

Climate change, mitigation and adaptation, environmental responsibility

Local Development Plan Topic Paper

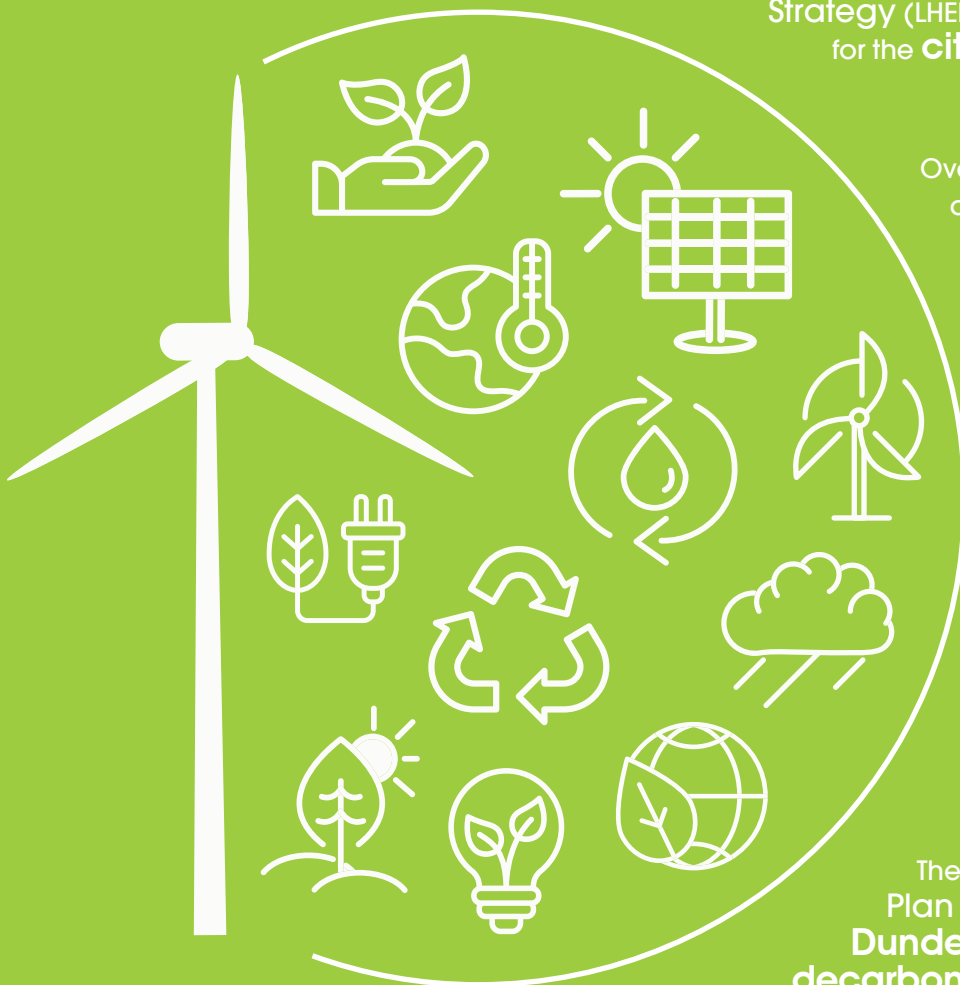
Dundee's Local Heat and Energy Efficiency Strategy (LHEES) is an important **strategic plan** for the **city**.

Over the last **thirty** years sea level across **Scotland** has risen between **two** and **three** times faster than over the previous 100 years.

The **Scottish** Government has set out a **bold** direction of **change** to deliver on **climate** and **nature** goals and to make a just transition.

Dundee is identified as a potential regional **hydrogen hub** due to being ideally located next to several **offshore wind farms**.

The **Dundee Local Area Energy Plan** will provide a route map for **Dundee** to transition towards a **decarbonised energy** system based on **data** and stakeholder collaboration.



Topic Paper – Climate Change, Climate Mitigation and Adaptation, Environmental Responsibility

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1. Introduction

This topic paper reviews evidence identified as relevant surrounding the Climate Change, Climate Mitigation and Adaptation, Environmental Responsibility topic grouping. This topic grouping includes:

- **NPF4 Policy 1 – Tackling the climate and nature crisis**
- **NPF4 Policy 2 – Climate mitigation and adaptation**
- **NPF4 Policy 10 – Coastal Development**
- **NPF4 Policy 11 - Energy**
- **NPF4 Policy 12 – Zero Waste**
- **NPF4 Policy 19 – Heating and Cooling**

The topic paper summarises all evidence and data identified and considers specifically its relevance to Dundee. The implications of this evidence and data have been considered and how this might inform the Proposed Plan. The conclusions set out are based on a professional judgement as to the land use planning implications of the data examined.

The topic paper also outlines consultation that has been undertaken thus far, in identifying evidence and datasets through a key stakeholder group and the current stage of public consultation.

2. Identification of Evidence/ Datasets

NPF4 Policy	Evidence/ Dataset and Source
Policy 1 Tackling the climate and nature crisis	National Planning Framework 4
	Dundee Local Development Plan 2019
	Climate Change Plan: third report on proposals and policies 2018-2032 (RPP3)
	Dundee Climate Action Plan
	Dundee City Council Net Zero Transition Plan
	Friends of the Earth - How Dundee is focusing climate action on helping people most at risk
	Dundee Local Heat and Energy Efficiency Strategy (February 2024)
	Local Area Energy Planning
	Natural Capital and Land Reform: Next Steps for a Just Transition
	Just transition for the built environment and construction sector: a discussion paper
	A Fair Energy Future: Unlocking a Just Transition for Consumers (SSEN Distribution)
	Our Past, Our Future
	Guide to Climate Change Impacts (Historic Environment Scotland)
	Advanced Infrastructure LAEP+/Project RESOP
	Climateview for Dundee 2045
	Hello Lamp Post
	Policy 2 – Climate mitigation and adaptation
Dundee Local Development Plan 2019	
Air Quality and Land Use Planning Supplementary Guidance	
Scotland’s Climate Change Plan	
Dundee Climate Risk and Vulnerability Assessment	
Local Area Energy Planning	
Dundee Climate Action Plan	
Dundee City Council Net Zero Transition Plan	
Dundee Local Heat and Energy Efficiency Strategy (LHEES)	
Just transition for the built environment and construction sector: a discussion paper	
Advanced Infrastructure LAEP+/Project RESOP	
Climateview for Dundee 2045	
Hello Lamp Post	
Natural Capital Baseline Assessment	
Our Past, Our Future (OPOF)	
Guide to Climate Change Impacts	
Policy 10 – Coastal Development	
	Dundee Local Development Plan 2019
	Coastal Change Adaptation Guidance

NPF4 Policy	Evidence/ Dataset and Source
	River Basin Management Plan for Scotland 2021-2027
	Tay Estuary Forum Management Plan
	National Marine Plan
	Scottish Coastal Observatory Data
	SEPA coastal flood maps
	Marine Scotland data on aquaculture, fisheries etc
	Guide to Climate Change Impacts
	Dynamic Coast
	SEPA Guidance on Climate change allowances for flood risk assessment in land use planning
Policy 11 - Energy	National Planning Framework 4
	Dundee Local Development Plan 2019
	Dundee Climate Action Plan
	Draft Energy and Just Transition Plan
	Hydrogen Action Plan
	Onshore Wind Policy Statement 2022
	Local Area Energy Planning
	Port of Dundee Infrastructure Masterplan
	National Marine Plan and Review
	Sectoral marine plan: regional locational guidance
	Pathway to 2030: A Holistic Network Design for Offshore Wind- ESO
	Beyond 2030- ESO
	SSEN Network Visibility Strategy
	Distribution Future Energy Scenarios 2023 (North of Scotland)
	Marine Scotland data
	National Grid ESO's interactive map
	SSEN Distribution Data Portal
	SSEN Local Energy Net Zero Accelerator (LENZA) tool
	SSEN Transmission Assets within local authority boundary (internal GIS layer)
	SSEN Transmission Open Data Portal
	Scottish Energy Statistics Hub
	Our Past, Our Future (OPOF)
	Guide to Climate Change Impacts
Policy 12 – Zero Waste	National Planning Framework 4
	Dundee Local Development Plan 2019

NPF4 Policy	Evidence/ Dataset and Source
	Scotland's Circular Economy and Waste Route Map to 2030 Consultation
	Dundee City Council Waste and Recycling Strategy & Action Plan 2020-2025
	Our Past, Our Future (OPOF)
	Guide to Climate Change Impacts
Policy 19 – Heating and Cooling	National Planning Framework 4
	Dundee Local Development Plan 2019
	Heat in Buildings Strategy 2021
	Heat Network Statement – non-statutory planning guidance
	Dundee Climate Action Plan
	Dundee District Heating Strategy
	Dundee Local Heat and Energy Efficiency Strategy (February 2024)
	Local Area Energy Planning
	Dundee City Council LHEES Webmap
	Scotland Heat Map
	Our Past, Our Future (OPOF)
	Guide to Climate Change Impacts

1. Summary of Evidence/ Datasets

Policy 1 - Tackling the climate and nature crises

National Planning Framework 4 (NPF4)

Policy 1 Tackling the climate and nature crises encourages, promotes and facilitates development that addresses the global climate emergency and nature crisis.

The policy outlines that when considering all development proposals significant weight will be given to the global climate and nature crises.

Dundee Local Development Plan 2019

Tackling the climate and nature crises currently has limited specific mention within the Dundee Local Development Plan 2019. However, climate adaptation, resilience and mitigation are key aims set out in Chapter 8 policies.

Climate Change Plan: third report on proposals and policies 2018-2032 (RPP3)

This plan sets out the path to a low carbon economy while helping to deliver sustainable economic growth and secure the wider benefits of a greener, fairer and healthier Scotland in 2032. It includes proposals and policies to reduce emissions from electricity generation, housing, transport, services, industry, forestry, peatlands, waste, and agriculture.

Dundee Climate Action Plan

In June 2019, the Council declared a Climate Emergency, recognising the serious and accelerating environmental, social and economic challenges faced by climate change.

