Acheilidh Wind Farm

Further Environmental Information
Volume I – Main Text

June 2026

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1 INTRODUCTION

Introduction

1.1 This Further Environmental Information (FEI) is submitted in support of an application for consent under Section 36 of The Electricity Act 1989 by Energiekontor UK Ltd ("the Applicant") on land approximately 7.6km south-east of Lairg ("the Site") for the development of up to 12 turbines at a height of up to 230m and associated infrastructure ('the proposed development'. The application was accompanied by an Environmental Impact Assessment Report ("the EIAR") as required under the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 ("the EIA Regulations").

1.2 In accordance with Regulation 20 of the EIA Regulations, this FEI will be advertised and made available for consultation.

1.3 The FEI has been prepared and written by Energiekontor however subcontractors have carried out the assessment of specialist topics and provided input into the assessment.

Purpose of FEI

1.4 This proportionate FEI has been prepared by the Applicant to provide details of the potential grid connection options for the proposed development, together with assessment of the potentially significant environmental effects associated with that connection, should the Scottish Ministers consider that the proposed development and the grid connection are functionally 'one project' for EIA purposes. The FEI is based on the information that is known at the time of writing and demonstrates that the likely effects of the connection have been identified and understood as is reasonably practical and proportionate given their stage of development and that they will be promoted by other entities.

1.5 For the avoidance of doubt, permission is not sought for the grid connection itself as part of this application. The connection will be subject to its own separate consenting process in the future and, as such, there are limitations on the level of detail currently available (including regarding construction and operation methodologies and appropriate mitigation).

1.6 It should be stressed at the outset that the final details of the grid connection are not currently known. A number of ongoing initiatives relating to electricity network planning may influence the eventual point of connection, connection date, connection voltage, routeing of the connection, and the balance of underground cable and overhead line. These include Connections Reform, the Strategic Spatial Energy Plan (SSEP), Regional Energy Strategic Plans (RESPs) and Centralised Strategic Network Planning (CSNP). These initiatives are discussed in section 2.

Structure of Report

1.7 This FEI is structured as follows:

- Section 2: Regulatory and Policy Background sets out the current grid reform landscape;
- Section 3: Approach to Routeing describes the approach to routeing for the District Network Operator (DNO) relevant to the proposed development and which has been used as the basis for the grid connection corridor;
- Section 4: Grid Connection Details sets out what is known about the likely grid connection at this stage;
- Section 5 to Section 10 set out subject specific environmental appraisals of potential significant effects; and

1.8 The assessment is accompanied by the appropriate figures which are cross referenced within each section. These can be found in Volume 2: Figures.

1.9 Energiekontor UK Ltd is a renewable energy development company with offices in Glasgow, Edinburgh and Leeds. The company was formed in 1999 and develops onshore wind and solar farms throughout the United Kingdom. The company operates eleven existing wind farms in the UK, including three subsidy-free wind farms in Scotland, with many others at various stages of the development process in the UK.

1.10 Energiekontor UK Ltd is part of the Energiekontor Group. The parent company, Energiekontor AG, was established in 1990 in Bremerhaven in Northern Germany. It has since grown to become one of the leading wind energy companies in Europe and is active in Germany, France, Portugal, the USA and the UK. The company has built more than 140 onshore wind farms in Europe.

Contact for Further Information

1.11 For additional copies, a charge of £5 will be made for a full electronic copy of this FEI on USB. Costs for paper copies are as follows:

- Volume I – Written Text £50
- Volume II – Figures £100
- Volume III – Technical Appendices £50

1.12 Requests for copies should be sent to: Calum Morris, Project Manager, Energiekontor UK Ltd, calum.morris@energiekontor.com

1.13 Hard copies of this FEI will be available for public inspection at Lairg Community Centre, The Main Street, Lairg, IV27 4DD.

2 REGULATORY AND POLICY BACKGROUND

Introduction

2.1 As part of its commitment to tackling climate change, the Scottish Government has set legally binding targets to reach net zero greenhouse gas emissions by 2045. In delivering net zero, the electricity system – how electricity is generated, transmitted, distributed and used – is undergoing significant transformational change. This section sets out the regulatory and policy context that underpins how this transformation will be delivered in practice.

Regulatory Context

2.2 Scottish Hydro Electric Transmission plc, operating and known as Scottish and Southern Electricity Networks Transmission ("SSEN Transmission") owns and maintains the electricity transmission networks across the north of Scotland.

2.3 There are a number of legal provisions which apply to the development of electricity transmission and distribution lines and associated infrastructure. The principal legislation which applies in the UK is the Electricity Act 1989. Licence holders are required under Section 9(2) of the Electricity Act to:

- Develop and maintain an efficient, co-ordinated and economical system of electricity transmission; and
- Facilitate competition in the supply and generation of electricity.

2.4 Transmission licence holders therefore have statutory and licence obligations to develop the electricity transmission network to provide adequate transmission capacity and to provide connections to customers who wish to connect to and use the transmission system to participate in the national wholesale electricity market, including new electricity generators. Similar obligations exist for distribution licence holders.

2.5 Section 38 and Schedule 9 of the Electricity Act imposes a further statutory duty on licence holders (including SSEN Transmission) to take account of the following factors in formulating proposals for the installation of overhead transmission lines:

- *"(a) shall have regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest; and*
- *(b) shall do what he reasonably can to mitigate any effect which the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects."*

2.6 The Construction (Design and Management) Regulations 2015 require that the design of new grid infrastructure minimises hazards and reduces risk during construction.

2.7 The Holford Rules provide guidance relating to the routeing of overhead electricity transmission lines.

2.8 In the context of the above, transmission licence holders are required to identify electrical connections that meet the technical requirements of the electricity system, which are economically viable, and which will, on balance, result in the least disturbance to both the environment and the people who live, work and enjoy recreation within it.

Policy Context

Planning Policy

2.9 NPF4 recognises the need for the expansion of the electricity grid in Scotland and includes 'Strategic Renewable Electricity Generation and Transmission Infrastructure' as a 'national development'. This is to support a large and rapid increase in electricity generation from renewable sources, which is essential for Scotland to meet its net zero emissions targets. This will require substantial reinforcement of the electricity transmission grid, including the addition of new infrastructure to connect and transmit the output from new on and offshore capacity to consumers in Scotland, the rest of the UK and beyond. NPF4 makes it clear that national developments "will be a focus for delivery".

2.10 Policy 11 of NPF4 relates to energy generation and infrastructure. The intent of the policy is stated to be:

> *"To encourage, promote and facilitate all forms of renewable energy development onshore and offshore. This includes energy generation, storage, new and replacement transmission and distribution infrastructure and emerging low-carbon and zero emissions technologies including hydrogen and carbon capture utilisation and storage (CCUS)."*

2.11 Policy 11 also states that "grid capacity should not constrain renewable energy development" and that "it is for developers to agree connections to the grid with the relevant network operator".

Connections Reform

2.12 The UK's energy system is undergoing a fundamental transformation to achieve the UK Government's Clean Power 2030 ambition, support the transition to net zero, and reform the way projects connect to the electricity network. The National Energy System Operator (NESO) has introduced 'Connections Reform' to address a grid connection queue. The reform introduces significant changes to the codes and methodologies that govern how projects enter and progress through the connections process; it will remove unviable projects from the grid connection queue; and prioritise those critical to delivering clean power and wider industrial decarbonisation.

2.13 Previously, the way energy projects connected to the grid was based on a long 'first come, first served' queue. Projects joined the queue according to the order in which their grid connection application was submitted, and whichever project was first in line would be

prioritised for connection first, even if that project was not ready to build. This led to delays, wasted resources and sometimes unnecessary network upgrades.

2.14 As part of the reformed connections process, the rules have changed and projects are now assessed and assigned a status – or 'Gate' – based on their readiness and strategic alignment with the UK Government's energy goals:

- Gate 1 applies to projects that do not meet the Gate 2 criteria. These projects may not be assigned a confirmed point of connection or connection date, but may progress in the future if both Readiness and Strategic Alignment can be demonstrated.
- Gate 2 applies to projects that meet the new requirements for Readiness and Strategic Alignment. These projects can secure a confirmed point of connection, connection date, and queue position.

2.15 Readiness and Strategic Alignment are defined by NESO in the new rules. Readiness generally means that a project has secured land rights, while Strategic Alignment for Scottish onshore wind projects currently means that planning consent has been gained.

2.16 Regardless of future Gate status, projects which are not currently at Gate 2 are unable to confirm their point of connection or connection date with the relevant grid licence holder until they gain planning consent and can move to Gate 2.

2.17 The status of the proposed development's grid connection is set out within section 4 of this FEI.

Strategic Spatial Energy Plan

2.18 NESO is currently working with a broad range of stakeholders, including the UK, Scottish and Welsh governments, to develop Great Britain's first ever spatial plan for energy: the Strategic Spatial Energy Plan (SSEP). This will be a comprehensive blueprint for the energy system across Great Britain and drive a more strategic approach to energy infrastructure planning from 2030 to 2050, aiming to speed up the transition away from fossil fuels and towards homegrown clean energy. The SSEP will be instrumental in achieving clean power and net zero.

2.19 The SSEP will be used to help plan the future of the energy system for the whole of Great Britain. It will take over from the government's Clean Power 2030 report and sit alongside and grow with future government policy and market-led interventions, providing a more strategic approach to energy system. The SSEP's outputs will directly feed into the Centralised Strategic Network Plan (CSNP), which is a plan for transmission network infrastructure which NESO is also developing.

2.20 The overall goal of the SSEP is to help accelerate and optimise the transition to clean, affordable and secure energy across Great Britain. This goal, and the objectives that support it, will be achieved via a partnership between the UK Government, Scottish and Welsh Governments, Ofgem, NESO and private industry. It will be supported in achieving

these goals through work including the CSNP and regional energy plans produced by Regional Energy Strategic Plans (RESPs).

2.21 The SSEP will contribute to achieving these goals by providing greater clarity on the long-term evolution of the energy system as we decarbonise the economy in line with our net zero commitments. It will also support policy decisions with its assessment of the optimal locations, quantities and types of energy infrastructure required to meet future energy demand with clean, affordable and secure supply. It will take account of public views, environmental considerations and cross-sectoral demands on land and sea, and express this information as a spatial plan for energy generation.

2.22 The first SSEP, currently due to be published in Autumn 2027, will take account of current and planned infrastructure and map the potential locations, quantities and types of electricity generation and storage infrastructure required between 2030 and 2050. Following publication of the first plan it is intended that the SSEP will be updated every three years. It is anticipated that the initial SSEP, together with future iterations, will revise the capacity requirements for individual generation technologies in different regions in response to evolving electricity demand patterns as the economy decarbonises.

