Local Development Plan – Draft Topic Paper

Climate Change and Land Use

May 2025

Introduction

Thanks for taking an interest in this Topic Paper, which is part of the evidence we're drawing together for our new Local Development Plan. The following notes explain what the Topic Papers cover and how these fit into the process to prepare the new Plan. At the bottom of the notes, you will find a list of guidance and information should you wish further details.

What is a Topic Paper?

The first stage in preparing a new Local Development Plan is the evidence gathering stage, which is the stage we are currently in. This involves collating information on key relevant policies, strategies and data for an Evidence Report which the National Park Authority has to submit to the Scottish Government for a review that is called a 'gate check'. This to ensure that sufficient information is available to start preparing a new Local Development Plan. The next step, after the gate check, is preparing a Proposed Plan which will set out policies, proposals and priorities which will be formally issued for a period of consultation.

To break the gathered evidence up into manageable blocks, we have created 10 Topic Papers by grouping the most closely related national planning policies of NPF4 (see Table below). Each of these 10 Topic Papers aim to summarise relevant national, regional and local evidence and information for the given topic area. Whilst we have grouped these national planning policies into 10 Topic Papers, we fully acknowledge that there are overlaps and linkages between these policies; for example, matters such as climate, nature, and flooding are of relevance to all of the topic areas. We have aimed to highlight these links, where explicit, in the Topic Papers.

How are the Topic Papers structured?

The Topic Papers cover all National Planning Framework 4's policies, as summarised in the table below.

Topic paper 1: Climate and Land Use	**Topic paper 2: Biodiversity, Natural Places, and Forestry, Woodland and Trees**	**Topic paper 3: Infrastructure First**	**Topic paper 4: Flooding, Water Management and Blue and Green infrastructure**	**Topic paper 5: Energy, and Heat and Cooling**
1. Tackling the Climate and Nature Crisis 2. Climate Mitigation and Adaptation 5. Soils 10. Coastal Development Land Use	3. Biodiversity 4. Natural Places 6. Forestry, Woodland and Trees	18. Infrastructure First 24. Digital Infrastructure	22. Flood Risk and Water Management 20. Blue and Green Infrastructure	11. Energy 19. Heat and Cooling
Topic paper 6: Sustainable Transport	**Topic paper 7: Housing**	**Topic paper 8: Living Well Locally**	**Topic paper 9: Cultural Heritage and Place**	**Topic paper 10: Rural Economy**
13. Sustainable Transport	16. Quality Homes 17. Rural Homes	15. Local Living and 20 Minute Neighbourhoods 23. Health and Safety 9. Brownfield, vacant and derelict land and empty buildings 21. Play, recreation and sport 12. Zero Waste	14. Design, Quality and Place 7. Historic Assets and Places 31. Culture and Creativity	29. Rural Development 30. Tourism 28. Retail 27. City, town, local and commercial centres 26. Business and Industry 32. Aquaculture 33. Minerals 25. Community Wealth Building

Each of the Topic Papers has the same format, as follows:

- List of the relevant sections of the Planning Act (and any other relevant legislation and statutory requirements);
- Links to the Evidence that informs that Topic Paper;
- Context of National Planning Framework 4 (NPF4) and the National Park Partnership Plan (NPPP)
- Summary of the selected Evidence for that Topic Paper;
- Implications that the Evidence presents for the preparation of the new Local Development Plan.

Additional sections in the Papers (i.e. Summary of Stakeholder Engagement & Statement of Agreement/Dispute) will be added upon the completion of this engagement phase and prior to the completion of the Evidence Report and its submission to Scottish Government.

It is important to note that the Topic Papers do not present any proposals– such as proposed sites for development. As these Papers are technical and follow a structure and template required by the Scottish Government, an additional 6 Area Summaries have also been prepared. These are separate map-based reports which have been designed to provide a summary of how this technical content relates to different areas of the National Park, for the series of in-person workshops during May and June. These also include a summary of the Local Place Plans prepared by communities, which the majority of communities have either prepared or are under preparation. While these reports will be primarily be used at in-person workshops, they will also included on the website if you would prefer to feedback on those.

The Topic Papers are engagement drafts; these are not the final ones that we will include within our Evidence Report. The Topic Papers have been prepared by National Park staff with advice and comments incorporated where possible from public bodies such as SEPA, Historic Environment Scotland, NatureScot, Transport Scotland and the Councils that cover the National Park. Where data or information has not been available, incomplete or is currently in the process of being finalised, this has been highlighted in the Topic Paper and where relevant this will be actioned for the final versions for the Evidence Report.

We are now sharing the Topic Papers with wider stakeholders who would like to review and provide us with feedback, helping us to identify any gaps or pieces of evidence we should also consider for the Evidence Report. This feedback can be given by filling in the survey available on our website.

The Topic Papers are technical and present a lot of information. This is due to their nature as baseline information to be reviewed by Scottish Government, as the foundation for the new Local Development Plan. We have also created shorter map-based summaries for different areas of the Park to be more accessible, as introduced above.

Feedback will help finalise the Topic Papers. Once we have completed the 8-week engagement period, we will review all the responses we have received. We will make changes to the Topic Papers where required and collate these into the full Evidence Report, which will also summarise the outcomes of our engagement. It is this full – finalised - Evidence Report that the Park Authority Board will need to approve before it can be submitted to the Scottish Government for review at the 'gate check'.

Next stage. Once we have received Scottish Government's feedback on whether we can either proceed or need to amend the Report the next stage is preparing the Proposed Plan (draft Local Development Plan). As noted already, there will be formal public consultation on the Proposed Plan.

