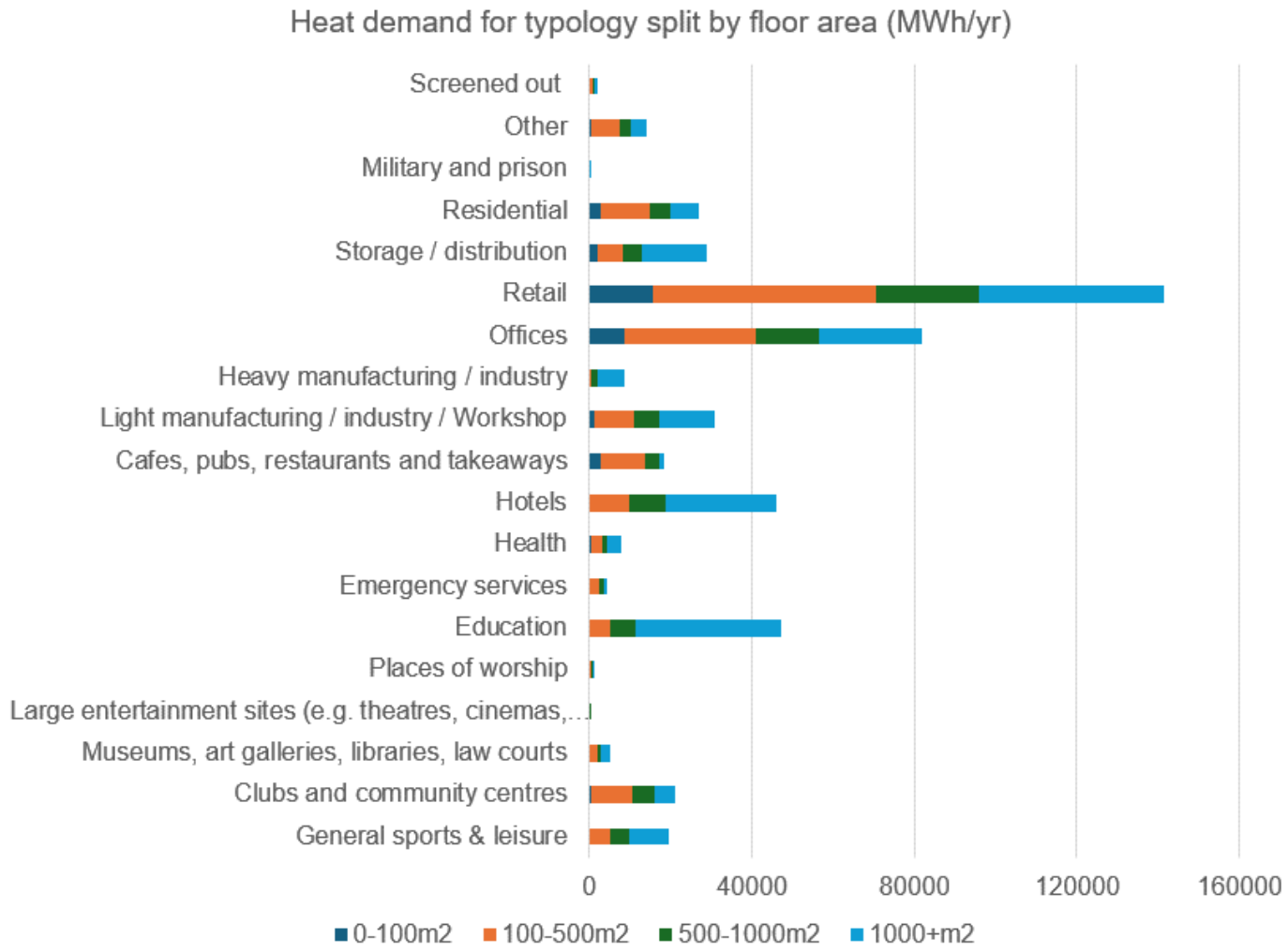
Domestic Energy Performance Certificate Band percentages.

6.2. Non-Domestic

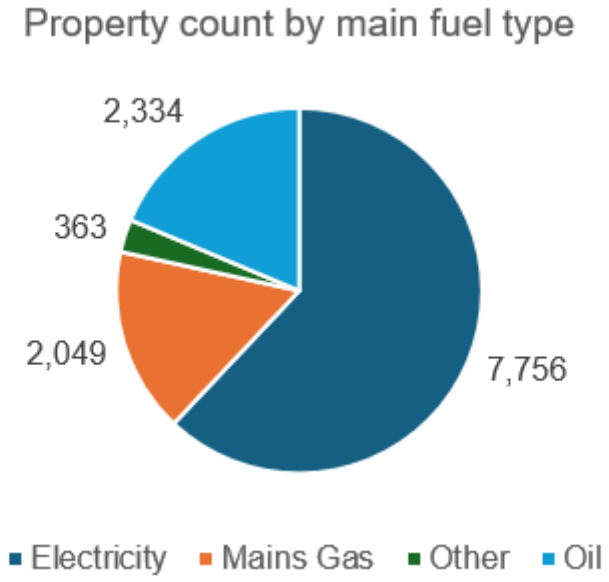
There are around 12,500 non-domestic buildings in Aberdeenshire[31]. The most common types being retail (39%) and offices (24%).

Heat demand is calculated to be 506,054MWh per annum. The graphs below show the energy demand split by floor area and also count of fuel type and heat demand by fuel.

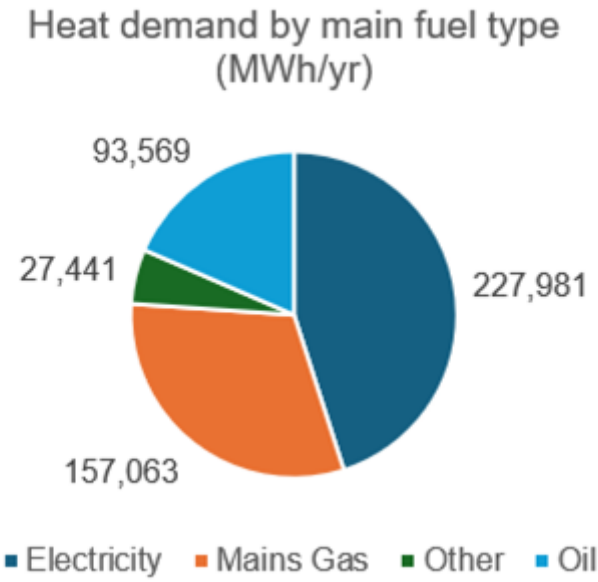
[31] 12,502 properties, based on Non-Domestic Analytics and Non-Domestic Baseline Tool.



Heat demand for non-domestic buildings split by floor area and type of occupant.



Non-domestic buildings fuel type count



Non-domestic buildings heat demand (MWh/yr)

Although only 16% of non-domestic buildings have gas for heating, the heat demand pie chart shows that around 30% of the non-domestic heat is fuelled by gas. The oil fuelled properties make up just over 18% and the oil-fired heat demand is 18% of the total. Between gas and oil, around half of the heat demand in these non-domestic buildings is high carbon.

There is a relatively even split between those built before 1949 (49%) and those after (51%) – with (46%) built pre-1919. Just over 3000 of pre-1919 properties are retail premises and offices. 39% of properties are in accessible rural locations with the remainder split across other urban areas, remote rural and remote small town. Challenges for Aberdeenshire are exacerbated by the fact that it is a large rural authority with no cities but a few large towns and many smaller population centres. Confidence in the non-domestic statistics is low, due to the amount of extrapolated data (around 80%), so any information that would potentially be used for other purposes would need to be verified. The recent requirement for public bodies to produce Building Assessment Reports will provide building specific, usable data for buildings that can be utilised for areas of interest, such as those which may be suitable for development of heat networks. It is anticipated that this requirement may be rolled out further in the coming years.