To respond to this challenge, a partnership Climate Action Plan has been prepared which has been the culmination of collaborative work, led by Dundee City Council and co-designed with public, private and community organisations, recognising that a concerted city-wide effort is required. It represents the first set of actions in a long-term pathway to first surpass the Covenant of Mayors target of 40% reduction in greenhouse gas emissions by 2030 and then to achieve net-zero greenhouse gas emissions by 2045 or sooner.

The Plan includes four themes of Energy, Transport, Waste and Resilience with each theme including an initial set of actions to reduce emissions or adapt to a changing climate, taking into account existing projects, stakeholder priorities and national initiatives. Sixty four actions have been identified in the plan, including measures to:

- reduce the consumption of energy, promote energy efficiency and increase the proportion of power and heat from low and zero carbon technologies;
- encourage active travel through walking, cycling and public transport and deploy sustainable alternatives to decarbonise transport;
- manage waste sustainably by reducing, reusing, recycling and recovering waste to improve resource efficiency whilst working towards a circular economy; and
- ensure our communities, green networks and infrastructure are adaptable to a changing climate and reduce the risks and vulnerability to unavoidable impacts.

To help inform the plan, a Climate Risk and Vulnerability Assessment (CRVA) has been carried out. It determines the nature and extent of climate-related risks by analysing potential hazards and assessing the vulnerability that could pose a potential threat or harm to people, property, livelihoods and the environment of Dundee. The process highlighted how important collaboration is between sectors (e.g. biodiversity / green infrastructure / health / flooding) and that adaptation requires a multi-disciplinary approach, where actions cannot be considered in isolation. Climate resilience actions aimed at ensuring the city's services, infrastructure and communities are able to adapt to a changing climate were then co-designed with stakeholders and incorporated into the Plan.

The Dundee Climate Action Plan is being reviewed and updated by the Dundee Climate Leadership Group in 2024. A new Climate Risk and Vulnerability Assessment is currently being undertaken to assess risks and prioritise actions under the 2- and 4-degree scenarios. A Natural Capital Baseline Assessment was published in March 2023 detailing the ecosystem services provided by green spaces in the City. A new regional partnership focussed on adaptation in Tayside commenced in January 2024, supported by Adaptation Scotland, to identify synergies in our CRVA's and potential regional climate resilience projects, as well as to maximise the impact of engagement and communication on resilience across the region.

Dundee Net Zero Transition Plan 2024-2030

This plan sets out how Dundee City Council will achieve its organisational goal of net zero emissions by 2038 by reducing emissions across these sectors:

- Stationary Energy – Buildings and streetlighting
- Transport – Fleet, business and service travel
- Waste – Dundee City Council waste

Specific actions are set out by service area to achieve emission reductions.

Case Study (January 2023) - Friends of the Earth - How Dundee is focusing climate action on helping people most at risk

Over 10,000 UK neighbourhoods are particularly vulnerable to the impacts of the climate crisis. Generally, people living in these areas are the least responsible for the crisis and are least equipped to respond. Some impacts of climate change are already locked in even if we take robust action on mitigation.

Dundee City Council is developing climate policies by identifying residents most at risk of extreme weather events and fuel poverty, and targeting support at these groups. This is a fairer approach to tackling climate change because it protects those most at risk from the climate crisis.

Dundee City Council has calculated that 31% of the city's households are affected by fuel poverty, which is above the Scottish national average. The city's location also leaves it vulnerable to extreme, unpredictable weather events such as flooding.

The council has worked hard to identify vulnerable community members before developing climate adaptation policies. It created a risk and vulnerability assessment plan mapping out the threat posed by climate change in 10 defined policy sectors, with supporting actions to help people at greatest risk from these dangers adapt to face them.

By using digital tools and resources such as the Place Standard Tool, ClimateView and Climate Just, the council was able to understand where people are facing social deprivation and are most vulnerable to climate threats.

The authority is also partnering with the NHS to build a risk register, pulled together by a Risk Management Officer (a role created by NHS Tayside but based at the council), in order to foster collaboration on winter management plans. This register will identify residents facing extreme weather such as storms, flooding and snow. It will also record the impacts that these events can have, such as interruptions in power supply, heating and water. The tool will help adapt winter management plans into climate risk plans.

Dundee Local Heat and Energy Efficiency Strategy (April 2024) and Delivery Plan (in-progress)

The requirement for a Local Heat and Energy Efficiency Strategy was introduced by the Scottish Government to drive forward heat decarbonisation and better energy efficiency in buildings.

Dundee's Local Heat and Energy Efficiency Strategy (LHEES) is an important strategic plan for the city. It highlights key steps for reducing heating related carbon emissions, enhancing building energy efficiency, and addressing fuel poverty. It will help to tackle the city's climate emergency and meet its net zero target whilst also improving the thermal comfort and health and wellbeing of residents and offering the potential for new economic opportunities in the city.

The Delivery Plan is to be published separately and will detail how the Council plans to implement the key actions in the Strategy.

LHEES has two core functions and six scopes, referred to as considerations in the guidance.

Figure 1 – What is the LHEES aiming to do?

Core Function	Considerations	Description
Heat Decarbonisation	Off-gas buildings	Transitioning away from oil and LPG in off-gas properties.
	On-gas buildings	Transitioning away from natural gas in on-gas properties
	Heat networks	Identifying potential heat networks for decarbonisation of heat.
Energy Efficiency Improvement	Poor building energy efficiency	Identifying possible locations at a strategic and delivery level where poor building energy efficiency exists across the Local Authority area. Target measures to improve the energy efficiency.
	Poor building energy efficiency as a driver for fuel poverty	Identifying possible locations at a strategic and delivery level where poor building energy efficiency acts as main driver for fuel poverty. Target measures to remove poor energy efficiency as the cause of fuel poverty.
	Mixed-tenure, mixed-use and historic buildings	Identifying buildings of mixed-tenure or mixed-use, historic buildings, listed buildings, and conservation areas. Target measures to improve energy efficiency and decarbonise heating for these buildings.

Image reference: https://www.dundee.gov.uk/sites/default/files/lhees_strategy.pdf

Local Area Energy Planning

The Local Area Energy Plan will provide a route map for Dundee to transition towards a decarbonised energy system. It will encompass all energy vectors (heat, electricity and transport) and will aim to understand the nature, scale, rate and timing of changes that need to be made through technical analysis and comprehensive stakeholder engagement. Optimisation modelling will consider local energy assets such as the local distribution system, electricity generation and storage, heat generation and storage, domestic and non-domestic buildings, in-boundary refuelling and transportation, and heat networks. Outputs are expected in summer 2024.

Natural Capital and Land Reform: Next Steps for a Just Transition

Scotland is embarking on significant land use change to meet climate and nature goals. Land reform and wider changes to land, tax, and fiscal policy need to work in coordination to make this a just transition – one which will meet the needs and ambitions of Scotland’s people and put the economy in a stronger, more resilient position.

The Scottish Government has set out a bold direction of change to deliver on climate and nature goals and to make a just transition. Market activity alone is unlikely to deliver the just transition sought, but both the land market and emerging carbon and nature markets are shaped by public policy. Stronger regulation of these markets is necessary to shape them in the public interest.

The opportunity is for a well-planned approach which actively shapes land use change in the public interest. This will ensure that the change driven by net zero is one which drives wider rural regeneration, meets the needs and ambitions of Scotland's people, and puts the economy in a stronger, more resilient position.

Just transition for the built environment and construction sector: a discussion paper

This discussion paper is intended to support engagement on a just transition for the built environment and construction sector. Building on this engagement, a draft targeted action plan and route map (late 23/24) will outline the key steps to delivering a fair transition for the sector.

The paper states that the built environment and construction sector currently accounts for around 40% of our emissions in Scotland. The sector will underpin the delivery of our net zero future throughout Scotland, delivering our homes, schools, hospitals and workplaces. Construction accounted for £6.6 billion of Gross Value Added (GVA) in 2020, 8.1% of Scotland's total GVA. With a turnover of £17 billion (8.2% of Scotland's total) in 2020, the sector provided employment to 158,000 people in 2021. The paper outlines that this will be the engine of our transition, delivering the necessary revolution in retrofit and buildings fit for the future.

A focus on standards in the construction sector will be critical for emissions reductions, sustainability, climate resilience and, crucially, for attracting the skilled and diverse workforce required to deliver these.

Within the Themes for Discussion is:

THEME 5: Maximising the manufacturing base in Scotland

The discussion paper states that the scale of what is required here presents huge opportunities for the industrial base in Scotland. Work is already being undertaken to revitalise manufacturing with the development of Michelin Dundee Innovation Park and the National Manufacturing Institute Scotland signalling our intent around industry-led delivery of net zero. The transition of the buildings offers the opportunity for this to expand even further; identifying the correct interventions and getting the sequencing of these right to establish markets and drive demand will be key. For instance, a recent study commissioned by the Centre for Local Economic Strategies explores the potential of registered social landlords to develop the retrofit supply chain in the south of Scotland.

A Fair Energy Future: Unlocking a Just Transition for Consumers (SSEN Distribution)

This strategy document sets out the distribution network operator's plan to protect consumers from being unfairly disadvantaged as we move towards the net zero energy system.

"A Fair Energy Future" outlines the partnerships and projects that SSEN has undertaken to explore and understand the new energy challenges consumers will face in the next two decades. To address these critical issues, SSEN has developed an action plan for delivering

a just transition for energy consumers. This plan includes 10 commitments that SSEN will pursue, along with further recommendations for the energy industry and policymakers to help unlock the benefits of net zero for all consumers. It considers all aspects of achieving fairness in the future energy system for workers, consumers, suppliers, and communities.

One such project is Regional Energy System Optimisation Planning (RESOP) which Dundee City Council have been trialling in partnership with SSEN.

This new tool helps councils to make better informed decisions about the location of low carbon infrastructure. The tool incorporates social demographics and network data and can be broadened out to include information from gas and water utilities to provide council planners with whole system insights.