Summary

2.23 In summary:

- Licence holders have statutory and licence obligations to develop the electricity network to provide adequate capacity and to provide connections to customers who wish to connect to and use the electricity system.
- NPF4 is clear that "grid capacity should not constrain renewable energy development" and that "it is for developers to agree connections to the grid with the relevant network operator".
- In delivering net zero, the electricity system – how electricity is generated, transmitted, distributed and used – is undergoing significant transformational change.
- Connections Reform has moved from the previous 'first come, first served' process to a new gated process, which prioritises projects based on their readiness and strategic alignment with the UK Government's energy goals.
- Only projects with Gate 2 status are assessed in detail by the network licence holders and only these projects will have confirmed points of connection and connection dates.

Scottish onshore wind projects with Gate 1 status will not have details confirmed for their points of connection or connection dates and, at least until the SSEP is published, will only progress to gate 2 when they receive consent.

3 APPROACH TO ROUTEING

Introduction

3.1 SSEN has a legal duty to develop and maintain a technically feasible and economically viable transmission and distribution system in central and southern Scotland. This section outlines how SSEN is likely to seek to fulfil this duty whilst having due regard to environmental interests including natural and cultural heritage assets and people

3.2 Scottish and Southern Electricity Networks (SSEN), the Transmission Operator for northern Scotland, carry out the design, environmental assessment and application to the Scottish Ministers for overhead grid connection routes under Section 37 of the Electricity Act 1989 (noting that, if used, underground grid connection routes are progressed under the Town and Country Planning (Scotland) Act 1997). This process is explained by SSEN in their Routeing Overhead Lines[1] document and is followed in EIAR documents which support the applications for other wind farm grid connections.

Approach to Routeing

3.3 The routeing process undertaken by SSEN follows the below stages:

- Stage 0: Routeing Strategy
- Stage 1: Corridor Selection
- Stage 2: Route Selection
- Stage 3: Alignment Selection
- Stage 4: EIA Process

Stage 0: Routeing Strategy

3.4 The routeing strategy is defined, the process of which is tailored to the scale and requirements of the individual project in question.

Stage 1: Corridor Selection

3.5 Large corridors (which can be "up to several kilometres wide") between the Point of Connection (PoC) and the wind farm substation are selected based on SSEN criteria. In some cases, Stage 1 takes place alongside Stage 2.

[1] https://www.ssen-transmission.co.uk/globalassets/projects/2030-projects/2030-project-documents/routeing-overhead-lines.pdf

Stage 2: Route Selection

3.6 Once the large corridor has been chosen, routes are identified within and can range from 500m to 1km in width depending on the environment through which they pass. Route options are evaluated in the same way as the corridor options, based on environmental and technical factors, to narrow the potential options to a proposed route.

3.7 Identification of route options takes place after desk-based assessment and field survey takes place. SSEN Transmission guidance is applied at this stage along with assessment of the route against each of the Holford Rules. Consideration is also given to site-specific environmental topics such as cultural heritage, settlements, landscape and visual and land use. Technical constraints assessed include infrastructure, design based on terrain, as well as access, construction, maintenance and operation.

3.8 Assessment of each topic as outlined above is carried out using a Red/Amber/Green (RAG) rating, based on the likelihood that the route option will be constrained by the particular topic. Red indicates high potential for the option to be constrained, amber indicates intermediate potential for the option to be constrained, and green indicates low potential for the option to be constrained.

3.9 The method of underground cable (UGC) is also evaluated at this stage, if using OHL in part of the route is assessed to cause likely significant effects.

Stage 3: Alignment Selection

3.10 The final stage aims to produce a final alignment within the route option selected in Stage 2. This is designed to be taken forward to the formal consenting process.

3.11 Further constraints are considered at this stage, which are local to the route that the connection follows. Multiple alignment options are carefully considered with respect to factors such as access, ecology, ornithology, geology and hydrology and both desk-based assessment and field survey is undertaken if required.

3.12 Further consideration is given to UGC if required and once the alignment with the least environmental and technical impact with respect to the topics outlined has been identified, then this is the route that is chosen.

3.13 In terms of identifying and appraising options for underground cable sections, as opposed to overhead lines, an approach is based on the premise that the most significant effects are likely to result from the level of ground disturbance required for the construction of cable trenches and associated works. Where possible, cables will be routed to follow existing linear features that have already created disturbance such as roads or existing overhead line corridors. Well routed cables take into account environmental and technical considerations and seek to avoid, wherever possible, areas of irreplaceable habitats which are difficult to reinstate. The following criteria are particularly important for underground cables:

- Suitable locations for transition between overhead line and cable (overhead lines may terminate to cable either via a separate 'sealing end compound' or by a gantry fitted to the tower body);
- Safety and reliability;
- Constructability;
- Likely impact on the local environment during construction and ability to mitigate this;
- Disruption to third parties during construction and ability to mitigate this;
- Ground conditions, including risk of contamination and also ground stability;
- The need to cross wet areas and/or habitats that are difficult to reinstate;
- Flood risk, proximity to water supplies and ability to cross watercourses at their narrowest point;
- Long term visibility of the cable route post construction, including the length that will be seen and the distance at which it will be visible;
- Likely long term loss of landscape features such as hedges or individual trees;
- Likely permanent impacts on known and unknown archaeology;
- Topographical and geological features;
- Ground stability and elevational alignment; and
- The need for long term access for maintenance.

3.14 In siting the associated terminal towers and sealing end compounds, used to connect the cable section with an overhead line, due consideration is given by SSEN to the Holford Rules, including the avoidance of areas of highest and high 'amenity' value where possible, the use of the visual containment offered by natural features such as woodland, and the potential use of bunding and/or screen planting where compatible with landscape character.

Stage 4: EIA

3.15 EIA is part of the iterative design process of overhead line routeing and, in conjunction with the technical design and landowner inputs, is used to refine the proposed route to a detailed alignment along with siting and design of tower or pole positions and ancillary development. Once the final design is 'frozen' the formal assessment of environmental effects is undertaken. EIAs are undertaken according to the following principal steps:

- Scoping of the EIA;

- Collection of baseline information;
- Identification and assessment of the likely significant effects;
- Identification of mitigation measures; and
- Preparation of the formal EIA Report

The Holford Rules

3.16 It is generally accepted across the electricity industry that the guidelines developed by the late Lord Holford in 1959 for routeing overhead transmission lines, 'The Holford Rules', should continue to be employed as the basis for routeing high voltage overhead transmission lines. The Holford Rules were reviewed circa 1992 by the National Grid Company (now NESO) as owner and operator of the electricity transmission network in England and Wales, with notes of clarification added to update the Rules. A subsequent review of The Holford Rules (and clarification notes) was undertaken by Scottish Hydro Transmission Ltd in 2003 to reflect Scottish circumstances. The Holford Rules are reproduced at Technical Appendix 3.1.

Stakeholder Engagement

3.17 SSEN seeks to engage with key stakeholders including local communities and others who may have an interest in a project. This engagement process begins at the early stages of development of projects to ensure that the project design balances the views of stakeholders and communities with SSEN's statutory obligations.

3.18 SSEN undertakes engagement at four different steps of project development:

- Step 1: Pre-notification and engagement. Discussions at this stage enable the views of stakeholders to inform project design, advice on routeing and assessment methodologies.
- Step 2: Information gathering. Discussions at this stage inform the routeing strategy through the gathering of relevant environmental and planning considerations within the study area.
- Step 3: Obtaining feedback on emerging route options and substation sites. This often includes discussion of alternative corridors, line routes, cable section routes and substation sites which are being considered. For larger projects, these alternatives may be set out in a 'Routeing Consultation Document' prepared by SSEN, which will clearly indicate the preferred route and set out the reasons for the other route options being discarded.
- Step 4: The EIA stage. The results of stakeholder engagement are taken into consideration and used to confirm the 'proposed route' (and substation site if relevant) for progression to EIA.

Summary

3.19 In summary:

- SSEN has a legal duty to develop and maintain a technically feasible and economically viable transmission and distribution system in the area in which they operate.
- SSEN seeks to fulfil this duty whilst having due regard to environmental interests including natural and cultural heritage assets and people.
- SSEN has a detailed approach to routeing which involves two main stages: identification of routes, and environmental assessment. These two stages must be completed before an application for consent is submitted.
- Consultation with stakeholders is undertaken by SSEN at various stages of the project's development.

3.20 For the proposed development, it is the case that SSEN has yet to begin carrying out any of these development or consultation activities.

4 GRID CONNECTION DETAILS

Introduction

4.1 This section outlines the currently understood parameters of the likely grid connection corridor for the proposed development. The subsequent sections provide a high-level assessment of the potential likely significant environmental effects associated with its routeing. This assessment is based on the information available at the time of writing, recognising that the final grid connection details have yet to be confirmed.

Uncertainty

4.2 The EIA process is designed to ensure robust information about the environmental effects of a development is reported in a systematic way to inform decision making. There will, however, always be an element of uncertainty as to the exact scale and nature of the predicted effects. These may arise through shortcomings in available information or due to the inherent limitations of the assessment process, including modelling and forecasting processes and the subjectivity in applying professional judgement. In terms of Schedule 4, Part 6 of the EIA Regulations, difficulties encountered in compiling the information and the main uncertainties should be identified.

4.3 Under the process of Connections Reform outlined in Section 2, the proposed development does not currently benefit from a Gate 2 grid connection agreement, however may do so in the future (see paragraph 4.5 below). As such the following details for the grid connection have not been confirmed by SSEN:

- Point of Connection (PoC) to the electricity transmission network;
- Connection voltage;
- Route corridors, including the preferred route; and
- The balance of overhead line and underground cable sections of the preferred route.

4.4 Until these details are confirmed by SSEN it is not possible to provide an EIA of the final grid connection route. As explained in Section 2, SSEN will not commence work on the connection details unless and until consent for Acheilidh Wind Farm has been granted. This necessarily limits the level of detail and the certainty at which environmental effects can be assessed at this stage.

4.5 The proposed development has a Gate 1 offer with Clause 3a protection. This means at this stage the offer is indicative; however it guarantees that the proposed development would be offered a Gate 2 offer (between 2031 and 2035) for projects which have submitted valid planning applications before 20th December 2024, upon consent of Acheilidh Wind Farm. This means that if the Scottish Ministers decide to grant consent and

deemed planning permission for the wind farm, NESO will subsequently provide a grid offer for it to join other Gate 2 projects.

4.6 Accordingly, this FEI presents a high-level environmental assessment based on the information currently available regarding the likely grid connection at the time of writing.

Indicative Grid Connection Details

Outline Plans

4.7 Discussions with SSEN to date have been caveated with the understanding that the trigger point for SSEN undertaking extensive work on the grid connection has not yet been met. However, it is understood that the likely method of connection would be via the existing distributor substation at Loch Buidhe, approx. 2km south of the site.

