Topic 5: Climate Change, Mitigation and Adaptation

Engagement version March 2025

Requirements addressed in this section:

Information required by the Town and Country Planning (Scotland) Act 1997, as amended, regarding the issue addressed in this section.

Town and Country Planning (Scotland) Act 1997, as amended

Section	Requirement
Section 15(5)	The principal physical, cultural, economic, social, built heritage and environmental characteristics of the district.
Section 15(5)	The principal physical and environmental characteristics of the district.
Section 3F	Policies regarding low and zero-carbon generating technologies in new buildings.

Other Relevant Legislation

Section	Requirement
The Town and Country Planning (Development Planning) (Scotland) Regulations 2023 Regulation 9 Have regard to: any river basin management plan; any flood risk management plan; and any local flood risk management plan.	

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National Planning Framework 4

Climate and Nature Crisis

LDPs must address the global climate emergency and nature crisis by ensuring the spatial strategy will reduce emissions and adapt to current and future risks of climate change by promoting nature recovery and restoration in the area.

Climate Mitigation and Adaptation

The LDP spatial strategy 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.

Flood Risk and Water Management

LDPs should strengthen community resilience to the current and future impacts of climate change, by avoiding development in areas at flood risk as a first principle. Resilience should also be supported by managing the need to bring previously used sites in built up areas into positive use; planning for adaptation measures; and identifying opportunities to implement improvements to the water environment through natural flood risk management and blue green infrastructure.

Plans should take into account the probability of flooding from all sources and make use of relevant flood risk and river basin management plans for the area. A precautionary approach should be taken, regarding the calculated probability of flooding as a best estimate, not a precise forecast. For areas where climate change is likely to result in increased flood exposure that becomes unmanageable, consideration should be given to alternative sustainable land use

Links to Evidence

Climate and Nature Crisis, Mitigation and Adaptation

- Scotland's Climate Change Plan
- Securing a Green Recovery Path to Net Zero: Climate Change Plan 2018 - 2032 Update
- Scottish National Adaptation Programme 2024 – 2029
- Progress in reducing emissions in Scotland 2023 Report to Parliament (2024)
- Scotland's Biodiversity Strategy and Delivery Plan
- Adaptation Scotland
- climate-projections-scotland-summary-dec21.pdf
- Low Emission Zones Scotland
- Scotland's Environment
- ESPON – Quantitative Greenhouse Gas Assessment tool for Spatial Planning
- National Planning Framework 4 Research Project: lifecycle greenhouse gas emissions of NPF4 proposed national developments: assessment findings
- Scottish Carbon Capture and Storage
- Nature Scot's Carbon and Peatland Map (2016)
- Improving Access to Geospatial Climate Risk data – Climatexchange
- Aberdeen Adapts
- Aberdeen Adapts Evidence Report
- Net Zero Vision for Aberdeen
- Net Zero Routemap Aberdeen
- Council Climate Change Plan 2021 -2025
- Met Office Climate Report for Aberdeen City (11/12/2024)
- UK local authority and regional greenhouse gas emissions statistics, 2005 to 2022 - GOV.UK
- Aberdeen Emissions Inventory Report (AEIR) 2021 (received as report submitted via email)

Flood Risk and Water Management

- The Flood Risk Management (Scotland) Act 2009: Delivering Sustainable Flood Risk Management
- National Flood Resilience Strategy (2024)
- Position Statement: Elevated buildings in areas of flood risk
- Flood Risk Management Plan
- Local Flood Risk Management Plan 2022 - 2028
- The River Basin Management Plan for Scotland 2021 – 2027
- climate-change-allowances-guidance.docx
- SEPA Flood Maps

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- Flooding | Beta | SEPA | Scottish Environment Protection Agency
- SEPA Water Scarcity Report
- Mapping Flood Disadvantage tool and report
- Water Environment Hub
- Recommended Riparian Corridor Layer for use in Land Use Planning
- Recommended Riparian Corridor map
- WAT-SG-44
- Strategic Flood Risk Assessment

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Summary of Evidence

Policy context

Purpose and Scope of Evidence Report Chapter

There is a climate and nature crisis. Planning can influence how we reduce greenhouse gas emissions, adapt to the impacts of climate change, protect and enhance our natural assets, and support a fair and inclusive transition to a low-carbon economy. Resilience regarding the water environment supports the current and future impacts of climate change. This will be discussed in further detail below.

This section is structured in the following order:

- Climate and Nature Crisis, Mitigation and Adaptation
- Flood Risk and Water Management

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Climate and Nature Crisis, Mitigation and Adaptation

Scotland's Climate Change Plan
Scotland's Climate Change Plan provides a high level overview of Scotland's climate change policies and actions. These are divided into six key themes as identified below:

- Net Zero Target: Scotland aims to achieve net zero emissions of all greenhouse gases by 2045.
- Climate Change Plan: The Climate Change Plan update reflects increased ambition and sets out actions to meet the targets.
- Adaptation and Resilience: Emphasizes the need to adapt and build resilience to climate change impacts.
- Just Transition: Focuses on ensuring a fair transition to a net zero economy, benefiting all sectors of society.
- Public and International Engagement: Involves engaging with businesses, communities, and international partners to tackle climate change.
- Legislation: Includes the Climate Change (Scotland) Act 2009 and its amendments, which set the framework for emissions reduction targets and climate action.

Securing a Green Recovery Path to Net Zero: Climate Change Plan 2018 - 2032 Update
An update to 'Scotland's Climate Change Plan', it outlines Scotland's strategy for achieving ambitious climate targets while promoting a green recovery from COVID-19. This Plan reiterates Scotland's ambitious target to achieve net zero by 2045 and, it emphasizes the integration of climate action with economic recovery post-COVID-19.

Key Sectors and Actions:

1. Electricity:
   - Increase renewable energy capacity.
   - Enhance grid infrastructure to support renewable integration.
2. Buildings:
   - Improve energy efficiency in homes and public buildings.
   - Promote the use of low-carbon heating systems.
3. Transport:
   - Encourage the adoption of electric vehicles.
   - Invest in public transport and active travel infrastructure.
4. Industry:
   - Support industrial decarbonization through innovation and technology.
   - Implement carbon capture and storage (CCS) projects.

5. Waste and Circular Economy:
    - Reduce waste generation and increase recycling rates.
    - Promote circular economy practices to minimize resource use.
6. Land Use and Agriculture:
    - Enhance carbon sequestration through forestry and peatland restoration.
    - Support sustainable agricultural practices.

Cross-Cutting Themes:

- Just Transition: Ensure that the transition to a low-carbon economy is fair and inclusive.
- Engagement: Involve communities, businesses, and stakeholders in climate action.
- Monitoring and Reporting: Regularly assess progress and adapt strategies as needed.

Notably, the plan references the 75% carbon emissions reduction by 2030, set by the Climate Change (Scotland) Act 2009. This has since been amended by the Climate Change (Emissions Reduction Targets) (Scotland) Act 2024, which introduced modifications to the interim targets. However, the target of achieving net zero emissions by 2045 remains.

Scotland's Climate Change Adaptation Plan 2024 – 2029

The Scottish Government produced the Climate Change Adaptation Plan under the Climate Change (Scotland) Act 2009. It is a requirement to produce an adaptation plan every 5 years in response to the Climate Change Committee's independent assessment of climate risks in the UK . The UK Climate Change Committee publish a monitoring and evaluation framework to help measure progress towards meeting the aims in the adaptation plan. The Scottish Government also publish annual progress reports on climate change adaptation: Scottish Climate Change Adaptation Programme: progress report 2023 to 2024

The Adaptation Plan sets out a long term vision and defines Scotland's priorities for action over the next five years. The Adaptation Plan is structured in five chapters, covering five outcomes to deliver a climate resilient Scotland. Under each outcome are objectives where key policy actions are set out, as set out in the following table:

Outcomes and objectives for adaptation

Five adaptation outcomes; 23 objectives	
Nature Connects	
Nature connects across our lands, settlements, coasts and seas.	
NC1: Nature-based solutions	NC2: Landscape scale solutions
NC3: Development planning	NC4: Nature networks
NC5: Marine, coastal and the blue economy	NC6: Natural carbon stores and sinks
Communities	
Communities are creating climate-resilient, healthy and equitable place.	
C1: Regional and place-based collaborations	C2: Locally-led adaptation
C3: Community resilience	C4: New and existing buildings
C5: Culture and historic environment	C6: Coastal communities
Public Services & Infrastructure	
Public services are collaborating in effective and inclusive adaptation action.	
PS1: Public body duties and capacity	PS2: Public service and infrastructure resilience
PS3: Scotland's water resources	PS4: Transport system
Economy, Business & Industry	
Economies and industries are adapting and realising opportunities in Scotland's Just Transition.	
B1: Business understanding of climate risk	B2: Support for farming, forestry, fishing and aquaculture sectors
B3: Innovation opportunities	B4: Economic development and supply chains
International Action	
Scotland's international role supports climate justice and enhanced global action.	
IA1: Supporting vulnerable communities globally	IA2: International Advocacy
IA3: Knowledge advocacy	

Figure 1 : Adaptation Outcomes and Objectives from Scotland's Climate Change Adaptation Programme, 2024,

Progress in reducing emissions in Scotland 2023 Report to Parliament (2024)
This report has been prepared by the Climate Change Committee (CCC) as an annual update to the UK Parliament, reporting on Scotland's progress towards their climate goals.

