Scottish & Southern Electricity Networks

Consultation Document

Project Update and Alternative Connection Options

Creag Dhubh to Dalmally 275kV Connection

August 2020

Ref: LT000029

CONTENTS

GLOSSARY

Alignment	A centre line of an overhead line OHL with location of key angle structures.
Amenity	The natural environment, cultural heritage, landscape and visual quality. Also includes the impact of SHE Transmission's works on communities, such as the effects of noise and disturbance from construction activities.
Conductor	A metallic wire strung from structure to structure, to carry electric current.
Consultation	The dynamic process of dialogue between individuals or groups, based on a genuine exchange of views and, normally, with the objective of influencing decisions, policies or programmes of action.
Corridor	A linear area which allows a continuous connection between the defined connection points. The corridor may vary in width along its length; in unconstrained areas it may be many kilometres wide.
Environmental Impact Assessment (EIA)	A formal process set down in The Electricity Works (EIA) (Scotland) Regulations 2000 (as amended in 2008) used to systematically identify, predict and assess the likely significant environmental impacts of a proposed project or development.
Gardens and Designed Landscapes (GDLs)	The Inventory of Gardens and Designed Landscapes lists those gardens or designed landscapes which are considered by a panel of experts to be of national importance.
Habitat	Term most accurately meaning the place in which a species lives, but also used to describe plant communities or agglomerations of plant communities.
Kilovolt (kV)	One thousand volts.
Listed Building	Building included on the list of buildings of special architectural or historic interest and afforded statutory protection under the 'Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997' and other planning legislation. Classified categories A – C(s).
Micrositing	The process of positioning individual structures to avoid localised environmental or technical constraints.
Mitigation	Term used to indicate avoidance, remediation or alleviation of adverse impacts.
National Scenic Area (NSA)	A national level designation applied to those landscapes considered to be of exceptional scenic value.
Overhead line (OHL)	An electric line installed above ground, usually supported by lattice steel towers or poles.
Plantation Woodland	Woodland of any age that obviously originated from planting.
Riparian Woodland	Natural home for plants and animals occurring in a thin strip of land bordering a stream or river.
Route	A linear area of approximately 1 km width (although this may be narrower/wider in specific locations in response to identified pinch points / constraints), which provides a continuous connection between defined connection points.

Routeing	The work undertaken which leads to the selection of a proposed alignment, capable of being taken forward into the consenting process under Section 37 of the Electricity Act 1989.
Scheduled Monument	A monument which has been scheduled by the Scottish Ministers as being of national importance under the terms of the 'Ancient Monuments and Archaeological Areas Act 1979'.
Semi-natural Woodland	Woodland that does not obviously originate from planting. The distribution of species will generally reflect the variations in the site and the soil. Planted trees must account for less than 30% of the canopy composition
Sites of Special Scientific Interest (SSSI)	Areas of national importance. The aim of the SSSI network is to maintain an adequate representation of all natural and semi-natural habitats and native species across Britain.
Span	The section of overhead line between two structures.
Special Area of Conservation (SAC)	An area designated under the EC Habitats Directive to ensure that rare, endangered or vulnerable habitats or species of community interest are either maintained at or restored to a favourable conservation status.
Special Landscape Area (SLA)	Landscapes designated by The Highland Council which are considered to be of regional/local importance for their scenic qualities.
Special Protection Area (SPA)	An area designated under the Wild Birds Directive (Directive74/409/EEC) to protect important bird habitats. Implemented under the Wildlife and Countryside Act 1981.
Stakeholders	Organisations and individuals who can affect or are affected by SHE Transmission works.
Study Area	The area within which the corridor, route and alignment study takes place.
Terminal Structure	A structure (tower or pole) required where the line terminates either at a substation or at the beginning and end of an underground cable section.
The National Grid	The electricity transmission network in the Great Britain.
VP	Viewpoint (Landscape & Visual) or Vantage Point (Ornithology)
Volts	The international unit of electric potential and electromotive force.
Wayleave	A voluntary agreement entered into between a landowner upon whose land an overhead line is to be constructed and SHE Transmission
Wild Land Area (WLA)	Those areas comprising the greatest and most extensive areas of wild characteristics within Scotland.
Wirescape	The arrangement of electrical wires and pylons within the landscape
Zone of Theoretical Visibility (ZVT)	Zone of Theoretical Visibility mapping, sometimes referred to as zone of visual influence (ZVI) mapping, is a tool used to determine the theoretical visibility of objects in the landscape (e.g. in this case we are using 'bare-earth' ZTV, where the theoretical visibility is mapped based on the 3d terrain model, excluding the presence of buildings and vegetation.)