4.8 It is assumed that in future, the next stages would be for SSEN to provide a further application to the onsite substation to Loch Buidhe.

Grid Connection Corridor

4.9 Based on the above, this FEI provides an indicative, high level assessment of a connection corridor based on the potential spatial arrangement of both the distributor substation and subsequent line to Loch Bhuide.

4.10 It should be noted that these are both based on the Applicant's logical assumptions around the siting of these features (having reference to the Holford Rules and other best practice factors around siting of infrastructure). The final orientation and selection of these locations, orientation and technical details will be a matter for SSEN.

4.11 The corridor has then been trimmed and expanded in a non-uniform fashion to meet the requirements of the Holford Rules as they relate to designations and constraints along the route. The assumptions made are explained below in Table 4.1.

Table 4.1: Grid Corridor and Holford Rules

Holford Rule	How it has been applied to the grid connection corridor
Rule 1 Avoid altogether, if possible, the major areas of highest amenity value, by so planning the general route of the line in the first place, even if the total	**Alternative routes.** Rule 1 Note a) requires the investigation of alternative routes, avoiding major areas of amenity value. The Applicant has provided a corridor in which there may be several alignments which may be possible.

Holford Rule	How it has been applied to the grid connection corridor
mileage is somewhat increased in consequence. Rule 1 Note a) requires the possibility of alternative routes. Rule 1 Note b) requires that the areas of highest amenity value should be established on a project-by-project basis having regard to international and national designations.	**Areas of highest amenity value** Designations in consideration when defining an indicative grid connection corridor include: • Strahcarnaig and Strathfleet Moors SPA to the north and south (Figure 7.1, 7.2) • Strahcarnaig and Strathfleet Moors SSSi to the north and south (Figure 7.1, 7.2) • Several Scheduled Monuments sit to the north east have been avoided. (Figure 6.1)
Rule 2 Avoid smaller areas of high amenity value or scientific interest by deviation. Areas not included in Rule 1 as a result of their spatial extent should be identified along with other areas of regional of local high amenity value. Effects on the setting of historic buildings and cultural heritage features should be minimised. If there is an existing transmission line through an area of high amenity value and the surrounding land uses have to some extent adjusted to its presence, then the effect of remaining on this route must be considered.	With the Strahcarnaig and Strathfleet Moors SSSI/SPA to the north and south of the grid route corridor, a 14,700+ hectare protected upland area designated for its national and international importance as a breeding ground for Hen Harriers It features upland heather moorland, blanket bog, and forest plantations. Final selection of routes within the grid connection corridor would seek to minimise effects upon the SPA and SSSI to the north and south.
Rule 3	The grid connection corridor selected has been chosen to reflect as direct a line as possible, given its

Holford Rule	How it has been applied to the grid connection corridor
Choose the most direct line, with no sharp changes of direction and thus with few angle towers. Too few angles on flat landscape can also lead to visual intrusion through very long straight lines of towers.	short distance, and will avoid unnecessary changes of direction where possible.
Rule 4 Choose tree and hill backgrounds in preference to sky backgrounds wherever possible, and when the line has to cross a ridge, secure this opaque background as long as possible.	The grid connection corridor has been selected such that it runs through the valley. This is consistent with other existing lines in the area.
Rule 5 Prefer moderately open valleys with woods where the apparent height of towers will be reduced and views of the line will be broken by trees. Utilise background and foreground features, minimise exposure of towers on prominent ridges and skylines, and where possible, follow open space and run alongside, not through woodland or commercial forestry.	The grid connection corridor has been selected such that whilst in an open area, it runs through a valley with view of forestry to the south of around the point of connection at Loch Buidhe.
Rule 6 In country which is flat and sparsely populated keep the high voltage lines as far as possible independent of	Not relevant for the grid connection corridor.

Holford Rule	How it has been applied to the grid connection corridor
smaller lines to prevent a 'wirescape'.	
Rule 7 Approach urban areas through industrial zones where they exist.	Not relevant for the grid connection corridor.

Overhead Lines

4.12 With an overhead line, conductors (or wires) are suspended at a specified height above ground and supported by wooden poles, spaced at intervals. Conductors can be made either of aluminium or steel strands.

4.13 Wood poles can be used for single circuit lines operating at 33kV and 132kV. Wood poles are fabricated from pressure impregnated softwood, treated with a preservative to prevent damage to structural integrity.

4.14 Wood poles can consist of single poles, or in certain circumstances, double 'H' poles which consist of two wooden poles joined by a steel cross bracing both above and below the ground. H poles are generally used for greater changes in direction or above certain altitudes.

4.15 There are three types of pole:

- Intermediate: where the pole is part of a straight line section.
- Angle: there is only one type of angle pole which can support changes in direction up to a maximum of 300 degrees. All angle structures will require to be back stayed.
- Terminal: where the overhead line terminates into a substation or on to an underground cable section via a cable sealing end.

4.16 Span lengths between poles average between 80m and 120m but can go up to 120m. The average height for a pole varies from 14m to 16m. New wood poles are dark brown in colour and weather over the years to a light grey.

Underground Cables

4.17 With an underground cable, the conductors are encased in insulated material and buried in a backfilled trench of suitable depth and width. The number of cables, and the depth

and width of the trench, depends on a range of factors including voltage, number of circuits and the rating of the cables to be installed.

4.18 Where connected to an overhead line, an underground cable may also involve the siting of terminal supports and sealing end compounds above ground. These require their own siting appraisal which should normally be undertaken in conjunction with the overhead line/underground cable routeing.

4.19 Open cut trenching is he most frequently used construction method for cable installation. However, in crossing under watercourses for example, a trenchless technique such as directional drilling may be used. Works at each section commonly consist of the excavation of the cable trench by mechanical excavators, the storage of excavated material, cable laying, the backfilling of the trench and surface reinstatement. Sections of cable are joined together at cable jointing pits, with the location of these dictated by a number of factors including cable size/length and ongoing access requirements. Manhole covers above jointing pits enable access just below the surface for routine maintenance. Underground cables are marked on service maps provided to other utilities and are installed with surface marker tape to warn of their presence below the ground. If lines are decommissioned, cables can either be left in situ or removed carefully by opening up the ground.

Environmental Effects Scoped In

4.20 Based on the currently understood parameters of the likely grid connection and the associated level of uncertainty, a high-level assessment of environmental effects is provided for the following topics:

- Landscape and visual effects;
- Cultural heritage;
- Ecology & Ornithology;
- Geology, hydrology and hydrogeology; and
- Traffic and transport.

4.21 These topics are considered separately in the following sections of this FEI.

Environmental Effects Scoped Out

4.22 The following topics are scoped out of assessment as it is considered that no significant environmental effects are likely:

- Air quality – Due to the short term and localised nature of the construction and decommissioning phases, any temporary impacts to air quality, including from construction traffic, are likely to be minimal and locally concentrated. Operational impacts are expected to be negligible as the activities associated with

maintenance will be sporadic. Consequently, no significant effects are predicted in relation to air quality.

- Construction and operational noise – Due to the short term and localised nature of the construction and decommissioning phases of the grid connection, any temporary noise created (including from construction traffic) is likely to be minimal and locally concentrated. During operation, overhead lines can create audible noise depending on the operating voltage and the type of conductor system used. For connections at 132kV and below however, audibility of noise would be limited to an observer directly below the line. Consequently, no significant effects are predicted in relation to noise. The distributor substation is sited in an area which is not adjacent to residential properties. Therefore, depending on the final location of the distributor substation, noise can be scoped out based on information known at this stage;

- Land quality and contamination – During construction and maintenance of the grid connection there could be a potential risk of accidental fuel or oil spills from the operation of plant and machinery, which could potentially lead to pollution of nearby watercourses or sensitive habitats. Best practice guidance will however be followed to prevent and manage any accidental discharges. Relevant Guidance for Pollution Prevention (GPP) documents will also be strictly followed to minimise risks. The use, storage, transport and handling of materials on site will comply with relevant legislation and best practice, including adherence to Control of Substances Hazardous to Health (COSHH) regulations and the appointed contractor will prepare and adhere to a Materials Management Plan (MMP) to mitigate any potential risks effectively. Given these robust preventative measures to manage and mitigate potential impacts, no significant effects are predicted in relation to land quality and contamination.

- Material assets and waste – The grid connection is not anticipated to generate significant quantities of waste during construction or operation. Effective waste management practices would be implemented to promote the reduction, reuse and recycling of waste material. Mitigation measures would be put in place to further minimise the potential environmental effects associated with waste storage and transportation. Consequently, no significant effects are predicted in relation to material assets and waste.

- Climate – It is considered unlikely that the grid connection would lead to significant effects on climate or the ability of receptors to adapt to climate change.

- Population and human health – Given that no significant effects are predicted in relation to noise, air quality and socio-economics, and that noise and dust nuisances will be adequately mitigated through the implementation of good practice construction methods and mitigation, it is considered that no significant effects are likely to occur in relation to population and human health.

- Major accidents and disasters – The grid connection is not located in an rea with a history of natural disasters and the operation of the connection would be

managed in line with the requirements of a number of health and safety related regulations. Consequently, no significant effects are predicted in relation to major accidents and disasters.

- Light, heat and radiation – Electromagnetic fields are produced by electrical charges. Exposure guidelines developed by the International Commission on Non-Ionising Radiation Protection (ICNIRP) ensure the protection of human health from dangerous levels of occupational and public exposure. These guidelines have been adopted by Public Health England, which the Sottish Government follows on matters relating to electromagnetic fields. The grid connection voltage and equipment are considered by the Government to be inherently compliant with exposure limits due to design. During construction, temporary pollution from light and heat sources would be minimised through adherence to standard best practice construction practices and working hours that would be implemented by the appointed contractor. Consequently, no significant effects are predicted in relation to light, heat and radiation.

- Socio-economics, recreation and tourism – The construction and decommissioning phases are anticipated to cause minimal disturbance to recreational activities, localised to small working areas as construction progresses. Post-construction, use of the land would continue as normal with the exception of the occasional need for maintenance. Due to the relatively short construction period and the scale of the grid connection, impacts to employment and local income generation are not anticipated to be significant, and there would be a small but not significant benefit due to the capital expenditure associated with the grid connection. Consequently, no significant effects are predicted in relation to socio-economics, recreation and tourism.

4.23 The subsequent sections consider the potentially significant environmental effects of the grid connection in relation to the topics scoped into this FEI, including cumulative effects.

5 LANDSCAPE AND VISUAL EFFECTS

Introduction

5.1 This section presents an outline assessment of the likely significant environmental effects of the proposed Acheilidh Wind Farm grid connection, within the identified Grid Route Corridor on landscape and visual amenity. It describes the baseline conditions that currently exist, the key constraints and likely landscape, visual and cumulative effects, and any proposed mitigation / recommendations.