Across the non-domestic stock, local authorities have the most influence on their own and then some influence over other public body buildings and other RSLs. At almost 100,000GWh/yr, around 20% of the annual non-domestic heat demand is under the control of Aberdeenshire Council.

The regulatory timelines are nearer for public body buildings when compared to other non-domestic sectors with respect to the requirements to reach energy efficiency targets or zero direct emissions. This will support change in the area by leading by example, increasing skills in the area, and giving potential heat network systems anchor loads of heat demand with which to improve the viability and economics of such systems.

7. Priorities and Outcomes

To achieve the aims of the LHEES, we have 4 priorities which form the basis of the strategy and delivery plan. They are all linked, and the order is not a reflection of importance. Here we explore these in more detail:

Priority 1 - Improve building energy efficiency to reduce energy demand, thus reducing fuel poverty and improving quality of life and health for building occupants.
Priority 2 - Increase uptake of low and zero carbon heating technologies across the area.
Priority 3 - Reduce fuel poverty within Aberdeenshire.
Priority 4 - Increase awareness of available information related to decarbonisation and energy efficiency.

7.1. Priority 1: Improve building energy efficiency.

7.1.1. Outcomes

Improvement in energy efficiency of domestic and non-domestic buildings is required across the area. This is necessary to ensure national targets for specific building groups are achieved within the relevant timeframe, contributing proportionately to the national targets set while recognising applicable challenges.

7.1.2. Context

Energy efficiency measures help reduce heat demand, which should lower costs to maintain comfort within the building. Energy efficiency is central to the Scottish Government HiB strategy which is designed to reduce fuel poverty and meet net zero targets. For inefficient buildings, improvement of building energy efficiency is a precursor to being able to switch to many of the zero emissions heating systems which operate at lower flow temperatures.

7.1.2.1. Domestic

Targets relevant to this priority are as follows:

- Private rented homes to reach EPC band C by 2028
- Social Housing to achieve EPC band B by 2032
- Remaining domestic dwellings to achieve EPC band C by 2033
- All fuel poor homes to achieve EPC band B by 2040 .

The last point is impossible to quantify as there are no limitations to which buildings may have fuel poor residents now or at a point in the future. A small change in circumstances can mean this applies to all so we will include all non-social landlord properties in this total, since social landlord properties will have to achieve B rating sooner than 2040.

These are challenging targets, partly due to the building stock types we have in Aberdeenshire with a high proportion of houses, as opposed to flats, with more surface area to insulate but also the higher percentages of dwellings with low energy efficiency ratings compared to the national average (63% have D-G EPC rating, national average is 51%[32]). Only 9% of Aberdeenshire properties are EPC rating A or B meaning around 100,000 properties will require some intervention to reach B by 2040 (or before).

[32] National averages provided by Energy Savings Trust and are from Home Analytics v3.8 aggregated to a national level.

Of the privately rented dwellings, there are just under 10,000 that will need some intervention to reach EPB C by 2028. The challenge will be ensuring there are available skills and there will be a risk that rents are increased because of the property improvement cost which will be something to look out for. Funding is also limited for this sector due to the properties not being occupied by the owner so effectively run as a business. This increases the risk that the costs are more likely to affect rent rates which will affect tenants and the overall rental market. Those at greatest risk of fuel poverty are more likely to rent than own. Another issue of concern is if property owners cannot afford to improve the building to required standards, this could increase the number of vacant or unlettable properties if they are not brought up to the required standard. We need to ensure that we work with colleagues in the Council and Scottish Government to support landlords through these changes.

The next target is for social housing to achieve EPC band B by 2032, (this target may be revised when EESSH2 is replaced by Social Housing Net Zero Standard). Although social housing energy efficiency is better than the average dwelling, around 27% of the current stock in Aberdeenshire currently meet these standards, which leaves 73% with varying amounts of efficiency measures to be undertaken.

There are almost 500 social housing properties in Aberdeenshire languishing at the bottom of the energy efficiency scale with F or G ratings, this accounts for 2.5% of the social housing in the area. A further 1281 properties currently sit at EPC E which is 6.6% of the social housing total. The remaining 64% are rated C and D which accounts for just over 7700 properties.

There has been a consultation on the EESSH2 standards and some of the RSLs in the area are awaiting the outcome of this review before continuing with energy efficiency upgrades to avoid the scenario of having to return to a property to achieve revised standards. Currently there are just over 14,000 social landlord properties (including local authority) that are below EPC B rating which will need to be upgraded prior to 2032. Should the revised standard include a requirement for decarbonised heating, there may be interventions required to many of the A and B rated properties in addition to those that are below the target EPC of B.

Picture: Average Energy Performance Certificate Band in Aberdeenshire (pdf /map snip insert to be received)

7.2. Priority 2: Increase uptake of low and zero carbon heating technologies across the area

7.2.1. Outcomes

This priority will ensure that Aberdeenshire buildings contribute proportionately to the national targets of achieving 35% of domestic heat demand and 70% of non-domestic heat demand by low or zero carbon means by 2032. This priority will identify potential heat network zones as another method of decarbonising heat.

7.2.2. Context

Low and zero carbon heat sources are also known as decarbonised heating. Systems include heat pumps (air source, ground source or water source), heat networks, infra-red heaters or electric heaters combined with solar photovoltaic panels (to reduce electricity demand); solar water heating; and thermal storage. Implementation of these heating systems will produce less emissions than gas, oil and coal heating and contribute towards meeting net zero targets.

7.2.3. Domestic

Most Aberdeenshire properties will fall out with any potential heat network zones, as such, heat pumps are likely to be the recommended low carbon solution for heat in these buildings. Whether they end up being individual property heat pumps or small networks run from one larger ground source system is to be decided on a case-by-case basis. Either way, the fabric of the building and readiness for lower temperature heating systems will be key to their success.

Within Aberdeenshire, 14% of domestic properties use electricity for their fuel source. This percentage will include those using heat pumps but there will be a significant amount of those that are using direct electric heating, without solar generation, which can be a costly method of providing heat. As the electricity grid is decarbonising, they fall within the low carbon heating category. This leaves around 26,000 properties that need to switch to low or zero carbon heating before 2032 to reach the domestic target.

Domestic properties fall into four categories with respect to being suitable for heat pump installation. Category 0 is for those that already have zero carbon heat sources, this accounts for just over 3% of dwellings in Aberdeenshire with the vast majority being in off grid areas (80%). Those in the category 1 bracket are considered heat pump ready, around 30% of our dwellings are considered heat pump ready. Only one third of the category 1 properties are in off gas areas with the other two thirds in on gas areas. Category 2 properties account for a further 23% of homes being split across on and off gas areas. This group require a small amount of intervention before they would be considered suitable for a heat pump. A weighty 44% of homes in Aberdeenshire fall into category 3 which are not considered to be viable for heat pumps without considerable intervention, this fraction is also split fairly evenly across on and off gas areas.
Decarbonising heat is not easy, there are various reasons for this, some of the key points are below:[33]

- **Net Zero targets** – in Scotland, the aim is to reach Net Zero by 2045. Some sectors will continue to emit carbon that will need to be offset or captured. This means that other sectors will have tougher targets to compensate with heating in building targets being zero carbon for the vast majority.
- **Size of the challenge** – around 5% of homes in the UK currently run on low carbon heating with the majority of those doing so for environmental reasons (as opposed to cost). Aberdeenshire, even with 45% of properties off the gas grid, is dominated by gas and oil for heating with around 100,000 homes that will need to switch.
- **No silver bullet solution** – low carbon or carbon neutral heating solutions already exist, however a top-down “blanket” solution such as all-electric or all-hydrogen is projected to cost over twice as much respectively compared to a bottom-up approach that chooses the best low carbon heating solutions on a place-by-place basis.
- **Poor energy efficiency** – UK building stock is generally of poor thermal efficiency. Many households suffer from either damp, draughts, or overheating – wasting energy and making home life uncomfortable. This does not bode well for introducing lower temperature heating such as heat pumps.
- **Incentives and workforce** – according to surveys carried out by the Department for Energy Security and Net Zero, around half the population have no awareness of low carbon heating and current funding levels do not encourage many households to switch to low carbon heating. This is backed up by the data we gathered for Aberdeenshire which shows the uptake of grants for energy efficiency measures as low across the area.