Our Past, Our Future (OPOF)

The important connection between the historic environment and the above policy areas is reflected in this strategy. It sets the direction of travel for the historic environment sector and of particular relevance to the topic areas above is the identification of a priority for Scotland's historic environment in *Delivering the transition to net zero*. The importance of the contribution that the maintenance, reuse and adaptation of our historic environment can make in preventing waste and reducing carbon emissions is recognised under the transition to net zero priority.

Scotland's traditional building stock is a unique asset, with around a fifth or more of Scotland's homes being traditionally built. Care must be taken to recognise this aspect of Scotland's heritage and ensure that changes associated with matters of adaptation and energy efficiency are made in such a way that its values and characteristics are protected and conserved for future generations to enjoy. The main risks are around poor-quality installation of fabric improvements or fabric improvements which use inappropriate materials. This could lead to problems, such as mould growth, which can in turn lead to adverse effects on health and building fabric.

Guide to Climate Change Impacts (Historic Environment Scotland)

This strategy sets out many of the risks and hazards of climate change that are facing Scotland's historic environment and offers routes to take action, to implement adaptation measures and enhance resilience to climate change.

Data

1. Advanced Infrastructure LAEP+/Project RESOP

Project RESOP (Regional Energy System Optimisation Planning) aims to take a 'whole system' approach, by drawing together data from multiple sources into a single tool that can be used to plan retrofit and roll out of low carbon technologies (LCTs) like electric vehicle charge points. This will help local authorities plan decarbonisation pathways by enabling LCTs to be sited in cost-effective locations whilst providing early warning to SSEN of additional demand on the network.

Project RESOP (Regional Energy System Optimisation Planning) was formed in 2020 by Scottish and Southern Electricity Networks (SSEN) under Ofgem’s Network Innovation Allowance (NIA). The project brings together a range of stakeholders, including Dundee.

Use Case: Informing a heat strategy

Geospatial analysis is key to developing a long-term low-carbon heating strategy. RESOP explains that it can also help identify immediate ‘no regrets’ decisions by supplying data on the geospatial potential for different heating technologies.

As part of RESOP, in Dundee, work has been carried out with a number of data providers and used innovative data inference techniques to map suitability for different heating types across the area. Including:

- Heat network potential zones
- Building level suitability for domestic heat pumps
- The existing gas network
- The water network

In Dundee, total heat demand is estimated to be 950GWh. There are 242 anchor loads which provide 45% of heat or 430.9GWh of anchor load demand. By overlaying heat network potential polygons, users can start to identify homes which might sit within heat networks, or are likely to need alternative heating sources - like heat pumps.

To support further analysis of heating potential, RESOP produced desktop assessments of building-level suitability for domestic heat pumps (pictured below) - as well as building-by-building modelled heat demand.

This data will be used by the two councils alongside the Local Heat and Energy Efficiency Strategy (LHEES) being produced by Arup as part of RESOP.

Figure 2: Building-level suitability for domestic heat pumps



Heat Network Potential Zones from the Scottish national assessment overlaid with a desktop assessment of domestic air Source heat pump potential produced by Advanced Infrastructure

Image reference: [Project RESOP \(Regional Energy System Optimisation and Planning \) \(advanced-infrastructure.co.uk\)](https://www.advanced-infrastructure.co.uk)

Use Case: Siting Rooftop PV

How much local renewable generation can an area support? This is a key data point for planners working on a Net Zero transition pathway.

The RESOP work in Dundee explains that using data on property type, roof type, roof size, and roof orientation they calculate the overall suitability, viable roof area, and estimated yearly outturn (kWh) of a PV array installed on the roofs of buildings across areas like Dundee. They have worked with Energy Systems Catapult to integrate their Local Energy Asset Representation (LAER) data with LAEP+ in Oxfordshire where it has been used by to support projects across the county.

This data in turn can inform Scottish and Southern Electricity Networks future network investment decisions to support targeted investment in the network where it is needed most.

Figure 3: Siting Rooftop PV



Image reference: [Project RESOP \(Regional Energy System Optimisation and Planning \) \(advanced-infrastructure.co.uk\)](https://www.advanced-infrastructure.co.uk)

2. Climateview for Dundee 2045

Dundee's pathway to net-zero – This data source has been assembled to provide an overview of all the shifts needed to reach net-zero. Data is available from Dundee City Council's Sustainability and Climate Change team.

Figure 4 – Transition for Dundee

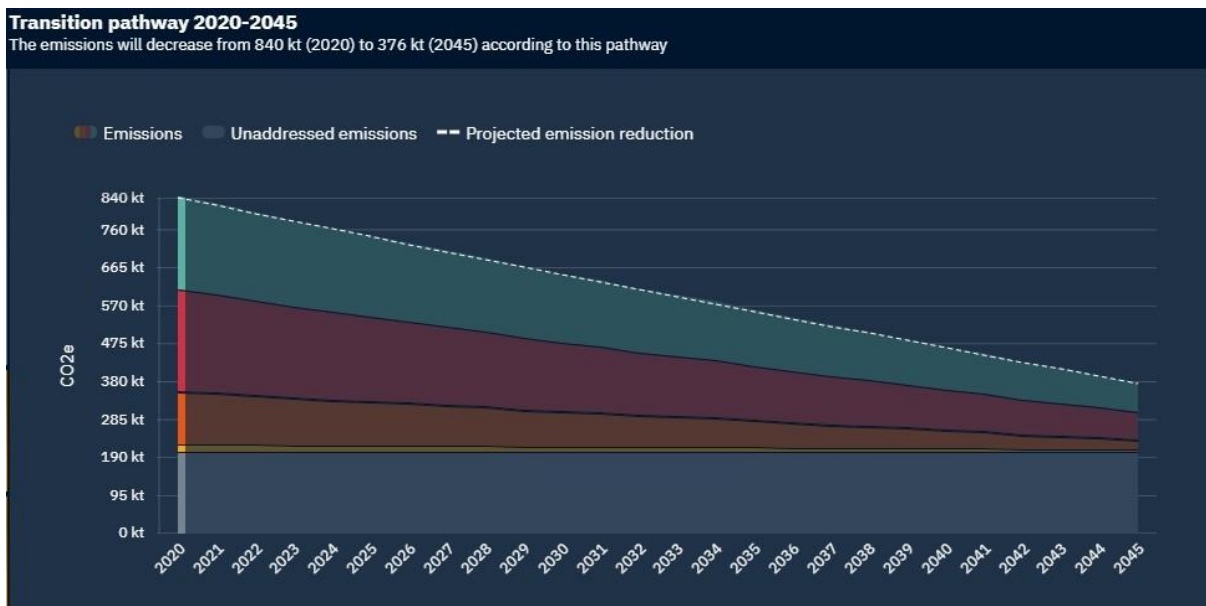
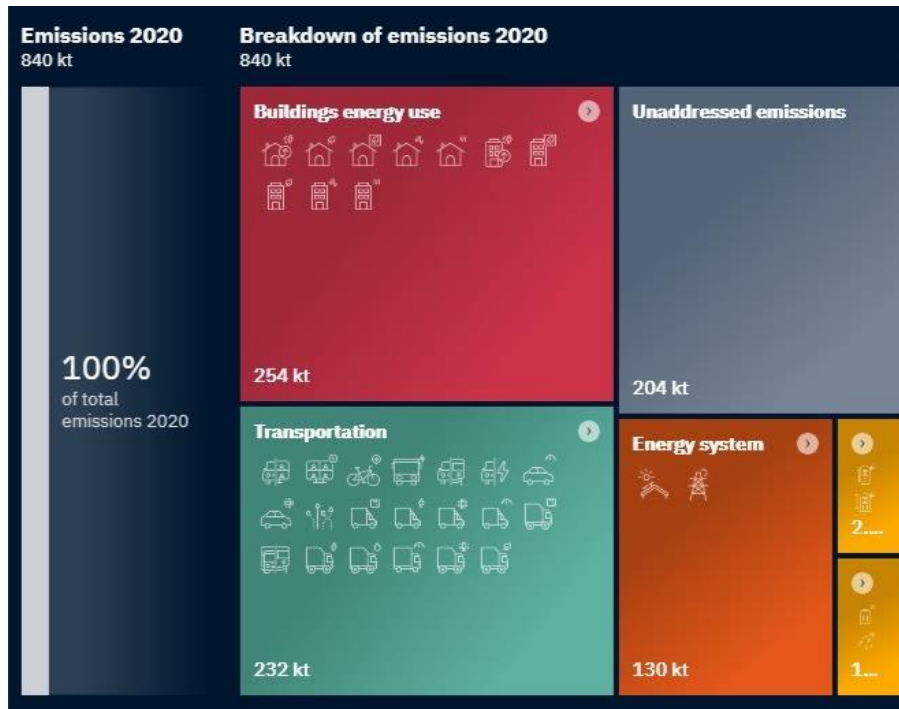


Image reference: <https://app.climateview.global/v3/public/board/40305d84-117a-41e0-a92c-f92d5cb6ac9f>

3. Hello Lamp Post

Hello Lamp Post is an innovative engagement platform that makes public spaces interactive. This is currently being piloted in Dundee and seeks to gather data from our diverse community about how they feel and share information about how to take action against climate change. There will be data available in the coming months to reflect the results of this.

Policy 2 – Climate Mitigation and Adaptation

National Planning Framework 4 (NPF4)

Policy 2 Climate Mitigation and Adaptation aims to encourage, promote and facilitate development that minimises emissions and adapts to the current and future impacts of climate change.

The policy outlines that LDP spatial strategies should be designed to reduce, minimise or avoid greenhouse gas emissions. The six spatial principles should form the basis of the spatial strategy, helping to guide development to, and create, sustainable locations. The strategy should be informed by an understanding of the impacts of the proposals on greenhouse gas emissions. LDPs should support adaptation to the current and future impacts of climate change by taking into account climate risks, guiding development away from vulnerable areas, and enabling places to adapt to those risks.

Dundee Local Development Plan 2019

Climate adaptation and mitigation currently does not have a specific policy within the Dundee Local Development Plan 2019. However, Climate Mitigation and Adaptation are addressed through Chapter 8 policies including Policy 37: Sustainable Drainage Systems and Policy 48: Low and Zero Carbon Technology in New Development.