Further information

Scottish Government's Guidance on preparing a Local Development Plan

National Planning Framework 4

Loch Lomond and the Trossachs National Park Development Plan Scheme

Contact

If you need help with any of the above or have queries on the Topic Papers, please contact localdevplan2@lochlomond-trossachs.org or call us on 01389 722600.

Issue: Topic/Place	Topic Paper 1 - Climate Change and Land Use
Information required by the Act regarding the issue addressed in this section	**Policy 1 – Tackling the Climate and Nature Crises** - Town and Country Planning (Scotland) (Act) 1997, as amended, • Section 15 (5): The principle physical and environmental characteristics of the district. **Policy 2 – Climate Mitigation and Adaptation** - Town and Country Planning (Scotland) (Act) 1997, as amended, • Section 15(5) 'the principal physical and environmental characteristics of a district' • Policies 3(F) 'policies regarding low and zero-carbon generating technologies in new buildings' **Policy 5 – Soils** - Town and Country Planning (Scotland) (Act) 1997, as amended, • Section 15 (5): The principle physical and environmental characteristics of the district. **Policy 10 – Coastal Development** - Town and Country Planning (Scotland) (Act) 1997, as amended, • Section 15(5) 'the principal physical and environmental characteristics of a district' Under Regulation 9, have regard to: • The National Marine Plan • Any Regional Marine Plan Other relevant legislation The Aims of National Parks in Scotland (as set out in the National Parks (Scotland) Act 2000)

Links to Evidence	**Overarching Policies, Strategies and Reports** National: • National Park Partnership Plan 2024 – 2029 • Climate Change (Scotland) Act 2009 • Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 • Climate Change (Emissions Reduction Targets) (Scotland) Act 2024 • Scotland's Climate Change Plan • Scottish National Adaptation Plan 2024-2029 (SNAP3) • Scottish Climate Change Adaptation Programme 2019 - 2024 • Scotland's National Marine Plan • Scotland's Biodiversity Strategy and Delivery Plan • Scotland's Third Land Use Strategy **Other relevant Policies, Strategies and Reports** Regional: • Clyde Regional Marine Plan Draft (pre-consultation draft) • RLUP Phase 1 Process Evaluation Final Report Local/National Park: • Loch Lomond and the Trossachs National Park Carbon Footprint Assessment and Proposed Pathway to Net Zero • Loch Lomond and the Trossachs National Park Climate Change Risks and Opportunities Assessment Report 2024 • Argyll and Bute Decarbonisation Plan 2022-2025 • Stirling Council's Climate and Nature Emergency Plan 2021-2045 • West Dunbartonshire Council's Climate Change Strategy (2021) • Perth and Kinross Council Climate Change Strategy • Loch Lomond and the Trossachs National Park - Peatland Action Delivery Programme 2024-2030 • Loch Lomond and the Trossachs National Park Authority Future Nature • DMG Deer Management Plans

	Existing Data • SEPA Flood Maps • SEPA Flood Management Maps • Scotland Soils Map • James Hutton Institute Land Capability for Agriculture (LCA)

National Planning Framework 4 (NPF4) Context

Acknowledging that reducing greenhouse gas emissions is a cross-cutting theme within multiple policies of National Planning Framework 4 (NPF4) and its overarching spatial strategy, this evidence paper summarises the individual policies, their intent and anticipated outcomes below:

Policy 1 - Tackling the Climate and Nature Crises gives significant weight to development that directly responds to the global climate emergency and the nature crisis. It emphasises that Local Development Plans should incorporate strategies to mitigate emissions and adapt to the impacts of climate change. This involves promoting nature recovery and restoration within the area, ensuring that spatial planning aligns with environmental sustainability and resilience. The intent is to create a framework that supports both ecological health and community well-being and explores land use tensions in the face of ongoing climate challenges.

Policy 2 - Climate Mitigation and Adaptation focuses on encouraging and promoting development that minimises greenhouse gas emissions and adapts to the impacts of climate change. Local Development Plans (LDPs) should be strategically designed to reduce, minimise or avoid emissions while following six spatial principles that guide sustainable location and development. The spatial strategy must consider the implications of proposed developments on greenhouse gas emissions and prioritise adaptation to current and future climate risks. This includes directing development away from vulnerable areas and ensuring that communities can effectively adapt to climate-related challenges. The overall intent is to foster resilient, low-emission environments.

Policy 5 - Soils aims to safeguard carbon-rich soils, restore peatlands, and minimise soil disturbance from development. Local Development Plans (LDPs) are required to protect soils that hold local, regional, national, and international significance, as well as areas of lesser quality that are culturally or locally important for primary use. The intent is to ensure that soil resources are preserved, protected and/or enhanced, promoting environmental benefits, sustainable and regenerative agriculture and carbon sequestration while recognising the value of all types of soils in the landscape.

Policy 10 - Coastal Development focuses on protecting coastal communities and assets while enhancing resilience to climate change impacts. Local Development Plans (LDPs) should incorporate strategies for adapting coastlines, recognising the significant risks posed by rising sea levels and extreme weather events. A precautionary approach to flood risk, including potential inundation, is essential. The policy encourages the use of nature-based solutions to strengthen the resilience of coastal areas, acknowledging their diversity and specific challenges. Additionally, LDP spatial strategies must identify both developed and undeveloped coastal regions and align with national, sectoral, and regional marine plans. The overall intent is to foster sustainable and resilient coastal development.

National Park Partnership Plan (NPPP) 2024 – 2029 Context

To support Scotland's target of becoming a Net Zero Nation by 2045, the Loch Lomond & The Trossachs National Park Partnership Plan (NPPP) sets out a clear and ambitious programme of action. The Plan outlines priorities to address the climate and nature crises while delivering tangible benefits for local communities and the economy.