The report monitors Scotland's progress in reducing emissions and assesses the policies in place for delivering future emissions reduction. The report is in accordance with Sections 9 (1) and (2) of the Climate Change (Scotland) Act 2009. The Scottish Government's response to the Climate Change Committee's 2023 report highlights several key points:

- Scotland's emissions halved between 1990 and 2022, while the economy grew by 67%, showing that tackling climate change and economic growth can go hand in hand.
- The second half of the journey to net zero will be more challenging, requiring a just transition in areas like agriculture, transport, and heat in buildings.
- Positive progress includes the extension of free bus travel to under-22s and planting nearly 75% of all new forests in the UK last year.
- The Scottish Government announced an accelerated package of new climate action measures, including the development of approximately 24,000 additional electric vehicle charging points by 2030 and a new integrated ticketing system for public transport.

The report goes on to identify next steps, of which the following have a relationship to development planning:

- The transport sector requires practical delivery plans in areas including charging infrastructure, car demand reduction and decarbonisation of aviation and shipping.
- Policy plans must address barriers to enable woodland creation and peatland restoration rates to scale up significantly.
- Stronger action is needed to increase recycling rates and reverse recent increases in waste incineration.

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Scotland's Biodiversity Strategy and Delivery Plan
This strategy sets out a clear ambition: for Scotland to be Nature Positive by 2030, and to have restored and regenerated biodiversity across the country by 2045. The vision for Scotland is to have restored and regenerated biodiversity across land, freshwater and seas by 2045. The natural environment, habitats, ecosystems and species, will be diverse, thriving, resilient and adapting to climate change.

Six detailed outcomes are identified which will help define what success will look like in terms of land and seascapes; on land; in rivers, lochs and wetlands; and, in marine and coastal environments.

- Accelerate restoration and regeneration;
- Protect nature on land and at sea, across and beyond protected areas;
- Embed nature-positive farming, fishing and forestry;
- Protect and support the recovery of vulnerable and important species and habitats;
- Invest in Nature; and,
- Take action on the indirect drivers of biodiversity loss.

Included within the Strategy is a commitment to protecting 30% of land and seas for nature by 2030 as part of the 30 by 30 policy.

Adaptation Scotland
The Adaptation Scotland programme provides advice and support to help Scotland be prepared and resilient to the effects of climate change. Within their 'Climate Projections for Scotland - Summary' report, they outline the following anticipated changes to our climate: average temperatures will increase across all seasons; typical summers will be warmer and drier; typical winters will be milder and wetter; intense; heavy rainfall events will increase in both winter and summer; sea levels will rise; reduced frost and snowfall, and; weather will remain variable and may become more variable. Additionally, they highlight 15 key impacts of climate change already observed in Scotland and are likely to become more prevalent over the coming years. Aberdeen Adapts, Aberdeen City Council's climate adaptation framework, outlines the impacts for the city. This is discussed in further detail later in this Topic Paper.

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Low Emission Zones Scotland
Low Emission Zones (LEZ) will help to protect public health by improving air quality, as well as delivering various health, environmental and economic benefits, including:

Health:
- cleaner air can have health benefits for everyone, especially for old and very young people and for those with existing heart and lung conditions.
- in 2010, the UK Government's Department of Health's Expert Advisory Committee, the Committee on the Medical Effects of Air Pollution (COMEAP), estimated that poor air quality shortens average life expectancy in Scotland by three to four months (compared to six to seven in England and Wales). Vulnerable groups are disproportionately affected (Health Protection Scotland, 2014).

Environment:
- can help reduce pollution from vehicle emissions.
- help to accelerate the uptake of lower emission vehicles – and cleaner vehicles. Also benefit all areas the vehicles travel through – not just the LEZ.
- encourage people to consider using more public transport and active travel methods instead of driving.

Economy
- can help improve air quality and protect public health within towns and cities. This makes them more attractive places to live, work and to visit.

Aberdeen's low emission zone was introduced on 31 May 2022, and covers an area of the city centre. The LEZ was introduced to address air pollution in the city centre, mainly nitrogen dioxide (NO2), caused by road traffic. Please see Wellbeing and Community paper for more information.

Scotland's Environment
The website hosts 229 mapping overlays that can be applied to an interactive map. The data hosted is shared by a variety of contributing partners such as Marine Scotland, Nature Scot, SEPA and the Scottish Land Commission. The map can therefore provide targeted information and datasets for Aberdeen.

ESPON – Quantitative Greenhouse Gas Assessment tool for Spatial Planning
This project is part of the ESPON 2020 Cooperation Programme, which aims to support the development of evidence-based spatial planning policies across Europe. The main objective of the QGasSP project is to create a robust, simple, and proportionate methodology that allows planning authorities at national, regional, and local levels to quantify and forecast the influence of spatial planning policies on greenhouse gas (GHG) emissions.

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Key points from the report include:

- The European Union (EU) is committed to reducing GHG emissions by 55% by 2030 and achieving climate neutrality by 20501.
- The project aims to collect consistent and comparable GHG baseline emissions data at various administrative levels to assess the urban and land-use share of GHG emissions relevant for spatial planning policy.
- The methodology will help model the efficacy of spatial plans and possible alternatives, aiding in cross-country, inter-regional, and inter-municipality comparisons.
- The project will enhance the scientific understanding of how planning authorities can prioritise relevant GHG mitigation strategies and build political will for climate action.

National Planning Framework 4 Research Project: lifecycle greenhouse gas emissions of NPF4 proposed national developments: assessment findings
This document provides an in-depth analysis of the lifecycle greenhouse gas (GHG) emissions associated with proposed national developments in Scotland's National Planning Framework 4 (NPF4). The assessment aims to support the Scottish Government's commitment to achieving net-zero emissions by 2045.

Key points from the report include:

- The assessment covers various proposed national developments, evaluating their potential GHG emissions throughout their lifecycle, from construction to operation and decommissioning.
- It identifies opportunities for reducing emissions through design, construction practices, and operational efficiencies.
- The report emphasises the importance of integrating low-carbon and renewable energy solutions into national developments to minimise their environmental impact.
- It also highlights the need for continuous monitoring and evaluation of GHG emissions to ensure that the proposed developments align with Scotland's climate targets.

The report evaluates several proposed national developments in Scotland, two of which are affiliated with Aberdeen:

- Urban Mass/Rapid Transit Networks: This development aims to facilitate a shift towards sustainable transport in Glasgow, Edinburgh, and Aberdeen, as well as their wider regions. It focuses on reducing transport-related emissions and supporting accessibility for all. This is outlined further in the Topic Paper: Sustainable Transport.

- Aberdeen Harbour: This project involves the expansion and improvement of facilities at Aberdeen Harbour to support the energy transition and enhance its role as a key port for the offshore energy sector.

These developments are part of Scotland's broader strategy to reduce greenhouse gas emissions and achieve net-zero targets. The report provides detailed assessments of the potential lifecycle GHG emissions associated with each of these projects and identifies opportunities for reducing emissions through design, construction practices, and operational efficiencies.

Scottish Carbon Capture and Storage (SCCS)
SCCS provides useful information, publications and datasets relating to carbon capture and storage (CCS) and, the journey to Net Zero. The website identifies CCS projects around the world, one of which is 'The Scotland Net Zero Infrastructure (SNZI) programme'. The project summary below outlines the important role the North East of Scotland has to play in achieving a Net Zero future for Scotland.

