Local Development Plan – Draft Topic Paper

Energy and Heat and Cooling

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	Energy and Heat and Cooling
Information required by the Act regarding the issue addressed in this section	**Town and Country Planning (Scotland) (Act) 1997**, as amended, • Section 15(5) (d) The infrastructure of the district (including systems for the supply of water and energy) • Section 15(5) (e) How that infrastructure is used **Town and Country Planning (Development Planning) (Scotland) Regulations 2023** Under Regulation 9, must 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 • Draft Energy Strategy and Just Transition Plan • Heat in Buildings Strategy • Onshore Wind Policy Statement • Pathway to 2030: A Holistic Network Design for Offshore Wind – National Energy System Operator (July 2022) *Local/National Park:* • Perth and Kinross LHEES • Stirling and Clackmannanshire Regional Energy Masterplan [Draft]

	• Argyll and Bute LHEES (2024) • West Dunbartonshire Council LHEES • Loch Lomond and the Trossachs National Park Carbon Footprint Assessment and Proposed Pathway to Net Zero **Other relevant Policies, Strategies and Reports** • SSEN Distribution Future Energy Scenarios Report 2024 • Scottish Hydro Electric Power Distribution PLC (SHEPD) Network Development Report 2024 **Existing Data** • SSEN Transmission Network Map – Generation Availability and Capacity • SSEN Transmission Projects Map • SSEN Transmission Open Data Portal • SPEN Transmission Generation Heat Map • SPEN Distributed Generation Heat Map

National Planning Framework 4 (NPF4) Context

Policy 11 - Energy, as outlined in NPF4, supports and promotes the development of renewable energy sources both onshore and offshore, including grid enabling upgrades to both transmission and distribution infrastructure. It seeks to maximise the areas potential for generating electricity and heat from renewable, low carbon and zero emission sources by identifying various opportunities for energy projects through the Local Development Plan.

Policy 19 - Heat and Cooling in NPF4 aims to encourage development that uses decarbonised solutions for heating and cooling, ensuring readiness for extreme temperatures. Local development plans should incorporate the areas Local Heat and Energy Efficiency Strategy and consider regions with potential for heat networks, including designated heat network zones.

As a designated National Park, Policy 4c of NPF4 is a key consideration for all development proposals. It states that development proposals affecting a National Park, National Scenic Area, Site of Special Scientific Interest, or National Nature Reserve will only be supported where: (i) the objectives of designation and the overall integrity of the areas will not be compromised; or (ii) any significant adverse effects on the qualities for which the area has been designated are clearly outweighed by social, environmental, or economic benefits of national importance.

As Loch Lomond and The Trossachs National Park is a designated landscape, there are numerous environmental constraints and considerations regarding energy infrastructure and generation within the National Park. Policy 11 recognises that certain impacts are inherent to some renewable energy forms. These include impacts on residential amenity (such as visual, noise, and shadow flicker), public access routes, aviation, telecommunications, road traffic, historic sites, water resources, biodiversity, and forestry, as well as the need for robust decommissioning and restoration plans and consideration of cumulative impacts. These issues must be addressed through careful project design and mitigation to ensure impacts are minimised as far as practicable.

In addition, Policy 11b of NPF4 specifically addresses wind farm developments, stating that: “Development proposals for wind farms in National Parks and National Scenic Areas will not be supported.” Various international and national designations, such as National Scenic Areas, Sites of Special Scientific Interest, Special Areas of Conservation, and Special Protection Areas will also be pertinent in evaluating renewable energy proposals within the National Park. Further information on these designations is provided in Topic Paper 2.

National Park Partnership Plan (NPPP) 2024 – 2029 Context

The National Park Partnership Plan (NPPP) highlights key priorities for energy under the theme of *Supporting Thriving Rural Communities*. One of the outcomes is to increase the resilience of rural communities by encouraging more local living and working. This can be achieved through reducing carbon emissions via individual and community-led actions. The Plan emphasises the importance of reducing the Park’s carbon footprint over the next few years. While many businesses and communities are already adjusting their energy use and supporting local supply chains, there is a need to expand community-scale energy and heat generation. There is a specific focus on the promotion of increasing community-scale energy and heat generation, with opportunities for district heat networks and the retrofitting of renewable micro-technology to community buildings also identified.