Air Quality and Land Use Planning Supplementary Guidance

Dundee City Council has Supplementary Guidance to compliment Policy 44: Air Quality of the Dundee Local Development Plan. Air Quality Management Area covers the whole area of Dundee.

Air quality may be a material consideration in determining applications for planning permission dependent on the nature, scale and locations of the proposed development. For example:

- through direct impact on air quality e.g. resulting from the particular business or use of land proposed;
- cumulative impact i.e. as a result of a number of developments which when added together would have a significant effect on air quality;
- indirect impacts e.g. as a result of traffic generated by the proposed land use;
- exposure e.g. through introducing new human exposure into areas of known poor quality without appropriate mitigation measures in place.

Cumulative impacts may also affect air quality at locations that are a considerable distance from the new development.

It is also a material consideration when a proposed development would:

- be affected by existing or potential sources of pollution;
- conflict with or render unworkable, any elements of the approved Air Quality Action Plan which have a land use aspect. For example measures contained within the Action Plan can be compromised when significant

- levels of traffic, parking provision or servicing are generated by proposals which affect a local area sensitive to air quality issues, or result in pollutant concentrations rising to a level where designation of a new Air Quality Management Area becomes necessary.

Scotland's Climate Change Plan

The Scottish Government statutory strategic deliver plan is published at least every 5 years and sets out national commitments to deliver on emissions reductions targets and ensure a green recovery.

Dundee Climate Risk and Vulnerability Assessment (CRVA) (2018)

This assessment was conducted across 10 policy sectors with internal and external partners through a series of workshops:

- Buildings
- Transport
- Energy
- Water
- Waste
- Land Use Planning
- Environment & Biodiversity
- Health
- Civil Protection and Emergency
- Tourism

Actions identified for mitigating climate risks through land use planning included retrofitting SUDS, considering air quality at early stages of the development process, and increasing well-designed blue and green infrastructure.

A new Climate Risk and Vulnerability Assessment based on the 2 degree and 4 degree scenarios is being carried out to refresh the 2018 version and this will be completed in 2024. Since the previous assessment, partnerships and expertise have broadened which will help to gather a more accurate representation of adaptation actions required and assess the economic impact of climate change.

Working with Perth and Kinross and Angus Councils and supported by Adaptation Scotland, regional adaptation work is being carried out to identify synergies in CRVAs, regional adaptation actions and funding opportunities.

Local Area Energy Planning

The Local Area Energy Plan will provide a route map for Dundee to transition towards a decarbonised energy system. It will encompass all energy vectors (heat, electricity and transport) and will aim to understand the nature, scale, rate and timing of changes that need to be made through technical analysis and comprehensive stakeholder engagement. Optimisation modelling will consider local energy assets such as the local distribution system, electricity generation and storage, heat generation and storage, domestic and non-domestic buildings, in-boundary refuelling and transportation, and heat networks. Outputs are expected in summer 2024.

Data

Natural Capital Baseline Assessment

A baseline assessment was carried out in March 2023 of the following Ecosystem services:

- Carbon storage & sequestration
- Soil erosion prevention
- Flood risk reduction
- Important areas for pollinators
- Important biodiversity habitats and connectivity for woodlands
- Enhanced biodiversity metric for Scotland

This report calculated the natural capital assets and ecosystem service flows within the council area and was a starting point to future adaptation planning. It will be repeated in 2026 to monitor the effectiveness of interventions. It will also be used as valuable data for the 2024 CRVA, a refresh of the 2018 data.

Policy 10 – Coastal Development

National Planning Framework 4 (NPF4)

Policy 10 Coastal Development aims to protect coastal communities and assets and support resilience to the impacts of climate change.

The policy outlines that LDP spatial strategies should consider how to adapt coastlines to the impacts of climate change. This should recognise that rising sea levels and more extreme weather events resulting from climate change will potentially have a significant impact on coastal and islands areas, and take a precautionary approach to flood risk including by inundation. Spatial strategies should reflect the diversity of coastal areas and opportunities to use nature based solutions to improve the resilience of coastal communities and assets. LDP spatial strategies should identify areas of developed and undeveloped coast and should align with national, sectoral and regional marine plans.

Dundee Local Development Plan 2019

LDP Policy 36: Flood Risk Management states that:

Medium to High Risk Areas

There is a general presumption against

- a) development on previously undeveloped land and
- b) development of essential civil infrastructure, in high risk areas based on a 0.5% or greater annual probability of flooding (equivalent to a 1 in 200 year flood or greater) plus an additional allowance of 600mm. Other development may be acceptable where:
 - 1) sufficient flood defences already exist, or a Flood Protection Scheme or flood defence, designed and constructed to a standard of 0.5% annual probability plus climate change allowance, will be in place prior to occupation of the proposed development;
 - 2) those flood defences will be maintained for the lifetime of the development and will not increase the probability of flooding elsewhere;
 - 3) the extent of development potentially affected by flooding is protected through the use of appropriate water resistant materials and construction; and
 - 4) the finalised scheme does not result in a land use which is more vulnerable to flooding. A flood risk assessment will be required for any development within the medium to high risk category.

Low to Medium Risk Areas

Areas with a 1 in 1000 to 1 in 200 year annual probability of flooding will be suitable for most development. A flood risk assessment may be required at the upper end of the probability range or where the nature of the development or local circumstances indicates heightened risk. These areas are generally not suitable for essential civil infrastructure. Where such infrastructure must be located in these areas, it should be capable of remaining operational and accessible during extreme flooding events.

Coastal Change Adaptation Guidance

There are two main parts to the guidance. Part One sets out the context, wider policy links and an introduction to Coastal Change Adaptation. Part Two is the suggested process to draft a Coastal Change Adaptation Plan.

Over the last thirty years sea level across Scotland has risen between two and three times faster than over the previous 100 years. Mean sea level is anticipated to rise by between 0.30-1.16 m by 2100 (according to a high emissions scenario relative to a baseline period of 1981-2010). However, this does not include Antarctic ice sheet collapse with some estimates exceeding 2.5 m by 2100 for high emissions scenarios. Despite the uncertainties, sea level is projected to rise under all future emissions scenarios by 2100.

Of specific relevance to Dundee Part Two (Action Plans) states that local authorities will have flexibility in how the Action Plans are costed and developed. For example, coastal erosion is not anticipated for Dundee city waterfront so the policy choice could be Hold the Existing Line (HTEL) with foreseeable adaptations required related to managing increasing flood risk.

River Basin Management Plan for Scotland 2021-2027

River basin management planning (RBMP) protects and improves Scotland's water environment for the benefit of people, wildlife and the economy.

Much of the water environment in Scotland is in good condition. However, there are still significant problems affecting water quality, physical condition, water resources, and the migration of wild fish.

The River Basin Management Plans for Scotland set out a range of actions to address these impacts. They are produced by SEPA on behalf of Scottish Government. They cover actions for public bodies, industry and land managers in Scotland. They summarise:

- the state of the water environment;
- pressures affecting the quality of the water environment where it is in less than good condition;
- actions to protect and improve the water environment;
- a summary of outcomes following implementation.

Figure 1 – Overall condition of surface waters in 2020



Image reference: [RBMP3 \(sepa.org.uk\)](https://sepa.org.uk)

Above are the watercourses, within closest proximity to Dundee:

- Invergowrie Burn is a river (ID: 6405) in the Dundee Coastal catchment of the Scotland river basin district. The Invergowrie Burn is noted as having a good overall condition.
- Dighty Water is a river (ID: 6001) in the Dighty Water catchment of the Scotland river basin district. The Dighty Water is noted as having a moderate overall condition.

Figure 2 – Surface waters affected by pressures from all themes in 2020



Invergowrie Burn

Current condition and future objectives

	Current	2027	Long Term
Overall	Good ecological...	Good ecological...	Good ecological p...
Water quality	Good	Good	Good
Water flows and levels	Good	Good	Good
Physical condition	Good ecological...	Good ecological...	Good ecological p...
Access for fish migration	High	High	High
Freedom from invasive species	High	High	High

Dighty Water

Current condition and future objectives

	Current	2027	Long Term
Overall	Moderate ecolog...	Poor ecological ...	Moderate ecologi...
Water quality	Moderate	Moderate	Good
Water flows and levels	Good	Good	Good
Physical condition	Moderate ecolog...	Good ecological...	Good ecological p...
Access for fish migration	High	High	High
Freedom from invasive species	Moderate	Moderate	Moderate

Above are the watercourses, within closest proximity to Dundee that are affected by pressures. The tables above outline the current condition (2020), expected condition in 2027 and the longer term expected condition. For the Invergowrie Burn this remains stable with no anticipated change in the condition of the watercourse. For the Dighty Water, there is change anticipated in 2027 to the overall condition, but this is expected to return to the current (2020) condition in the longer term. This should be read in conjunction with the action proposed to the Dighty Water as outlined in the maps below. This is also relevant for water quality and physical condition which are both anticipated to improve.