Scotland Net Zero Infrastructure (SNZI) Programme:

- Collaborators: Includes Pale Blue Dot, SSE Thermal, National Grid, Petrofac, LNG9/GB-Tron, University of Strathclyde, and NECCUS.
- Projects:
    - Detailed engineering for Acorn CCS and Hydrogen projects.
    - New CCS-equipped power station at Peterhead.
    - Re-use of onshore pipelines for CO2 transport.
    - Carbon capture design for a new gas-fired power station in Grangemouth.
    - Design of CO2 tanker ships for coastal emitters.
- Investments and Developments:
    - £1.23m investment for Scotland's Net Zero Roadmap project.
    - Establishment of the UK Industrial Decarbonisation Research and Innovation Centre at Heriot Watt University.
    - Potential for over £3 billion in onshore and offshore developments.
- Advantages for Scotland:
    - Utilizes existing infrastructure and CO2 storage potential.
    - Leverages large-scale renewable energy build-out.
    - Ensures a Just Transition for the skilled workforce.

This programme positions Scotland as a leader in industrial decarbonisation and net zero efforts.

Nature Scot's Carbon and Peatland Map

The Carbon and Peatland map 2016 can be used to identify locations of carbon-rich soils, deep peat and priority peatland habitat. Classes 1 and 2 are identified as being a nationally important resource and areas that are likely to be of high conservation value.

Within Aberdeen, small areas of Class 1 land can be found on land adjacent to Gough Burn (north-west of Kepplestone) and at Leuchar Moss (south-east of Garlogie). There is no Class 2 within the city boundary. There is only one recorded location of Class 3 land (referring to Leached Soils), which is of poorer quality than Class 1 and 2 land, and is largely covered by the southern edge of the Prime Four Business Park at Kingswells.

There are multiple areas of Class 5 (Organic Soils) within Aberdeen located at Grandhome Moss, land at Burn of Mundurno, Lily Loch, Corby Loch, South Mains of Charleston, and land to the South-East of Lochside Academy.

The types of peat shown on the map are:

- carbon-rich soils
- deep peat
- priority peatland habitat

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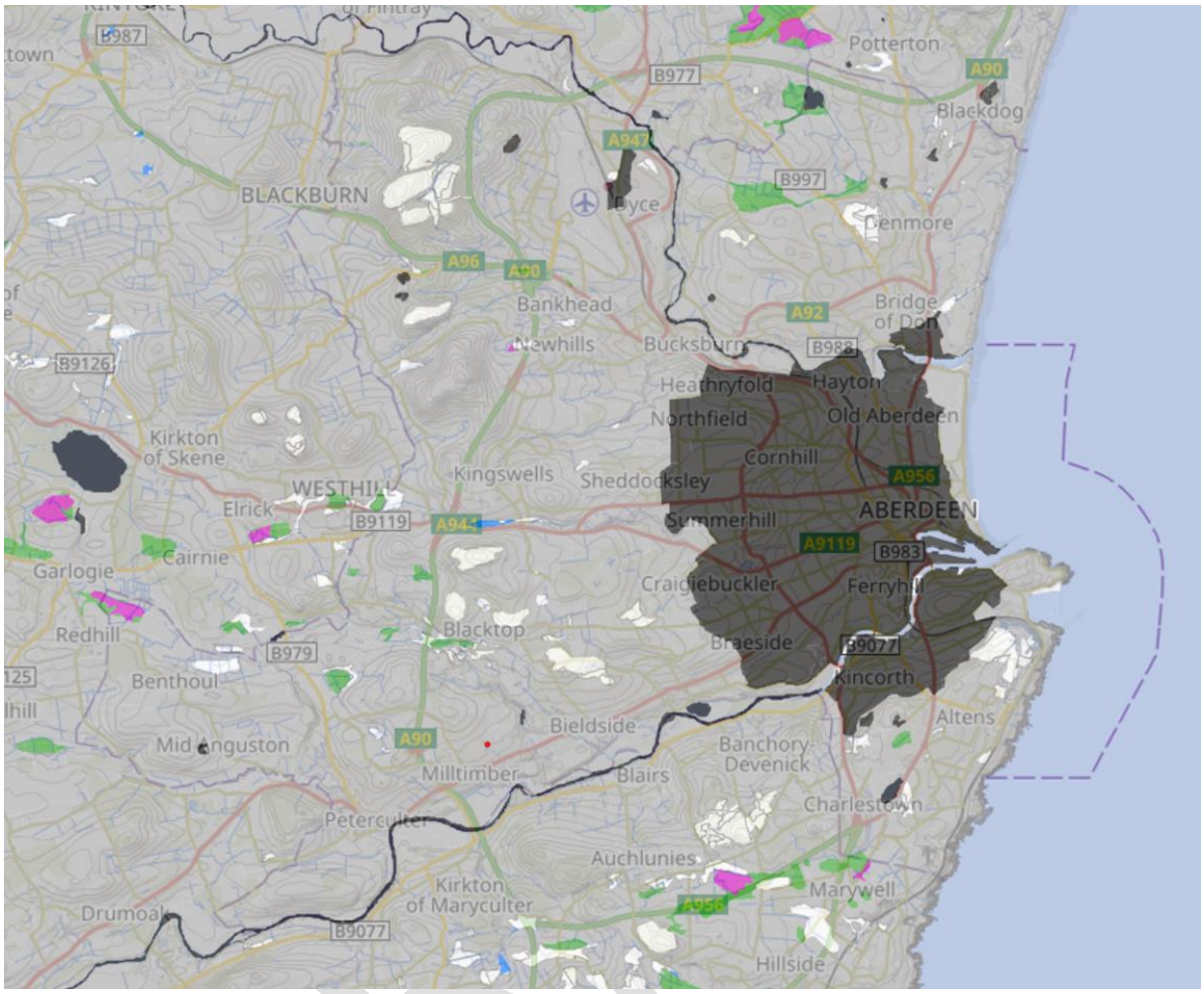


Figure 2: A snapshot of Aberdeen taken from Scotland's Carbon and Peatland Map 2016. Can be found at : Scotland's Soils - soil maps

Aberdeen Adapts

Aberdeen Adapts is a collaborative framework for city-wide working on adaptation. Incorporating the views of local organisations and communities. Page 10 highlights projected climate impacts for Aberdeen and, shares the evidence base used to inform the document.

Future Climate Impacts indicated for Aberdeen:

- A reduction in summer rainfall which could affect water quality and availability.
- An increase in autumn/winter rainfall. This won't mean more rainy days, but when it does rain it will be much heavier.
- There will be an increase in temperatures across all seasons.
- In winter there will be less snow, ice and frost days, although there could still be an extreme snowfall event.

- In summer there will be an increase in temperatures and what we consider a heatwave could occur more frequently.
- There will be a rise in sea level.

"An assessment of climate risks has been produced in a separate Evidence Base for Aberdeen Adapts. This takes on board information relevant to Aberdeen from UK Climate Projections UKCP18 and relevant risks identified in the Third UK Climate Change Risk Assessment. The Evidence Base is a live document and identifies climate risks relevant to Aberdeen, actions already taking place; and in line with the UK approach, indicates where more action is needed, where further investigation is required, where action should be sustained and areas that need monitored." (Aberdeen Adapts, 2022, pg. 10).

The Evidence Base report sets out climate risks and opportunities relevant to Aberdeen for the following categories:

- Buildings and heritage;
- Transport & infrastructure;
- Water, energy & communications;
- Species, habitats & landscape;
- Soil;
- Trees and woodlands;
- Watercourses and coastline;
- Communities;
- Health and wellbeing;
- Economy; and,
- Food.

The report includes additional information of challenges and opportunities for research and awareness. It summarises the current policies and actions relating to adaptation in Aberdeen and, it identifies ways to strengthen resilience to climate change.

Net Zero Vision for Aberdeen

The vision emphasizes the city's role in leading the shift from fossil-based energy systems to renewable energy sources, leveraging its expertise in the oil and gas industry to support this transition.