PREFACE

This Consultation Document has been prepared on behalf of Scottish Hydro Electric Transmission plc (SHE Transmission plc) to seek comments from all interested parties on the options for the proposed Creag Dhubh to Dalmally 275kV Connection project formerly the North Argyll project).

The Consultation Document is available online at www.ssen-transmission.co.uk/projects/creag-dhubh-dalmally-275kv-connection/

Virtual public consultation events detailing the proposals described in this document will be held at the following times and locations:

Date of event	Website address to join consultation
Tuesday 01 September 2020, 2 pm – 4 pm	www.ssen-transmission.co.uk/projects/creag-dhubh-dalmally-275kv-connection/
Wednesday 02 September 2020, 10 am – 12 pm	
Wednesday 02 September 2020, 6 pm – 8 pm	

Comments on this document should be sent to:

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All comments are requested by **25th September 2020**.

EXECUTIVE SUMMARY

This Consultation Document invites members of the public, statutory consultees and other key stakeholders to provide comment on the options for a 275 kV connection between the proposed Creag Dhubh 132 / 275 kV substation and the existing Dalmally to Inverarnan 275 kV overhead line.

New generation connection requests from renewable energy projects throughout Argyll and Kintyre exceed the capacity of the existing transmission system to connect those generators. To meet license obligations and ensure security of supply, SHE Transmission needs to provide a new 275 kV connection. In response to previous consultation in 2018, three connection options to meet this need have been identified.

Option 1: Overhead Line from Creag Dhubh to Dalmally

Option 1 comprises an overhead line connection (see Figure 1) between Creag Dhubh substation and the existing Dalmally substation, owned by Scottish Power. This option was described as the preferred option in the consultation completed in 2018.

Consultation feedback received since 2018 for this option, identified concerns regarding the visual impact of the overhead line and the impact on residential visual amenity, specifically where it crosses the Strath of Orchy. Further analysis has confirmed that there would be locally significant effects on visual receptors; however, no properties were identified as experiencing effects that would be overbearing or pervasive.

Option 2: Overhead Line from Creag Dhubh combined with Underground Cable Connection from Croftintuime to Dalmally Substation

Option 2 comprises an overhead line connection from Creag Dhubh substation to Croftintuime on the preferred alignment (part of Option 1), where it would transition, via a sealing end compound, to an underground cable to cross the Strath of Orchy and connect to Dalmally substation (see Figure 2). This option would address the concerns raised through consultation, regarding visual impacts within the Strath of Orchy.

This report presents a comparative analysis of engineering, environmental and economic criteria of two underground cable route options. While both options would be feasible from an engineering perspective, the comparative analysis identified specific engineering and environmental risks and significantly increased cost associated with all underground cable options. The risks caused by the underground cable within the Strath of Orchy are a combination of ground conditions (including peat), regular seasonal flooding and the potential for pollution during both the construction and operation of the underground cable.

Option 3: Overhead Line from Creag Dhubh turning east at Duncan Ban MacIntyre Monument to a new Switching Station in Glen Lochy

Option 3 comprises an overhead line connection from Creag Dhubh to the Duncan Ban MacIntyre Monument on the preferred alignment (part of Option 1), where it would connect via an overhead line route (alignment still to be developed) to a new switching station in Glen Lochy, adjacent to the existing Dalmally to Inverarnan 275 kV overhead line (see Figure 3). The existing Dalmally to Inverarnan 275 kV overhead line is owned by Scottish Power.

This report presents a comparative analysis of engineering, environmental and economic criteria of four overhead line route options and five switching station sites. Overhead line route option B1 and switching station 6 were selected as the preferred options for a Glen Lochy connection. This option would address the concerns regarding visual impacts within the Strath of Orchy and provide a preferable engineering alternative to the underground cable options considered. The additional risks caused by the underground cable options are not also caused by option 3. However, option 3 has a significantly increased cost compared to option 1, as it requires a new switching station to be built.