A key outcome is for the National Park to reach Net Zero emissions by 2035 and become carbon negative by 2045. This will be achieved through land-based carbon sequestration, nature restoration, low-emissions infrastructure and sustainable development. The Plan also aims to ensure the Park becomes a carbon sink – absorbing more carbon than it emits – through climate-conscious land management and policy alignment with the Paris Agreement.

In response to increasing climate-related impacts such as flooding, landslips and rising temperatures the Partnership Plan prioritises building climate resilience. Key actions include improving infrastructure to withstand extreme weather events, enhancing emergency response planning and implementing nature-based solutions, such as wetland restoration, to mitigate flooding and soil erosion.

Recognising the risks posed by sea level rise and increasingly frequent storms, the Plan highlights the need for adaptive coastal management to protect both natural and human environments. It outlines actions such as monitoring erosion in vulnerable areas to inform decision-making, implementing nature-based coastal defences that work with natural processes to reduce risk, and supporting community-led initiatives aimed at adapting local infrastructure and land use in response to changing coastal conditions.

To address the growing threat to ecosystems and biodiversity, the Plan sets out a programme of large-scale habitat restoration. This includes expanding woodland coverage and creating connected habitat networks to support species movement and resilience. It also prioritises the restoration of degraded peatlands, which play a critical role in carbon storage and biodiversity enhancement. In addition, the Plan calls for better management of unsustainable grazing levels in sensitive upland and woodland areas to enable natural regeneration and long-term ecological recovery.

Transport is a major contributor to the Park's carbon emissions, and the Plan outlines a series of actions to reduce car dependency and support the shift to low-carbon alternatives. This includes investing in active travel infrastructure, such as walking and cycling routes, and enhancing sustainable public transport options to serve both residents and visitors. The Plan also supports the development of electric vehicle infrastructure and aims to improve access for people without cars, promoting greater equity while easing traffic pressure on local communities.

The Partnership Plan supports a transition to regenerative land management practices that improve soil health, reduce greenhouse gas emissions, and strengthen the resilience of rural businesses. Through an integrated Regional Land Use Framework, the Plan advocates for the adoption of regenerative farming techniques, alongside strategic land-use planning that maximises carbon sequestration and enhances habitat quality. It also emphasises the importance of protecting soil through measures that reduce erosion and increase organic matter content, ensuring long-term environmental and economic sustainability.

Summary of Evidence

This paper addresses key policies outlined in National Planning Framework 4 (NPF4), including:

- Policy 1 – Tackling the Climate and Nature Crises,
- Policy 2 – Climate Mitigation and Adaptation,
- Policy 5 – Soils, and
- Policy 10 – Coastal Development.

The vital role that sustainable and regenerative land use plays in enhancing soil health and supporting climate and nature restoration is acknowledged. Although there is no specific NPF4 policy on land use, this topic paper incorporates this critical evidence to highlight its significance in achieving broader climate and nature goals. As set out in the National Park Partnership Plan, an integrated approach to land use and development is essential.

It is also important to acknowledge that there is overlap between the Infrastructure First paper and NPF4 Policy 22 – Flood Risk and Water Management. However, this policy will be explored in more detail in Topic Paper 4. Similarly, the overlap and relationship between climate and nature is recognised in light of the need to address both the climate and nature crises. However, NPF4 Policy 3 – Biodiversity will be considered in more detail in Topic Paper 2.

The summary of evidence section below is structured in the following order:

- Climate Change: Mitigation and Adaptation
- Land Use

CLIMATE CHANGE: MITIGATION AND ADAPTATION

Scotland's Climate Change Legislation

The Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 is part of Scotland's effort to tackle the climate crisis. It builds on the Paris Agreement by aiming to limit global warming to well below 2°C, ideally to 1.5°C. The Act updates the previous 2009 Climate Change (Scotland) Act by setting stricter emissions reduction goals, with targets to reduce emissions by 75% by 2030, 90% by 2040, and to reach net-zero emissions by 2045, all based on levels from 1990.

More recently, the Climate Change (Emissions Reduction Targets) (Scotland) Act 2024 builds upon the framework set by the 2019 Act, with a key shift towards a carbon budget system. This replaces the previous approach of annual emissions reduction targets, offering a more flexible, multi-year framework for achieving Scotland's goal of net-zero emissions by 2045.

Scotland's Climate Change Plan

The Scottish Government publishes a strategic delivery plan every five years to meet emissions reduction targets. The 2020 update to the 2018 Climate Change Plan outlines a pathway to reduce emissions by 2032. Work is ongoing for the next plan, covering 2026 to 2040, which will be published in draft after receiving advice from the Climate Change Committee and setting Carbon Budget levels through secondary legislation.

Scottish National Adaptation Plan 2024-2029 (SNAP3)

The Scottish National Adaptation Plan outlines actions to enhance Scotland's resilience to climate change, focusing on supporting communities, businesses, public services, and nature in adapting to a changing climate in a fair and inclusive manner. It sets a long-term vision and defines priorities for the next five years, in line with the Climate Change (Scotland) Act 2009, which imposes a legal duty on the public sector to support adaptation goals. The Plan aims to help Scots adapt and thrive in a changing climate.