Summary of Evidence

This paper covers National Planning Framework 4 (NPF4) Policy 11(Energy) and Policy 19 (Heat and Cooling). The summary of evidence section is structured in the following order:

- National Context
- Local/National Park Context
    - Existing Energy Generation in Loch Lomond and the Trossachs National Park
    - Opportunities for Energy Development
    - Energy: Use, Transmission and Storage

It is also important to acknowledge that there is overlap between the Energy and Heat & Cooling Paper and NPF 4 Policy 1 – Tackling the Climate and Nature Crises, Policy 2 – Climate Mitigation and Adaptation and Policy 18 – Infrastructure First. Although the link between these policies is noted in this paper, there is more detail in the following papers:

Policy 1 & 2 – Topic Paper 1

Policy 18 – Topic Paper 3

National Context:

Draft Energy Strategy and Just Transition Plan

In January 2023, the Scottish Government published their Draft Energy Strategy and Just Transition Plan 2023 (SESJTP), setting out their priorities and policy direction for realising their climate change and Net Zero ambitions with regards to energy. This looks to transform the way that Scotland generates and uses energy until 2030 and sets out a number of key ambitions, including:

- Deploying more than 20 GW of additional renewable electricity on and off-shore by 2030.
- At least the equivalent of 50% of Scotland's energy across heat, transport and electricity demand will come from renewable sources by 2030.

The draft SESJTP does not include any policy that specifically relates to small-scale renewable energy. However, it does support communities to ensure they derive maximum benefit from the energy transition, including outlining support for regional hydrogen hubs, community ownership and supporting schemes such as Community and Renewable Energy Scheme (CARES).

The SESJTP document remains in draft form following a consultation period from January to May 2023 and is yet to be adopted but it illustrates the key priorities and policy direction of the Scottish Government on the energy transition.

Heat in Buildings Strategy

Scotland's Heat in Buildings Strategy aims to decarbonise heating systems in homes and non-residential buildings to achieve net-zero emissions by 2045. Key points include enhancing energy efficiency through retrofitting and stricter building standards to

reduce energy consumption and improve insultation. The strategy also promotes expanding the use of heat pumps and other low carbon technologies, such as district heating and hydrogen for heating buildings. New regulations and standards will be implemented to ensure this transition, including phasing out fossil fuel heating in new buildings from 2024. The Heat in Buildings Bill provides the regulatory framework for zero emissions heating and energy efficiency, and it is currently in the consultation phase.

Onshore Wind Policy Statement

Scotland's Onshore Wind Policy Statement outlines a strategic approach to develop onshore wind energy in alignment with climate targets. It emphasises supporting projects that contribute to Scotland's renewable energy goals while ensuring sustainable development. This includes harnessing the potential of onshore wind to significantly reduce carbon emissions and transition towards a cleaner energy future.

Community engagement is a cornerstone of the policy, aiming to involve local communities in the development process. It encourages consultation and offers opportunities for communities to benefit economically from projects through ownership or shared revenue schemes. This approach not only enhances local acceptance but also ensures that communities directly affected by wind developments have a stake in their outcomes.

Environmental considerations play a crucial role in the policy, particularly concerning national parks, rural landscapes and other sensitive areas. The policy sets criteria to minimise visual and environmental impacts, requiring rigorous environmental assessments before project approval. This ensures that onshore wind developments are located and operated responsibly, safeguarding Scotland's natural heritage and biodiversity.

Pathway to 2030: A Holistic Network Design for Offshore Wind – National Energy System Operator (July 2022)

The Holistic Network Design (HND) outlines a recommended onshore and offshore transmission network to support the UK Government's target of delivering 50 GW of offshore wind capacity by 2030. It includes connections for 23 GW of offshore wind (with the remaining capacity delivered through other existing or planned projects outside the scope of the HND). The HND is designed to ensure that the National Electricity Transmission System (NETS) is economic, efficient, operable, sustainable, and well-coordinated, enabling the effective transfer of power from offshore wind generation to areas of demand.