A Report on Consultation will be produced before the end of October, which will document the consultation comments received, and the responses by SHE Transmission to those comments.

1. INTRODUCTION

1.1 Purpose of Document

Scottish Hydro Electric Transmission Plc (SHE Transmission) is proposing to construct and operate a new 275 kV overhead line between the proposed new 275/132 kV Creag Dhubh substation and Dalmally. This Consultation Document invites comments from all interested parties on the alternative connection options under consideration.

The proposed overhead line would connect to the existing SHE Transmission 132 kV overhead line between Inveraray and Taynuilt at the proposed Creag Dhubh substation and connect to the existing 275 kV overhead line at Dalmally owned by Scottish Power. The area of the project is shown in Figure 1.

Please note:

- Option 1 (see Section 3) is the preferred option described in the consultation completed in 2018.
- Options 2 and 3 (see Sections 4, 5 and 6) describe alternatives to the northern section of the overhead line route only, north of the Duncan Ban MacIntyre Monument.

SHE Transmission, is required by their licence to comply with the National Electricity Transmission System Security and Quality of Supply Standards[1] (NETS SQSS), which sets out criteria and methodologies for planning and operating the GB Transmission System. New generation connection requests from renewable energy projects throughout Argyll exceed the capacity of the existing transmission system in the area. As such, to meet the license obligations relating to security of supply as set out in the NETS SQSS, there is need to provide a new 275 kV transmission connection between the existing Inveraray to Taynuilt 132 kV overhead line, connecting to the existing Dalmally to Inverarnan 275 kV overhead line.

This Consultation Document describes the different connection options evaluated in more detail and invites interested parties to provide their views.

All comments received will inform SHE Transmission's selection of a preferred option to take forward.

[1] URL: https://www.ofgem.gov.uk/licences-industry-codes-and-standards/standards/security-and-quality-supply-standard-sqss (accessed 05/08/2020)

1.2 Document Structure

This report is comprised of eight sections as follows:

1. Introduction – setting out the purpose of the Consultation Document, a summary of the project context and history;
2. Project Overview – describes the project consultation history and the alternatives connection options considered;
3. Option 1 - Overhead Line from Creag Dhubh to Dalmally
4. Option 2 – Overhead Line from Creag Dhubh combined with Underground Cable Connection from Croftintuime to Dalmally Substation
5. Option 3 - Overhead Line from Creag Dhubh turning east at Duncan Ban MacIntyre Monument to a new Switching Station in Glen Lochy
6. Option 3 - Switching Station Site Selection - Glen Lochy – describes the evaluation of options for a new switching station in Glen Lochy;
7. Summary of Options.
8. Consultation on the Proposals and Next Steps

The main body of this document is supported by a series of figures and appendices, as follows:

- Appendix 1: Figures
- Appendix 2: Route Selection Process – Overview of methodology
- *Appendix 3: Consultation Document Route Selection, North Argyll substation to Dalmally 275kV Over Head Line, June 2017.*
- *Appendix 4: Consultation Document, Alignment Selection, Creag Dhubh substation to Dalmally substation 275kV Overhead Line, March 2018.*
- *Appendix 5: Creag Dhubh Substation to Dalmally Substation 275 kV Connection Cable Route Options: Environmental Appraisal, July 2019.*
- *Appendix 6: North Argyll Cable Route Report (Engineering Constructability), April 2019.*
- *Appendix 7: Glen Lochy 275 kV Switching Station Engineering Site Selection Report, July 2020.*
- *Appendix 8: Glen Lochy 275 kV Switching Station, Environmental Site Selection Study, July 2020.*
- *Appendix 9: Overhead Line Route Engineering Assessment for the Glen Lochy Switching Station, July 2020.*
- *Appendix 10: Overhead Line Route Environmental Assessment for the Glen Lochy Switching Station, August 2020*.

(Note: Appendices 3 to 10 are available on request).

2. PROJECT OVERVIEW

2.1 Consultation History

The project was first introduced to stakeholders in March 2016. At this stage SHE Transmission shared the general project scope and identified search areas for a new overhead line route. In October 2016, stakeholders were consulted on the preferred route for an overhead line alongside the alternative options that were presented.