The vision for Scotland is one that is resilient, inclusive, and well-adapted to climate change. Over the next five years, critical actions will lay the foundation for this future, where:

1. Nature is connected across the land, settlements, coasts, and seas, supporting biodiversity, providing shelter from extreme weather, and enhancing physical and mental health, with urban areas benefiting from green spaces.
2. Communities create climate-resilient, healthy, and equitable places, where people are empowered, buildings are safe from flooding and overheating, and communities contribute to making their environments attractive and resilient.
3. Public services work collaboratively, ensuring people have reliable access to essential services like health, education, and transport, with climate adaptation benefiting health, wellbeing, and equity.
4. Economies and industries adapt and seize opportunities within Scotland's Just Transition, creating a wellbeing economy that is resilient to climate shocks. Sectors like farming, forestry, fishing, and aquaculture are adapting to sustain livelihoods, with secure supply chains.
5. Scotland's international role supports climate justice and global adaptation efforts, offering practical solidarity with the Global South, contributing to global climate goals, and advocating for climate justice for the most affected countries.

In essence, the Adaptation Plan aims to ensure Scotland is well-prepared to face climate change while fostering a fair and sustainable future for its people, economy, and the environment.

Scotland's National Marine Plan

Scotland's National Marine Plan addresses climate change and coastal change by emphasising the need for adaptive management of marine and coastal environments. It acknowledges the risks posed by rising sea levels, increased flooding, and extreme weather events, advocating for strategies that enhance resilience in coastal communities and ecosystems. The plan encourages the use of nature-based solutions to mitigate these impacts, promote biodiversity, and support sustainable economic activities. By integrating climate considerations into marine planning, the NMP aims to ensure the sustainable use of marine resources while protecting coastal areas from the adverse effects of climate change.

Scotland's Soils Map

Scotland's Soils Map offers a detailed overview of the soil types and characteristics within Loch Lomond and the Trossachs National Park reflecting the diverse geology and topography. Understanding the soil distribution within the National Park helps in the following ways, to protect peatlands and other sensitive soils for climate and nature, to promote sustainable farming and regenerative practices to ensure soil health and productivity and also by selecting appropriate tree species for planting based on soil characteristics promoting healthy and successful woodland environments.

The Loch Lomond and the Trossachs National Park straddles the Highland Boundary Fault dividing it into two distinct regions as characterised in Nature Scot's Landscape Character Assessment. Blanket peats and gleys (wet clay soils deprived of oxygen) dominate the soils above 200m and are widespread on gentler hills, slopes and rounded summits. Soils become thin on upland slopes, and rock outcrops, boulders and screes can be extensive. Unsustainable levels of wild and domesticated grazing and browsing animals in some upland and woodland areas are leading to reduced tree cover and the erosion of soils.

South of the Highland Boundary Fault and in sheltered glens, soils are primarily Brown Earths, which are well-drained and have high natural fertility. They often support better quality grassland or are cultivated for fodder crops.

SEPA Flood Maps

SEPA's coastal flood maps show a high risk of flooding along the coast from Kilmun to Arrochar and Succoth along Loch Long, as well as Loch Goil and surrounding villages. As a planning authority, the Park Authority must ensure through the planning process that people and property are protected, and new development in these areas at high risk of coastal flooding is appropriately controlled.

The SFRA (see Appendix) analysis also highlights areas vulnerable to coastal erosion and flooding, particularly along the Cowal Peninsula. Based on the Dynamic Coast Future Erosion data, parts of settlements such as Ardentinny, Lochgoilhead, Carrick Castle, Kilmun, Strone, and Blairmore are most at risk by 2050 under a high emissions scenario. Some areas, including Loch Long, Loch Goil, Gairletter Point, and settlements like Ardentinny, Kilmun, Blairmore, and Strone, already have artificial coastal defences in place.

Coastal Change Adaptation Plans (CCAPs) are vital for understanding both current and future coastal erosion and flooding risks. While Argyll and Bute Council's CCAP status is still to be confirmed, plans are under development for locations identified in Cycle 2 of the Local Flood Risk Management Plan. Ongoing engagement will help improve the approach to coastal risk management.

While this topic paper focuses specifically on coastal flooding and defence, it is important to recognise the need to consider both climate resilience and sustainable land management in wider flood mitigation strategies; a more comprehensive overview of all types of flooding within the National Park is provided in Topic Paper 4 and the associated Strategic Flood Risk Assessment (SFRA).

Clyde Regional Marine Plan Draft

Once adopted by Ministers, the Clyde Regional Marine Plan will provide a statutory policy framework to support decision-making and inward investment. The plan will also support Scotland's National Marine Plan and UK Marine Policy Statement at a regional level.

Around the Clyde region, the mean sea level is projected to be at least 47cm higher in 2080 than it was in 2008. Thus, with increased frequency of extreme weather events, the management of existing and proposed developments and activities along the coastal areas of the National Park is crucial.

Argyll and Bute Decarbonisation Plan 2022-2025

Argyll and Bute Council's Decarbonisation Plan for 2022-2025 aims to significantly reduce greenhouse gas emissions and promote sustainability, with a target of achieving net-zero by 2045. Key initiatives include enhancing energy efficiency in public buildings, increasing investment in renewable energy sources, and developing sustainable transport infrastructure to encourage active travel. The plan also emphasises community engagement to foster local participation in climate action and prioritises biodiversity through the enhancement of natural habitats. Overall, it takes a comprehensive approach to integrate environmental, economic, and social factors for a sustainable future in the region.

Stirling Council's Climate and Nature Emergency (CaNE) Plan 2021-2045

Outlines five pivotal objectives designed to address the interconnected challenges of climate change and biodiversity loss. The first objective is to achieve net-zero carbon emissions by 2045. This ambitious goal encompasses a comprehensive set of strategies aimed at reducing energy consumption, enhancing the utilisation of renewable energy sources and promoting sustainable transportation options throughout the region.