5.2 It should be read in conjunction with the Landscape and Visual Impact Assessment (LVIA) in the EIA Report, April 2024 (EIAR).

Scope and Methodology

5.3 The outline LVIA accords with the methodology in the EIAR, Volume 4, Technical Appendix 6.1. Because of the preliminary nature of the proposals a desk-based assessment has been undertaken, although this has been supported by ZTV analysis and early site visits of the general area, undertaken as part of the main EIAR. The provision on an outline LVIA at this stage is appropriate to the preliminary nature of the Grid Route Corridor (shown in Figure 4.1) and identifies the likely significant landscape, visual and cumulative effects that would arise from a theoretical overhead grid connection, located anywhere within the Grid Route Corridor. As such the outline LVIA has also taken a precautionary and conservative approach in comparison to an LVIA for a specific grid connection route.

5.4 The outline LVIA has considered both the construction and operational periods of the grid connection which are assumed to align with the same periods for the proposed Acheilidh Wind Farm. Both the proposed Acheilidh Wind Farm and the grid connection would be subject to decommissioning at the end of the operational period. Decommissioning of the grid connection would be short term, and it is unlikely to result in any significant landscape or visual effects. Therefore, decommissioning of the grid connection has been excluded from this outline LVIA.

5.5 A further iterative process of the route selection will be undertaken by SSEN to identify the optimal alignment for the grid connection within the corridor.

5.6 In response to Regulation 19 of the Electricity Works (Environmental Assessment) (Scotland) Regulations 2017 this outline LVIA addresses the following:

"*A proportionate assessment of the potential for significant effects of the grid connection by itself;*

A combined assessment of the effects of the Wind Farm and the grid connection; and

A cumulative assessment of the effects of the Wind Farm together with the grid connection where both the proposed Wind Farm and the grid connection infrastructure are both likely to have an impact on the same receptor." (Email from ECU dated 20th April 2026).

5.7 Although an assessment of the "*potential for significant effects of the grid connection by itself*" is provided here, it should be noted there would be no circumstances where the proposed grid connection would exist without the existence of the proposed Acheilidh Wind Farm.

5.8 Further, the proposed Acheilidh Wind Farm and the grid connection are within the same general location, and due to the short length of the Grid Route Corridor they would cumulatively affect the same (and not different) receptors. Therefore, there is no scope for the Grid Route Corridor to affect a different landscape (or visual) receptor, that would not otherwise be affected by the proposed Acheilidh Wind Farm.

5.9 At this stage, there are no other known grid connections which would contribute to a cumulative assessment. However, it is anticipated that other grid connections would be proposed to provide connections for the consented Lairg II and Garvary wind farms. Further, individual grid connections for each of these wind farms could create an adverse cumulative effect that may be significant depending on the route details, particularly as the grid connections converge to access the Loch Buidhe Substation.

Indicative Grid Connection and Study Area

5.10 The Grid Route Corridor is shown in Figure 4.1 indicating a short, approximately 6km grid connection between the proposed Acheilidh Wind Farm substation, in the northern part of the wind farm and the grid connection at Loch Buidhe Substation, approximately 3km to the south of the wind farm.

5.11 The grid connection is likely to be formed via an underground or above ground connection or a combination of the two. If the grid connection is underground, there would be no landscape or visual effects during its operation and the temporary construction effects would not be significant.

5.12 The outline LVIA has assumed a 'worse case' that the grid connection is entirely above ground, via a combination of single or double wood poles supporting a 132 kV 'trident' overhead line (OHL). The height of the OHL would typically range between 13-15m in height and up to 18m in some circumstances. The intervening spans between poles range between 70m and 120m. Typically the detailed LVIA study area for this form of development could extend to between 2-5km from the centreline of the grid connection route, where overlapped by Zone of Theoretical Visibility (ZTV) analysis.

5.13 There are no national level landscape designations or Wild Land Areas within the Grid Route Corridor or within 5km, and ZTV analysis indicates that a study area of 2km would be appropriate.

The Holford Rules

5.14 The Holford Rules comprise well established design principles which aim to minimise the landscape and visual impact of overhead and high voltage transmission lines. Their consideration is relevant to the outline LVIA in identifying potential landscape or visual constraints which may have a bearing on the sensitivity of landscape and visual receptors

and point towards appropriate mitigation. At this stage of the design and assessment process the Grid Route Corridor accords with the Horford Rules as follows:

Holford Rules 1 and 2: The indicative grid connection route and study area avoids areas of "highest amenity" and "smaller areas of high amenity value". In this respect, there are no National Parks, National Scenic Areas, Wild Land Areas, Gardens and Designed Landscapes or locally designated Special Landscape Areas within the Grid Route Corridor or study area.

Holford Rules 3, 4 and 5: These relate to detailed design and assessment as part of the Section 37 consent and include aspects of route option and design such as the location of angle points relative to the topography and landscape context.

Rule 5: refers to design options that may limit the apparent height of towers which are not applicable to this grid connection. However, the grid connection would be seen in the context of the proposed Acheilidh Wind Farm (turbines 200-230m to blade tip) which, in comparison would reduce the apparent height of the wood poles. In addition, the undulating topography and landscape character of the Grid Route Corridor offers many opportunities to avoid locating the route on ridges or hill summits.

Holford Rules 6 and 7 are not applicable for the following reasons:

Holford Rule 6 applies to flat landscapes and the need to separate high voltage lines from smaller lines to avoid the creation of 'wirescape'. Although wind farms are not referenced, this assessment has considered the Scottish Natural Heritage, Siting and Design of Windfarms in the Landscape, Version 3a, August 2017 which seeks to avoid the creation of a 'cluttered' landscape with the aim of maintaining a simple landscape context for wind farm development. This aspect has been considered as part of the appraisal and concludes that adverse effects in this regard would be unlikely.

Holford Rule 7 applies to urban, industrial and residential areas which are not applicable in this case.

5.15 Further, more detailed design criteria may be developed at a later design development stage and some recommendations have been made at the back of this report.

ZTV and Viewpoint Analysis

5.16 Zone of Theoretical Visibility (ZTV) analysis indicates that theoretical visibility of an 18m tall OHL is mostly contained within 2km of the Grid Route Corridor and fragmented at 2-5km distance.

5.17 ZTV coverage and theoretical visibility is largely contained within the moorland plateau landform (*Rounded Hills - Caithness & Sutherland* Landscape Character Type (LCT)). Consequently, there would be no visibility from Achany Glen (*Strath - Caithness & Sutherland* LCT), Lairg, Torroble or Tomich to the west or northwest, and no visibility from Strath Fleet (*Strath - Caithness & Sutherland* LCT) to the north, except for a small area at approximately 3km distance from the edge of the Grid Route Corridor at Muie in Strath Fleet. To the west there is no visibility from Strath Fleet including Rogart Station, and ZTV coverage across the undulating moorland is patchy and focused on local hill summits and facing slopes. This same ZTV pattern continues to the south and southwest with no ZTV

coverage or visibility from Strath Oykel or the Kyles of Sutherland (*Strath - Caithness & Sutherland* LCT) including Invershin, Bonar Bridge or the Dornoch Firth National Scenic Area at Migdale, approximately 6km to the south of the Grid Route Corridor.

5.18 Relevant assessment viewpoints, within the Grid Route Corridor study area include Viewpoints 1-3. Whilst there would be no visibility from Viewpoints 1 and 3 of an OHL anywhere within the Grid Route Corridor, there could be visibility of an OHL from Viewpoint 2 which is illustrated in the EIA Report, Volumes 3 and 5, noting Volume 3, Figure 6.19a-e - Viewpoint 2: Lochbuie Road is most relevant.

Baseline Conditions

5.19 There are no national level landscape designations or Wild Land Areas within the Grid Route Corridor or within 5km of the Grid Route Corridor.

5.20 The following landscape and visual receptors are noted within the Grid Route Corridor 2km study area and the ZTV as follows:

Landscape receptors:

Rounded Hills - Caithness & Sutherland LCT.

Visual receptors:

A minor road linking Bonar Bridge with the A9 and The Mound in Strath Fleet, via Strath Carnaig; and Scotways Hill Track 318: Aultguish Inn to Ardgay (Dornoch Firth)

5.21 Two hill tracks are located within the 2km study area. The northern 'dead end' track is partly within the Grid Route Corridor and is routed from the minor road to the south of Loch Buidhe Substation, north, to access Loch Cracail Mor, to the west of the proposed Acheilidh Wind Farm site boundary. The western track links the A836 Moray Tourist Route with the northern track (providing a 'through route') via Loch Laro. Except for the eastern most 1.5km, this route is outwith the ZTV and would have no view of the OHL.

5.22 A further forest track leads through the forest to the south of Loch Buidhe and over Meall Mor to Loch Beinn Domhnaill. This route has been excluded because of the forestry screening and its location beyond the Loch Buidhe Substation and associated pylons, relative to the Grid Route Corridor, such that significant visual effects would be unlikely.

5.23 Theoretical visibility from a small area of Strath Fleet at Muie from approximately 3km distance from the edge of the Grid Route Corridor would not be sufficient to affect the landscape character of the *Strath - Caithness & Sutherland* LCT. Views from the minor road and properties at Muie are also unlikely to be significantly affected by views of the OHL, particularly if the route avoids any sky lining and the closest summit of An Stoc bheinn in the northern part of the proposed Acheilidh Wind Farm.

5.24 There are no settlements, residential properties, other promoted recreational routes (including long distance routes, Sustrans routes or Core Paths), main transport routes (including the Moray Tourist Route), or recreational / visitor attractions within the ZTV or 2km study area.

Assessment of Landscape Effects

5.25 In summary, there would be no potential for significant landscape effects resulting from the Grid Route Corridor, assuming adherence to the Holford Rules.

5.26 The *Rounded Hills - Caithness & Sutherland* LCT is not valued in terms of landscape designation or wild land and its open, undulating, moorland topography and the presence of existing pylons to the south of the proposed Acheilidh Wind Farm reduce its susceptibility to the OHL. The combination of lower sensitivity and susceptibility indicate a Medium to Low sensitivity for this LCT and its inherent characteristics.

5.27 Landscape elements of moorland and bog, which comprise the *Rounded Hills - Caithness & Sutherland* LCT are also noted to be of lower landscape sensitivity in the EIAR. Although the moorland would be subject to direct effects during construction and operation the loss would not be significant in LVIA terms.