Feedback received in Dalmally specifically indicated a general objection to the project. Stakeholders cited concerns regarding proximity to residential properties, visual impact and the proximity of the project to the existing Scottish Power transmission line. There were requests that the line be undergrounded in Dalmally due to these concerns.

During 2017, SHE Transmission completed an initial investigation into potential underground cabling route options around Dalmally. The results of an underground cable feasibility study, which identified three potential options, each heavily constrained with no clear preference, were presented to the local community council in January 2018.

In March 2018, SHE Transmission held a consultation to share the preferred alignment for an overhead line connection from Creag Dhubh to the existing Scottish Power Dalmally substation, located on the north side of Strath of Orchy.

Following consultation feedback, which confirmed continued objection to the preferred option, SHE Transmission committed to further assess undergrounding in places of particular local sensitivity, focussing on the area of greatest concern at the Strathy of Orchy. Detailed assessment of the potential underground cable connection options was completed in 2019.

A review considering the assessment of engineering, environmental and economic criteria followed and is presented in this consultation document in section 2. This identified specific technical and environmental risks caused by the underground cable options and increased cost associated with an underground cable connection. As a result, SHE Transmission decided to evaluate alternative options that would address concerns raised by the community without requiring an underground cable connection. An alternative solution was identified comprising an overhead line connection to a new switching station adjacent to the existing Scottish Power overhead line in Glen Lochy.

The consultation history is summarised in Box 1 overleaf.

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Box 1 – Summary of previous consultation for the proposed Creag Dhubh to Dalmally 275kV Connection (formerly named the North Argyll project).

March 2016

Project Introduction Consultation

The North Argyll project is introduced to local stakeholders.

We share the project scope and search areas being considered for a new overhead line to connect to the existing Dalmally substation.

October 2016

Route Options Consultation

A preferred route for the new overhead line is shared with the local community alongside alternative options considered. Feedback received in Dalmally specifically indicated a general objection to the project. Community members cited concerns regarding proximity to residential properties, visual impact and the proximity of the project to the existing Scottish Power transmission line. There were requests that the line be undergrounded in Dalmally due to these concerns.

Throughout 2017

Initial Cable Investigations

During analysis and review of all feedback received during the consultation process (including the March 2016 consultations) a decision was made to carry out an investigation into potential underground cabling route options around Dalmally.

January 2018

Cabling Update Meeting Glenorchy and Innishail CC

Members of our project team attended a local Community Council meeting to present the results of a Cable Feasibility Study which took place in 2017.

Three potential options were identified, each constrained by the location, with no clear preference between options.

March 2018

Preferred Alignment Consultation

We share our preferred alignment for the overhead line proposals between the preferred substation site (Creag Dhubh) and Dalmally Switching Station.

The vast majority of feedback received is in objection to the preferred route and subsequent alignment, citing landscape and visual concerns.

May 2019

Further Underground Cabling Investigations Announced

In recognition of the consultation feedback in Dalmally, we announce plans to further explore undergrounding across the Strath of Orchy and appoint a design contractor to conduct ground investigation studies.

Late 2019

Cabling Investigation Results

Two potentially feasible cabling options are identified, however, due to the high risk of environmental pollution and engineering challenges; a decision is made to investigate other potential connection options which would aim to respond to the community's landscape and visual concerns.

Early 2020

Glen Lochy switching station

An alternative connection location, avoiding the Strath of Orchy is identified to the east of Dalmally; which would link to the existing overhead line between Dalmally and Inverarnan substation.

September 2020

Virtual Consultation

Three options presented for consultation:

1. an overhead line from Creag Dhubh to the existing Dalmally substation (preferred solution from 2018),
2. a combination of overhead line and underground cable to the existing Dalmally substation; and
3. an alternative overhead line connection location east of Dalmally and new Switching Station.