Given Loch Lomond and The Trossachs National Park's location between the major anticipated offshore wind developments along Scotland's east and west coasts, there could be implications for grid capacity within and around the National Park. Further information on grid capacity is provided in Topic Paper 3 – Infrastructure First, under the Electricity section.

Local/National Park Context:

Local Heat and Energy Efficiency Strategies

Local Heat and Energy Efficiency Strategies take a localised approach to improving energy efficiency, decarbonising heat and ensuring that efforts are aligned with the specific needs and circumstances of each local area. At present, two of the local authorities that cover the National Park boundary have published their strategies: Perth and Kinross Council and Stirling Council.

Perth and Kinross Council

The LHEES for Perth and Kinross was developed in Q3 2024 to align with NPF4. The strategy is guided by Scotland's statutory goals to reduce greenhouse gas emissions and alleviate fuel poverty. In terms of renewable energy priorities, the LHEES focuses on two main strategic priorities: first, decarbonising heat within the evolving energy system by emphasising heat networks and heat pumps; second, enhancing building energy efficiency to achieve affordable warmth and meet regulatory needs. As such the Council is considering a district heating policy to enhance energy efficiency in local communities, although rural impracticalities have been highlighted.

Stirling and Clackmannanshire Regional Energy Masterplan [Draft]

Stirling and Clackmannanshire's Regional Energy Masterplan details the steps needed to transform local energy systems and provide zero-carbon, affordable energy for everyone. The plan is structured around five key objectives and follows the energy hierarchy through four main work streams: sequestration, energy generation, heat management, and energy efficiency. Stirling Council's current focus for renewable energy initiatives is on heat networks alongside investigating ways of receiving funding for community-led renewable projects.

In the energy efficiency workstream, Balfron and Drymen are identified as priority area five for Stirling Council area, with a 24.7% average household risk of fuel poverty. Callander and the Trossachs are ranked 14th with a 21.4% risk. Among nine potential

district heating network sites, Callander High School is ranked fifth with a score of 3.65 out of 5. This score is based on factors such as carbon emissions, fuel poverty, finance, local economy, environment, societal factors and resilience.

For energy generation, no Council-owned sites within the National Park boundaries are deemed suitable for renewable energy projects. However, land east of Callander is recognised as having significant potential for re-wetting, the process of restoring water levels in previously drained wetlands or peatlands, often by blocking drainage channels or ditches, to return the area to a more natural, waterlogged state. There are several additional suitable sites within the National Park.

Argyll and Bute Council (2024)

Argyll and Bute Council is making significant progress in developing their LHEES, with plans to complete it by the end of the year. A key component of the strategy is the introduction of heat networks, particularly micro heat networks.

Looking forward, Argyll and Bute plan to place greater emphasis on solar energy storage technologies, viewing them as essential for meeting energy demands and reducing dependence on conventional power sources. However, a major challenge identified is grid capacity, which is why battery storage is being given priority. The current infrastructure is unable to support large-scale renewable projects without significant upgrades, presenting a key obstacle to expansion in the near term.

The local authority is prioritising community benefits, aiming to ensure renewable energy projects provide not only environmental gains but also create green jobs and long-term employment for residents, beyond traditional financial compensation.

West Dunbartonshire Council

At present, West Dunbartonshire's LHEES is being finalised and should be complete during 2024. This topic paper will be updated if this is before the submission to Scottish Government as part of the Evidence Report. Battery storage applications have steadily increased, highlighting its role in managing intermittent energy sources like wind and solar. However, concerns were raised in the wider Glasgow City Region about its impact, as battery storage uses valuable land with limited job creation, potentially sacrificing sites that could offer greater economic benefits.

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

To support evidence-based climate action, a carbon footprint assessment was commissioned for the National Park. This assessment has been referenced in other topic papers where relevant, particularly in relation to climate adaptation, land use and transport. The findings are cross-cutting and support a range of planning considerations, but this section focuses specifically on the energy-related aspects of the assessment and their implications for reducing emissions and achieving net zero within the National Park.