The second objective focuses on biodiversity enhancement and habitat restoration. Recognising the critical importance of maintaining healthy ecosystems, the plan emphasises the need to protect and improve local biodiversity. Initiatives aimed at restoring habitats and expanding green spaces are central to this objective, supporting wildlife and contributing to overall ecological health.

Community engagement and empowerment constitute the third objective of the plan. By fostering robust participation in climate and nature initiatives, Stirling Council aims to raise awareness and encourage local actions that contribute to sustainability efforts. This community-centred approach empowers residents to take an active role in addressing environmental challenges.

The fourth objective promotes sustainable practices across all council services, encouraging both businesses and residents to adopt environmentally responsible behaviours. By embedding sustainability into daily operations and community life, the Council seeks to create a culture of environmental stewardship that extends beyond its own activities.

Finally, the plan emphasises the importance of building resilience to climate impacts as its fifth objective. Enhancing the resilience of communities and infrastructure is crucial in preparing for the adverse effects of climate change. This involves implementing adaptation strategies that address risks such as flooding and extreme weather events, ensuring that the region is better equipped to handle future challenges.

To support the CaNE Plan, Stirling Council's Draft Adaptation Strategy is currently out for public consultation. Appendix 1 of the Plan outlines a range of climate-related risks and opportunities specific to the Stirling Council area, offering a helpful evidence base to inform the development of the National Park's Proposed Plan.

West Dunbartonshire Council's Climate Change Strategy (2021)

West Dunbartonshire's Climate Change Strategy presents a comprehensive framework aimed at addressing climate change through targeted mitigation and adaptation efforts. A key component of the strategy is the establishment of ambitious carbon reduction targets. These targets are designed to significantly decrease carbon emissions across the council area, aligning with national objectives for achieving net-zero emissions.

In support of these carbon reduction goals, the strategy promotes sustainable energy initiatives. This includes a strong emphasis on increasing the use of renewable energy sources and implementing energy efficiency improvements in buildings and infrastructure. By reducing reliance on fossil fuels, the strategy aims to foster a more sustainable energy landscape within the region.

The strategy also highlights the importance of enhancing local biodiversity and preserving green spaces. Protecting and restoring habitats is essential for supporting wildlife and maintaining ecological health. By prioritising green spaces, West Dunbartonshire seeks to create a more resilient natural environment that benefits both the ecosystem and the community.

Community engagement is another crucial aspect of the strategy. The Council actively seeks to involve residents in climate initiatives, raising awareness about climate change and encouraging local actions that contribute to resilience. By fostering community participation, the strategy aims to empower residents to take meaningful steps toward sustainability.

Finally, the Climate Change Strategy outlines specific adaptation measures to address the impacts of climate change. This includes strategies for flood management and improving the resilience of infrastructure to withstand extreme weather events. By integrating these adaptation measures, West Dunbartonshire aims to ensure that its communities are better prepared for the challenges posed by climate change.

Perth and Kinross Council Climate Change Strategy

Perth and Kinross Council's Climate Change Strategy encompasses key objectives aimed at addressing climate change comprehensively. These include reducing greenhouse gas emissions across various sectors, promoting renewable energy development, and enhancing energy efficiency in buildings and infrastructure. The strategy emphasises community engagement to involve residents and local stakeholders in climate action initiatives. Additionally, it focuses on adaptation and resilience by identifying measures to protect vulnerable areas and enhance community infrastructure against climate impacts. Supporting biodiversity and nature recovery is also a priority, contributing to ecosystem health and sustainability. Collectively, these objectives aim to foster a sustainable and resilient future for the region while aligning with national climate goals.

Loch Lomond and the Trossachs National Park Carbon Footprint Assessment and Proposed Pathway to Net Zero

In May 2023, a carbon footprint assessment and proposed pathway to net zero for the National Park was published. Commissioned by the Park Authority, prepared by Small World Consulting, this report is part of a wider initiative to assess carbon emissions across all 15 of the UK’s National Parks and chart a clear path towards achieving net zero.

The Report provides a consumption-based assessment of greenhouse gas emissions. The baseline year for the assessment is 2019, and it also includes Paris-aligned target recommendations for transitioning the region to net zero and beyond. The details can be found in the report linked above.

It highlights planning as a key tool to address GHG emissions, specifically through decarbonising the built sector and informing what types of renewable energy technology that will be appropriate and where within the National Park. There is also scope for Planning to increase new green infrastructure through its natural capital enhancement strategies, with policies on Ecosystem Services and Biodiversity Net Gain having the potential to deliver biodiversity and climate change adaptation benefits through development.

Carbon Footprint Assessment

The results of the GHG assessment are shown in Table 1 below. In 2019, Loch Lomond & The Trossachs residents emitted a total of 217,000 tCO2e. In comparison to the national averages, the per capita carbon footprint of residents in Loch Lomond & the Trossachs is 17.6% higher. Key contributors to this higher footprint include driving, which produces emissions 36% above the UK average, and flying and other transport, which are approximately 30% higher. Household fuel emissions (excluding driving) are about 12% higher than the national average, while household electricity emissions are significantly higher, at 61% above the UK average. These factors indicate a relatively higher environmental impact in the National Park compared to other regions in the UK.