[33] https://es.catapult.org.uk/guide/decarbonisation-heat/

The challenge is huge for the heat sector. Building emissions account for around a fifth of Scotland's greenhouse gas emissions and making progress on reducing this figure is essential to the accomplishment of reaching net zero emissions targets. A centrally driven communications plan as noted in the Heat and Buildings strategy will go some way to increasing knowledge of the requirements.

Running lower temperature systems such as heat pumps requires the fabric of the building and the heat loss from within to be of a very good standard to give the energy efficiencies published. A well-insulated home with a heat pump can be a very cost-effective method to heat the home. However, fitting heat pumps in buildings that are not well insulated can cause electricity bills to rise significantly.

To date, much of the switch to low carbon heating has been carried out for environmental reasons. In general, the public seem unaware of how to improve buildings to be able to take on low carbon technologies. There is a need for a mass behavioural shift in understanding how we heat our homes and benefits of making the change to other heating technologies. Some of the reluctance stems from the outlay for zero carbon systems compared to replacing like for like. There are some funding streams available which reduce the outlay, but it is not enough to drive mass uptake alone[34].

7.2.4. Non-domestic

Within the non-domestic sector 52% of the heat demand is produced by electricity. Like the domestic electrically heated properties, this can be treated as low carbon, regardless of whether it is direct electric heating or a heat pump. This leaves a requirement of a further 18% of the non-domestic heat demand requiring decarbonisation which is likely to be in the region of 3000 properties (total non-domestic count is 12,500, with 52% of heat demand already electric but heat demand is 50% oil or gas). As mentioned previously, 20% of non-domestic heat demand falls under the control of Aberdeenshire Council. We are already working on reducing the carbon intensity of the heat provided in our buildings along with other public body organisations to achieve net zero direct emissions by 2038 which will help drive the improvement in non-domestic decarbonisation of heat.

The national data on building fabric of non-domestic buildings is comprised of a considerable amount of extrapolated information and as such, focussing initially on public body buildings where data is recorded and available makes most sense.

7.2.5. Heat Networks

Part of the low and zero carbon heating technologies for both non-domestic and domestic buildings could be covered by heat networks. These are systems that supply heat (or cooling) to multiple buildings from one heat source. The heat source can be waste heat from an industrial source or a large heat pump. Having one system supplying the thermal needs for multiple buildings removes the requirement for individual boilers in each property. These systems are also known as district heating.

The Heat Networks (Scotland) Act 2021 established new statutory targets for heat networks. The thermal targets to be supplied by Heat Networks in Scotland is 2.6TWh by 2027 and 6TWh by 2030. With Aberdeenshire being a rural local authority without cities, it is not anticipated that the heat supply requirement level will be set very high for our area though this is a heating method that has been proven to be very successful across mainland Europe, and when tied in with waste

[34] https://www.climatexchange.org.uk/research/projects/public-awareness-of-and-attitudes-to-low-carbon-heating-technologies/

heat sources or energy generation, can be successful at heating both large and small areas sustainably and at very reasonable costs (depending on governance of the systems in the recipient country).

There is also a requirement under the act for each local authority to identify areas that could potentially be suitable for heat networks. This information will then be used in the near future to quantify areas that are viable, and the authority will be expected to designate such areas as heat network zones. This process will require further investigation and data gathering. Further guidance on this process is anticipated. Heat networks are a potential solution to help decarbonise heat one area at a time which can be large or small scale. The provision of heat networks in an area can be a significant investment opportunity, providing jobs and a stable heat source which is not linked to volatile carbon fuel price variations. In some European countries, district heating systems are owned by co-operatives or municipally run. Depending on the framework of operation, heat networks have the potential to provide sustainable, low-cost heat, supporting the reduction in fuel poverty in our area as well as the opportunity to create funds for use in the community which can then further improve communities within the region.

7.2.5.1. Existing Heat Networks

Aberdeenshire has a significant heat network in part of Banchory. It is a privately run, biomass system with gas back up. The system serves around 250 dwellings, a sports centre and 7 other businesses. Any potential to expand or fully switch to decarbonised heat sources will be explored in the detailed delivery plan. Other than this one, there are a significant number of small networks around the area.

Insert point map of existing heat networks*

7.2.5.2. Potential Heat Networks

The Heat Networks (Scotland) Act 2021 puts a duty on local authorities to carry out a review to identify potential heat network areas. Any formal designation that follows will use this initial information as a starting point before carrying out more detailed analysis on the areas and deciding whether they are suitable for formal designation and all that may encompass. Further legislation which will cover formal designation of heat network zones is anticipated by 2025.

The LHEES methodology (Heat Networks – Generation of Potential Zones) was followed to identify potential heat networks in Aberdeenshire, building on the First National Assessment work carried out by Scottish Government. We focussed on areas with at least 2 anchor loads in the control of the local authority/public buildings to begin with. Anchor loads are buildings with a high heat which improve the economic viability of any potential heat network. These are usually non-domestic buildings. The guidance uses linear heat density, buffer zones and anchor load numbers to identify the potential in an area. The methodology has both baseline requirements and stringent requirements giving what would be considered potentially viable and most likely viable outputs. As Aberdeenshire is made up of towns and villages, initial feeling was that our area was not as suitable for heat network systems, however, there is some funding streams directed at this low carbon solution and in areas of fuel poverty, this can be a significant opportunity to provide low-cost heat which is also low or zero carbon which would satisfy multiple priorities.

See below table for the threshold criteria used for potential heat network zone identification and prioritisation:

	Linear heat density benchmark (kWh/year/m)	Anchor load threshold (MWh/year)	Minimum number of anchor loads per cluster
Baseline	4,000	500	2
Stringent	8,000	500	5

Using the criteria above, 14 potential zones have been identified using the baseline methodology. These potential zones are spread across Aberdeenshire in the towns of Fraserburgh, Peterhead, Inverurie, Alford, Westhill, Portlethen, Banchory, Stonehaven and Laurencekirk.

As part of the delivery plan development, further analysis and engagement will be done. This will enable further prioritisation of zones which will help achieve the best return on our priorities as well as ensuring that the statistics are up to date (some information used in the first stage of analysis we are aware has since undergone significant changes to heat demand). This will improve confidence to support zone prioritisation. We will look at all potential sources for heat supply and engage with other potential stakeholders as part of the process. There are multiple potential areas in Peterhead, Fraserburgh and Inverurie. The total heat demand of the potential zones is 279,628 MWh/yr with the majority of them falling within on-gas areas. Moving properties from gas to heat network could support the requirement to have 1 million on gas homes transitioned to zero emissions heating by 2033. Furthermore, in areas of higher risk of fuel poverty, heat networks can help alleviate this.