Figure 3 – Where action is not required and action is planned to address surface water pressures from all themes

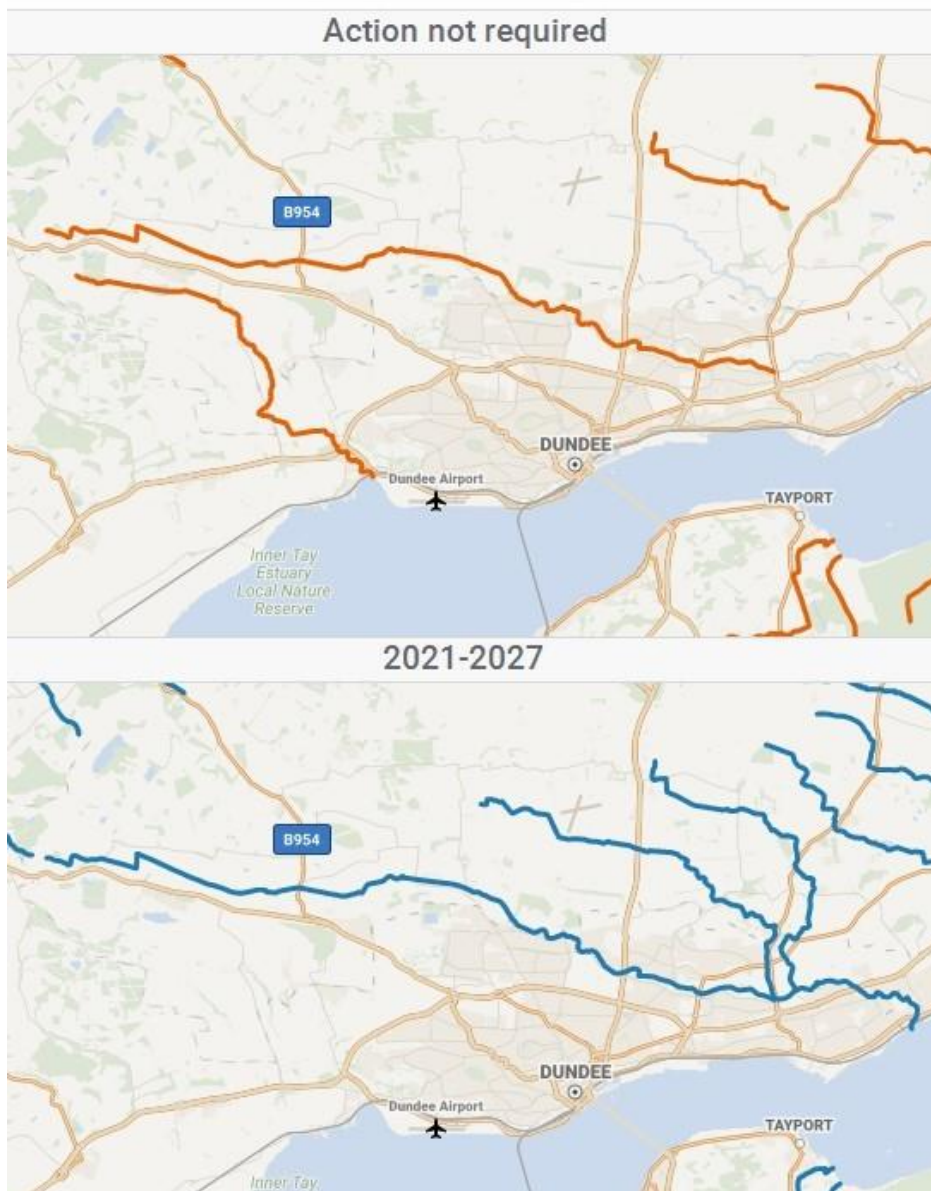


Image reference: [RBMP3 \(sepa.org.uk\)](https://sepa.org.uk)
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There is action noted for the Dighty Water including modifications to the physical condition (rural) of the watercourse and modifications to the physical condition (urban). There is also action planned on rural diffuse pollution and water quality.

Water Environment data: The classification data referred to in the paper is for 2020 as this was the data available at the time of publication of the River Basin Management Plan for Scotland 2021-2027. However, Dundee City Council are aware that the most recent water environment classification data now available is for 2022 and can be accessed from the Water Classification Hub (sepa.org.uk). This will be referred to, and cross-referenced, as work on the Local Development Plan progresses.

Tay Estuary Forum Management Plan

The Forum region extends from the tidal limit of the Firth of Tay at Scone, to Fife Ness and to the River North Esk on the open coastline; it extends to a distance of at least 5 km offshore. The area is governed by four local authorities (Angus, Dundee, Fife and Perth & Kinross), and encompasses a diverse range of environments, including three estuaries: the Tay, Eden and Montrose Basin.

The region is rich in biodiversity with nationally and internationally important designated species and habitats. Home to over half a million people, there are inevitable pressures along this stretch of coast where the interactions between people, their environment and economic demands are constantly evolving.

This work is quite dated now, but remains relevant for Dundee and the wider region read alongside other more up to date plans, strategies and projects.

National Marine Plan

This Plan covers both Scottish inshore waters (out to 12 nautical miles) and offshore waters (12 to 200 nautical miles).

This National Marine Plan sets out strategic policies for the sustainable development of Scotland's marine resources out to 200 nautical miles. It is required to be compatible with the UK Marine Policy Statement and existing marine plans across the UK, in particular where there is interaction between England inshore and offshore marine plans and Northern Ireland Marine Plans

As set out in the National Marine Plan and of specific note for Dundee:

Oil and gas: The location of Scottish ports in relation to oil and gas reserves in the North Sea means they have strategic importance in handling products as well as servicing of industry boats and infrastructure and general support of the industry. Sullom Voe, Flotta, Grangemouth, Aberdeen and Dundee are of particular importance

Guide to Climate Change Impacts

This strategy sets out many of the risks and hazards of climate change that are facing Scotland's historic environment and offers routes to take action, to implement adaptation measures and enhance resilience to climate change. The guide has a specific section that considers the impacts and adaptation for the coastal historic environment.

SEPA Guidance on Climate change allowances for flood risk assessment in land use planning

This guidance provides regional uplift values for Scotland, indicating how much peak rainfall, river flows and sea levels are expected to rise. Sea level rise allowances (0.85m for the Tay River Basin Region) included in this guidance should be used to calculate areas at risk of

flooding in site specific assessments. This guidance will be updated as evidence on climate science evolves.

Data

Scottish Coastal Observatory Data - This data set comprises the monitoring data collected as part of the Scottish Coastal Observatory. Some of this data is quite dated but a baseline which other more up to date plans and strategies are relevant.

SEPA coastal flood maps – SEPA's flood maps are designed to help understand how places could be affected by flooding. The maps show areas which are likely to flood from rivers, the sea and surface water. The flood maps are a public tool and used by a wide variety of people for a range of work. As per NPF4, 'at risk of flooding' means there is an 'annual probability of being flooded of greater than 0.5% which must include and appropriate allowance for future climate change'. This risk is indicated on SEPA's Future Flood Maps.

Marine Scotland data portal - Marine Scotland Data Publication is a platform for publishing datasets with associated digital object identifiers (DOI's). This allow users to reference data appropriately, and for researchers to gain recognition for publishing data.

Dynamic Coast- This research project aims to provide the strategic evidence base on the extent of coastal erosion in Scotland and improve awareness of coastal change. The Future Erosion data shows anticipated erosion areas for a High Emissions, 'do nothing' scenario by 2050 and 2100. There are visible areas in Dundee, particularly along the Broughty Ferry esplanade, which is likely to be a significant future challenge, and may increase the risk of flooding.

Policy 11 - Energy

National Planning Framework 4 (NPF4)

This policy aims to encourage, promote and facilitate renewable energy development onshore and offshore. It states that “LDPs should seek to realise their area’s full potential for electricity and heat from renewable, low carbon and zero emission sources by identifying a range of opportunities for energy development”. The policy offers strong support for proposals that:

- Maximize renewable energy generation and reduce emissions,
- Deliver economic benefits to local communities,
- Minimize negative impacts on people, landscapes, and the environment.

Project designs must consider and mitigate potential issues like noise, visual impact, and ecological disruption.

Dundee Local Development Plan 2019

Policy 45: Energy Generating Facilities

This policy outlines where large and small-scale energy generating facilities can be built in Dundee. Large facilities must be located in designated employment areas to minimize impact. They should also use technology to reduce emissions and may require air quality assessments. Small scale facilities outside industrial zones are only supported if they produce heat or power locally. Development may be acceptable where set criteria are met. These include minimal noise, odour, and visual impact, along with best available technology for pollution control.

Policy 47: Wind Turbines

Dundee is unable to accommodate large scale wind farms due to proximity to residential and urban areas. Small scale proposals involving the production of energy by wind turbines will be supported provided there would be no unacceptable negative effects in relation to biodiversity, landscape and visual impacts, carbon rich soils, effects on the quality of the water environment.

Policy 48: Low and Zero Carbon Technology in New Development

This policy aims to reduce greenhouse gas emissions from buildings, a major contributor in Scotland.

New buildings must incorporate low-carbon technologies like solar panels or heat pumps to meet the carbon emissions reduction standard set by Scottish Building Standards.

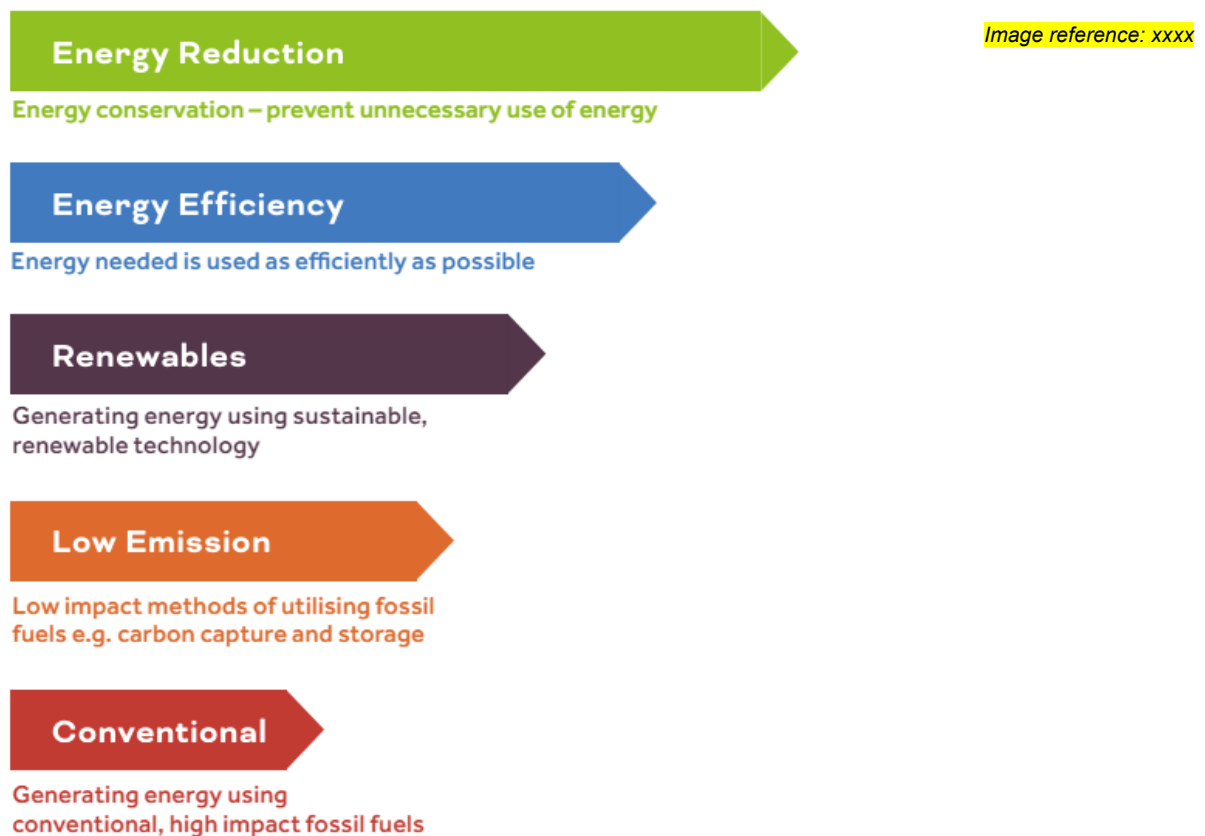
Exceptions include alterations and extensions to buildings, change of use or conversion of buildings, ancillary buildings that stand alone and cover an area less than 50 square metres, and those which will not be heated or cooled, other than by heating provided solely for frost protection.