Table 1: Results of the Carbon Footprint Assessment for Loch Lomond and the Trossachs National Park

Loch Lomond & The Trossachs National Park (See Figure 2 – Figure 5)	
Annual emissions from residents	**217,433 tCO_2e** (14.5 tCO_2e per person per year)
Annual emissions from visitors while in the National Park	**95,712 tCO_2e** (21.2 $kgCO_2e$ per visitor-day)
Annual emissions from visitors travelling to/from the National Park	**290,978 tCO_2e** (106.8 $kgCO_2e$ per visit)
Annual industry emissions	**52,938 tCO_2e**

Visitors to the park generated 387,000 tCO2e in emissions, with 290,978 tCO2e attributed to travel to and from the park and 95,712 tCO2e produced during their stay. Emissions from visitor travel are primarily driven by personal flights (51%) and vehicle fuel (35%), with other public transport accounting for just 5%. While in the park, the majority of visitor emissions come from food and drink (42%), followed by accommodation (18%) excluding food.

The industry-related GHG emissions in Loch Lomond & The Trossachs total 52,938 tCO2e. The largest source of emissions comes from Accommodation and Food Services, which account for 41% of the total emissions (21,735 tCO2e). This is followed by Agriculture, Forestry, and Fishing, contributing 19% (9,819 tCO2e), and Production (manufacturing) at 11% (5,981 tCO2e).

Proposed Pathway to Net Zero

The Report sets out the pathway to reach a consumption-based net zero by 2033 and beyond, to become a carbon sink as one of the "lungs" of Scotland contributing to the UK's Net Zero target. It establishes a 2019 baseline for the National Park for the purposes of achieving net zero of 301,367 tCO2e per year, and provides tailored, Paris-aligned emission reduction targets across six categories. These are energy-related greenhouse gas emissions, food and drink consumption by residents and visitors, other goods purchased, visitor travel to and from the park, and land use-related carbon dioxide and non-carbon dioxide emissions. More detail on the rationale and scope of target categories is found in section 6 of the Report.

The proposed emissions reduction and carbon sequestration targets call for immediate and ambitious action across all six emission categories, with each component being the minimum required in order to align with the IPCC's recommendations for limiting global temperature change to 1.5°C compared to pre-industrial conditions. Land use change measures, particularly peatland restoration and new woodland creation, are noteworthy as contributing the largest proportion of the annual net reduction in GHG emissions of the footprint categories (see Figure 20 of the Report). The Report also notes the importance of managing agricultural land sustainably, both to enhance soil carbon sequestration and to achieve co-benefits such as biodiversity gains and flood risk mitigation The dominance of car travel is a major contributor to carbon emissions and is covered in more depth in Topic Paper 6 – Sustainable Transport.

Based on the target-setting of the Report, the National Park would achieve a total cumulative reduction in the net annual GHG emissions of 1,003,990 tCO2e per year between 2019 and 2050. The net estimate includes both reductions in emissions and carbon sequestration.

Loch Lomond and the Trossachs National Park Climate Change Risks and Opportunities Assessment

In January 2024, LUC was appointed by the Loch Lomond & Trossachs National Park Authority to conduct a strategic climate change adaptation risk and opportunities assessment for the National Park. The assessment covers the entire park, which has been divided into nine areas to facilitate analysis and future adaptation planning. These areas were determined using Community Council boundaries, taking into account the locations of the main settlements so that each area includes at least one

settlement. Localised climate projections and hazard identification results were used to pinpoint the primary climate hazards most likely to cause damage or impact activities and services within the park. The following key hazards were identified:

- Wildfire
- Flood risk
- Storms
- Increased temperatures and extreme temperature events
- Reduced water availability/drought
- Increased precipitation
- Landslides

Additionally, a list of the main receptors - elements that can be harmed by these hazards - was identified and agreed upon in collaboration with the Park Authority. These receptors were categorised into infrastructure, habitats, visitor and recreational destinations, settlements, historic assets, and agriculture and forestry. They were selected based on their critical importance in supporting nature, communities, local economies, visitors, and the Park Authority's operations.

Finally, the risks identified were scored and assigned a risk rating based on an assessment of the severity of the risks for each receptor in relation to each hazard. It is important to note that the use of this risk assessment for future planning must be supplemented by further locationally specific research and ground truthing to determine the exact nature and severity of the risks. The details of the in-depth climate change risk assessment and mapping for each of the areas can be found in the assessment report linked above.

Informed by the UK Climate Change Risk Assessment (CCRA3) Summary for Scotland, the report also identified a small number of opportunities. However, it is important to recognise that these opportunities are influenced by various factors and may come with uncertainties and new risks. Additionally, some opportunities may be linked to specific adaptation responses rather than directly arising from the changing climate.

Loch Lomond and the Trossachs National Park - Peatland Action Delivery Programme 2024-2030

It is estimated that 68,000ha of land within Loch Lomond and the Trossachs National Park is covered by peatland, including four Special Sites of Scientific Interest (SSSIs) that are designated due to their peatland component.

The 68,000 hectares of peatland within the National Park are estimated to store around 20 million tonnes of carbon. However, a significant portion of this peatland has been degraded over time due to historical agricultural practices, forestry, and other forms of land management. In addition, natural processes - such as erosion and drought - have also contributed to its decline. To support climate goals and enhance carbon capture, the National Park Authority must prioritise the restoration of degraded peat, ensuring these vital ecosystems are protected and their condition significantly improved.

Within the National Park, this amounts to approximately 11,000ha of peatland. These areas of broken peat within the National Park are shown in map 1 - attached in the Appendix - alongside the restoration projects that have been completed up to the end of 2023/24 financial year. Of the 57,000ha that is not visibly degraded, national estimates suggest that up to 45,600ha (80%) of that peatland will also be degraded, but not to an extent that it will be visible from aerial imagery. This 45,600ha represents peatland that is likely to require changes in land management practices such as reductions in grazing pressure by sheep and deer or changes in forestry such as forest to bog conversion. The remaining 7,054ha of degraded peatland is suitable for physical restoration via National Park Authority Peatland ACTION funding, 1,887ha of which has been restored from 2015 to March 2024.