Visual to be updated without Banff. Potential heat network zones identified by performing a baseline heat network assessment on Aberdeenshire (could be replaced with visual marking differences between those passing baseline criteria and stringent (different colour). Banff showing (snip from Arc GIS) but didn't make the baseline/stringent tables). Individual maps of the 14 locations in appendice 3 (to be added when received)

7.3. Priority 3: Reduce fuel poverty within Aberdeenshire.

7.3.1. Outcomes

This priority is to drive a reduction in the number of people in the area at risk of or experiencing fuel poverty. There will be a transition to more energy efficient homes, reducing energy input required to maintain comfort. Ensuring that the strategy and delivery plan have a positive impact and provide a just transition to net zero is a key factor. Reducing fuel poverty.

7.3.2. Context

Poor energy efficiency in buildings can be a driver of fuel poverty, simply due to the extra energy required to heat the inefficient property. While low-income households are the most likely to experience fuel poverty, it can be experienced across income levels where a disproportionate amount of income is spent on heating the property.

7.3.2.1. Just Transition and Health

As part of our journey to net zero, we must ensure that the transition is a just one which is inclusive and promotes social equality at the heart of achieving our climate linked goals. We must ensure that in making Aberdeenshire more energy efficient and reducing the carbon impact of heating, that affordability to carry out works required does not end up isolating those that are in most need of the measures. Improving property energy efficiency can help lift occupants out of fuel poverty and improve health and wellbeing at the same time[35].

Part of this strategy is to ensure that measures do not cause unintended consequences such as condensation or interstitial damp within properties. Such consequences could have a negative impact on indoor air quality which would be detrimental to occupants. To ensure that measures are carried out in a manner that will not have negative impacts, we will engage with Government and other partners to ensure approved methods are backed by research.

7.3.2.2. Fuel Poverty

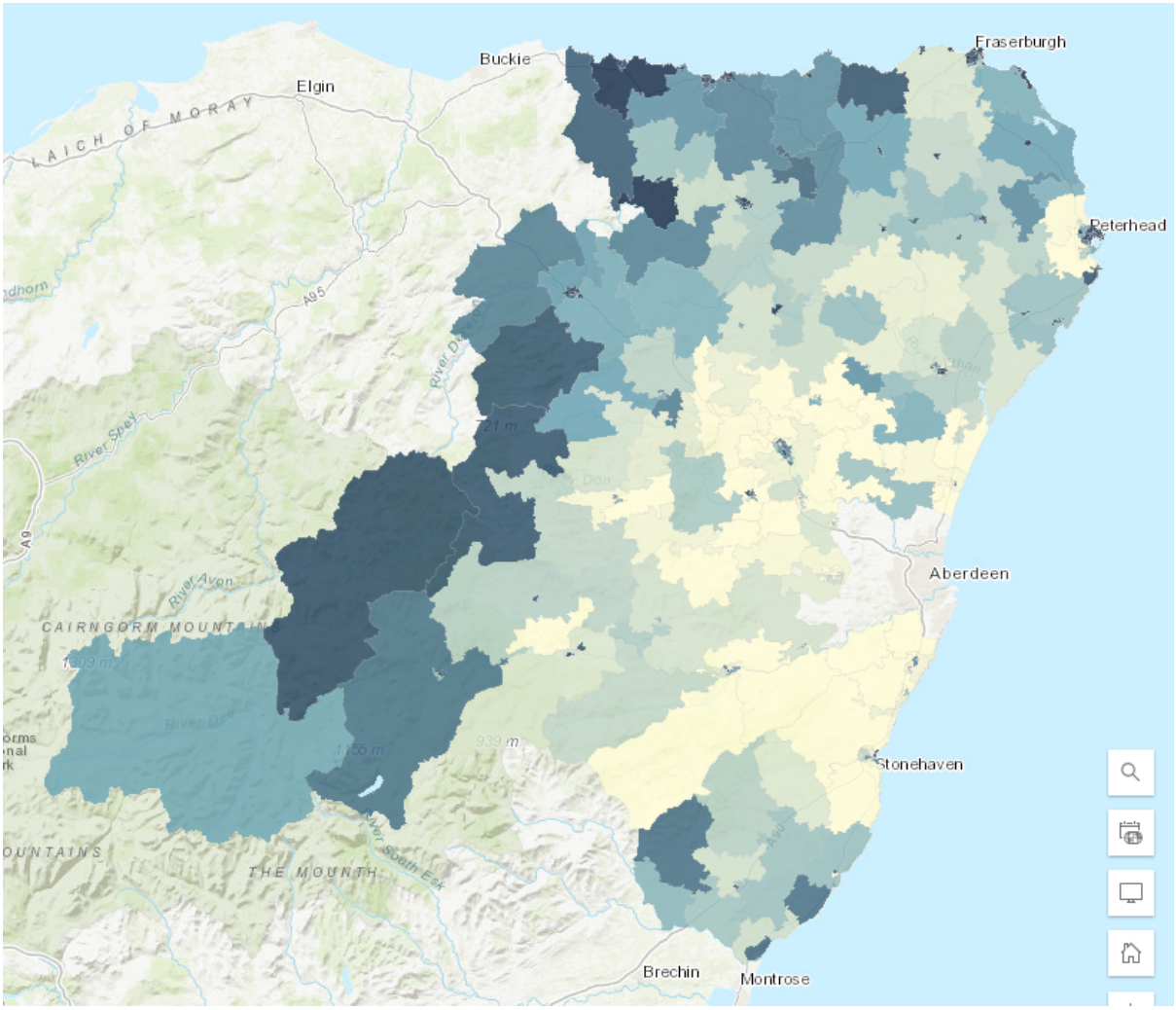
As previously noted, fuel poverty occurs when a household spends more than 10% of adjusted net income on fuel, with the remaining income unable to sustain an acceptable standard of living. For extreme fuel poverty, the spend on fuel increases to 20%. Data relating to fuel poverty suggests our area is in line with national levels of fuel poverty at 25% which will affect around 30,500 households. The extreme fuel poverty data reflects slightly higher than national levels 15% which accounts for around 18,100 households. As the data used was collated before the recent energy crisis it is likely that fuel poverty levels will be higher than the statistics show, albeit that the national averages will also have risen.

The likelihood of fuel poverty is higher in off-gas properties, which applies to almost half of Aberdeenshire. Properties where fuel poverty is most likely to be driven by energy inefficiency statistically in Aberdeenshire are shown below, interestingly the highest risks are not in off-gas areas, though some of the locations further down the ranking are. The regeneration towns of Fraserburgh, Peterhead, Macduff and Banff all feature in the table.

[35] https://www.who.int/teams/environment-climate-change-and-health/healthy-urban-environments/housing/strategies

Most at risk from poor energy efficiency driving Fuel Poverty		
1.	Fraserburgh Harbour and Broadsea	7. Portsoy, Fordyce and Cornhill
2.	Fraserburgh central – Academy	8. New Pitsligo
3.	Peterhead Harbour	9. Huntly
4.	Peterhead Bay	10. Macduff
5.	Banff	11. Gardenstown and King Edward
6.	Fraserburgh Lochpots	12. East Cairngorms

Fuel poverty probability in Aberdeenshire – darker colours indicate highest risk of fuel poverty. (awaiting better visual)



As well as energy efficiency driving fuel poverty, research indicates several groups 'more likely' to experience fuel poverty[36]. These groups include people with the lowest net income, people with disabilities, young & middle age groups, women, single marital status, families with 2+ children or lone parents, social housing/private rented, ethnic minority communities, those relying on electric heating, and those in rural areas.

[36] Not everyone in these groups will be struggling to the same extent to pay for fuel - in social research studies, evidence suggests high levels of people classified as being in fuel poverty, stated they did not have heating problems and were managing well financially.