The strategy identifies several priority actions to support the energy transition, including investments in renewable energy, energy efficiency, and sustainable transport, such as:

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- Investing in Renewable Energy: This includes expanding the use of offshore wind, hydrogen, and other renewable energy sources. The goal is to leverage Aberdeen's existing expertise and infrastructure to become a leader in renewable energy production.
- Enhancing Energy Efficiency: The strategy emphasizes the importance of improving energy efficiency in buildings and infrastructure. This involves retrofitting existing buildings and ensuring new developments meet high energy efficiency standards.
- Developing Sustainable Transport: The plan includes initiatives to promote sustainable transport options, such as electric vehicles, public transport, and active travel. This aims to reduce emissions from the transport sector and improve air quality in the city.
- Supporting Innovation and Technology: Aberdeen aims to foster innovation and technology development in the energy sector. This includes supporting research and development projects, as well as creating an environment that encourages the growth of new energy technologies.
- Building a Resilient Economy: The strategy highlights the need to build a resilient economy that can adapt to the challenges of the energy transition. This involves supporting businesses and workers in the transition to new energy industries and ensuring that the benefits of the transition are shared widely.

Overall, the Aberdeen Energy Transition Vision 2020 provides a roadmap for the city's transition to a sustainable and climate-positive future.

Net Zero Aberdeen Routemap

The Net Zero Aberdeen Routemap and the supporting six themed strategies set out the approach for the journey to a net zero city, aiming to build on the existing foundations of Aberdeen's Net Zero Vision. The six themed strategies are as follows:

- Buildings and heat: reducing energy demand, energy efficiency and transitioning to low and zero carbon heat.
- Circular economy: making better use of valuable resources.
- Energy Supply: increasing decentralised energy, developing green hydrogen, offshore wind; alongside expanding skills and supply chains.
- Mobility: Reducing the demand for travel, moving to low and zero emission vehicles and boosting active travel.
- Natural Environment: Protecting and enhancing nature across the city, contributing to an overall reduction in emissions from land and to increase carbon stores.
- Empowerment: Setting the means and mechanisms for input, participation and collaboration vital to a just transition for the city.

Net Zero Aberdeen sits alongside Aberdeen Adapts: Climate Adaptation Framework. In driving forward to meet city net zero ambitions, we need to build in resilience, taking action to prepare for inevitable changes in climate.

Council Climate Change Plan 2021 - 2025

The Council Climate Change Plan 2021-2025 sets a net zero target for Aberdeen City Council's own assets and operations and drives a significant increase in actions to reduce carbon emissions and to build resilience. Delivery of the plan will make an active contribution to the Council's wider net zero city commitment. The Plan identifies the Councils targets for a net zero future:

"We will achieve net zero corporate carbon emissions by 2045 at the latest with interim targets of: - a reduction of at least 48% by 2025 - a reduction of at least 75% by 2030 (against Council 2015/16 reporting baseline) This plan will be reviewed in 2025 and thereafter every 5 years, or earlier taking into account changes to legislation strategy and guidelines."* (Council Climate Change Plan 2021 - 2025, Pg. 4).

The document provides a table which highlights five themes covering council assets and operations and a list of outcomes. These are identified as:

- Buildings: Council Buildings and Council Housing;
- Mobility: Fleet and Staff Travel;
- Operations: Street Lighting, Internal Waste, Nature Based Action;
- Leadership and Governance: Process, Procurement and Decision Making; and,
- Awareness and Behaviour Change: Communications, Participation and Training.

Under these themes the document identifies a number of projects which the Council will undertake to satisfy the outcomes identified within the five themes to move towards their net zero target. The Local Development Plan is one of a number of Plans and Strategies that will be used to deliver these projects, for example the 'Mapping of Blue / Green Infrastructure Opportunity Sites' project.

Met Office Climate Report for Aberdeen City

The Met Office generated climate report for Aberdeen City provides an overview of climate change forecasting at a local level. A summary is as follows:

Current Climate:

- Eastern Scotland experiences the highest summer temperatures and significant rainfall variations.
- Recent decades have seen increased temperatures and changes in rainfall patterns.

Climate Change Impacts:

- Heat: Increased energy demand for cooling.
- Sea Level Rise: Higher risk of coastal flooding.
- Heavy Rainfall: Increased flooding risks.
- Health: Greater risk of heat stress.
- Drought: Potential water supply issues.
- Transport: Disruptions due to extreme weather.
- Environment: Threats to biodiversity.
- Energy: Infrastructure risks from flooding.

Future Projections:

- Warmer, wetter winters and hotter, drier summers.
- Increased frequency of extreme weather events.
- Sea level rise will continue, affecting coastal areas.

Local Climate Indicators:

- Projected increases in summer and winter temperatures.
- Changes in precipitation patterns, with potential for more intense rainfall events.

Sea Level Rise:

- Continued rise expected, with significant impacts on coastal infrastructure and communities.

Action and Adaptation:

- Emphasises the need for both mitigation (reducing emissions) and adaptation (preparing for impacts).
- Encourages local authorities, businesses, and the public to take proactive steps.

This report highlights the importance of understanding and preparing for climate change impacts specific to Aberdeen City.

Aberdeen Greenhouse Gas (GHG) Data

UK greenhouse gas statistics show that greenhouse gas emissions in Aberdeen City have been on a downward trend from 2005 to 2022 (published June 2024), shown in figure 3 below. The data confirms the key sources of GHG emissions are the transport and domestic sectors, shown in figure 4 below.

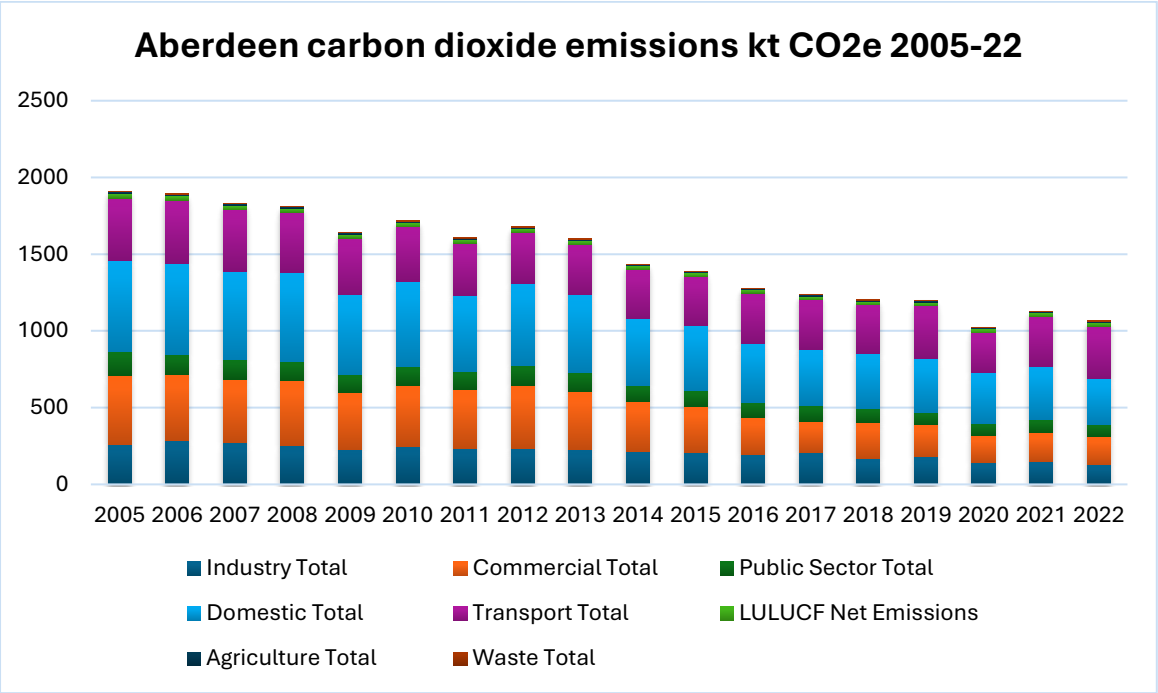


Figure 3: Bar graph showing the trend of carbon dioxide emissions by sector in Aberdeen from 2005-2022. Taken from Aberdeen Greenhouse Gas Data, submitted via email.