3. OPTION 1 - OVERHEAD LINE FROM CREAG DHUBH TO DALMALLY (PREFERRED ALIGNMENT IN 2018)

3.1 Proposed Route and Preferred Alignment

A Strategic Study Area was defined for the connection by taking a straight line between the existing Dalmally substation and the centre point of the Creag Dhubh substation Search Area, and offsetting this by 5 km. This allowed a range of route options and tie-in locations to be assessed. This exercise produced six potential routes to connect Creag Dhubh with Dalmally substation, following SHE Transmission guidance and taking into account the physical, environmental and amenity constraints.

The route selection process was carried out in 2016 and subsequently consulted on in July 2017. From this process, a proposed route was selected to be brought forward to the more detailed alignment selection stage.

The results of the route selection stage environmental assessment are described in Consultation Document Route Selection, North Argyll substation to Dalmally 275kV Over Head Line, June 2017.

Following assessment, Route 6 was selected as the preferred route (see Figure 1). Following consultation, surveys and more detailed assessment a preferred alignment was developed within Route 6, which was presented at consultation in March 2018. Further information on the March 2018 consultation is available on the project webpage: https://www.ssen-transmission.co.uk/projects/north-argyll/.

The overhead line would be constructed using self-supporting fabricated galvanised steel lattice towers, L8(c) series, that are approximately 50 metres (m) high and separated by approximately 300 m to 350 m. The alignment, as shown in Figure 1, runs from Dalmally substation across Strathy of Orchy parallel to the B8077 to the west of Stronmilchan and across the River Orchy. It then turns south-south-west to cross the A85 and railway line close together, to the west of Dalmally village near Croftintuime. The alignment then enters an area dominated by plantation forestry, to the south of the Duncan Ban MacIntyre monument. It then runs southwest, broadly parallel to the loch shore to Creag Dhubh, south of Achlian. From there it follows roughly parallel to the A819, before turning south of Cladich, to the Creag Dhubh substation.

Table 3.1 provides a summary of the environmental analysis completed in 2017 for the proposed Route 6. Table 3.2 summarises the engineering appraisal of the preferred overhead line route (2017 consultation).

Table 3.1: Summary of Environmental Appraisal and RAG Rating of Proposed Overhead Line Route (July 2017)		
Guidance Criteria Environmental	Route 6	Summary of Environmental Analysis
Landscape		A high risk of potential significant landscape effects were identified for the section of the alignment crossing the Strath of Orchy due to the high value and sensitivity of the valley landscape.
Visual		A high risk of potential significant visual effects were identified due to the proximity to receptors within the settlements of Dalmally, Stonmilchan and Croftintuime, and tourists on the A85 and Oban railway, visitors to Kilchurn Castle and recreational users of the surrounding hills.
Ecology		The analysis identified that the key constraints would be native woodland and prioritiy peatland habitats.
Ornithology		The analysis identifed the key constraint as being the proximity to the Glen Etive and Glen Fyne SPA, which supports golden eagle *Acquila chrysaetos* 19 territories and 4.2% of the GB population in 2003).
Cultural Heritage		The analysis identified the potential for indirect setting effects on Kilchurn Castle Scheduled Monument, the Tom a'Chaisteal Dun Scheduled Monument and the Duncan Ban MacIntyre memorial (cateogry B listed building).
Land Use		The analysis identified some potential conflict with other land use in the strath of Orchy. The potential for impacts on commercial plantation woodland was noted for the other sections.
Hydrology/geology		The analysis noted the challenges associated with the River Strae and River Orchy and the potential for peatland to be encountered.

Table 3.2 Summary of Engineering Appraisal and RAG Rating of Proposed Overhead Line Route (July 2017)		
Guidance Criteria Engineering	Route 6	Summary of Engineering Analysis
Road Crossing		All routes would need to cross the A85, the A819 and the B8077, the Oban to Crianlarich railway, the river Strae and river Orchy.
Elevation		This route is nearly all below 200 m AOD.
Number of Deviations		This route contains more deviations (angle towers) than route 3.
Residential Proximity		It is approximately 150 m from residential receptors in Stronmilchan.
Access Routes		There are some existing access tracks, but new access tracks would be required.
Route Length		There are shorter route options available.

HV Crossings		Five 33 kV overhead lines crossings would be required.
Ground Conditions		There are areas of deep peat on the route, with one known area in Strath of Orchy unlikely to be avoidable.
Terrain		The route crosses undulating terrain, including river valleys.