Applicants are required to submit a statement demonstrating compliance with this policy when applying for planning permission.

Dundee Climate Action Plan

One of the four key themes of this plan is to reduce the consumption of energy, promote energy efficiency and increase the proportion of power and heat from low and zero carbon technologies. In Dundee, according to the 2015 MEI, less than 1% of our locally generated electricity comes from renewable sources. There is therefore great potential to increase the percentage of local electricity generation from renewable sources in Dundee to make a significant reduction in emissions.

The Climate Action Plan was developed with the principles of the energy hierarchy, where the approach seeks to reduce the amount of energy used in the first place, before employing technologies to reduce energy, as shown below.



Draft Energy and Just Transition Plan

This plan sets out the Scottish Government's route map of actions towards delivering a flourishing net zero energy system that supplies affordable, resilient and clean energy to Scotland's workers, households, communities and businesses. Key ambitions for Scotland's energy future include:

- More than 20 GW of additional renewable electricity on- and offshore by 2030.
- An ambition for hydrogen to provide 5 GW or the equivalent of 15% of Scotland's current energy needs by 2030 and 25 GW of hydrogen production capacity by 2045.
- Increased contributions from solar, hydro and marine energy to our energy mix.

- Accelerated decarbonisation of domestic industry, transport and heat.

Hydrogen Action Plan

The Scottish Government's proposed actions to support the development of a hydrogen economy are set out in this plan. Dundee is identified as a potential regional hydrogen hub due to being ideally located next to several offshore wind farms. Michelin Innovation Parc (MSIP) is a key site, focused on driving innovation and research and development in sustainable mobility and low-carbon energy and offering a wide range of industrial spaces.

Onshore Wind Policy Statement 2022

This statement sets an overall ambition of 20 GW of installed onshore wind capacity in Scotland by 2030. The policy focuses on deploying wind turbines in designated areas to minimize impact on communities and the environment.

Developers are encouraged to involve communities and offer them ownership opportunities in new wind projects. The policy emphasizes using best practices to minimize noise, visual impact, and other potential negative effects of wind farms.

Local Area Energy Planning

The Local Area Energy Plan will provide a route map for Dundee to transition towards a decarbonised energy system. It will encompass all energy vectors (heat, electricity and transport) and will aim to understand the nature, scale, rate and timing of changes that need to be made through technical analysis and comprehensive stakeholder engagement. Optimisation modelling will consider local energy assets such as the local distribution system, electricity generation and storage, heat generation and storage, domestic and non-domestic buildings, in-boundary refuelling and transportation, and heat networks. Outputs are expected in summer 2024.

Port of Dundee Infrastructure Masterplan

Forth Ports Dundee lies on the north side of the River Tay estuary and serves the North Sea sector, encompassing the transition to low carbon energy sources. Current and ongoing Dundee Port Renewables Sector Wind Farm Projects work areas include:

- Wind Turbine Construction
- Jacket Logistics
- Subsea Foundation or Moorings
- Subsea Transmission Cables
- Commissioning/Operations & Maintenance

National Marine Plan and Review

The National Marine Plan for Scotland, adopted in March 2015, sets out strategic policies for the sustainable development of marine resources. The plan provides a framework for managing all developments, activities, and interests in or affecting Scotland's marine area. Dundee port is recognised as a National Renewables Infrastructure Plan site due to being a key location to meet offshore renewable industry needs i.e. construction/installation, manufacturing and inspection, repair and maintenance.

The NMP is currently being updated. A key reason to update is the need to have more of a

focus in marine planning on addressing the twin crises of climate change and biodiversity loss. Scottish Government's Marine Directorate are leading the process for the development of NMP2, starting in 2023 and taking several years.

Sectoral marine plan: regional locational guidance

This sets out regional spatial baseline data for the sectoral marine plan for offshore wind energy and describes the information used in the planning and assessment process. The Port of Dundee's strategic position within the East Region means that it plays a significant role in supporting renewable energy through manufacturing and maintenance.

Pathway to 2030: A Holistic Network Design for Offshore Wind- ESO Beyond 2030- ESO

The National Grid ESO (Electric System Operator) strategies leading up to 2030 and beyond are important in setting the broader aims/targets for aiding the transition to Net Zero. These papers refer to the wider UK context rather than Dundee specifically but set out the bigger picture on large strategic electricity network developments, which will be largely influenced by the increase in renewable energy generation from offshore wind development driven by on-going Scot Wind seabed leasing rounds.

SSEN Network Visibility Strategy

This strategy sets out how SSEN Transmission envisage their involvement in upgrading and modernizing the electricity distribution network to achieve reductions in carbon emissions across operations and enhance reliability and resilience against extreme weather events and other challenges. The primary focus is on advanced grid technologies, including smart grid systems and automation as well as facilitating the integration of more renewable energy sources into the grid.

Distribution Future Energy Scenarios 2023 (North of Scotland)

The Distribution Future Energy Scenarios (North of Scotland) is a strategic framework developed by Scottish and Southern Electricity Networks (SSEN) to explore and plan for potential future energy demands and supply scenarios in the North of Scotland. This framework aims to understand and anticipate the evolving energy landscape over the coming decades, driven by technological advancements, policy changes, and the transition to low-carbon energy sources. It includes Dundee-specific data and modelling on energy from waste, battery storage sites and EV uptake.

Data

Marine Scotland data

Marine Scotland Maps is a portal to provide spatial information and data to support national and regional marine planning. One key dataset is an assessment of Scottish blue carbon. Blue carbon habitats such as saltmarsh, sand dunes and seagrass have been threatened by coastal energy development and competing land use.

National Grid ESO's interactive map

This map features the Electricity System Operators' view of future transmission requirements and the capability of Great Britain's National Electricity Transmission System over the next 10 years. It also includes recommendations for which reinforcement projects should receive investment.

SSEN Distribution Data Portal

This portal allows access to electricity network datasets including the NeRDA Opengrid dashboard which aims to examine how near real-time energy demand and usage can be best used by stakeholders.

SSEN Local Energy Net Zero Accelerator (LENZA) tool

SSEN and Advanced Infrastructure have developed a net zero planning tool which allows stakeholders including Dundee City Council access to up-to-date network capacity, building stock data and modelling tools to support informed decision making. This tool has been used in the development of the Council's Local Heat and Energy Efficiency Strategy and Local Area Energy Planning.

SSEN Transmission Assets within local authority boundary (internal GIS layer)

This internal GIS layer assists planning officers with identifying planning applications that fall within the notification corridor around SSEN Transmission's assets e.g. overhead and underground electricity lines. If an application falls within the polygon, SSEN Transmission are consulted.

SSEN Transmission Open Data Portal

This portal includes datasets and maps setting out the location and characteristics of SSEN Transmission's infrastructure assets including substation sites, grid towers, and overhead lines.

Scottish Energy Statistics Hub

This provides interactive charts, commentary and downloadable data related to energy in Scotland. Themes include electricity and gas systems, oil and gas, energy efficiency and renewables and low carbon.

Policy 12 – Zero Waste

National Planning Framework 4 (NPF4)

Policy 12 Zero Waste aims to encourage, promote and facilitate development that is consistent with the waste hierarchy.

The policy outlines that LDPs should identify appropriate locations for new waste management infrastructure to support the circular economy and meet identified needs in a way that moves waste as high up the waste hierarchy as possible.

Dundee Local Development Plan 2019

LDP Policy 43: Waste Management Installations states that:

Existing waste management installations are safeguarded unless evidence is presented to demonstrate that the facility is no longer required and that the capacity can be met through an alternative facility. New waste management installations should be located in the first instance in General Economic Development Areas identified in the Proposals Map unless the Council is satisfied that proposals are consistent with a strategy or programme approved by the Council or serve a strategic need for the management of waste.

Development which meets the above requirement may be permitted provided:

- 1) there is no detrimental impact on neighbouring uses or local residential amenity;
- 2) there is no unacceptable traffic impact;
- 3) it does not have an adverse effect, either alone or in combination with other proposals or projects, on the integrity of any Natura site.; and
- 4) suitable standards of restoration following decommissioning are proposed and agreed by the Council.

LDP Policy 44: Waste Management Requirements for Development states that:

Development proposals should demonstrate that they adequately address the Scottish Government's Zero Waste Policy and that sufficient provisions are made to maximise opportunities for waste reduction and waste separation at source and enable the separate collection of recyclable material as outlined in the Waste (Scotland) Regulations 2012. Site waste management plans are required for major developments to ensure sufficient control for site waste during construction and operation of new development.