7.3.3. Summary

This priority highlights the requirement for this strategy to have positive impacts that close the fuel poverty gap, improving comfort and health and wellbeing for all. This will be through lowering fuel requirements with energy efficiency improvements and aiming for affordable warmth for all.

There is further work to do on understanding optimum insultation methods to all building types so there are no unintended consequences and ensuring that measures are done to the relevant standard to enable use of lower temperature zero carbon heating systems that will not deepen fuel poverty. We will continue to liaise with national partners with specialist knowledge and ensure that actions are supported with this knowledge.

Priority 4: Increase awareness of available information related to decarbonisation and energy efficiency.

7.3.4. Outcomes

People in Aberdeenshire are aware of the requirements of national and local policy relating to energy efficiency and have the knowledge to increase energy efficiency and decarbonise heat within their own properties as well as having access to support mechanisms including funding to facilitate behaviour change.

7.3.5. Context

In order to make informed, climate friendly changes, people need to have information and knowledge to progress. According to the ClimateXChange, broad concern about climate change does not seem to be translating into widespread uptake of low carbon heat[37]. To achieve a just transition all people responsible for buildings and wider stakeholders need to be engaged with and informed on the Local Heat and Energy Efficiency Strategy. From being aware of how to improve energy efficiency within buildings to decarbonising the heat sources or being able to access support or funding that may be available. Making this information easily accessible and driving awareness up the agenda is required to encourage behaviour change and make achievement of national targets within reach.

[37] https://www.climatexchange.org.uk/research/projects/public-awareness-of-and-attitudes-to-low-carbon-heating-technologies/

7.3.5.1. Existing Support

There are organisations across Scotland, the UK and Aberdeenshire that can provide generic and tailored advice to those seeking information on decarbonisation and low carbon heating. As part of the delivery plan, these organisations and groups will be promoted along with available funding resources to drive the switch. The Council can work with these organisations to ensure the message is getting through to those who need it. Sharing information across sectors will help upskill groups in the community who can then inform those approaching them for advice. Information and advice services:

Home Energy Scotland[38]	Provide information on large and small measures householders can take as well as information on decarbonising heat and funding.
Aberdeenshire Council[39]	The Home energy advice team (HEAT) provide energy efficiency advice and support.
Aberdeenshire Voluntary Action (AVA)[40]	Third sector interface with Warm Spaces information and more.
Energy Savings Trust[41]	Independent organisation giving advice on energy efficiency and clean energy empowering householders to make better energy choices. They also work in partnership with government to deliver energy programmes. They also support businesses.
Changeworks[42]	Environmental charity Changeworks' vision is for a world where everyone is able to live, work and enjoy life with a low-carbon impact. The webpages contain energy and retrofit advice for homeowners.
Business Energy Scotland[43]	Funded by the Scottish Government for SME's, giving guidance on saving energy, access to training and can even perform energy efficiency audits.
Net Zero Nation[44]	Website from Scottish Government giving advice and information about saving energy and reaching Net Zero. Has a section on home energy.

In addition to the information and advice services noted in the table, Scottish Government have plans to set up a National Public Energy Agency[45] which will provide some leadership and coordination in the quest to increase the pace to decarbonise heat.

7.3.6. Summary

This priority cuts across every sector to ensure all buildings are included in the decarbonisation journey. We must bring everyone with us and increase awareness of what needs to be done and the appropriate timescales for the various building types and sectors. There is some funding and national support along with research going on to ensure that retrofit efforts are positive and anticipated outcomes achieved.

[38] Home Energy Scotland
[39] https://www.aberdeenshire.gov.uk/housing/private-housing/energy-efficiency-advice-and-support/
[40] https://www.avashire.org.uk/
[41] Energy Saving Trust
[42] www.changeworks.org.uk
[43] https://businessenergyscotland.org/
[44] https://www.netzeronation.scot/
[45] https://www.gov.scot/policies/energy-efficiency/the-national-public-energy-agency/

A key action from this priority will be to build a communications strategy that works in tandem with any Government led campaign ensuring all stakeholders are reached and enlightened with developing information as it becomes available.

8. Delivery Plan

The first delivery plan is a summary of high-level actions that we will work on to flesh out in the coming months with the aim of having the first full delivery plan in spring 2025. This will give time to engage further with external and internal stakeholders.

Our detailed delivery plan needs to support the meeting of regulatory requirements across the board. It needs to contribute to reducing fuel poverty and be deliverable, paying heed to potential limitations such as grid capacity, cost of measures or conservation/listed building status.

It is important that this strategy and delivery plan are viewed as live and flexible documents. This will allow potential heat solutions to be researched with emerging technologies and solutions to be incorporated to the live delivery plan as and when they arise.

Delivery plan outline:

Building energy efficiency

- Work with internal stakeholders using the route map to direct the improvement of Aberdeenshire Council buildings with the aim of achieving net zero direct emissions by 2038 from building stock (or other date as dictated by consultation from Heat in Buildings Bill outcomes).
- Engage with RSLs to work together across areas where collaboration can lead to cost and time saving.
- Continue to use ABS funding to install measures to areas at risk of fuel poverty using data to select optimum areas as per the Local Housing Strategy.
- Work with partners to create a knowledge base of archetype specific retrofit to ensure no unintended consequences occur when improving property energy efficiency.
- Identify areas for no-regret measures for energy efficiency improvement, targeting fuel poor areas.

Heat Network opportunities

- Identify from the potential zones (14) which are most likely to achieve key strategy aims and objectives and work with HNSU to carry out feasibility studies on the top zone.
- Continue to work with external stakeholders on any potential to decarbonise or expand existing heat networks.
- Keep information updated and include any new LDP zones which may influence viability of potential zones.
- Engage with local communities to improve understanding of acceptance of potential heat network opportunities through community partners and council teams.
- Engage with other public body organisations regarding potential anchor load buildings incorporation in identified/potential heat network zones.
- Explore any investment or funding opportunities related to progressing heat networks, particularly for potentially fuel poor areas.
- Engage with potential waste heat producers.

Other decarbonisation actions

- Engage with DNOs regarding potential heat decarbonisation zones to ensure the grid in the area can support mass change to electrified heat, potentially building an area wide energy plan.

- Explore potential ground source multi property opportunities that are emerging via some suppliers.
- Engage with external public bodies to include their site-specific plans to decarbonise as required.
- Work with RSLs making use of multi-organisation funding as it arises.

Other actions

- Work with government and other local authorities to build a communications strategy that will increase awareness of forthcoming targets, energy efficiency opportunities and decarbonisation options for everyone.
- Continue to seek external funding to realise community opportunities and increase the sense of place within them.
- Explore if there are opportunities arising from the Just Transition funding awarded to the North East to transition away from oil and gas with respect to decarbonisation of properties in the area.
- Engage with educational and workforce stakeholders regarding learning and employment opportunities that the heat transition can provide in order for appropriate courses and employment to be made available.

8.1. Asks for Scottish Government

This strategy is largely aspirational as there is a large gap between the steps to take to resolve or achieve priorities and that for which Local Authorities have the resource and funds to complete. Across the country (and the wider UK) there will need to be investment in educating the general populus as well as funding the measures required to make this strategy a realistic tool for completing the priority actions and making progress with decarbonisation, fuel poverty and energy efficiency. To further support success of this strategy, financial and practical support from Scottish Government is required. This includes funding, communications, research, and policy support. All Scottish Local Authorities have been tasked with developing the LHEES for their area but there are large segments of heat and energy efficiency in the locality that we will not have under our control or influence and further legislative developments will be required to ensure all segments are bound to make progress in these areas.

Actions below were summarised by Fife Council and are seconded by Aberdeenshire Council as necessary to the ongoing success in decarbonising heat and improving energy efficiency across Scotland.