5.28 According to The Holford Rules an OHL within the Grid Route Corridor would avoid sky lining on ridges and hill summits and a route to the south or west of the proposed Acheilidh Wind Farm, or through the proposed turbines, avoiding the summit of An Stoc bheinn would benefit from both landform screening and back-clothing against the moorland hills. It is also likely that the route would avoid lochs and loch edges due to hydrological and ecological reasons. The southern part of the route would likely either cross the lower slopes of Meall na Tulchainn or follow the existing track and overhead line (pylons) to avoid the Allt Garbh-airigh water course. It is not considered that the additional OHL would lead to the creation of a 'wirescape' with the existing pylons due to its lower profile and there would be a logical land use in routing the OHL along existing man-made elements.

5.29 These considerations indicate a Low magnitude of change and a Minor to Negligible level of effect that would be **not significant**. The nature of this effect would be direct, adverse, temporary (during construction) and long-term (during operation).

Cumulative Effects

5.30 In terms of cumulative effects, the Grid Route Corridor would affect the same area of the *Rounded Hills - Caithness & Sutherland* LCT as the proposed Acheilidh Wind Farm

5.31 The likely landscape effects of the Grid Route Corridor would be completely contained within and overlap with the area (approximately 2-3.5km of the proposed turbines) which would be significantly affected by the proposed Acheilidh Wind Farm (EIA Report, Volume 1, Chapter 6, paragraph 6.327).

5.32 The additional cumulative effect of adding an OHL, within the Grid Route Corridor to the proposed Acheilidh Wind Farm would be slightly reduced in comparison to the 'stand-alone' effects due to the overlap of landscape effects and the tendency for the proposed turbines to override the effects of the OHL. The additional cumulative effect would therefore be Negligible and **not significant**. The nature of this effect would be direct, neutral, temporary (during construction) and long-term (during operation).

5.33 The combined cumulative effect of the OHL and the proposed Acheilidh Wind Farm would be the same as previously assessed for the proposed Acheilidh Wind Farm (Major and significant) on account of the proposed Acheilidh Wind Farm and *not* the OHL grid connection. It is not anticipated the proposed grid connection and the other windfarm developments would lead to an increase in the previously assessed impacts and effects.

Assessment of Visual Effects

5.34 In summary, there would be no significant visual effects on the views and visual amenity experienced by people on the minor road linking Bonar Bridge with the A9 or the Hill Track 318 and other tracks resulting from the Grid Route Corridor, noting the adherence to the Holford Rules.

Minor road linking Bonar Bridge with the A9

5.35 The minor road linking Bonar Bridge with the A9 and The Mound in Strath Fleet, via Strath Carnaig is not a promoted tourist / scenic route and the section within the Grid Route Corridor and the study area is adversely influenced by existing electrical infrastructure with three rows of pylons (including fenced end pylons) converging towards the Loch Buidhe Substation. The lower value and medium susceptibility of road users indicate a Medium sensitivity.

5.36 It is likely that an OHL within the Grid Route Corridor would be theoretically visible from approximately 5km of the road (approximately 3km west bound and 1.5km north bound). Approaching from the south, the OHL would be visible beyond two rows of pylons which also cross the road to access the Loch Buidhe Substation. The strong influence of these features would render the OHL as a small or negligible addition to the view, back-clothed by the containing hill slopes with a likely Very Low magnitude, increasing to Low at the point of road crossing. It is not considered that the additional OHL would lead to the creation of a 'wirescape' with the existing pylons due to its lower profile and smaller scale. The level of effect would be Minor to Negligible and **not significant**. The nature of this effect would be direct, adverse, temporary (during construction) and long-term (during operation).

Cumulative Effects

5.37 The likely visual effects of the OHL on the minor road would overlap with the same area (approximately 9.5km from the proposed turbines) that would be significantly affected by the proposed Acheilidh Wind Farm (EIA Report, Volume 1, Chapter 6, paragraph 6.331). The views would also be strongly influenced by the existing pylons, which would tend to appear in the foreground of views from the road. The additional cumulative effect of adding an OHL, within the Grid Route Corridor would be slightly reduced in comparison to the 'stand-alone' effects due to the appearance of the existing pylons and the proposed Acheilidh Wind Farm which would predominate or overrule the effects of the OHL. The additional cumulative effect would therefore be Negligible and **not significant**. The nature of this effect would be direct, neutral, temporary (during construction) and long-term (during operation).

5.38 The combined cumulative effect of the OHL and the proposed Acheilidh Wind Farm would be the same as previously assessed in the EIA Report for the proposed Acheilidh Wind Farm (Major and significant) with the significant effects attributable to the proposed Acheilidh Wind Farm and *not* the OHL grid connection.

Hill Track 318: Aultguish Inn to Ardgay (Dornoch Firth)

5.39 Hill Track 318 crosses the landscape diagonally (southwest to northeast) to the south of the proposed Acheilidh Wind Farm, crossing a row of existing pylons to the south of the wind farm where the route overlaps with an existing track leading north to Loch Cracail Mor. There is little evidence of this route on the ground, although as a promoted route used by walkers it has been afforded high sensitivity.

5.40 It is likely that an OHL within the Grid Route Corridor would be theoretically visible from up to 8km of the route, depending on the exact location of the OHL. Approaching from the southwest at approximately 2km the OHL would be screened by landform, although it would be theoretically visible from the remaining section of Hill Track 318, subject to the location of the OHL, particularly from minor hills and facing slopes. It is likely that Hill Track 318 would be crossed once by the OHL, north of the pylons and it would appear as a relatively small feature in the context of the large-scale landscape and the influence of the existing pylons. It is likely that the route would be back-clothed with a Very Low magnitude, increasing to Low at the point of hill track crossing. It is not considered that the additional OHL would lead to the creation of a 'wirescape' with the existing pylons due to its lower profile and smaller scale. The level of effect would be Moderate to Minor and **not significant**. The nature of this effect would be direct, adverse, temporary (during construction) and long-term (during operation).

Cumulative Effects

5.41 The likely visual effects of the OHL on the minor road would overlap with the same area significantly affected by the proposed Acheilidh Wind Farm (EIA Report, Volume 1, Chapter 6, paragraph 6.331). The additional cumulative effect of adding an OHL, within the Grid Route Corridor would be slightly reduced in comparison to the 'stand-alone' effects due to the appearance of the proposed Acheilidh Wind Farm which would predominate over the effects of the OHL. The additional cumulative effect would therefore be Minor and **not significant**. The nature of this effect would be direct, negative, temporary (during construction) and long-term (during operation).

5.42 The combined cumulative effect of the OHL and the proposed Acheilidh Wind Farm would be the same as previously assessed in the EIA Report for the proposed Acheilidh Wind Farm (Substantial / Major and significant) with the significant effects attributable to the proposed Acheilidh Wind Farm and *not* the OHL grid connection.

Track accessing Loch Cracail Mor

5.43 The 'dead end' track, routed from the minor road to the south of Loch Buidhe Substation, north, to access Loch Cracail Mor and the 1.5km section of adjoining track accessing Loch Laro have been assessed together. Part of the track accessing Loch Cracail Mor is within

the Grid Route Corridor to the south and west of the proposed Acheilidh Wind Farm. The route is signposted and the condition of the track indicates that it continues to provide access to walkers indicating high sensitivity.

5.44 All of this route would theoretically view the OHL, particularly assuming a 'worse case' of the OHL routed alongside the hill track. Although this would be the most visible option from the track, it also indicates appropriate and logical land management. The scale of the OHL and the span between wood poles is likely to be of Low magnitude, noting that the OHL would tend to be mostly back clothed by enclosing hills and facing slopes. The level of effect would be Moderate and **not significant** due to the influence of existing pylons and the logical association of the OHL with the hill track. The nature of this effect would be direct, adverse, temporary (during construction) and long-term (during operation).

Cumulative Effects

5.45 The track would overlap with the same significantly affected area attributed to the proposed Acheilidh Wind Farm (EIA Report, Volume 1, Chapter 6, paragraph 6.331) and the additional cumulative effect of adding an OHL, within the Grid Route Corridor would be slightly reduced in comparison to the 'stand-alone' effects due to the appearance of the proposed Acheilidh Wind Farm which would predominate over the effects of the OHL. The additional cumulative effect would therefore be Minor and **not significant**. The nature of this effect would be direct, negative, temporary (during construction) and long-term (during operation).

5.46 The combined cumulative effect of the OHL and the proposed Acheilidh Wind Farm would be the same as previously assessed in the EIA Report for the proposed Acheilidh Wind Farm (Substantial / Major and significant) with the significant effects attributable to the proposed Acheilidh Wind Farm and *not* the OHL grid connection.

Recommendations and Mitigation

5.47 As outlined in Section 3, the main strategy for mitigating any impacts of the proposed grid connection will be through avoidance by careful routeing and through adherence to the Holford rules when the grid connection route is progressed by SSEN. The exact route of the OHL within the Grid Route Corridor should seek to avoid sky lining and the summit of An Stoc bheinn in the northern part of the proposed Acheilidh Wind Farm.

Summary

5.48 An outline Landscape and Visual Impact Assessment (LVIA) of the potential likely significant environmental effects of the proposed Acheilidh Wind Farm grid connection, within the identified Grid Route Corridor has been undertaken. It should be read in conjunction with the LVIA in the EIA Report, April 2024 (EIAR) and accords with the methodology in the EIAR, Volume 4, Technical Appendix 6.1.

5.49 It describes the baseline conditions that currently exist, the key constraints and likely landscape, visual and cumulative effects, and any suggested mitigation / recommendations. In particular it addresses:

"A proportionate assessment of the potential for significant effects of the grid connection by itself;

A combined assessment of the effects of the Wind Farm and the grid connection; and

A cumulative assessment of the effects of the Wind Farm together with the grid connection where both the proposed Wind Farm and the grid connection infrastructure are both likely to have an impact on the same receptor."

5.50 Although an assessment of the "*potential for significant effects of the grid connection by itself*" is provided here, it should be noted there would be no circumstances where the proposed grid connection would exist without the existence of the proposed Acheilidh Wind Farm. Due to the short length of the Grid Route Corridor they would cumulatively affect the same (and not different) receptors.

5.51 The Grid Route Corridor is shown in Figure 4.1 indicating a short, approximately 6km grid connection between the proposed Acheilidh Wind Farm substation, in the northern part of the wind farm site and the grid connection at Loch Buidhe Substation, approximately 3km to the south of the wind farm. The outline LVIA has assumed a 'worse case' that the grid connection is entirely above ground, via a combination of single or double wood poles supporting a 132 kV 'trident' overhead line (OHL). It has been assumed that the grid connection would comply with the Holford Rules and that it would be subject to further route selection, alignment and detailed design at a later stage, undertaken by SSEN.

5.52 The Grid Route Corridor is located within an area of *Rounded Hills - Caithness & Sutherland* LCT and would be visible from people using the minor road linking Bonar Bridge with the A9 and The Mound in Strath Fleet, via Strath Carnaig; Scotways Hill Track 318: Aultguish Inn to Ardgay and two minor tracks providing access Loch Cracail Mor and Loch Laro.