A detailed carbon footprint assessment of the National Park was commissioned to explore pathways to reaching net zero, with specific targets aligned to the Paris Agreement. The research identified six key areas for emissions reduction, with energy-related emissions emerging as particularly important. These include direct emissions from heating, electricity, and transport used by residents, businesses, and visitors, as well as indirect emissions from the production and delivery of that energy, such as those embedded in supply chains. While the largest opportunity for emissions reduction lies in land use change, particularly through peatland restoration and woodland expansion, the report makes clear that decarbonising energy consumption across all sectors is a critical part of meeting the National Park's net zero ambitions.

Existing Energy Generation in Loch Lomond and the Trossachs National Park

The following data has been finalised and extracted from commissioned research to provide accessible evidence of existing energy generation within the National Park.

For the existing and consented renewable energy developments presented in Table 1, the data is sourced from several key databases. This includes the Department for Energy Security & Net Zero's (DESNZ) Renewable Energy Planning Database (REPD) from July 2024, which lists renewable electricity projects over 150kW. However, projects below 1MW before 2021 may not be included. Additionally, data from the Park Authority on small-scale hydroelectricity projects is used, as it is considered more accurate than the DESNZ data. The research also incorporates data from the Local Energy Scotland Projects Index (2024), which covers community and locally owned renewable energy projects. Only operational and consented developments are included in the table, as consented developments are expected to be operational in the future, providing the most current information on emerging renewable energy projects within the local planning authority.

Table 1: Existing operational and consented renewable development in the National Park, including capacity, output and CO2 savings.

Source	Technology	Estimated total capacity (MW)	Electricity output (MWh/year)	Potential CO2 savings (tonnes/yr)
Operational				
REPD and Local Energy Scotland	Biomass (dedicated)	5.98	29,722	3,953
LLTNPA data and Local Energy Scotland	Hydro (LLTNPA data and Local Energy Scotland)	27.59	92,312	12,278
Consented (permitted/under construction)				
REPD	Solar Photovoltaics - Roof	0.18	142	19
	Total operational and consented	**33.76**	**122,176**	**16,249**
Abandoned				
REPD	Hydro	2.00	6,691	890
Withdrawn				
REPD	Wind Onshore	4.00	8,924	1,187
Planning permission refused / appeal refused				
REPD	Wind Onshore	20.00	44,621	5,935

The total operational and consented electricity output from renewable energy development in the National Park is 122,176 MWh per year. The individual electricity output for each type of renewable technology is detailed below:

Hydro

There is currently 92,312 MWh per year of electricity output from operational hydro developments within the National Park.

Solar Photovoltaics (PV)

142 MWh per year of electricity from roof mounted solar photovoltaics is permitted in the National Park and due to be operational in the future.

Biomass

There is currently 29,722 MWh per year of electricity output from dedicated biomass developments within the National Park.

Hydrogen

The Scottish Government's Hydrogen Action Plan 2022 outlines Scotland's strategy to become a leading producer and exporter of renewable hydrogen. Key goals include developing 5GW of hydrogen production by 2030 and 25GW by 2045. The plan focuses on economic growth through job creation, infrastructure development and fostering innovation. It also emphasises international collaboration and creating a supportive regulatory framework to drive the hydrogen economy and help Scotland achieve its net-zero targets by 2045.

In Loch Lomond and the Trossachs National Park there are currently no major hydrogen projects in the area or identified in the Scottish Government Hydrogen Action Plan.

Heat Networks

Due to licensing constraints, data on Heat Network Zones and Heat Network Potential has not been available. However, the Authority will seek to address these data gaps through continued engagement with the relevant Local Authorities and by drawing on the findings set out in their Local Heat and Energy Efficiency Strategies (LHEES).

Opportunities for Energy Development

The research highlights the national ambition of delivering a coordinated approach to climate change mitigation and renewable and low carbon technologies and the National Park's objectives for creating a low carbon place and greener way of living. Although the National Park's special qualities and sensitivities can place certain limitations on the deployment of such technologies, the National Park's planning function can play a key role in identifying and guiding communities and stakeholders towards the relevant considerations, appropriate scales of and locations for these technologies.