Route 6 was selected on the basis it had the lowest environmental impact of the options considered, and the engineering risks were deemed acceptable. It was, acknowledged in the Consultation Document in 2018 that there were risks and potentially significant environmental effects; associated with landscape and visual, residential proximity, ornithology and ground conditions.

During the alignment selection process, further consideration was given to addressing the environmental and engineering constraints identified during the route selection process. The alignment process first selected a 'baseline' alignment, driven primarily by technical and cost considerations within the proposed route. Various deviations to the baseline alignment were then tested, leading to the adoption of the following:

- A deviation from the baseline alignment to pass 'behind' the Tom a'Chaisteal Dun Scheduled Monument, away from the view to the loch and at a greater distance, reducing the potential effect on its setting;
- A deviation away from the baseline alignment to avoid ancient woodland; and
- The adoption of the baseline alignment where it provides the best 'landscape fit'.

While ornithology was identified as a potential key constraint at the route selection stage, the alignment selection avoids crossing the Glen Etive and Glen Fyne SPA. Further surveys have confirmed that the area crossed by the preferred alignment does not provide breeding habitat for golden eagle and limited foraging potential.

The preferred alignment option was considered preferable following a technical, environmental and economic assessment. Feedback from the March 2018 consultation (and previous public engagements) expressed clear opposition to an additional overhead line at the head of Loch Awe, crossing the Strath of Orchy. SHE Transmission therefore committed to exploring options for an underground cable to cross the Strath of Orchy (see Section 4). In addition, further analysis was carried out to understand the potential landscape and visual, residential visual amenity and cultural heritage setting effects in more detail than had been undertaken before the 2018 consultation.

3.1.1 Preliminary Landscape and Visual Impact Assessment (LVIA)

The aim of the assessment was to understand where significant effects are likely to occur to determine whether any further design or decision-making exercises are required.

Residual Effects on Landscape Fabric

The assessment identifies localised non-significant effects on landscape fabric in areas of the Strath of Orchy landscape where an operational corridor and access tracks would be cut through established riparian woodland and shelterbelt plantation.

Whilst this would entail the loss of a corridor of characteristic vegetation, the area of woodland removal would be of comparatively modest scale in the context of the geographical extent of existing forest cover in the area, assuming that vegetation clearance would be limited to only that which is required for construction and operation of the OHL. In general felling would be broadly consistent with similar patterns of forestry and woodland elsewhere where grid infrastructure and forestry tracks are present and such clearances have already occurred.

Residual Effects on Landscape Character

Localised significant effects are predicted on the Craggy Upland and Upland Glens LCTs[2]. Option 1 would have a notable alteration to the character of the landscape and would likely become a defining characteristic within the landscape surrounding the OHL. Effects on other LCTs within the study area are assessed as non-significant.

Effects in the Craggy Upland LCT would reduce with distance, option 1 being accommodated in what is a large-scale landscape. The influence of option 1 would be experienced over a relatively localised part of the LCT, and one which is currently characterised by forestry and road infrastructure. The characteristic features of the upland landscape further to the north east would not be significantly affected. Forestry and woodland within the lower lying parts of the LCT would assist with limiting the influence of the OHL by providing screening.

The Upland Glens - Argyll LCT is subject to influence by existing transmission infrastructure (i.e. the Dalmally substation, the Dalmally – Windy Hill OHL) and by road and rail infrastructure which runs to the south of the LCT. Infrastructure is currently located on the edges of the LCT, while the interior of the LCT is occupied by low lying marshy grassland and crofting ground, shelter belts and riparian strips, woodland copses and scattered properties. Option 1 would introduce an OHL within the flat landscape, extending the influence of grid infrastructure further into the LCT; becoming one of the notable characteristics of the LCT due to the character areas small size and limited coverage within the wider Argyll and Bute area. Option 1 would represent a notable alteration to the characteristics of the landscape character within the landscape of the western extent of the Strath of Orchy. In the area of the development, it is likely that the OHL would become a defining characteristic of the landscape.

Residual Effects on Landscape Designations

Within the study area, there are a number of landscape designations which could be affected by option 1, as summarised in Table 4.2. There would be the potential for localised major/ moderate (significant) effects experienced at locations at Stronmilchan within the North Argyll Area of Panoramic Quality (APQ). No significant effects are anticipated for other areas designated for landscape or scenic quality.