Asks for Scottish Government

	Ask	Outcome
Funding	Provide a significant increase in funding to support energy efficiency and heat decarbonisation projects, and supporting activities (fuel poverty; data collection, modelling, and analysis; funding for community organisations).	Greater funding availability.
	Provide significant funding for research institutions, local authorities, social landlords, and others to develop studies and Building Information Modelling for archetypes.	Guidance for each archetype.

Knowledge & Awareness	Produce a national communications toolkit to raise awareness of Local Heat and Energy Efficiency Strategies; energy efficiency and heat decarbonisation measures; support and advisory services.	Improved awareness and behavioural change.
	Deliver “a public communications programme to raise awareness of the support and advisory services available and to encourage home upgrades, in order to maximise uptake of these schemes."	Improved awareness and behavioural change.
Research/ Data	Encourage use of Building Energy Management Systems and sub-metering by building owners and sharing of data.	Greater awareness of building performance.
	Develop a sustainable data sharing model and platform.	Improved data accessibility.
	Research the density of new housing/building developments required to support a new heat network.	Improved modelling.
	Research how indoor air quality is impacted/improved by energy efficiency/heat decarbonisation measures by: • Ensuring indoor air quality and retrofitting buildings are fully considered in the Clean Air Strategy 2 review. • Agreeing standard methodology for monitoring indoor air quality pre- and post-retrofit – including pilot projects. • Developing a framework model to identify how factors impact indoor air quality (e.g. insulation type, air tightness). • Convening task group to identify actions to be undertaken to address issues associated with indoor air pollution.	An understanding of how risks related to poor indoor air quality can be mitigated to make improved decisions on building level actions to implement.
	Model heat efficiency in the context of changing workstyles now and moving forward.	Greater insight of heat demand.
Policy	Map policies/targets to evidence and tools to provide a timeline of anticipated improvements.	Improved awareness and accessibility to key policies.
	Clarify the phrase “*as far as reasonably possible*” in the Heat in Buildings Strategy.	Improved understanding of targets.
	Increase the number of green jobs (and supporting roles) to close the skills gap.	More green skilled jobs.
	Incentivise and/or further regulate developers to ensure new builds are suitable for decarbonised heating.	New builds suitable for net zero.
	Work with the Building Research Establishment on energy performance certificate reform to develop an improved metric.	An improved metric.

	Agree a new Energy Efficiency Standard for Social Housing 2 target, aligned to net zero and supporting fuel poverty eradication.	A revised target.
	Develop policy levers to support short-term mitigation to alleviate current grid capacity pressures. For example: revise battery storage definition; private wire for heat networks; surplus from private grids/renewables to power local buildings.	Alleviation of grid pressures improving capacity.
	Continue to support National Planning Framework 4 Policy 19: *Development proposals within or adjacent to a Heat Network Zone identified in a Local Development Plan will only be supported where they are designed and constructed to connect to the existing heat network*.	Heat networks become standard consideration for developments.

8.2. Next steps

Following consultation and adoption by the Council, the strategy and delivery plan will be published online. It must be appreciated that this strategy is a flexible and live document. Monitoring of actions to ensure key outcomes are achieved will be pivotal for success. The delivery plan will adapt to incorporate any changing requirements and include new information or updated data. We will report updates within the Council to the relevant Committee/s on a regular basis. Internally, the stakeholders that have worked together to contribute to development of the

LHEES and delivery plan will continue to play a key part in the ongoing development.
The development of the detailed delivery plan will continue through 2024, homing in on the top actions to make progress on the key priorities highlighted.

The Strategy and Delivery Plan are required to be reviewed at least every 5 years though we anticipate the delivery plan will have continuous amendments throughout that timeframe.

Appendix 1 Full Table of National Policies and Strategies

National Policy/Strategy	Description	Priorities/actions
Climate Change (Emissions Reduction Targets) (Scotland) Act 2019	Targets to reduce Scotland's emissions of all GHGs to net-zero.	
Updated Climate Change Plan	This update to Scotland's 2018-2032 Climate Change Plan sets out the Scottish Government's pathway to our new and ambitious targets set by the Climate Change Act 2019. It is a key strategic document on our green recovery from COVID-19.	See Heat in Buildings Strategy
Programme for Government	The Programme for Government is published every year at the beginning of September and sets out the actions we will take in the coming year and beyond.	2020 Programme for Government: Over the next Parliament to invest nearly £1.6 billion in transforming buildings to ensure that emissions from heating are eliminated by 2040 to remove poor energy efficiency as a driver of fuel poverty. The deal uplifts Heat and Energy efficiency spend from £112m in 2019/20 to £398m p.a. in 2025 26 and will include: •Additional £55 million to support scale up of energy efficiency programmes •At least £95 million to decarbonise the public sector estate •Opening the £50 million Green Recovery Low Carbon Infrastructure Transition Programme (LCITP) •Up to £50 million to invest in significant energy efficiency improvements to the Royal Botanic Gardens in Edinburgh •£25 million for zero carbon energy infrastructure and heat networks for residential and commercial premises along the river Clyde's path

Heat in Buildings Strategy	Updates the Energy Efficient Scotland route map and commits to putting in place standards and regulation for heat and energy efficiency to ensure that all buildings are energy efficient by 2035 and use zero emission heating and cooling systems by 2045.	Sets out approx. 111 actions and proposals that SG will take to work towards target and aspirations.
Energy Efficient Scotland	20-year route map to define a set of actions aimed at making Scotland's buildings near zero carbon by 2050, in a way that is socially and economically feasible.	2 main objectives. Remove poor energy efficiency as a driver for fuel poverty. Reduce greenhouse gas emissions through more energy efficient buildings and the decarbonisation of heat supply.
Heat Networks (Scotland) Act 2021	The aim of the Act is to encourage greater use of heat networks in Scotland.	The Act puts in place rules and regulations on heat networks, including: • making applications • identifying exemptions • granting licenses • setting up heat network zones
Fuel Poverty (Targets, Definition and Strategy) (Scotland) Bill	The Bill sets out a new target relating to the eradication of fuel poverty, as well as providing a revised definition of fuel poverty.	
EESSH 1 & EESSH2	The Standard aims to improve the energy efficiency of social housing in Scotland.	EESSH 2 was suspended in 2022 pending review. During the review period, Scottish Government advised landlords to continue with planned investment in energy efficiency measures and decarbonised heating systems, prioritising the investment on measures that would contribute to meeting Net Zero targets.
Scottish Energy Strategy	The 2050 vision for energy in Scotland is to provide a 'flourishing, competitive local and national energy sector, delivering secure, affordable, clean energy for Scotland's households,	The 3 core principles are to: take a whole-system view; provide an inclusive energy transition and; have a smarter local energy model.