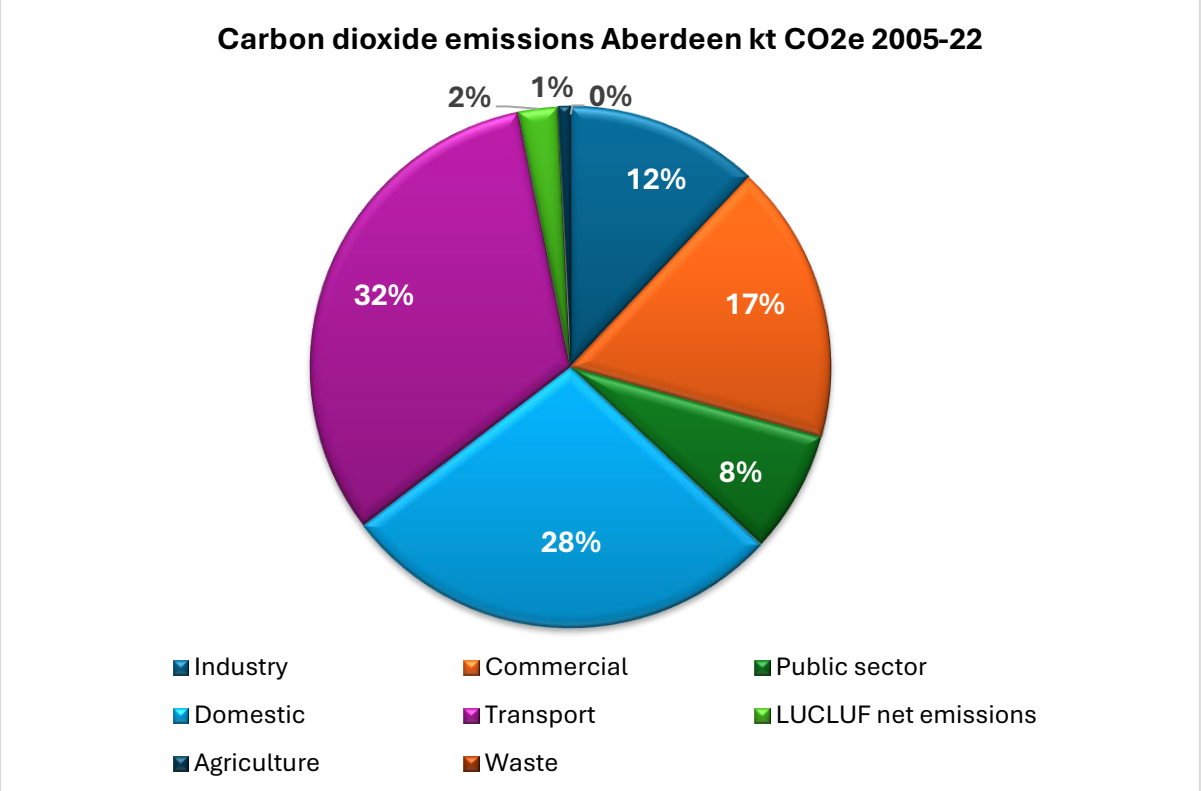


Figure 4: Pie chart showing the breakdown of carbon dioxide emissions by sector in Aberdeen from 2005-2022. Taken from Aberdeen Greenhouse Gas Data, submitted via email.

Topic 5: Climate Change, Mitigation and Adaptation

Aberdeen City Annual Emissions Inventory Report (2021)

The Annual Emission Inventory Report from the Scottish Climate Intelligence Service provides a comprehensive overview of 2021 area-wide emission categories within the ClimateView official board for the Aberdeen City area. Among the key takeaways outlined in the report, it is highlighted that between 2020 to 2021 there was a 3% increase in emissions. Regarding energy consumption, it is noted that from 2005-2021, energy consumption has reduced at a much slower rate with fluctuations in part related to the variation in retail price of natural gas and electricity. As the rate of grid decarbonisation slows, achieving further emission reductions will require a decrease in consumption.

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Flood Risk and Water Management

The Flood Risk Management (Scotland) Act 2009: Delivering Sustainable Flood Risk Management

The guidance reminds Local Authorities of their responsibilities around flood risk management under the Act. These responsibilities include:

1. Flood Risk Assessment:
   - Conduct assessments to identify areas at significant risk of flooding.
2. Flood Risk Management Plans:
   - Develop and implement local flood risk management plans in coordination with SEPA and other stakeholders.
3. Flood Protection Schemes:
   - Design, construct, and maintain flood protection schemes to reduce flood risk.
4. Surface Water Management:
   - Manage surface water to prevent flooding, including the implementation of sustainable urban drainage systems (SUDS).
5. Public Engagement:
   - Engage with communities to raise awareness about flood risks and involve them in flood risk management planning.
6. Emergency Response:
   - Prepare and implement emergency response plans for flood events.

National Flood Resilience Strategy (2024)

This report was produced as a response to the national climate emergency and seeks to offer a strategy to steer Scotland toward a flood resilient future. The report highlights that flooding is the costliest hazard caused by climate change in Scotland of which the frequency and severity of flooding is increasing. Future Projections state that by 2080, nearly 400,000 properties in Scotland will be at risk of flooding.

This strategy forms part of the Scottish National Adaptation Plan 2024-2029 (SNAP3), which is included in the Climate Mitigation and Adaptation section above. It identifies three key areas of focus:

- People: Involving communities in flood resilience decision-making.
- Places: Adapting land management and placemaking for flood resilience.
- Processes: Integrating flood resilience into planning and increasing collaboration.

The report confirms that Aberdeen is at high risk of flooding, particularly from coastal and river sources. Key outcomes to enable flood resilient places the report identifies for areas such as Aberdeen include:

1. **Community Engagement**: Active involvement of local communities in flood resilience planning and decision-making processes.
2. **Enhanced Land Management**: Implementation of adaptive land use practices and natural flood management techniques to reduce flood risks.
3. **Infrastructure Upgrades**: Improvements to urban drainage systems and the introduction of sustainable urban drainage systems (SuDS) to manage surface water effectively.
4. **Advanced Data Utilization**: Use of data analytics and real-time monitoring to enhance flood risk mapping and predictive modelling for better planning and response.
5. **Long-term Resilience**: Focus on building long-term flood resilience through collaborative efforts and strategic planning.

Position Statement: Elevated buildings in areas of flood risk
Aberdeen City Council acknowledges SEPA's guidance for elevated buildings in areas of flood risk and understands that it applies only where such structures are used to enable development that would not otherwise be acceptable according to National Planning Framework 4 Policy 22.

Local Flood Risk Management Plan – North East
The Flood Risk Management (Scotland) Act 2009 places a duty on responsible authorities to manage flood risk on a plan-led, risk based, sustainable way.
North East Local Plan District covers Aberdeen. It sets out the long term ambition for flood risk management. The actions are described and prioritised in six year planning cycles. Aberdeenshire are the lead local authority for the are responsible for providing the flood risk management plan for Aberdeen.

There is river, surface water and coastal flood risk in the Local Plan District, with the main risk coming from river and surface water flooding. Significant flooding from the sea and from smaller watercourses and surface water has also occurred, most notably in Aberdeen, with many towns and villages also affected by flooding.

Potentially vulnerable areas (PVAs) were designated in 2018 based on the potential current or future risk from all sources of flooding. They provide more specific local actions to manage flood risk in target areas. There are four PVA's in Aberdeen: Aberdeen City – North, Aberdeen City – South, Peterculter, Cove and Nigg Bay.

Aberdeen City – North is designated as a potentially vulnerable area due to the risk of flooding from surface water, small watercourses and the River Don to Bridge of Don, Dyce and Kingswells (north). There is a history of flooding to parts of the potentially vulnerable area from these sources, including recent flooding from surface water and small watercourses. Identified priority actions include flood studies, surface water management plans, flood scheme or works design, community engagement, flood scheme or works implementation, sewer flood risk

assessment, shoreline management plan (coastal adaptive plan), flood defence maintenance.

Aberdeen City – South is designated as a potentially vulnerable area due to the risk of river, coastal and surface water flooding to Aberdeen. Coastal flood risk is likely to increase due to sea level rise caused by climate change. Riverside Drive floods from the River Dee due to high tides. Surface water flooding affected Aberdeen on a number of occasions, causing roads to flood. The Merchant Quarter was particularly affected in the past. Identified priority actions include flood defence maintenance, flood scheme or works design, community engagement, flood scheme or works implementation, flood study, flood warning maintenance, strategic mapping improvements, shoreline management plan (coastal adaptive plan), sewer flood risk assessment, surface water management plan.

Peterculter is designated as a potentially vulnerable area due to river flooding from the Culter Burn, and surface water flooding. Recent flooding occurred due to river and surface water flooding. Identified priority actions include data collection, community flood alert, sewer flood risk assessment, surface water management plan, flood warning maintenance.