In addition to storing carbon, healthy peatlands also play a key role in regulating water flows. Intact peatlands act as natural sponges - soaking up rainfall and slowly releasing it over time - which can help reduce the severity of both flooding during heavy rain and drought during dry periods. By restoring and maintaining healthy peatland, the National Park can strengthen its resilience to climate impacts and protect downstream communities and habitats from water-related extremes.

LAND USE

Scotland's Biodiversity Strategy and Delivery Plan

Scotland's Biodiversity Strategy to 2045 acknowledges the intertwined nature of the climate and biodiversity crises, emphasising that addressing one necessitates tackling the other. The Strategy also emphasises integrating nature-based solutions to combat climate change, recognising that health ecosystems play a crucial role in carbon sequestration and climate resilience. The strategy sets ambitious goals to be Nature Positive by 2030 and to have restored and regenerated biodiversity across the country by 2045.

Scotland's Biodiversity Strategy to 2045 also emphasise the critical role of land use change and soil management in enhancing biodiversity and combating climate change through peatland restoration, sustainable land management to improve soil health and soil conservation.

Scotland's Third Land Use Strategy (2021-2026)

Scotland's Third Land Use Strategy integrates climate change and soil health into land use decisions to encourage sustainable, climate-resilient land management, such as afforestation and regenerative farming. Soil management through restoring and protecting soils is promoted through actions like peatland restoration. The strategy encourages land use that enhances resilience to climate change through activities such as maintaining and enhancing wetland areas. The strategy advocates for a more integrated approach to deliver multiple objectives, incorporating actions for climate and soil conservation to benefit climate, nature and local communities.

Regional Land Use Partnerships: Phase 1 Process Evaluation Final Report

The Regional Land Use Partnerships: Phase 1 Process Evaluation Final Report highlights Scotland's commitment to integrating land use planning with climate change mitigation and soil health. It underlines that land use is essential for achieving net-zero targets and fulfilling future actions of Scotland's Biodiversity Strategy. The report emphasises that balancing various land demands is crucial for a just transition to net-zero, with regional approaches offering a balance between local needs and national goals. The evaluation recognises the importance of the development of Regional Land Use Frameworks (RLUFs) to identify land use opportunities that support climate and nature targets, foster collaborative delivery and establish data tools for natural capital assessment to inform land use decisions.

Loch Lomond and the Trossachs National Park as an established pilot region will integrate where possible their Regional Land Use Framework and Local Development Plan.

Loch Lomond and the Trossachs National Park Authority Future Nature

The Future Nature Strategy is an ambitious initiative aimed at halting and reversing the decline of nature within the park and emphasise the importance of restoring habitats and enhancing biodiversity to create a resilient, nature-rich environment. The strategy acknowledges the intrinsic link between climate change and biodiversity loss and emphasis the restoration of peatlands

for their significant role in carbon storage. The strategy promotes sustainable land use practices that align with nature restoration and climate objectives.

DMG Deer Management Plans

Deer Management Plans can play a significant role in land use planning to deliver for climate and soil health by planning for managing deer numbers to address overgrazing, allow the widespread natural recovery and expansion of native woodlands, and the protection of fragile soils, at a landscape and collaborative scale. Management of deer across a landscape can support and restore healthy habitats vital for carbon sequestration.

Within Loch Lomond and the Trossachs National Park there are nine active Deer Management Groups or Forums supported by Nature Scot and other agencies. The Loch Lomond and the Trossachs National Park Authority Herbivore Action Plan is currently in draft and once finalised it will co-ordinate an annual action plan across the landscape going forward.

James Hutton Institute - Land Capability for Agriculture Map

The Land Capability for Agriculture map is a tool to help guide sustainable land use policies, ensuring that land is used efficiently to deliver for carbon storage, biodiversity and sustainable food production.

Within the boundaries of Loch Lomond and the Trossachs National Park, land use is categorised with 65% of predominant land use for agriculture primarily involving extensive livestock farming of hill sheep and beef cattle. 7% of land use is categorised as water with the remaining land use being woodlands including commercial forestry, ancient broadleaf woodland, wood pasture and farmland with trees.

Understanding land use classifications can help in considering land use opportunities, for example by identifying land with high potential for afforestation or reforestation and areas suitable for habitat restoration and conservation. The map can also provide detailed information on soil types and their capabilities guiding the selection of crops best suited to specific areas as well as identifying areas prone to soil erosion and where soil conservation practices could be applied.

Prime agricultural land (classes 1-3) can be more intensively farmed and sustainable and regenerative practices can reduce emissions. For lower-quality agricultural land (classes 5-7) considering mixed land use can deliver multiple benefits supporting

agriculture and biodiversity. The Park Authority are currently in the process of commissioning a report on the Value of Farming and Land Use which will seek to quantify and explore further the classifications for the National Park Authority.

Summary of Stakeholder Engagement

This section will be completed following the end of the engagement period and prior to inclusion in the final Evidence Report.