	communities and businesses.	
National Planning Framework	The National Planning Framework (NPF) sets the context for development planning in Scotland and provides a framework for the spatial development of Scotland as a whole.	A successful sustainable place – supporting economic growth, regeneration and the creation of well-designed places; A low carbon place – reducing our carbon emissions and adapting to climate change; A natural resilient place – helping to protect and enhance our natural cultural assets and facilitating their sustainable use; A connected place – supporting better transport and digital connectivity.
Hydrogen Policy Statement	Sets out vision for Scotland to become a leading hydrogen nation in the production of reliable, competitive, sustainable hydrogen, securing Scotland's future as a centre of international excellence as we establish the innovation, skills and supply chain to underpin our energy transition.	Support for the development of a low-cost hydrogen capability to meet an initial ambition of generating 5GW of renewable and low-carbon hydrogen by 2030.
Heat Policy Statement	The Heat Policy Statement 2015 (HPS) sets out how low carbon heat can reach more householders, business and communities and a clear framework for investment in the future of heat in Scotland.	It sets out our future policy direction for addressing the three key aspects of the heat system: how we use it (heat demand and its reduction); how we distribute and store it (heat networks and heat storage); where our heat comes from (heat generation).
Scotland's Sustainable Housing Strategy	Scotland's position for warm, high-quality, affordable and low carbon homes, and a housing sector that supports the establishment of a low carbon economy.	Delivery of the Home Energy Efficiency Programmes for Scotland (HEEPS); appropriate use of standards and regulation; market transformation.
Tenements (Scotland) Act 2004	The Tenement Management Scheme, as outlined in Schedule 1 of the Tenements (Scotland) Act 2004, lists the 'scheme property' (explaining	The Climate Change (Scotland) Act 2009 amends the Tenement Management Scheme to log insulation installation as a maintenance measure rather than an 'improvement' so changes can be approved via a majority rather than unanimously.

	what parts for the tenement every flat owner should maintain) and explains how to come to arrangements about maintenance ('scheme decisions') and how costs are shared between owners.	
Historic Environment Policy Scotland	HEPS is a non-statutory policy statement directing decision-making that should be taken into account whenever a decision will affect the historic environment.	HEPS outlines three policies on managing change to the historic environment: - Decisions affecting the historic environment should ensure that its understanding and enjoyment as well as its benefits are secured for present and future generations. - Plans, programmes, policies and strategies, and the allocation of resources, should be approached in a way that protects and promotes the historic environment. - Changes to specific assets and their context should be managed in a way that protects the historic environment. Opportunities for enhancement should be identified where appropriate.
The Planning (Listed Building Consent and Conservation Area Consent Procedure) (Scotland) Regulations 2015	Listed building consent is the mechanism by which planning authorities ensure that any changes to listed buildings are appropriate and sympathetic to their character. It helps to protect what is a rare and unique resource. Conservation area consent controls the demolition of unlisted buildings in conservation areas.	

Appendix 2 – Full Table of Local Policies and Strategies

Strategy/Policy/ Plan	Description	Priorities/actions
Local Outcome Improvement Plan	This Plan provides a vision and focus, based on agreed local priorities, to which partners work systematically and collaboratively to meet the needs and aspirations of local communities in Aberdeenshire. Identifies four key priorities, each with their own action plans, only one of which is relevant for LHEES (see Reducing Poverty Action Plan below)	Priority 1: Reducing Child Poverty in Aberdeenshire (broadened to "Reducing Poverty" in 2020) - see detailed actions in row below.
Reducing Poverty Action Plan (September 2021 Update)	Identified 17 key actions for reducing poverty across Aberdeenshire	Action 5. Reducing home energy and fuel costs. Outcome is reduced living costs. Key focus is minority ethnic groups. KPIs: Increase the number of families that receive support to reduce fuel costs. Increase the number of funded energy efficiency measures installed in the private sector, via Scottish Government schemes. Decrease the number of families in both private and social sector housing living in fuel poverty. Action 10: 10. Increase support for those who are financially vulnerable. KPI: Increase household income of low-income families by developing and implementing a comprehensive benefit take-up campaign i.e. fuel poverty voucher scheme/winter warm scheme

Council Plan	Sets the strategic aims and outcomes that drive the council's work.	Three key pillars: Our People (Learning for life, Health and wellbeing), Our Environment (Climate change, Resilient communities) and Our Economy (Economic growth, Infrastructure and public assets). Key relevant council priorities: Health & Wellbeing: • Enable and deliver the provision of good quality, energy efficient and accessible housing. Climate Change: • Reach a 75% reduction in emissions by 2030 and Net Zero by 2045, with the Council showing leadership. Resilient communities: • Develop and implement a Place Strategy that considers the current and future needs of communities. • Support communities to help themselves and encourage and assist in the delivery of community priorities. • Improve the life chances of people at risk of falling into poverty, or already living in poverty. • Promote greater participation by communities in decisions that impact them. Economic Growth: • Enabling community organisations and businesses to access project funding • Stimulate and nurture a culture of entrepreneurship within the region • Support new and existing businesses to thrive, creating competitive advantage and providing fair work opportunities • Develop our key sectors and secure inward investment to sustain economic growth Infrastructure and Public Assets: • Create and sustain a Council Estate that is fit for purpose to provide modern public services that meet the current and future needs of our communities.
Local Housing Strategy	The Local Housing Strategy sets out Aberdeenshire's key housing plans over a five-year period. Also covers fuel poverty and	Priority 2: Energy Efficiency, Fuel Poverty and Sustainability. • Improve the energy efficiency of housing across all tenures • Assist households to maximise their income • Reduce fuel costs for households across all

	energy efficiency priorities for the Council (no separate plans for these)	tenures • Change behaviours KPIs (no quantitative targets set): • Energy efficiency measures installed in private sector housing • Energy efficiency measures installed in social sector housing • Households receiving in-house, in-depth energy efficiency advice • Households provided with social tariff referrals • Households assisted to maximise their income Priority 6: Private sector. • The quality of private sector housing is maintained and improved to promote health and wellbeing by addressing disrepair and enhancing energy efficiency. • The private rented sector provides high management standards that inspires consumer confidence and encourages growth through attracting increased investment. KPIs: • Number of households assisted in order to address BTS elements or prevent properties falling BTS.
Local Development Plan	The Plan sets out the policies that will be used for assessing planning applications and identifies development opportunities across Aberdeenshire.	Aim: To take on the challenges of Sustainable Development and Climate change: Policies say that new developments must reduce greenhouse gas emissions. We have introduced new policies to encourage the development of renewable energy resources in a sensitive way. New development will be sustainable, what we do and how we live today should not leave our children unable to achieve a similar quality of life in the future and should take into account the important issues of climate change and reducing carbon.
Aberdeenshire Council Environmental and Climate Change Policy Statement	One page policy statement recognising the Council's impact on the environment and making commitments to reduce this. Accompanying action plan detailed below.	Set challenging targets to act in a way best calculated to reduce CO2 and other greenhouse gas emissions from council buildings, operations and activities reporting these each year in our Carbon Budget. Provide a planning system that ensures all development is sustainable and take action to

		prevent pollution and minimise environmental risks.
Climate Change Action Plan	A Climate Change Action Plan to cover the operations of the Council itself - *to be replaced by Route Map 2030 once live*	Defines a number of actions and outcomes from page 5 onwards, the most relevant of which are outlined here. 1.1. Investigate the installation of ground mounted PV arrays on Council land. Outcome: Effective use of Council assets to reduce CO2 emissions and generate income. 1.2. Investigate feasibility of creating Council run/owned Energy Service Company (ESCo). Outcome: Sale of energy to internal & external customers. Fuel security, income generation. 2.5 Maintenance Strategy. Continue to improve the condition of buildings and plant and to reduce energy consumption. 3.15. Upgrade the Heat/Energy Map of Aberdeenshire. 3.26 Develop a Climate Change Adaption Strategy 3.27 Development of a Carbon Budget Set challenging targets to act in a way best calculated to reduce CO2 and other greenhouse gas emissions from council buildings, operations and activities reporting these each year in our Carbon Budget.
Regional Economic Strategy	20-year plan to deliver a range of activities that maintain and grow the economy, period covered is 2015-2035.	This is in development following the awarding of Investment Zone to the North East region. A draft was presented prior to this to Full Council last year: Agenda for Aberdeenshire Council on Thursday, 29th June, 2023, 10.15 am - Aberdeenshire Council (moderngov.co.uk) Key themes include: •To establish the North East as a pioneer of the energy transition, by delivering an 80% reduction in carbon emissions per head. • Maintain a healthy, sustainable, working age population through increasing economic participation rates • Protect and enhance the natural capital of the