Cove and Nigg Bay is designated as a potentially vulnerable area due to the risk of surface water flooding in the Cove Bay and Nigg Bay areas of Aberdeen. Identified priority actions include surface water management plan, and sewer flood risk assessment.

The River Basin Management Plan for Scotland 2021 – 2027

SEPA has prepared a River Basin Management Plan (RBMP) for Scotland for 2021 to 2027 which sets out a framework for protecting and improving the benefits provided by the water environment. This RBMP builds on previous RBMPs published in 2009 and 2015, setting revised objectives for the period from 2021 to the end of 2027 and providing a programme of actions for achieving the objectives. 2027 is a significant date in the RBMP process. Over the past two cycles SEPA have been working towards having all feasible and proportionate actions in place by 2027 to achieve good or better condition for Scotland's water environment. This evidence source is explored further in the Nature and Biodiversity topic paper.

The Council has not prepared its own River Basin Management Plan but is seeking to mitigate the impact on the water environment and help halt species decline by seeking to deliver high quality, multifunctional blue-green spaces in new developments and promoting natural solutions such as rain gardens to deal with surface water.

- Surface Water Management Plans

Aberdeen City Council do not have a localised Surface Water Management Plan however, the organisation are working closely with Scottish Water and SEPA to provide a Strategic Growth Agreement (SGA). The SGA provides recommendations for sufficient natural remedies in terms of blue/green infrastructure to alleviate the pressures of surface water flooding in identified areas of risk. A final draft of the SGA is hoped to be published soon and so, whilst it cannot be considered within this evidence report, due consideration will be given to the SGA and all other relevant sources when drafting the next Local Development Plan.

- Coastal erosion

Evidence gathered regarding the effects of climate change on coastal communities are explored in the Spatial Strategy Topic Paper.

SEPA's guidance on Climate Change Allowances for Land Use Planning
The guidance sets out required allowances for climate change that must be used for flood risk assessment. It allows planning authorities in Scotland to underpin their land use planning decisions with the best evidence available. Allowances are "*a prediction of anticipated change in peak river flow, peak rainfall intensity or sea level rise caused by future climate change. The type of allowance used will depend upon the type of flooding being considered and, for river (fluvial) flooding, the size of catchment or location.*"

These allowances are made in available in map form. See a screenshot from the map below:

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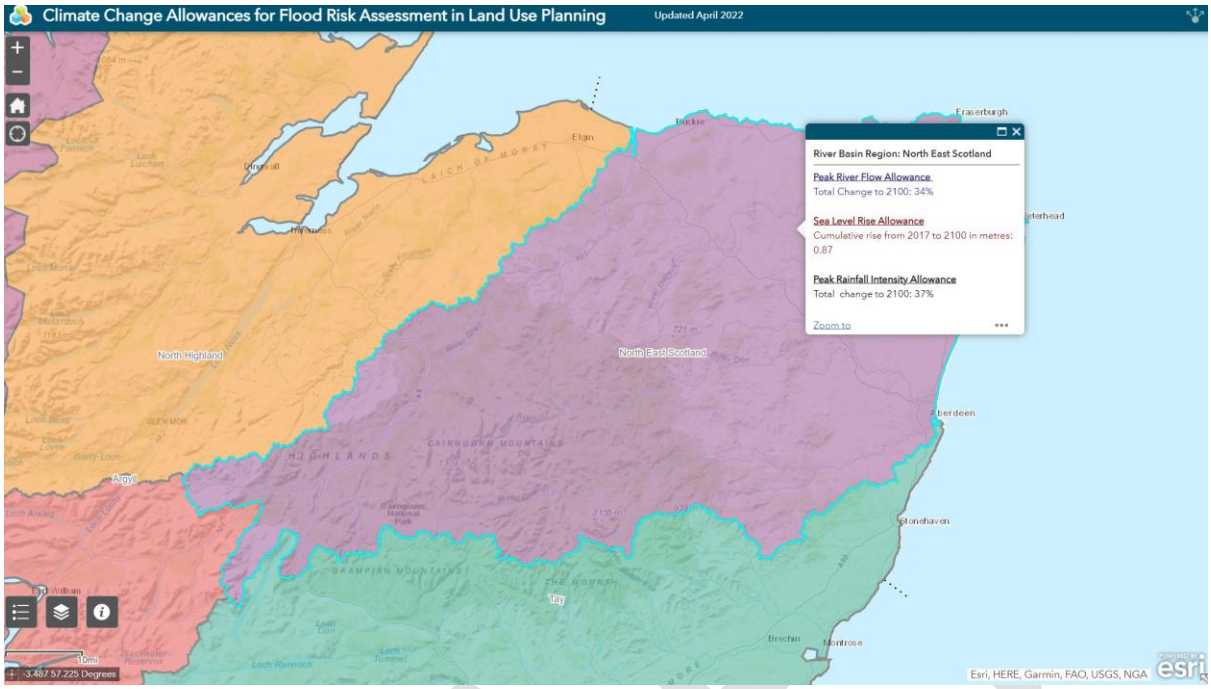


Figure 5: A snapshot taken from SEPA's Climate Change Allowances for Flood Rish Assessment in Land Use Planning maps, only used here for the purpose of demonstrating the peak river flow allowance, sea level rise allowance and, peak rainfall intensity allowance within the North East River Basin Region. Found at: (Climate Change Allowances for Flood Risk Assessment in Land Use Planning (arcgis.com))

SEPA Flood Maps

SEPA provide interactive maps which show the locations and different types of flooding in the Aberdeen area and the likelihood at which they are predicted to happen on an annual basis. These maps should be used as a screening tool to identify where a proposed development may be at risk of flooding.

The map below is a screen shot from the SEPA flood map of Aberdeen. The dark tones of navy (river flooding), green (coastal flooding), and purple (surface water flooding), represent a high likelihood of flooding, predicted at 10% chance of flooding every year. SEPA have provided guidance on how to use the flood maps effectively to ensure new development is not located in an area of high risk of flooding (Land use planning - Flood Maps | SEPA).

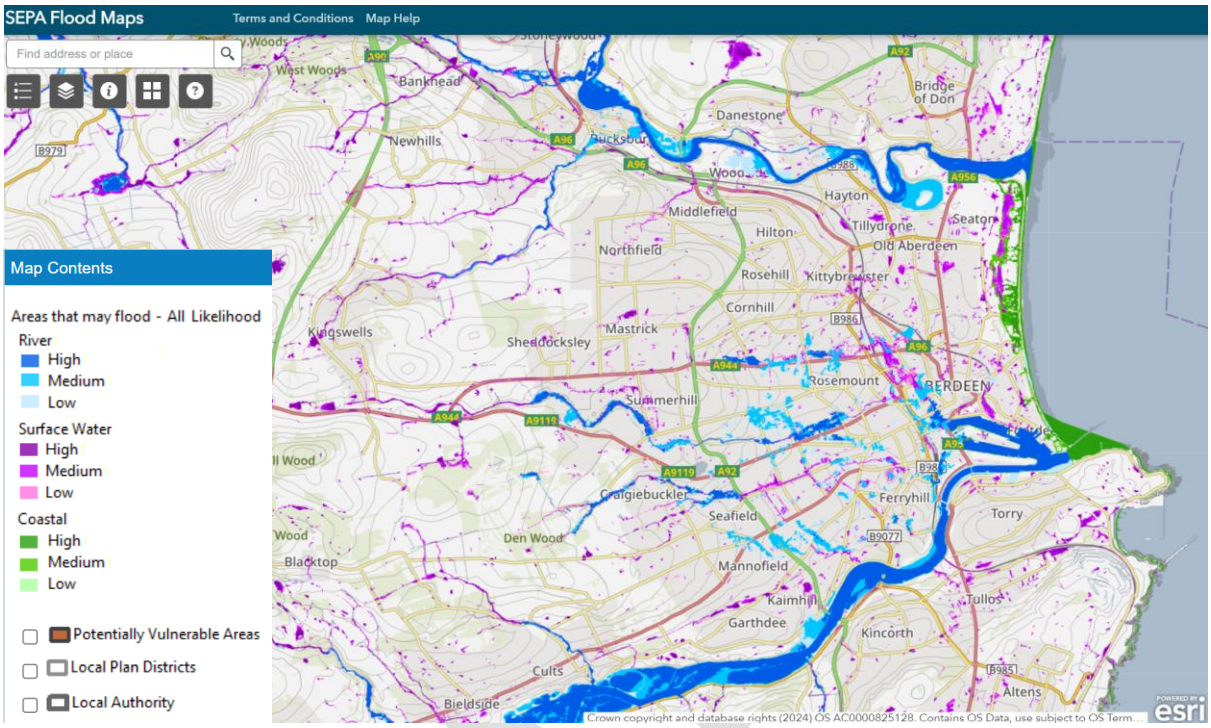


Figure 6: A snapshot taken from SEPA's flood maps only used here for the purpose of demonstrating the information that SEPA holds regarding the likelihood of flooding in Aberdeen on an annual basis. Further information and key above.