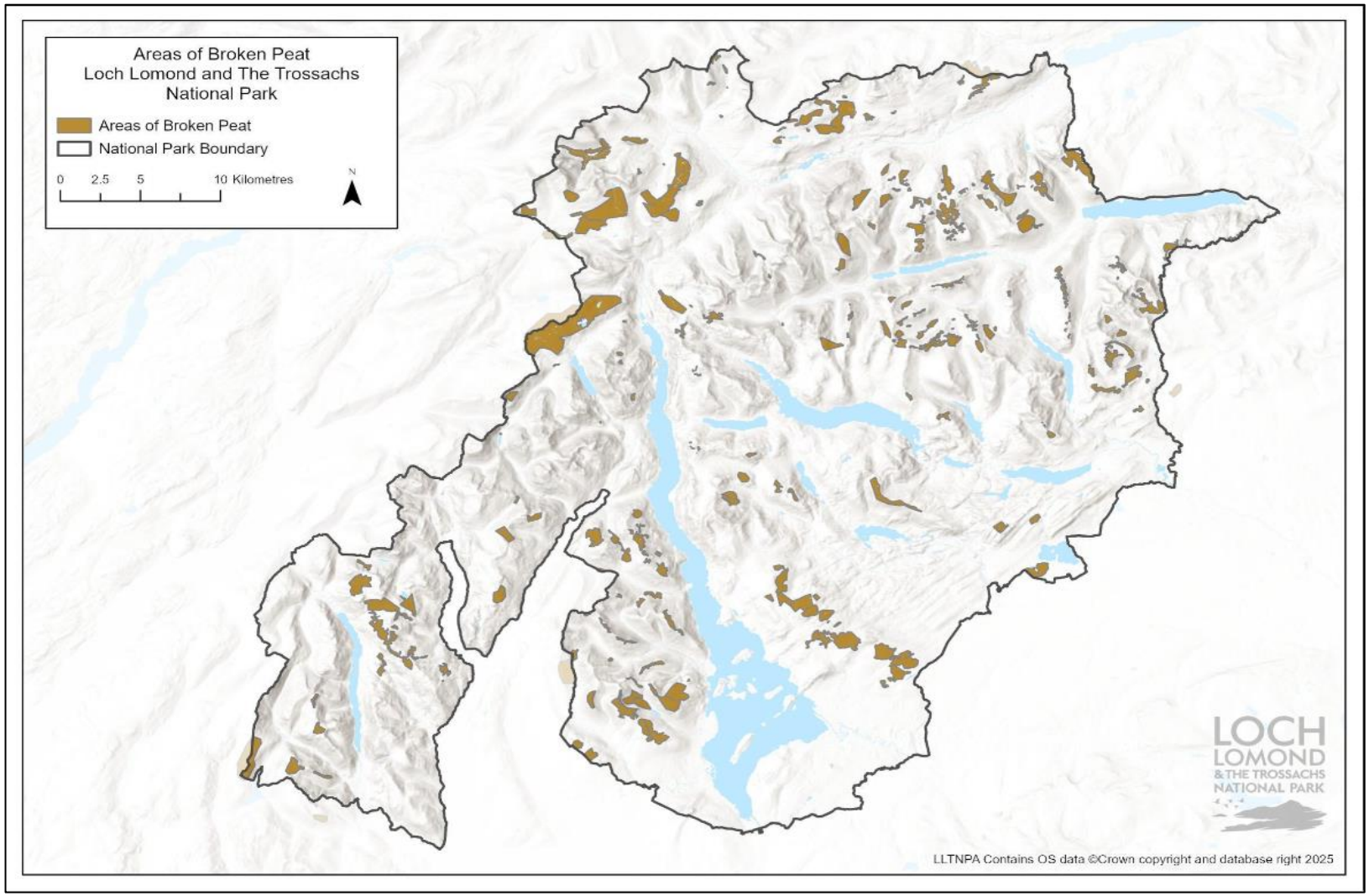
Summary of Implication for the Proposed Plan

The implications of the evidence for the Proposed Plan may be summarised as follows:

- In line with the National Park Partnership Plan 2024-2029, national legislation and international agreements the National Park Authority is required to take urgent and effective action to address the risks of climate change and meet crucial carbon emission reduction targets by 2035. As such, the new Local Development Plan (LDP) will need to consider the reduction, minimisation and avoidance of greenhouse gas emissions within the spatial strategy, while also supporting adaptation to and mitigation of the current and future impacts of climate change.
- The new LDP should prioritise sustainable locations for development. This would promote local living and reduce car travel distances, thereby directly contributing to addressing the climate crisis.
- As outlined in Topic Paper 5 – Energy & Heat and Cooling, and directly relevant to tackling climate change, the new LDP should explore and maximise the area's potential for renewable, low-carbon, and zero-emission energy opportunities as well as promote community-scale energy and heat generation in areas of high energy demand.
- The new LDP should be supported by updated Renewable Energy Planning Guidance, providing locational guidance that directs appropriate renewable energy development within the National Park.
- To reduce the significant amount of greenhouse gas emissions produced from exposed, damaged and drained peatland soils across the National Park, the new LDP should protect carbon-rich soils, the restoration of peatlands and minimise soil disturbance from development activities.
- The new LDP must ensure that site allocations are based on comprehensive flood risk information, addressing coastal flood risk and climate change in accordance with NPF4 Policy 22, and in doing so refer to the Strategic Flood Risk Assessment (SFRA) to support flood risk management and site suitability assessments.
- Additionally, the new LDP should consider identifying and safeguarding land for flood management.
- The new LDP should seek to identify soils that are of local and cultural value to protect and enhance.
- The Regional Land Use Framework (RLUF), which will be integrated into the new Local Development Plan (LDP), will explore opportunities for land use change to ensure an integrated delivery framework. By highlighting existing constraints, whether

environmental, infrastructure, policy or regulation, the plan can enable informed and constructive discussion, helping to balance development potential with the proactive land management delivering for multiple public benefits.
Statements of Agreement / Dispute
This section will be completed following the end of the engagement period and prior to inclusion in the final Evidence Report.

Appendix



Map 1: Map showing the areas of Broken Peatland within the National Park