		region by aligning to national ambitions to manage 30% of the region for people and nature by 2030
Local Energy Plan (Aberdeenshire Council Net Zero Roadmap - decarbonisation assessment)	Report identifies what actions and decarbonisation options are available for Aberdeenshire Council assets to meet the net zero trajectory and makes recommendations on which actions to follow - *in development and needs to be reviewed by the Committee for approval*	Stage 1: Fabric First Energy Efficiency Programme (~2022 - 2030) Stage 2: Off Gas Buildings (start with fuel oil and kerosene then LPG) (~2023-2030) Stage 3:On gas buildings (schools, leisure centres and sheltered housing) (~2025 - 2040) Stage 4: Other buildings and hard to treat buildings (~2030-2045) A Heat Decarbonisation Decision Roadmap is proposed to be followed, which starts with fabric improvements and energy efficiency, then district heating assessment and then technologies choices based using on gas and off gas Heat Decarbonisation Decision Tree for short term (2021-2025), medium term (2025-2030), and long term (>2030) decisions. (p.65-67 for more detailed actions/recommendations)
Strategic Housing Investment Plan	Sets out the strategic policy approach by Aberdeenshire Council and its partners to delivering affordable housing in accordance with the Local Housing Strategy.	This SHIP will enable the delivery of high quality and energy efficient homes including specialist housing provision (and appropriate support) as well as assist in reducing fuel poverty and carbon emissions. The main outcome of this SHIP to enable the delivery of high quality, energy efficient housing. This will be done across a variety of tenures whilst maximising a range of funding streams and delivery options.
Local Community Plans (Marr Community Plan)	Aberdeenshire council has six Local Community Plans which define the priorities for the local areas - Banff, Buchan, Fortmarine, Garioch, Kincardine and Mearns, and Marr. Each of the plans were reviewed and only one (Marr) included relevant priorities/targets for LHEES.	Goals: •We will support community housing projects •Community projects are supported that seek to address climate change mitigation, adaption and preparedness

Aberdeen City & Shire Strategic Development Plan	This Strategic Development Plan outlines where and how the City Region can grow and is used to inform Local Development Plans prepared by both Aberdeen City and Aberdeenshire Councils.	Target: For all new developments to be designed to minimise resource demand and incorporate water and energy efficiency measures. How to meet the target: Local Development Plans and masterplans will identify areas where technology can potentially contribute to the supply of renewable energy along with the potential opportunity to use residual or waste heat. Both Councils should use masterplans to consider the scope of combined heat and power and district heating schemes to contribute towards using energy more efficiently and in reducing the amount of energy used overall. Other: Developments should examine the potential for including, or linking to, combined heat and power schemes or district or community heating schemes, and also ensure the incorporation of low and zero carbon generating technologies wherever appropriate. Tackle the supply of energy during the Plan period. This will involve increasing the supply of heat and power from renewable sources, as well as supporting reduced emissions from existing power stations. We will also need to tackle the supply of energy during the Plan period. Opportunities for energy from waste, solar and biomass, as well as ground, water and air source heat pumps to be explored. All developments must consider opportunities to reduce fuel poverty and address the impact of climate change. It is hoped that hydrogen from St Fergus will be blended directly into the gas grid and enable phased decarbonisation of heat. The City Region also remains committed to Carbon Capture and Storage and the development of hydrogen opportunities, both to maximise the benefits from existing energy resources and energy infrastructure available.

Climate Ready Aberdeenshire (CRA)	CRA is a voluntary cross-sector network to create and coordinate Aberdeenshire's climate change adaptation and mitigation strategy.	CRA's shared vision is that: "All sectors, including public, private and the community, are increasingly engaged in shared dialogue, shared goals and shared action relating to climate, biodiversity, and sustainability in support of a flourishing Aberdeenshire." Through its network, CRA's objectives are to: • Increase the understanding and awareness of climate change risks, challenges, and opportunities within Aberdeenshire. • Encourage the use of a place-based approach when engaging with communities on how to mitigate and adapt to climate change. • Support decision-makers to contribute to the delivery of local and national commitments to climate change that mutually benefit Aberdeenshire's environment, economy, and people. • Ensure that network members are best placed, within their remit, to provide knowledge, advice, and support on climate change mitigation and adaptation action, including helping to signpost businesses, community groups, and individuals to resources, projects, and funding opportunities to deliver change.
North East Scotland Regional Economic Strategy Statement in Response to COVID-19	Paper outlining the economic ambitions of the region despite the challenges following the Covid-19 pandemic and recovery (an addition to the Regional Economic Strategy)	The refreshed vision reflecting this is as follows: In 2040, the Aberdeen city region provides outstanding economic opportunities, best-in country quality of life and a spectacular natural environment. It is: • a net-zero city region that powers the nation and drives energy transition nationally and internationally; • a competitive city region to work and invest in with a diverse and robust economy, high-value jobs, and nationally significant productivity; and • a city region of choice where prosperity and opportunity, educational attainment, quality of life, natural heritage and sense of place attract and retain talent, enterprise and investment. Net Zero – a region with an integrated energy cluster that is a global leader in the

		development of energy transition and net zero carbon solutions.
Carbon budget	An annual carbon budget figure is set each year to keep the council on track for its commitment to reduce emissions by 75% by 2030 and Net Zero by 2045 using 2010/11 as a baseline year.	Each annual carbon budget report contains projects across the Council which will reduce emissions – this includes work being carried out in relation to energy efficiency and heat decarbonisation across the Council's owned non-domestic building stock.
Route Map 2030 (and beyond)	The Route Map to 2030 (and beyond) has been developed to identify what must happen across the authority in order to meet a 75% reduction in its own emissions by the end of the decade. A key aspect of the Route map is the creation of a toolkit which supports a cost-abatement curve and demonstrates which projects give us the most carbon savings for the least financial outlay so we can prioritise projects that give best value carbon reduction initially, moving to the harder to reach projects as we progress.	1: Set up a central steering group. 2: Define accountabilities, clear roles, responsibilities across the Authority for delivering the Route Map 2030. 3. Supply Chain Capacity and Capability Gap Analysis: 4: Set targets for reducing Direct and Indirect emissions 5: Delivery of the Feasibility studies at operational buildings, to support definition of future Carbon Budgets 6. EV/H2 Fleet assessment 7. Develop Hydrogen strategy 8.1 Electrification risk / resilience study. 8.2 Embed zero carbon standard for both new build and retrofit initiatives. 9.1 Residual Emission Action Plan including an organisational carbon footprint scope and target review. 9.2 Resilience / Adaptation assessment 9.3 Develop LHEES 9.4 Develop Re-use business case. 10. Central assurance and reporting: 11. Communications to support and implement the change and generate buy-in of the people and Directorates at all levels.

Climate Change Declaration	Statement of intent regarding climate change	Actions: Significantly cut our own emissions by reducing our dependence and use of fossil fuels, avoiding waste, and promoting biodiversity; Work with others across the region to ensure that Aberdeenshire reaches Net Zero by 2045, by promoting energy transition and a circular economy; We will support a transition that is socially fair and just and will communicate reasons for change and the potential effects on service delivery to our communities and staff.
Waste Strategy	Four-year waste strategy	Deliverable 5: Recover energy from waste not prevented, reused or recycled. Continue working with Aberdeen City and Moray Councils to build a joint facility for recovering energy (heat and power) from non-recyclable waste. Objective 6: Reduce carbon emissions. • Carbon emissions from disposal and reprocessing of waste.

Appendix 3

14 potential HNZ identified areas maps.