The map includes data from a number of additional filters including: depth and velocity, groundwater, flood defences, impacts of flooding, natural flood management, and natural susceptibility to coastal erosion. These extra data sets are noted and will be considered in the drafting of the proposed Local Development Plan.

SEPA produce a wide range of maps and datasets around flooding. All maps are available at: Environmental data | Scottish Environment Protection Agency (SEPA)

Additionally, SEPA provide datasets detailing past flood events, with details including river flow data, water level data, and rain gauge data. These are available at: Flooding | Beta | SEPA | Scottish Environment Protection Agency

SEPA Water Scarcity Report

SEPA's Water Scarcity Reports provide regular updates on the status of water resources in Scotland, particularly during periods of low rainfall. In this particular report dated 10th October 2024, Aberdeen is showing as 'Normal Conditions'. This report acknowledges the SEPA Water Scarcity Reports. This evidence source is explored further in the Nature and Biodiversity topic paper.

Mapping Flood Disadvantage tool and report

The Mapping Flood Disadvantage in Scotland 2015: Main Report identifies and maps the neighbourhoods in Scotland that are most disadvantaged by flooding. The research aims to provide a comprehensive understanding of the social vulnerability to flooding and the resulting flood disadvantage across Scotland.

Key points from the report include:

- Social Vulnerability to Flooding: The report assesses social vulnerability to flooding by considering various factors such as personal, social, and environmental characteristics that influence how different communities are affected by flooding.
- Flood Disadvantage Mapping: The research maps the neighbourhoods most disadvantaged by flooding, highlighting areas where high social vulnerability coincides with high flood exposure.
- Policy Context: The report provides a policy context, discussing how the findings can inform flood risk management and social policy in Scotland.
- Case Studies: The report includes case studies from local authorities such as Dumfries and Galloway, Dundee City, and Scottish Borders, providing detailed insights into the specific challenges and responses in these areas.

Aberdeen specific conclusions include:

- In Aberdeen City surface water flooding is likely to affect the highest proportion of residential properties.
- The assessment of the levels of social vulnerability has revealed that just below 8% of all data zones are classified as having an extremely high or acute vulnerability to flooding. These are mainly located in large urban areas (Glasgow, Edinburgh, Dundee and Aberdeen).
- The highest number of data zones with acute and extreme flood disadvantage with respect to river flooding are found in Edinburgh, Stirling and Highland, followed by Falkirk and Aberdeen.
- Glasgow presents the highest concentration of surface water flood disadvantage, with one-third of the extremely disadvantaged neighbourhoods. This is followed by City of Edinburgh and Aberdeen City.

By leveraging the findings from the report, Aberdeen can develop comprehensive and inclusive flood risk management policies that not only reduce the physical risk of flooding but also address the social vulnerabilities of its communities.

Water Environment Hub

The Water Environment Hub is an online data tool for exploring the current river basin management plan for Scotland. It provides information on the health, impacts, action to be taken, and planned future condition for Scotland's water environment, including rivers. The web page shows all of the information for river basin planning, including information on each waterbody, pressures, measures, and objectives set by SEPA.

Below is a snap shot taken from the Water Environment Hub for Aberdeen City. The interactive maps identifies the water bodies within the area and their condition. Links to each water body provide further information as to their condition and actions/objectives to improve their quality.

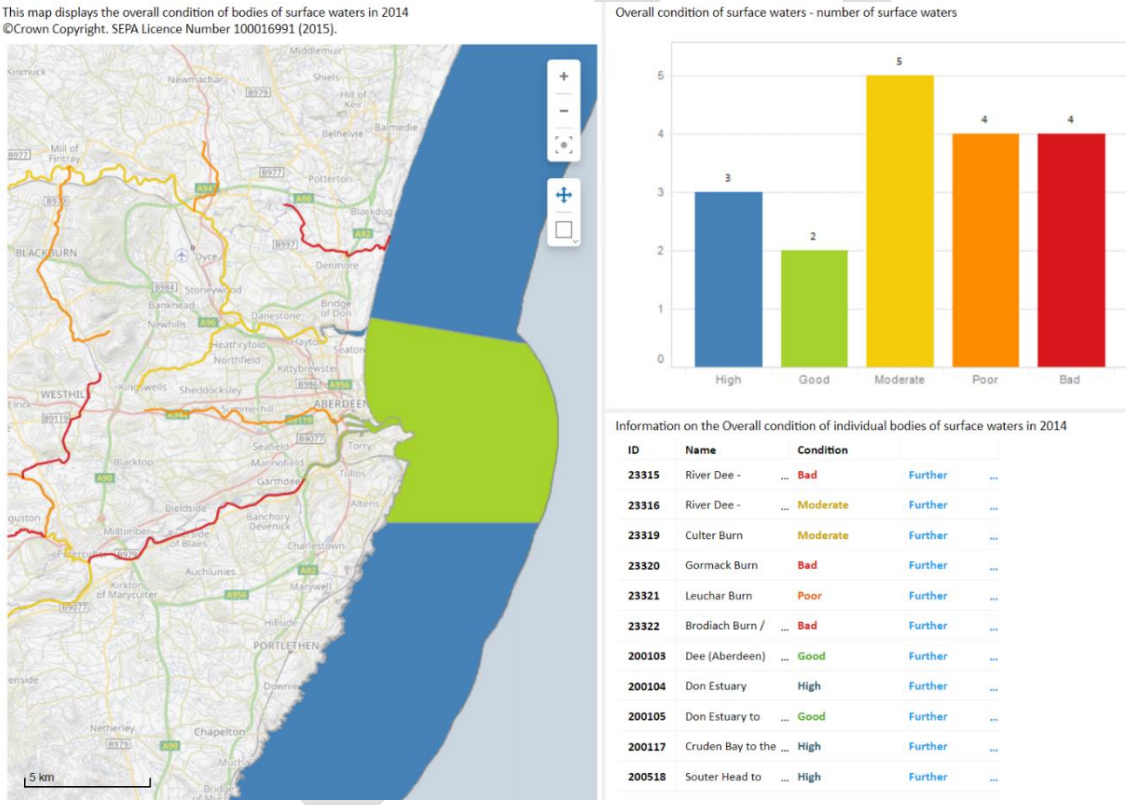


Figure7: A snapshot taken from The Water Environment Hub, only used here for the purpose of demonstrating the information that the Water Environment Hub holds regarding the condition of surface waters in Aberdeen. Further information above.

Recommended Riparian Corridor Layer for use in Land Use Planning
Functioning riparian (river bank) corridors can help increase the resilience of a place This document provides guidance on the recommended width of riparian corridors to protect water features and provide multiple benefits, such as contributing towards the resilience of a place to the impacts of climate change and help address the nature crisis, providing environmental benefits, and a wide range of public services. These areas are also an important element of blue green infrastructure (BGI) and nature networks (NN).

The document provides guidance on the recommended minimum corridor widths for each channel bank, provided in the table below.

Channel width	Recommended corridor width on each channel bank
< 2 m	10 m
2 to 15 m	15 m
> 15 m	30 m

Table 1: Outlines SEPA's guidance on channel bank widths. Taken from SEPA's Recommended Riparian Corridor Layer for Land Use in Planning document.

A GIS layer has been created which indicates the minimum space needed along rivers (i.e. riparian corridor width scaled to river width) to give rivers space to adapt to changes in flood frequency and magnitude. The GIS layer shows the minimum proposed riparian corridor widths scaled to the width of the watercourse, which if left undeveloped increase climate resilience by giving rivers space to adapt to changes in flood frequency and magnitude and provide a wide range of benefits.