5.53 Assuming the continued adherence to the Holford Rules, the landscape and visual effects of the OHL within the Grid Route Corridor are unlikely to be significant on either a 'standalone' basis or cumulatively with the proposed Acheilidh Wind Farm. Due to the short length of the Grid Route Corridor, there is no scope for the Grid Route Corridor to affect a different landscape (or visual) receptor, that would not otherwise be affected by the proposed Acheilidh Wind Farm.

5.54 It is recommended that the exact finalised route of the OHL should continue to align with the Holford Rules and seek to avoid sky lining and the summit of An Stoc-bheinn in the northern part of the proposed Acheilidh Wind Farm.

6 CULTURAL HERITAGE AND ARCHAEOLOGY

Introduction

6.1 This section presents an assessment of the potential effects of the grid connection for Acheilidh Wind Farm (the 'proposed grid connection') on Cultural Heritage. The chapter is supported by the following figures:

- Figure 6.1: Heritage assets

Scope and Methodology

6.2 The scope of the assessment is to determine the potential direct impacts and effects from the proposed grid connection on heritage assets within the proposed grid connection corridor, and those within the study area. The study area has been set at 1km from the edge of the proposed grid connection corridor, and is based on professional judgement of the potential for significant effects to arise due to changes within the setting of designated heritage assets from the introduction of the grid connection.

6.3 The assessment of indirect (or secondary) impacts is scoped out, as there is no evidence to suggest that indirect effects will arise in relation to heritage assets as a result of the proposed grid connection. The assessment of temporary construction impacts through changes within the setting of heritage assets are scoped out as construction activity would be minimal and temporary, and would not result in a significant effect.

6.4 No site visits have been conducted as part of this assessment. This would be a future requirement once the final grid connection alignment is known.

6.5 The levels of effect upon a heritage asset would depend upon its level of importance and the potential magnitude of change. The methodology for assessing the importance of heritage assets, and the magnitude of change remains the same as it previously was within Chapter 7: Cultural Heritage of the Acheilidh Wind Farm EIA.

Baseline Conditions

6.6 There are no designated heritage assets (World Heritage Sites, Scheduled Monuments, Listed Buildings, Gardens and Designed Landscapes, Inventory Battlefields, or Conservation Areas) within the grid connection corridor or within the 1km study area around it.

6.7 There are 20 non-designated heritage assets within the proposed grid connection corridor, consisting of prehistoric settlement activity and agricultural remains such as clearance cairns, alongside later post-medieval farmsteads and agricultural field systems.

6.8 The full list of heritage assets within the proposed grid connection corridor is shown in Table 1, and the locations of the heritage assets can be seen on Figure 6.1: Heritage Assets.

Table 1 – Heritage assets within the proposed grid connection corridor

Heritage Asset Reference	Designation	Heritage Asset Name and type	Period
NRHE 5518 HER Ref: MHG12778	Non-designated	Loch Cracail Beag crannog	Prehistoric
NRHE 5505 HER Ref: MHG12765	Non-designated	Loch Cracail Beag hut circle	Prehistoric
NRHE 5506 HER Ref: MHG12766	Non-designated	Loch Cracail Mor hut circle	Prehistoric
NRHE 5511 HER Ref: MHG12771	Non-designated	Loch Cracail Mor hut circles	Prehistoric
NRHE 5512 HER Ref: MHG12772	Non-designated	Loch Cracail Mor hut circle	Prehistoric
NRHE 5513 HER Ref: MHG12773	Non-designated	Allt Ach'na H-uaighe hut circle	Prehistoric
NRHE 5514 HER Ref: MHG12774, MHG32643, MHG32644	Non-designated	An Stoc-Bheinn hut circle and field system	Prehistoric
NRHE 5517 HER Ref: MHG12777	Non-designated	Loch Cracail Beag hut circle	Prehistoric
NRHE 13949 HER Ref: MHG40419, MHG10324, MHG62915, MHG62916	Non-designated	Allt Garbh-Airigh hut circle and field system	Prehistoric
NRHE 91348	Non-designated	Allt An Cealgaiche farmstead	Post-medieval

HER Ref: MHG19228			
NRHE 91087 HER Ref: MHG19071	Non-designated	Dun Garbh-Airigh farmstead	Post-medieval
NRHE 91268 HER Ref: MHG19395	Non-designated	Ach Na H-uaighe enclosure and field boundary	Post-medieval
NRHE 346953	Non-designated	Ach Na H-uaighe enclosure	Post-medieval
NRHE 346954	Non-designated	Ach Na H-uaighe enclosure and structure	Post-medieval
NRHE 346955	Non-designated	Loch Cracail Mor clearance cairns	Prehistoric
NRHE 346956	Non-designated	Loch Cracail Mor clearance cairns	Prehistoric
NRHE 13968 HER Ref: MHG10099	Non-designated	Garvary cairnfield and hut circle	Prehistoric
NRHE 91089 HER Ref: MHG24632	Non-designated	Allt Garbh-Airigh farmstead, field system, and head dyke	Post-medieval
NRHE 91088, 13958 HER Ref: MHG10055	Non-designated	Allt Garbh-Airigh township, rig and furrow, and head dyke	Post-medieval
HER Ref: MHG63033	Non-designated	Dyke – near Loch Buidhe	Post-medieval

Assessment of Effects

6.9 A full assessment of effects on heritage assets within the proposed grid connection corridor and the study area will be dependent upon the final alignment selection and whether the connection is through the use of an overhead line (OHL) or underground cable. It has been assumed for the purposes of this assessment that the proposed grid connection will take the form of a double wood pole or trident wood pole OHL.

Impacts During Construction

6.10 There is the potential for direct impacts to the non-designated heritage assets within the proposed grid connection corridor from the construction of the OHL and the access tracks required. There is a cluster of non-designated heritage assets within the northwest corner

of the grid connection corridor, consisting of hut circles (NRHE 5506, 5511, and 5514) and clearance cairns (346955 and 346956). The heritage assets would be avoidable by choosing an alignment to the eastern side of the proposed grid connection corridor. Also, the micro-siting of wood poles and access tracks could also avoid the locations of these heritage assets if a westerly OHL is required. Similarly, the other non-designated heritage assets would be all avoidable through micro-siting of the wood poles and access tracks away from their locations.

6.11 The cluster of non-designated heritage assets in the southern end of the proposed grid connection corridor would be avoidable, with the township (NRHE 91088) and hut circles (NRHE 13949) set north to south of each other, and allowing for options to the east and west that would avoid physical impacts

6.12 The southeast corner of the proposed grid connection corridor is more constrained by the presence of a head dyke (MHG63033) and blackhouse (NRHE 91089), making it more difficult to avoid direct physical impacts. However, the blackhouse has been excavated as part of the Beauly to Denny OHL project, and the head dyke would be possible to oversail without any impacts. The worst-case magnitude of impact would be a Low magnitude of impact due to minor alterations of the heritage asset from construction of access tracks through the dyke. On a heritage asset of low value, this would result in a Minor adverse significance of effect (not significant).

Impacts During Operation

6.13 The non-designated heritage assets dating to the post-medieval period, and the two clearance cairns (346955 and 346956) are not considered to have wide landscape views forming part of their cultural significance. Therefore, during operation of the proposed grid connection, there would be no impacts to 10 of the 20 heritage assets within the proposed grid connection corridor.

6.14 There are a number of prehistoric hut circles (NRHE 5505, 5506, 5511-5514, 5517, 13949, 13968) and a crannog (5518) within the proposed grid connection corridor that have the potential to be impacted through changes within their setting. The setting of these prehistoric heritage assets will form part of their cultural significance, with localised views and intervisibility between them a key aspect of their setting. The visibility between the hut circles in the northwest corner would be limited due to topography, so the key aspect of intervisibility would be limited to the nearest hut circles and field systems from each heritage asset. The An Stoc-Bheinn hut circle and field system (NRHE 5514) would be visible from each of the individual elements, as would the Allt Garbh-Airigh hut circle and field system (NRHE 13949). There may be intervisibility between the Loch Cracail Mor hut circles (NRHE 5506 and 5511) but there is unlikely to be visibility of contemporary heritage assets from the individual hut circles of Loch Cracail Beag hut circle (NRHE 5505), Loch Cracail Mor hut circle (NRHE 5512), Allt Ach'na H-uaighe hut circle (NRHE 5513), and Loch Cracail Beag hut circle (NRHE 5517) due to their isolated locations.

6.15 The potential impacts from the proposed grid connection would be of negligible adverse magnitude. It would not be anticipated that the impacts would affect the key characteristics of the heritage assets setting as the OHL would not be anticipated to be

located between the various elements of the individual clusters of hut circles. Therefore, the resulting significance of effect on heritage assets of low to medium importance, would be Minor adverse (not significant).

Cumulative Effects

6.16 As there are no designated heritage assets within the proposed grid connection corridor, or within the 1 km study area, there are no shared receptors between the wind farm and the grid connection that could result in a significant effect. The introduction of the wood poles adjacent to the turbines would not increase the impacts from the development in terms of changes within the setting of designated heritage assets. Therefore, the cumulative effects would be the same as the effects reported within the EIAR.

Mitigation Measures

6.17 Using the standard approach of avoidance of known heritage assets during the routing and alignment of overhead lines or underground cables, any potential physical impacts would be avoidable. The design of the proposed grid connection would be set out to ensure avoidance, and where necessary, further demarcation and avoidance measures can be put in place during construction to further reduce any impacts.

6.18 In the unlikely event that a known heritage asset is to be impacted by the proposed grid connection, there would be a requirement to preserve the heritage asset by record through a programme of archaeological works, to be approved by the Highland Council Historic Environment Team.

6.19 During construction, it is anticipated that archaeological monitoring of ground breaking works in areas of high archaeological potential will be required, in compliance with NPF4 Policy 7o). The methodology for any works will be set out within a Written Scheme of Investigation (WSI), to be approved by the Highland Council Historic environment Team.

Residual Effects

6.20 Through the use of the mitigation measures outlined above, it is anticipated that any impacts from the proposed grid connection would not result in any significant effects. Any physical impacts to the head dyke (MHG63033) can be avoided through micro-siting of wood pole locations. If impacts could not be avoided then preservation through recording of the heritage asset, would result in a Minor adverse significance of effect (not significant).

Summary

6.21 There are 20 non-designated heritage assets within the proposed grid connection corridor that have the potential to be impacted upon during construction of the grid connection. Assuming a worst-case technology is used for the proposed grid connection (Overhead Line), there is a potential Minor adverse effect on the head dyke (MHG63033) to the east of the existing substation.