Within the National Park context, the research highlighted the following opportunities and considerations for each type of existing renewable energy development:

Solar

If, within the National Park, full technical capacity for rooftop solar and thermal photovoltaics (19.07MW & 24.22MW respectively) could be achieved there is a potential for approx. 2,750 tonnes of carbon emissions to be saved each year from roof-mounted

solar. Whilst this represents a small percentage of overall emissions, this cannot be discounted as the increasing affordability of solar technology could further encourage the adoption of these technologies. There may be opportunities for ground mounted solar within the National Park, however assessing technical capacity and potential at strategic levels was not possible, compared to roof mounted options. Both technologies have their own physical and technical space requirements and environmental constraints that require to be considered.

Heat Pumps

There is a significant opportunity in the National Park for the inclusion of heat pumps (i.e. air source, ground source) to new and existing building stock to secure the decarbonising of heating emissions from existing fuels. Both technologies have their own physical and technical space requirements and environmental constraints, but subject to criteria may not always require planning permission. The research highlighted that across all domestic and non-domestic building stock, there is potential for approximately 32,500 tonnes of carbon emissions to be saved per year in the National Park from the integration of heat pumps.

Battery Energy Storage Systems (BESS)

Broader trends have shown a rise in demand for BESS across the country to support the increased efficiency of the grid in the transition of renewable energy production. Establishing technical potential for the National Park was not possible as part of this study, due to demand being dependent on the sources of renewable energy potential and grid capacity. The research does identify that, subject to environmental and locational considerations, there could be scope for the co-location and deployment of batteries, proportionate to the scale of renewable energy development

Hydro

It is anticipated that schemes coming forward in the National Park are likely to be relatively small-scale ‘run-of-river’ schemes. However, in April 2025 SSE launched a planning application with the Energy Consents Unit for the new Sloy Pumped Hydro Storage scheme which is a larger scheme that is currently under consideration.

Wind

Only small-scale wind development is supported by planning policy in the National Park (i.e. single turbines with a height to blade tip of no more than 30m). As supported by existing planning policy, there is a place for small-scale wind development

within the National Park and evidenced demand for this to be part of the energy mix, including co-located with other technologies. Most small-scale wind turbines have potential where they can be sited and designed to have minimal adverse environmental impacts. All proposals should be assessed on a case-by-case basis and cumulatively with other developments.

Biomass

With regard to the technical potential for biomass within the National Park, it is assumed that most properties could incorporate a domestic-scale biomass boiler. Larger scale proposals may require a dedicated boiler room or separate fuel store. Overall, the future role of biomass within the National Park is likely to align with the Scottish Government's position that bioenergy should only be used in those applications where its carbon reduction is maximised and where alternative options are not available.

Energy: Use, Transmission and Storage

This section on energy use, transmission and storage builds on the electricity-related information provided in Topic Paper 3 – Infrastructure First, offering further insights into the current and future capacity of energy infrastructure within the National Park.

NESO (National Energy System Operator) is the energy system operator for the United Kingdom. Within the National Park, SSEN Transmission is the primary Transmission Operator (TO) and SSEN Distribution is the Distribution Network Operator (DNO). However, for the Balloch area of the park, the TO and DNO is Scottish Power Energy Networks (SPEN).

SSEN Transmission Networks

SSEN Transmission (SSEN-T) is responsible for operating, maintaining and upgrading and reinforcing the high-voltage electricity transmission networks. These networks transport electricity over long distances from power stations to substations, utilising steel towers, underground cables and overhead lines.

There are three electricity transmission grid supply points within the National Park, one at Sloy (132kV), one at Killin (132kV), and one at St Fillans (132kV). There is also a transmission substation at Inveranan and a switching station at Sloy which are integral to the operation of the transmission network. In terms of network capacity, the GSP at Killin is constrained, meaning the network doesn't have the capacity to transport electricity required or produced from a new connection.