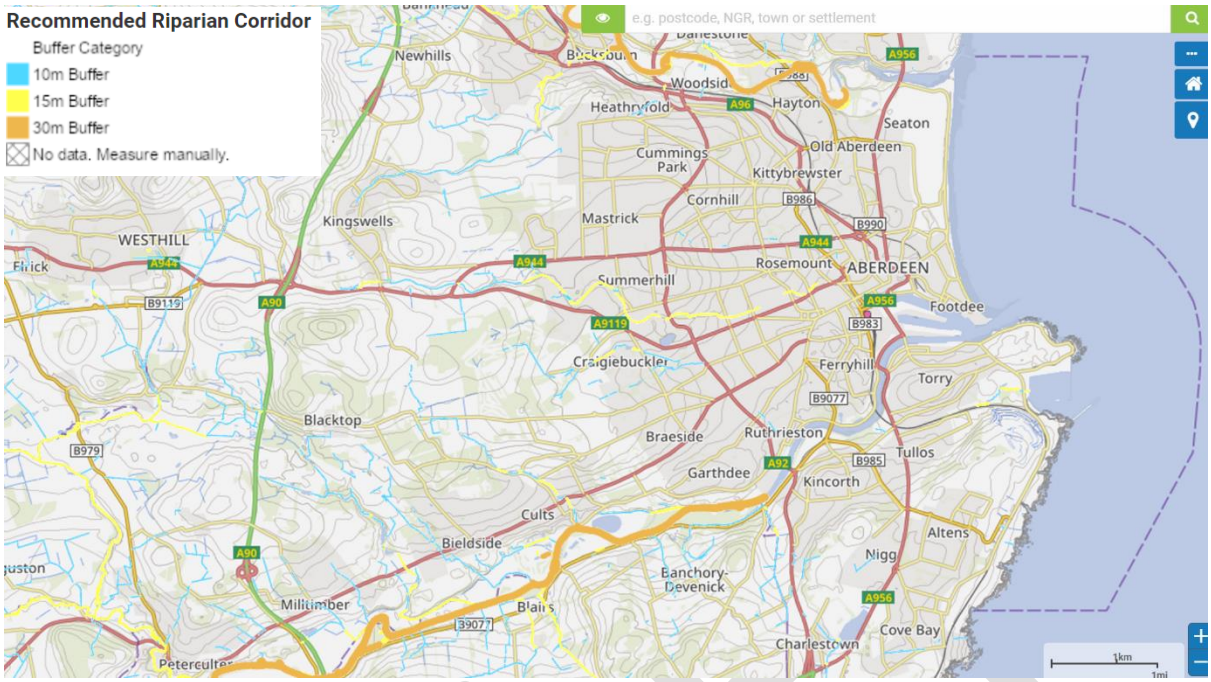


Figure 8: A snapshot taken from SEPA's 'Recommended Riparian Corridor' map, only used here for the purpose of demonstrating the information that SEPA holds regarding the recommended riparian corridors in Aberdeen. Can be found at: Map | Scotland's environment web

The map below provides an up close view of the same map, showing channels in the Gardee and Kincorth areas of Aberdeen. Using the map legend above, it is clear to see where SEPA have recommended specific channel bank widths on specific channels.

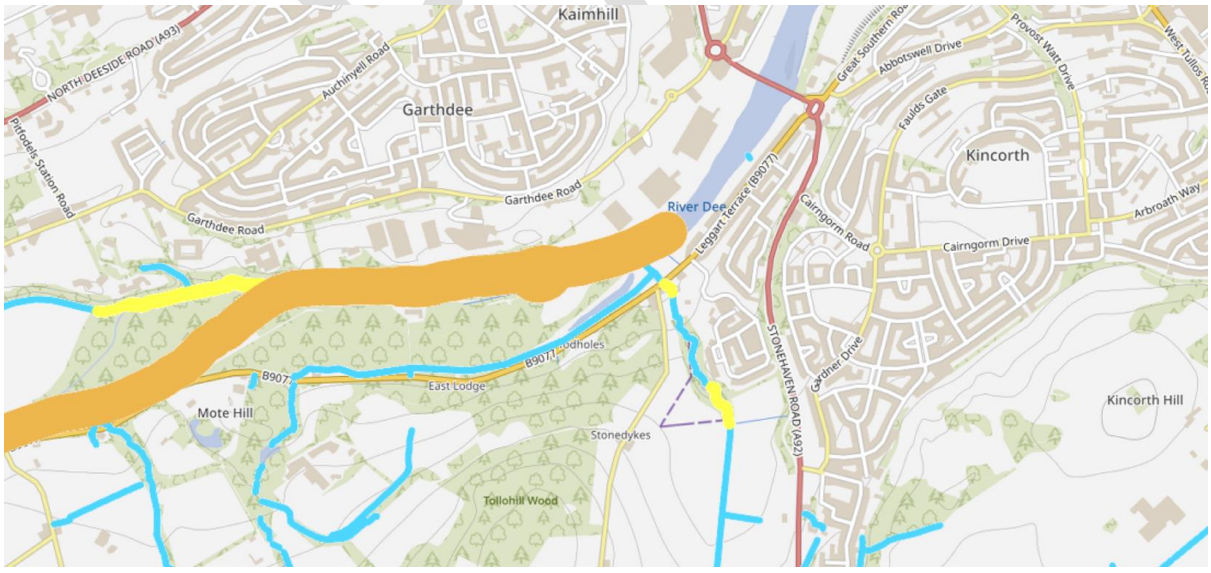


Figure 9: A snapshot taken from SEPA's 'Recommended Riparian Corridor' map, only used here for the purpose of demonstrating the information that SEPA holds regarding the recommended riparian corridors in Aberdeen. Can be found at: Map | Scotland's environment web

Additionally, SEPA provides guidance on riparian vegetation planting opportunities. It offers further guidance for natural flood management along riverbanks.

Strategic Flood Risk Assessment

The Local Authority is responsible for producing a Strategic Flood Risk Assessment. The most recent one produced by Aberdeen City Council is dated March 2020 when it accompanied the Proposed Plan for the 2023 Local Development Plan.

Strategic Flood Risk Assessment (SFRA) is designed to inform the development planning process and to reduce flood risk by avoiding areas at significant risk of flooding. It is a strategic overview of flood risk to the development plan area and involves the collection, analysis and presentation of all existing and readily derivable information on flood risk sources. It has been produced in consultation with the Scottish Environmental Protection Agency (SEPA) as well as other Council services.

A new Strategic Flood Risk Assessment is required as part of the new Local Development Plan which is currently being prepared.

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Summary of Implications for Proposed Plan

Climate and Nature Crisis, Mitigation and Adaptation

The Proposed Plan should recognise its role in tackling the climate and nature crisis and consider how it can build resilience to current and future place based climate risk.

The Proposed Plan should consider the need for sustained reductions in Greenhouse Gas emissions. This will require a whole systems approach, with implications and influence across topic papers.

The Proposed Plan will need to consider a policy approach to implement National Planning Framework 4 and deliver carbon offsetting if required.

The Proposed Plan should reflect the required spatial outcomes necessary to pursue Aberdeen's commitment to reach net zero emissions.

The Proposed Plan should manage and mitigate wider impacts of climate change, including infrastructure risks, community resilience, air quality and food availability.

Flood Risk and Water Management

The Proposed Plan should consider the impacts of climate change and flooding in the development of the spatial strategy to ensure long term climate adaptation and resilience is prioritised.

The Proposed Plan should take into account the probability of flooding and must ensure that the necessary level of information is available as part of site assessments to ensure the avoidance of flood risk.

The Proposed Plan should consider the outputs of the Strategic Flood Risk Assessment, when available, to inform the development planning process and reduce flood risk.

Marmot Places

Aberdeen, along with North Ayrshire and South Lanarkshire, has been confirmed as one of three Marmot Places in Scotland. Aberdeen will seek to embed the eight Marmot Principles within the Proposed Plan. The table below identifies where the topic paper aligns with the Marmot Principles.

Topic 5: Climate Change, Mitigation and Adaptation

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Principle	**Potential implication for the Plan**
Give every child the best start in life.	
Enable all children, young people and adults to maximise their capabilities and control over their lives.	
Create fair employment and good work for all.	
Ensure a healthy standard of living for all.	X
Create and develop healthy and sustainable places and communities.	X
Strengthen the role and impact of ill health prevention.	X
Tackle racism, discrimination and their outcomes.	
Pursue environmental sustainability and health equity together.	X

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