6.22 There is also the potential for effects on the prehistoric heritage assets within the proposed grid connection corridor through changes within their setting. As the key aspects of the heritage assets would not be impacted upon through micro-siting of the wood poles to avoid areas of intervisibility, the resulting significance of effect would be Minor adverse (not significant).

6.23 It is not possible at this stage to provide a detailed assessment of likely significant effects upon cultural heritage assets. However embedded mitigation through standard practice for the routing and alignment of electrical infrastructure, alongside measures of demarcation and avoidance or archaeological recording, would remove or minimise any potential impacts.

7 ECOLOGY AND ORNITHOLOGY

Introduction

7.1 This section presents a desk-based assessment of the likely significant environmental effects of the grid connection route corridor on ecology and biodiversity, including ornithology. It also describes the baseline conditions that currently exist and any mitigation measures likely to be proposed. The grid connection route corridor is illustrated on Figure 4.1.

Scope and Methodology

7.2 Existing information relating to statutory and non-statutory nature conservation sites, priority habitats and species, and legally protected species has been gathered from NatureScot's 'Sitelink' website[2], and a review of the EIAR for Acheilidh wind farm.

7.3 The first stage of an ecological or ornithological impact assessment is 'determining value' of features or 'receptors'. The Chartered Institute of Ecology and Environmental Management (CIEEM) places the emphasis on identifying different aspects of value including designations, biodiversity value, potential value, secondary or supporting value, social value, economic value, legal protection and multi-functional features. These values are applied to the receptors within a defined geographical context.

7.4 Following the determination of value, potential effects are identified and characterised. This process involves a review of the proposed construction methods and timescales with a view to identifying the pathways by which features and receptors may be affected.

7.5 CIEMM best practice guidance does not recommend that significance is defined as 'Major', 'Moderate' or 'Minor' due to the complexities of ecological processes. Therefore, for the purposes of this assessment, all 'significant' effects are considered significant within the context of the EIA Regulations.

7.6 This assessment does not provide definitive EIA significance levels upon receptors given the final route and methods are not yet known. However, it sets out potential effects and mitigation measures to be taken account of.

7.7 This document will not replace the need for detailed ecological survey and assessment for grid connection purposes as required for an application under Section 37 of the Electricity Act.

[2] https://sitelink.nature.scot/home

Baseline Conditions

Designated Sites

7.8 Statutory designated sites are protected by EU and UK legislation and those considered in this report are:

- Special Protection Areas (SPA);
- Special Areas of Conservation (SAC);
- Ramsar sites;
- Sites of Special Scientific Interest (SSSI); and
- Ancient Woodland.

7.9 Information about statutory and non-statutory sites designated for nature conservation were sought as part of this assessment. A 5km search area from the outer extent of the grid connection corridor was used to gather data relating to statutory designated sites, with the exception of SPAs for which the search area was extended to 20km. In terms of ornithology, internationally designated nature conservation sites (Special Protected Areas (SPAs) and Ramsar sites) within 20km of the Development and nationally designated sites (SSSIs and National Nature Reserves; NNRs) within 5km of the Development will be identified.

7.10 Data relating to non-statutory sites designated for nature conservation within 1km of the Development site will be considered for the assessment.

Table 2 – Designated Sites

Site name	Designation	Distance from site (km)	Reason for designation	Considered further in this assessment
Strath Carnaig and Strath Fleet Moors	SPA and SSSI	The southern section of the grid corridor lies within one of the composite features of the SPA. The northern section of the grid corridor abuts one of the composite features of the SPA.	Designated on account of its breeding hen harrier *Circus cyaneus* population.	Yes. Within grid connection corridor.
River Evelix	SAC	2.6km South	Designated on account of its freshwater pearl mussel *Margaritifera Margaritifera* population.	No. Not within catchment of grid corridor.
Lairg and Strath Brora Lochs	SPA and SSSI	3.3km North	Breeding black-throated diver *Gavia arctica*.	Yes. Within foraging range of this species.
Caithness and Sutherland Peatlands	SPA, SAC, SSSI and Ramsar	8km Northwest	SPA and Ramsar considered only here as the SAC and SSSI are greater than 5km from the site. Breeding black-throated diver, golden eagle *Aquila chrysaetos*, dunlin *Calidris alpina*, common scoter *Melanitta nigra*, golden plover *Pluvialis apricaria*,	No. Outwith core foraging ranges of qualifying species, save for greylag goose and habitats in corridor sub-

Site name	Designation	Distance from site (km)	Reason for designation	Considered further in this assessment
			greenshank *Tringa nebularia*, hen harrier, merlin, red-throated diver *Gavia stellata*, wigeon *Anas penelope*, short-eared owl *Asio flammeus*, wood sandpiper *Tringa glareola* (SPA); Breeding birds, blanket bog greylag goose *Anser anser* and dunlin (Ramsar).	optimal for this species.
Dornoch Firth and Loch Fleet	SPA and Ramsar	8.7km East	Bar-tailed godwit *Limosa lapponica*, curlew *Numenius arquata*, dunlin, greylag goose, osprey *Pandion haliaetus*, oystercatcher *Haematopus ostralegus*, redshank *Tringa totanus*, scaup *Aythya marila*, teal *Anas crecca*, wigeon, non-breeding waterfowl assemblage.	Yes. Within core foraging range for osprey only.
Morangie Forest	SPA	15.5km South	Capercaillie *Tetrao urogallus*.	No. Outwith range for this species.

Habitats

7.11 The habitat surveys undertaken for Acheilidh Wind Farm highlighted extensive areas of bog habitats, areas of flushes and GWDTE habitats within the survey area. A review of the aerial photography of the grid route option corridor indicates that similar habitat types are likely to be present over much of this area.

Ornithology

7.12 Strath Carnaig and Strath Fleet Moors SPA lies partially within the route corridor and is designated for breeding hen harrier. Lairg and Strath Brora Lochs SPA is designated for black-throated diver and lies within the foraging range of this species.

7.13 The habitats present along the route have the potential to support the following species/species groups (which were also recorded during the surveys undertaken for Acheilidh Wind Farm) waders, divers, moorland raptors and black grouse. Additionally, the forestry near Loch Buidhe Substation is suitable for goshawk.

Protected Species

7.14 The waterbodies and watercourses that lie within the route option corridor are suitable for otter *Lutra lutra*, which are known to be present from surveys undertaken for Acheilidh Wind Farm. Similarly, background records sourced as part of the wind farm EIAR confirmed the historical presence of water vole *Arvicola amphibius* near the site and the slow flowing peaty headwaters and bog habitats are suitable for this species.

7.15 Surveys undertaken for Acheilidh Wind Farm confirmed the area is used by low numbers of bat species. Species comprised common pipistrelle *Pipistrellus pipistrellus*, soprano

pipistrelle *Pipistrellus pygmaeus* and brown – long-eared bat *Plecotus auritus*, with Myotis sp. and pipistrelle (family not recorded to species) bats also recorded.

7.16 The habitats along the route are likely to contain common reptile species such as adder *Vipera berus*, common lizard *Zootoca vivipara* and slow worm *Anguis fragilis* and there were sightings of common lizard during the surveys undertaken for Acheilidh wind farm.

7.17 In addition to the above there is the possibility of the presence of pine marten *Martes martes* and red squirrel *Sciurus vulgaris* in the forestry near Loch Buidhe Substation at the southern extent of the route corridor (the open habitats in the remainder of the route corridor are of negligible suitability for these species). There is also potential for badger *Meles meles* along the route.

Assessment of Effects

7.18 In the absence of mitigation there is the Likely Significant Effect in respect of Strath Carnaig and Strath Fleet Moors and Lairg and Strath Brora Lochs SPA. There is also the potential for the direct loss and indirect effects (such as secondary compression) of Annex 1 habitats, such as blanket bog, and GWDTEs. In terms of ornithological receptors and protected species there is also the risk of the loss of, or disturbance or displacement to the receptors listed above.

Mitigation Measures

7.19 Mitigation measures are set out below to address any potential negative significant effects. Specific mitigation is designed to reduce the significance of effects, while general site-wide mitigation provides a mechanism for best practice measures and those that will support compliance with wildlife legislation, irrespective of significance of effects. In addition to the mitigation measures outlined below, as part of the EIAR, it is anticipated that a Habitats Regulations Appraisal (HRA) will be required in respect of the Strath Carnaig and Strath Fleet Moors and Lairg and Strath Brora Lochs SPAs. The purpose of the HRA will be set out measures to protect the SPA qualifying features and to provide the competent authority with sufficient Information to Inform an Appropriate Assessment in respect of both of these Natura 2000 sites. The EIAR will also include a cumulative assessment for the route and other renewable energy and grid connection routes at the regional (Natural Heritage Zone) level.

Mitigation by Design

7.20 An iterative process of corridor and route selection will be undertaken by SSEN to identify the optimal alignment for the grid connection. Ecology and ornithology will be a key consideration throughout. Key receptors, in particular any designated sites, valued habitats or other sensitive locations for birds and protected species, will be avoided wherever possible.

Baseline Surveys

7.21 Baseline ecological and ornithological surveys would be undertaken to identify and potential constraints. This would include surveys for habitats (NVC and GWDTE), nesting birds (waders, raptors, black grouse and divers and under Schedule 1 licence where required), bird flight activity surveys (to identify areas of potential collision risk), bat roost surveys , and surveys for protected species (otter, water vole, pine marten, red squirrel and badger). A watching brief will also be maintained throughout the other surveys to record the presence of any reptile species.

7.22 The information gathered from these surveys would be used to inform the EIAR for the grid connection route and to develop an Ecological Management and Mitigation Plan to safeguard, and, where possible, enhance features of ecological interest; and a Breeding Bird Protection Plan. These would be live documents and updated regularly as the grid connection project progresses.

7.23 The Breeding Bird Protection Plan will outline relevant best practice construction measures to safeguard nesting birds, including the establishment of buffer zones around active nest sites to avoid disturbance of protected birds that are listed under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended).

Timing of Construction Works

7.24 In order to reduce any potential impacts on the assemblage of breeding birds present in the vicinity of the grid connection corridor, any vegetation removal that is necessary to facilitate construction would be undertaken during the bird non-breeding season (September – February) where possible. Should this not be possible for any reason then pre vegetation clearance checks would be undertaken to confirm the presence or absence of nesting birds. Best practice mitigation measures would be outlined within the Ecological Management and Mitigation Plan and the Breeding Bird Protection Plan and agreed with key stakeholders during the development of these live documents.

Deflectors

7.25 For overhead line elements, deflectors (or line markers) have been shown to reduce bird collisions by 78%[3]. As a precaution deflectors could therefore be installed on certain sections of the route, the exact positioning of which would be determined later during the development of the detailed design for the grid connection following flight activity survey work to identify key flight routes.