In terms of SSEN-T generation availability. Both GSPs at Sloy and Killin are constrained, meaning there is limited capacity for new electricity generation to be connected to the electricity grid. However, at St Fillans there is generation availability.

SSEN Transmission Projects

SSEN-T are currently upgrading its electricity network to meet net zero targets. SSEN-T is also expanding the national transmission grid in northern Scotland including Argyll and Bute, Loch Lomond and the Trossachs National Park and the Western Isles, to handle increased capacity and support new renewable energy generation. The current and completed projects within the park are listed below:

- The Killin VISTA project was completed in 2023 and involved undergrounding 7.8km of overhead line and removing 32 steel lattice towers.
- The Glen Falloch and Sloy VISTA project has been complete and is in its operational phase.
- The 132kV overhead line from Sloy to Windyhill requires reconductoring and refurbishing due to deterioration. Planning permission for access tracks were granted in April 2023 and these works will be progressing in the near future.
- Transformers to the south of the existing Sloy Substation are required, however, there have been delays due to onsite ground contamination. A planning application is due to be submitted in future but the timescale for submission is currently unknown.

SSEN Distribution Networks

SSEN Distribution (SSEN-D) is responsible for delivering electricity from the transmission network to homes and businesses across the north of Scotland. The distribution network transports lower voltage electricity through overhead lines, underground cables and service lines.

There is a SSEN-D grid supply point in the National Park, located at St Fillan's (33kV). In terms of generation availability, the GSP at St Fillan's is constrained meaning there is no room for more electricity generation in St Fillans.

SPEN Transmission Networks

There are two overhead SPEN Transmission lines that run through the park, a 132kV line from Dumbarton to Craggan Hill and a 132kV line from Glasgow to Cruachan via Inverarnan.

SPEN Distribution Networks

SPEN Distribution is responsible for delivering electricity to those within a small area at the south of the National Park, particularly those who live in Balloch and on the Westside of Loch Lomond as far as Arden. As highlighted by SP Energy Networks Distributed Generation Heat Map for those living within the above-mentioned areas of the park, at least one factor in the network is close to its operational limit and so installation of most levels of Distributed Generation and local connection is highly unlikely.

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:

- To support the NPPP, the new Local Development Plan (LDP) should promote community-scale energy and heat generation in locations where there is high energy demand and these measures can be effectively implemented, such as public buildings or residential clusters.
- NPF4 Policy 11 recognises that certain impacts are inherent to some renewable energy forms. The new Local Development Plan, supported by updated guidance, should continue to set out local requirements for new development.
- The Local Development Plan should seek opportunities for increased energy efficiency in new developments and consider the role it will play in tackling energy efficiency of existing stock through retrofitting solutions.
- The spatial strategy should be informed by areas of heat network potential and any designated District Heat Network Zones identified in the relevant Local Heat and Energy Efficiency Strategies (LHEES). For example, Callander High School has been identified in Stirling and Clackmannanshire's Regional Energy Masterplan as having district heat network potential. Although it is recognised that there are some rural impracticalities to the development of district heat networks in the National Park and so the LDP should consider alternative solutions.

- The Renewable Energy policies in the current Local Development Plan should be reviewed and updated spatial guidance should set out what types of renewable energy technology will be appropriate and where within the National Park, facilitating communities/businesses switching to non-fossil fuel sources of power and heat.
- The Local Development Plan should acknowledge that the connection of new renewable energy generation developments to the electricity grid may require prior upgrades and/or expansion of the grid infrastructure. As part of the planning process, the LDP should ensure that potential renewable energy projects are assessed for their compatibility with existing and potential grid capacity.
- The National Park already hosts a range of renewable energy technologies, and research indicates potential for further development, particularly at the community scale and through micro-renewables. In addition, as new technologies emerge and demand evolves, the new Local Development Plan should consider opportunities for Battery Energy Storage Systems (BESS) and hydrogen, where these can be delivered in ways that are appropriate and sensitive to the National Park's Special Qualities. Renewable energy policies and associated guidance should also remain flexible to accommodate future technological advancements.
- There is an established hydro-electric presence within the National Park, which could offer opportunities for further electricity generation.

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.