Scotland's Circular Economy and Waste Route Map to 2030 Consultation

The route map sets out strategic direction for delivering our system-wide, comprehensive vision Scotland's circular economy from now to 2030. Building on a first consultation (2022), the Route Map consults on key priority actions that will unlock progress across the waste hierarchy.

A circular economy, based on sustainable consumption and production, is reported to be essential to power Scotland's transition to a fair, green and sustainable economy, and critical to meeting our obligations to tackle the twin climate and nature emergencies.

Material consumption and waste are primary drivers of nearly every environmental problem Scotland currently faces, from water scarcity to habitat and species loss. Around four-fifths of Scotland's carbon footprint comes from the products and services we manufacture, use and

throw away and 90% of global biodiversity loss and water stress is caused by extraction and processing of these products.

The Scottish Government is committed to delivering a different approach to our economy, one where we move from a "take, make and dispose" model to one where we value materials and keep them in use.

Measures in the Route Map are grouped under four strategic aims, which reflect the span of the waste hierarchy:

1. Reduce and reuse - Reducing and reusing waste are the first goals of the waste hierarchy and central to changing our relationship with materials and products. Building an economic system that moves away from being based on items that are designed to be disposable will bring significant environmental benefits.

2. Modernise recycling - Recycling helps to conserve our natural resources, keep valuable materials flowing through our economy and reduce the amount of waste sent to landfill. The Route Map notes that Scotland is to become a world-leader in recycling, where recycling and reuse services are easy to use and accessible to all, and support and encourage positive choices. By 2030, we want a high-performing recycling system that has modernised recycling services for households and businesses across Scotland, optimised the performance of collection services, and can recycle most waste types to maximise diversion of waste from disposal. Increasing the amount of materials recycled and increasing the proportion of these recycled in Scotland will deliver carbon reductions, reduce the environmental impacts associated with extracting new raw materials, and create a 10 range of important economic opportunities to reprocess and reuse materials here in Scotland.

3. Decarbonise disposal - The production and management of waste results in environmental impacts and represents missed economic opportunities for these materials. That is why the focus in the Route Map is to prevent materials from becoming waste in the first place. As the move to a circular economy is accelerated, less waste will be produced. It is important to ensure that materials that cannot be avoided, reused or recycled are managed in a way that minimises environmental and climate impacts, encourages management of materials further up the waste hierarchy, and minimises broader societal impacts.

4. Strengthen the circular economy - Delivering a circular economy is not a simple task. It requires sustained transformational system change, and a range of actions that are both complementary and coordinated to drive sustainable management of our resources. If Team Scotland are to maximise the opportunities that a circular economy brings to Scotland, a strategic approach to its delivery must be maintained, ensuring the right structures and support are in place to enable action across the circular economy.

Waste and Recycling Strategy & Action Plan

This strategy seeks to consolidate the work already undertaken to further improve sustainable waste management within Dundee to ultimately meet the aspiration of an entirely waste free Dundee. Actions have been identified to achieve this overall aim. This will increase Dundee's recycling rate, influence widespread behavioural change and foster a greater sense of civic pride amongst residents, visitors and businesses.

In order to affect any significant change in Dundee's overall recycling performance, a step change in the behaviour of service users is required.

Whilst many Dundee citizens are committed recyclers, others have not yet made the shift away from their reliance on the general waste bin to dispose of all wastes indiscriminately. In common with other city authorities, this is a particular issue in flatted property areas with communal bins in central locations due to lack of ownership and reduced efforts to recycle.

Policy 19 – Heating and Cooling

National Planning Framework 4 (NPF4)

Policy 19 Heating and Cooling aims to encourage, promote and facilitate development that supports decarbonised solutions to heat and cooling demand and ensure adaptation to more extreme temperatures.

The policy outlines that LDPs should take into account the area's Local Heat & Energy Efficiency Strategy (LHEES). The spatial strategy should take into account areas of heat network potential and any designated Heat Network Zones (HNZ).

Dundee Local Development Plan 2019

Policy 46: Delivery of Heat Networks

Proposals for new development should meet their heat demand through heat networks, by considering the feasibility to create or link into an existing energy centre and heat network or demonstrate the capability to progress towards this technology in the future. A statement will be required to be submitted with an application for planning permission to demonstrate that consideration has been given to the viability of creating or linking into a heat network.

This requirement applies to the following development:

- a) Proposals that are subject to a Major planning application, or would cumulatively exceed the Major planning application thresholds; or
- b) Proposals for housing or commercial development in locations where Scotland's Heat Map or the City's heat network strategies indicate that they are close to a significant heat supply source or a planned heat network.

In both cases the development layout should be designed to be capable of connecting to the heat network or heat source and areas for pipe runs within the development should be safeguarded to enable future connectivity.

Heat in Buildings Strategy 2021

This sets out the Scottish Government's vision for the future of heat in buildings, and the actions being taken in the buildings sector to deliver climate change commitments, maximise economic opportunities, and ensure a just transition, including helping address fuel poverty. The approach and timeline for Local Heat and Energy Efficiency Strategies is also set out in this document.

Dundee City Council Heat Network Statement Planning Guidance 2020

This guidance is used to assist developers/agents on what is required to comply with Dundee Local Development Plan Policy 46: Delivery of Heat Networks with regards to the submission of a statement with their planning applications.

The type of development and where it is located within the City determines the action required. In the first instance developers should check Scotland's heat map and Dundee's District Heating Strategy to identify if there are any heat centres, identified heat demand or opportunities that may be appropriate to the development. If it is considered that there is an opportunity to create or link to a heat network as part of the development, early discussion

with the Council is required to establish how this could be implemented. Where the creation of or link to a heat network is not considered viable, evidence of why this would be case is required e.g. evidence from heat mapping, heating strategy etc. Where a heat network is considered unviable developers are required to demonstrate how the development could be future proofed to enable future connection and choice for the end user.

DCC District Heating Strategy 2018-2028

This document aims to identify potential district heating networks in Dundee, including the short, medium and long-term strategic opportunities and the development of a long term vision to support the City’s growth and low carbon transition using decentralised energy.

District heating systems use a network of pipes to deliver heat from a place where heat is generated to multiple customers where heat is used.

The heat is typically in the form of hot water and is transported through a network of pre-insulated underground pipes. The heat may be generated in an energy centre using any of a range of technologies (e.g. surplus heat recovered from an energy from waste facility or other industrial plant, water source heat pump, gas combined heat and power (CHP), solar thermal, etc.), and could change over time as lower carbon/ renewable heat sources emerge.

Buildings are connected to the heat network through a substation where the heat used is metered. Buildings may have an associated energy centre which at times provides heat to the building, but at other times feeds heat into the wider district heating network. As the district heating network expands, higher levels of efficiency and resilience are achieved through the incorporation of multiple heat sources supplying multiple and varying demands.

Figure 1 – Diagram of a district heating network

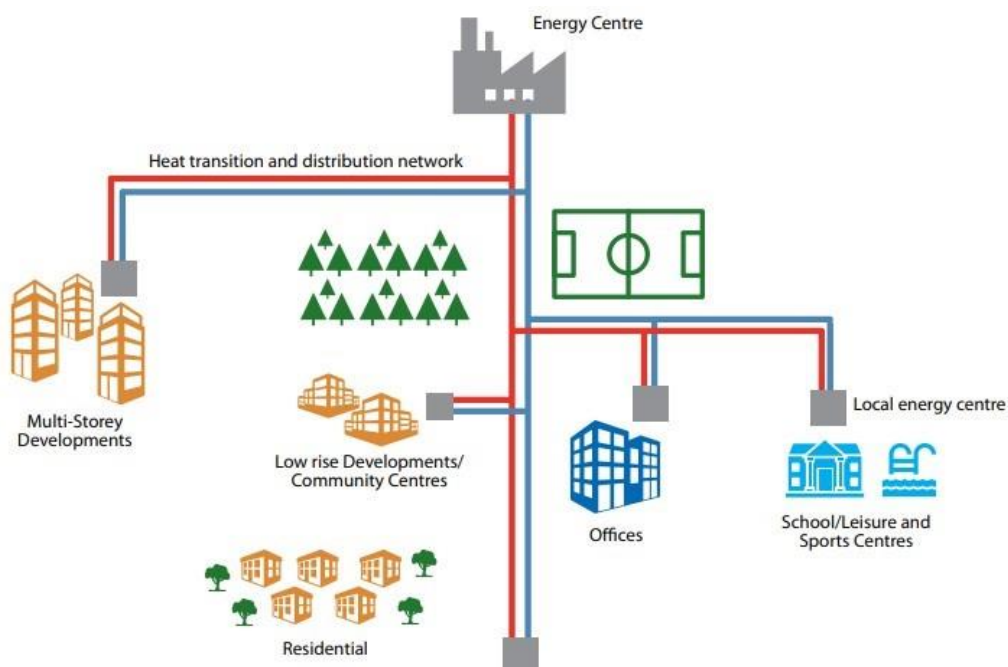


Image reference: <https://www.dundee.gov.uk/sites/default/files/publications/districtheating.pdf>

District heating systems usually offer benefits deriving from economies of scale.

Tackling fuel poverty, reducing CO2 emissions and decentralising energy are key issues for the city as identified in the City Plan, the Council Plan and the Capital Investment Strategy. The District Heating Strategy has therefore been brought forward to deliver these commitments and aims to provide another step forward in the Council's long standing aspiration for the city framed around jobs, social inclusion and quality of life.

The District Heating Strategy follows the Scottish Government's Heat hierarchy of:

1. Reducing the need for heat
2. Supply heat efficiently and at least cost to consumers
3. Use renewable and low carbon heat resources

Dundee Local Heat and Energy Efficiency Strategy (February 2024)

The requirement for a Local Heat and Energy Efficiency Strategy was introduced by the Scottish Government to drive forward heat decarbonisation and better energy efficiency in buildings.

Dundee's Local Heat and Energy Efficiency Strategy (LHEES) is an important strategic plan for the city. It highlights key steps for reducing heating related carbon emissions, enhancing building energy efficiency, and addressing fuel poverty. It will help to tackle the city's climate emergency and meet its net zero target whilst also improving the thermal comfort and health and wellbeing of residents and offering the potential for new economic opportunities in the city.