Summary

7.26 No likely significant effects on ecology, biodiversity and ornithology are anticipated as a result of the grid connection as surveys to inform the final route location will take into account features of ecological interest and maximise the distance of the final route from

[3] Barrientos R., Alonso J.C., Ponce C. and Palacin C. (2011) Meta-analysis of the Effectiveness of Marked Wire in Reducing Avian Collisions with Power Lines

these features. The mitigation outlined above follows general best practice measures or would be proposed on a precautionary basis (e.g. the use of bird deflectors). On the assumption that mitigation measures are implemented, no likely significant residual effects are predicted.

8 GEOLOGY, HYDROLOGY AND HYDROGEOLOGY

Introduction

8.1 This section presents an assessment of the likely significant environmental effects of the grid connection on geology, hydrology and hydrogeology. It also describes the baseline conditions that currently exist and any mitigation measures likely to be proposed.

Scope and Methodology

8.2 The assessment is undertaken through a desk study of existing geology, hydrogeology and hydrology-related features within and surrounding the grid route corridor. The existing conditions are described and potential risks that may be associated with the grid connection are identified and assessed. This includes damage to soils and designated sites, damage to private water supplies, damage to watercourses and flood risk.

8.3 The significance of potential effects has been classified taking into account three principal factors: the sensitivity of the receiving environment, the potential magnitude of the effect, and the likelihood of that effect occurring. Potential effects are then assessed taking into account any proposed mitigation measures. Effects considered as major or moderate are deemed to be significant, whilst those assessed as minor or negligible are deemed to be not significant.

Baseline Conditions

8.4 The potential grid route corridor has a number of small watercourse which run through it, along with the larger Allt Garoh-airigh, as well as Loch Buidhe.

8.5 There are no private water sources within the study area.

8.6 The NatureScot Carbon and Peatland map (2016) shows that there are areas of Class 1, 2 and 3 peat within the grid corridor.

Assessment of Effects

8.7 The assessment of effects is based on the project description as outlined in Section 4: Grid Connection Details. Unless otherwise stated, potential effects identified are considered to be negative and adverse.

8.8 The assessment assumes the integral measures described in the Good Practice Mitigation section below would be incorporated into the scheme design by SSEN, as these are typically seen as good construction practice measures. These measures along with those presented within the other chapters would likely be used by SSEN to inform a site-specific Construction Environmental Management Plan (CEMP) that would be prepared prior to construction.

8.9 The sensitive receptors are considered to be surface waterbodies, PWSs, GWDTEs, and peat and carbon rich soils.

8.10 Construction of the grid connection from site to substation has the potential to cause pollution to watercourses and hydrological features as a result of excavation during construction.

8.11 During construction, there is potential for peat destabilisation and peat slide risk as well as potential for the loss and compaction of peat or soils. Potential effects relating to peat disturbance and the subsequent effects from excavated peat and management of peat and peaty soils however this would be minimised through mitigation measures as set out below.

Mitigation Measures

8.12 The following mitigation measures could be utilised to minimse effects on hydrological features.

Mitigation by Design

8.13 An iterative process of corridor and route selection will be undertaken by SSEN to identify the optimal alignment for the grid connection. The importance of geology, hydrology and hydrogeology will be a key consideration throughout. Peatland areas, watercourses and waterbodies, designated sites, and private water supplies, will all have a considerable influence on the design.

Soils and Peat

8.14 Soil stripping would be undertaken with care and would be restricted to as small a working area as practicable. Topsoil would be removed and laid in a storage bund on unstripped ground adjacent to the working area. Care would be taken to maintain separate stockpiles for separate soil types in order to preserve the soil quality.

8.15 For work within areas of peat, construction work would make use of current best practice guidance relating to developments in peatland areas. A risk management system, such as a geotechnical risk register, would be compiled and maintained at all stages of the project and developed as part of the post-consent detailed design works.

8.16 Micrositing would be used to avoid possible problem areas identified during ground investigations or other detailed design works. This would be assisted by verification of peat depths in any highlighted areas where construction work in peatland is required.

8.17 Construction activities would be restricted during periods of wet weather, particularly for any work occurring within 20m of a watercourse or within areas of peatland. Careful track design and use of trackway panels and bog mats to minimise requirements for temporary stone tracks would ensure that the volume and storage timescale for excavated materials would be minimised as far as practicable during construction works.

8.18 Where peat requires removal it would be removed and stored in stockpiles with the vegetation side at the top. Acrotelmic and catotelmic peat would be stored in separate stockpiles. Catotelmic peat is sensitive to handling, and loses its internal structure easily, so would be transported as short a distance as possible to its storage location. Excavation of catotelmic peat would be limited by careful infrastructure design. For underground cables, the excavated peat would be used to backfill the cable trench following installation of the electrical infrastructure.

8.19 All soil and peat stockpiles would be left with rough, unsmoothed surfaces to minimise soil losses from rainfall erosion. Stockpiles on sloping ground would have sediment control measures installed near the base, on the downslope side, to collect and retain any sediment mobilised by rainfall. Soils and peat would be stored for as short a time as practicable, in order to minimise degradation through erosion and desiccation. A damping spray would be employed during prolonged periods of dry weather to maintain surface moisture on the soil and peat stockpiles.

Surface Watercourses, Private Water Supplies and Groundwater

8.20 A Pollution Prevention Plan (PPP) would be prepared for the grid connection which would outline the detailed methods for dealing with watercourse, private water supply and groundwater pollution risk. The PPP would accompany any required applications for authorisation under the Controlled Activities Regulations (CAR).

8.21 All works within and adjacent to wetland areas would be supervised by an Environmental Clerk of Works (ECoW). This would be informed by a ground water dependent terrestrial ecosystem assessment.

8.22 A water quality monitoring programme would be established. Details would be agreed with SEPA but are likely to include visual checks for entrained sediment and in suite measurements of pH, temperature and specific conductivity. Any change during construction to pH and/or specific conductivity compared with baseline levels could potentially indicate an incident and additional investigation would be required in order to identify the origin of the change.

Cumulative Effects

8.23 Cumulative effects arising from the grid connection are anticipated to overlap with construction of the Proposed Development. In particular there is potential for temporary cumulative effects where activities occur at the same time and place (for example, construction traffic on the local road network). However, given the lack of any likely significant effects identified for the grid connection route, in no case would the likely significant effects identified for other cumulative developments be increased by the in-combination effects with the grid connection.

Summary

8.24 Overall, the grid connection is not predicted to result in likely significant residual effects on geology, hydrology or hydrogeology. Potential construction effects are anticipated to be

localised and temporary in nature and, with embedded mitigation (including application of the NPF4 mitigation hierarchy for peat) are predicted to be Not Significant.

9 TRAFFIC AND TRANSPORT

Introduction

9.1 This section presents an assessment of the likely significant environmental effects of the grid connection on traffic and transport. It also describes the baseline conditions that currently exist and any mitigation measures proposed.

Scope and Methodology

9.2 The most identifiable traffic and transport characteristics associated with the grid connection would be the transportation of plant and construction materials to overhead line or underground cable locations, access to the wind farm substation, and to the point of connection to the electricity grid.

9.3 Trips would be undertaken mainly by heavy goods vehicles (HGVs). The characteristic of this form of traffic is a temporary intensification of HGV traffic on the road network. This intensification varies depending on the scale of the development, the construction stage and the activity to be undertaken. A small amount of traffic would also be generated by construction workers community to / from the various site access locations during the construction stage. This assessment therefore considers the following:

- The transport routes for vehicles accessing the construction areas;
- The potential impact of increased traffic along the access routes, particular HGVs; and
- Any traffic management measures required to support the construction of the grid connection.

9.4 On the basis of a detailed desktop study, the professional judgement of the consultant team and experience from other relevant projects and policy guidance, the following effects have been scoped out of this assessment, and only the construction stage has been assessed:

- Operational Stage – Once operational, the amount of traffic associated with the grid connection would be minimal, relating to maintenance only. The effect of vehicle movements during the operational phase would be Negligible, therefore the operational phase has been scoped out of this assessment;
- Decommissioning stage – At some point in the future, the grid connection may be decommissioned by SSEN although given the nature of the development, it is likely that cables would remain in the ground following decommissioning. Should full decommissioning be required, traffic associated with the stage is anticipated to be slightly less than that generated during construction and the effects of decommissioning have been scoped out of this assessment.

Baseline Conditions

9.5 Given that the grid connection route only extends outside the Acheildih Wind Farm site by a short distance onto the minor road, it is considered appropriate to utilise the same access routes and study area as that previously used for the Acheilidh Wind Farm transport assessment. The routes for general construction HGVs have been identified as:

- A9
- A839
- A836
- Unclassified road to Torroole

Assessment of Effects

9.6 Due to the short term and localised nature of the construction of the grid connection, any temporary disturbance created during construction is likely to be minimal and concentrated in small areas at any one time as the contractors progress along the course of the route.

9.7 Short-term construction traffic would be expected to be suitably managed through the application of best practice measures and could include implementation a Construction Traffic Management Plan (CTMP), if required. Traffic management measures would be consistent with those implemented for previous construction and maintenance works associated with existing OHL infrastructure in this area, which were previously considered acceptable in planning terms.

9.8 During operation, only maintenance vehicles would be required with limited visits anticipated.

Cumulative Effects

9.9 Cumulative effects have been considered for other developments which may utilise any sections of the road network required for the Proposed Development or the grid connection. Operational developments have been scoped out of this assessment as they have Negligible operational traffic and therefore have no cumulative traffic effect.

9.10 Should construction timescales coincide for other nearby wind farm developments, a co-ordinated delivery schedule would be undertaken as part of the CTMP for each development to reduce the risk of potential significant cumulative effects. Specific detail relating to the overall increase in traffic volume would be addressed in the CTMP to minimise effects from increased traffic volumes.

9.11 The CTMP for each development would ensure that there are open lines of communication with TS, relevant local authorities and other stakeholders and developers as required to monitor the progress of the construction stages.

Mitigation Measures

9.12 A Construction Traffic Management Plan (CTMP) would be prepared for the grid connection as a good practice measure. The CTMP would identify measures to reduce the number of construction vehicles as well as considering reducing or avoiding the impact of vehicles through construction programming / routing and identification of an individual with responsibilities for managing traffic and transport impacts and effects.

9.13 The CTMP would be developed during the detailed design phase of the project. It would therefore have the benefit of detailed construction planning stage to allow for detailed estimates of traffic movements per tasks and vehicle type to be understood. It would be possible to set these vehicle movements against the fully developed construction programme, allowing mitigation efforts to be focused on the activities and locations that require them the most.

Summary

9.14 Based on this assessment it is not predicted that the grid connection would give rise to any significant traffic impacts (or associated environmental effects) on the study area road network and could be managed through a CTMP.