The Delivery Plan is to be published separately and will detail how the Council plans to implement the key actions in the Strategy.

LHEES has two core functions and six scopes, referred to as considerations in the guidance.

Figure 1 – What is the LHEES aiming to do?

Core Function	Considerations	Description
Heat Decarbonisation	Off-gas buildings	Transitioning away from oil and LPG in off-gas properties.
	On-gas buildings	Transitioning away from natural gas in on-gas properties
	Heat networks	Identifying potential heat networks for decarbonisation of heat.
Energy Efficiency Improvement	Poor building energy efficiency	Identifying possible locations at a strategic and delivery level where poor building energy efficiency exists across the Local Authority area. Target measures to improve the energy efficiency.
	Poor building energy efficiency as a driver for fuel poverty	Identifying possible locations at a strategic and delivery level where poor building energy efficiency acts as main driver for fuel poverty. Target measures to remove poor energy efficiency as the cause of fuel poverty.
	Mixed-tenure, mixed-use and historic buildings	Identifying buildings of mixed-tenure or mixed-use, historic buildings, listed buildings, and conservation areas. Target measures to improve energy efficiency and decarbonise heating for these buildings.

Image reference: https://www.dundee.gov.uk/sites/default/files/lhees_strategy.pdf

Key considerations from LHEES

- 12% of properties are off-gas in Dundee. The LHEES focuses on initiatives to target these properties with energy efficiency improvements.
- 87% of domestic properties are connected to the mains gas supply, suggesting a huge challenge in transitioning away from natural gas.
- The LHEES analysis has built on the Scottish Government National Assessment work to identify 23 Potential Zones using the Baseline criteria, with a total heat demand of 767 GWh/year (about 48% of total heat demand in Dundee).
- Ten Potential Zones were then identified using the Stringent criteria in Dundee, with a total heat demand from all properties within the zone of 538 GWh/year (about 34% of total heat demand in Dundee).
- After additional analysis, five Potential Zones were selected for closer analysis, in line with section 48 of the Heat Network (Scotland) Act 43. These zones have been identified as strategically important for heat network development in Dundee and are classed as 'Priority Zones'. They are given the highest priority and incorporate additional contextual factors such as fuel poverty, existing heat networks, feasibility studies, and decarbonisation plans.

- The properties in the five Priority Zones use a **total of 554 GWh/year of heat (35% of total demand in Dundee)**. Key factors that influenced which zones were chosen were LDP housing allocations, Scottish Water sewer pipes, Council owned properties, and existing heat networks:
 - HNZ 1 – City Centre
 - HNZ 2 – Baldovie
 - HNZ 3 – Ninewells
 - HNZ 4 – Caird Park
 - HNZ 5 – Lochee
- 47% of domestic properties in Dundee are rated EPC D-G, which is lower than the national average (51%).
- The average probability of a household being in fuel poverty and extreme fuel poverty is 31% and 21%, respectively. This is higher than the Scottish average.
- Around half of Dundee’s domestic properties are situated within multi-dwelling buildings. Of these properties, approximately 70% are contained in buildings with more than one type of tenure (owned, rented, etc).

Local Area Energy Planning

The Local Area Energy Plan will provide a route map for Dundee to transition towards a decarbonised energy system. It will encompass all energy vectors (heat, electricity and transport) and will aim to understand the nature, scale, rate and timing of changes that need to be made through technical analysis and comprehensive stakeholder engagement. Optimisation modelling will consider local energy assets such as the local distribution system, electricity generation and storage, heat generation and storage, domestic and non-domestic buildings, in-boundary refuelling and transportation, and heat networks. Outputs are expected in summer 2024.

Data

Dundee City Council Local Heat and Energy Efficiency Webmap

This is a key spatial data source setting out domestic and non-domestic property baselines, areas of heat demand, strategic zones and potential heat network zones. One layer of the map presents Prioritised Zones, those taken forward for prioritisation of heat network development, based on results from heat network zoning analysis, stakeholder engagement and existing knowledge of opportunities in the area. These zones are: City Centre (which includes the University of Dundee Campus and City Quay), Lochee, Caird Park, Ninewells Hospital, and Baldovie.

Scotland Heat Map

The Scotland Heat Map is a GIS tool that can be used to identify opportunities to reduce carbon emissions from heat in buildings. The map includes spatial information on aspects such as district/communal heat networks and heat demand confidence.

3. Implications for the Proposed Plan

Policy 1 - Tackling the climate and nature crises

Climate change and extreme weather events have already impacted many aspects of our natural environment and our society, including buildings and property, health, agriculture, forestry, transport, water resources and energy demand.

Climate change affects a range of social and environmental determinants of health, such as clean air, safe/uncontaminated drinking water, sufficient food and shelter (World Health Organisation). Increased risk of flooding to people, communities and buildings remains among the most severe climate change risks for Scotland.

Climate change may also bring a range of benefits to people. The most common perceived opportunities from climate change in Scotland being that of a more active outdoor lifestyle and exercise, and increased tourism.

In light of the evidence above, below outlines some issues and questions which will be required to be addressed in moving forward towards the Proposed Plan:

- Review the site selection process to ensure that there are criteria and requirements built in to consider climate change requirements as set out in NPF4.
- Consider the implications of 20-minute neighbourhoods, rural living and reducing emissions.

Evidence relating to the nature crisis is also relevant to this topic area but has been more extensively set out in the preceding Biodiversity and Natural Places Topic Paper. The Proposed Plan will need to address the twin threats of climate change and the nature crisis and best address these through an emphasis on place and healthy living.

Policy 2 – Climate Mitigation and Adaptation

See Policy 1 Tackling the climate and nature crisis

Policy 10 – Coastal Development

For Dundee, the Proposed Plan will require to take into account areas of developed and undeveloped coast. Through this, consideration and analysis will also be required into the implications of projected coastline changes in the city, and the potential impacts of these. Identifying opportunities for soft engineering solutions which provide ecological solutions where possible, rather than hard structures on undeveloped coastline is a key consideration.

Furthermore, and related to this will be for the Proposed Plan to consider projected sea level changes and the probability of flooding from all sources. The above data sources and evidence also include reference to the River Basin Management Plan. This is important for Dundee, in particular the two main water courses which flow into the Tay and the implications of these and coastal development. The significance of these water courses, and the impacts of climate change, is a key consideration in moving forward to the Proposed Plan. The National Marine Plan refers to this, but as this plan is now quite dated, its importance will now be how the aims and objectives of this are taken forward into the Proposed Plan alongside current projects and policy objectives for the future.

Policy 11 - Energy

The growth in electric vehicles, emerging technologies such as hydrogen, and changes to how we store energy across the system will impact electricity networks and are likely to place extra pressure on the electricity network's ability to generate, store and deliver the capacity necessary to meet peaks in demand. A 'whole systems' approach is required which considers heat, electricity and transport in planning future decarbonised energy systems.

In respect of stand-alone energy production facilities, it is doubtful that this policy will have a significant impact upon Dundee due to the limited geographical area. The City does however have obvious opportunity for small scale renewables to play a role as well as supporting the offshore renewable energy industries. Existing and emerging strategies for the delivery of key strategic grid improvements and the delivery of renewables will help to identify key locations in the LDP. There are clear links between this policy theme and heating/cooling as well as the Infrastructure First approach set out in NPF4.

Energy infrastructure must not have a detrimental impact on nationally and internationally important designated sites and valued natural and cultural assets. However, due to the constrained urban area of Dundee, the assessment of new critical energy infrastructure will need to consider wider public benefits as well as quantifiable detrimental impacts on a designation or asset.

Policy 12 – Zero Waste

The evidence above reiterates that transforming our economy into a circular one, where materials are kept in use for longer, is key to responding to zero waste challenges. This is a key commitment of the Scottish Government in tackling the climate emergency. The climate emergency has intensified our focus on emissions reduction, and how we view and treat our resources. We can see day-to-day the impacts that climate change and the nature crises are having on our communities, our society, our economic wellbeing, and our environment in Dundee.

Achieving zero waste, and a circular economy, going forward must be a team effort, with planning having part of that responsibility. Clear direction through the Local Development Plan will ensure consistency in decision making through planning applications and help contribute to national goals. The Proposed Plan and spatial strategy will require to consider and identify appropriate locations for new waste management infrastructure.

Policy 19 – Heating and Cooling

The LDP can have a role in increasing awareness of the importance of improving energy efficiency, tackling fuel poverty and promoting measures for new development to meet net zero.

Heat Network Zones (HNZ) identified through the LHEES should be included in the LDP as designated areas. There are five Priority Zones identified within the LHEES as strategically important for heat network development in Dundee. The Priority Zones appear well suited to the building and operation of heat networks and have been given the highest priority as they incorporate additional contextual factors such as fuel poverty, existing heat networks, feasibility studies and decarbonisations plans. The LHEES Delivery Plan provides a summary

of the priorities, targets and indicators that will be used to measure the progress of LHEES and this will be a key monitoring and delivery tool that will inform the inclusion and designation of HNZs within the spatial strategy of the LDP.

Development proposals within or adjacent to a Heat Network Zone identified in the LDP, will be only supported where designed and constructed to connect to an existing heat network.

The LHEES and Scotland Heat Map will inform the potential for co-locating developments with a high heat demand together with sources of heat supply such as heat recovered from surplus or waste heat sites (e.g. wastewater treatment sector).

4. Engagement and Consultation

Stakeholder Working Group

The below initial stakeholder working group was developed through internal and external individuals with specific interest in the thematic area of Biodiversity, Natural Places, Trees and Soils. The initial stakeholder working group was restricted to internal Dundee City Council representatives and external contacts within Key Agency group topic experts. These topic experts have assisted in developing a robust evidence base for the topic paper grouping.

Internal

- DCC Environment
- DCC Sustainability and Climate Change

External

- NatureScot
- SEPA
- Scottish Water
- Historic Environment Scotland
- SSEN Transmission
- SSEN Distribution