Table 4.2: Residual Effects on Landscape Designations (Summary)	
Designation	Residual Effects (Summary)
Ben More and Glen Coe National Scenic Area (NSA) Loch Lomond and Trossachs National Park (LTTNP)	Due to the location of the Ben More and Glen Coe NSA and the LLTNP on the edge of the study area, and the limited level of ZTV coverage within these designated areas, it is not anticipated that option 1 would have significant effects on the special qualities or reason for designation.
North Argyll Area of Panoramic Quality (APQ)	Option 1 would introduce a new linear infrastructural element within the APQ. The magnitude of impact on this designation would be negligible, but with localised medium impact in locations at lower elevations where receptors are near option 1 (i.e. Strath of Orchy). On this basis, residual effect would overwhelmingly be minor, but with localised significant) effects experienced at locations at Stronmilchan.
Wild Land Areas (WLAs) (Loch Etive and Ben Lui)	The aesthetic and perceptual aspects of the WLA would not be compromised or altered. The magnitude

[2] Landscape Character Types (LCTs)

Table 4.2: Residual Effects on Landscape Designations (Summary)	
	of impact would be negligible. It is predicated that option 1 would result in moderate/ minor effects on both WLAs.
Gardens and Designed Landscapes (GDL) (Ardenaisaig house and Inveraray Castle	No impacts are predicated on the Inveraray Castle GDL. While visible from some points within Ardanaiseig house GDL, it is not anticipated that this would exert such an influence upon the qualifying features of the GDL to the extent where they would be impacted, or their enjoyment diminished. The magnitude of impact would be negligible. The effect would be not significant.

Residual Visual Effects

- Significant effects are predicted on views from properties at Stronmilchan. The OHL would be viewed in close proximity, with direct views from the majority of these properties. It would create a new focal point in the landscape in the foreground of the view, comprised of large-scale structures and horizontal lines.
- From Dalmally, views would largely be screened by mature woodland which surrounds the village and aligns the A85. Impacts would be negligible, and effects would not be significant.
- Elsewhere, scattered properties within the study area would generally view option 1 at a greater distance, within the context of a broader landscape view.
- Properties at lower elevations along the A85 as it runs along the western shore of Loch Awe, would experience glimpsed views, as established woodland would provide filtering. Effects on these properties would not be significant.
- In certain locations along this western shore, properties are elevated above woodland cover and option 1 would be a notable new element across the hillside. For these elevated properties, the effect would be significant.
- There would be significant effects on users of the B8077 due to the proximity to option 1 and the duration of the impact as the road user travels through the Strath. No other significant effects are predicated for transport users on other routes within the study area.
- Locally significant effects are predicted on Core Path C450 as it passes beneath option 1 and as it reaches the summit at Duncan Ban MacIntyre monument. These effects would reduce to not significant elsewhere along the path.
- Significant effects are not predicted at any other core path due to a combination of distance from the OHL, and intervening landscape features providing a high level of screening.
- No significant effects are predicted at any other recreational receptor locations within the study area.
- Of the 21 VPs assessed, six were found to experience significant visual effects as a result of option 1. This is due to the proximity of option 1 to the VP, the presence of other transmission infrastructure within the existing view causing a 'wirescape' in the foreground of the view, and the introduction of transmission infrastructure into a view which is currently across areas of woodland and forestry with small (human scale) settlement.

3.1.2 Preliminary Residential Visual Amenity Assessment

Option 1 would introduce large, infrastructural elements into close proximity views from a number of properties within the study area. While option 1 would result in significant effects on views from these properties, no property was identified as experiencing effects which would be considered overbearing, overwhelming, pervasive or oppressive. Option 1 is not considered to contribute to the encirclement of properties by overhead

transmission development. On this basis it is concluded that the properties would not be affected by option 1 to the extent that they would be considered an unsatisfactory place in which to live.

The Preliminary Residential Visual Amenity Assessment (RVAA) addresses the effect of option 1 on the visual amenity of residential properties within 500 m of the alignment of Proposed Development. The methodology for the RVAA is based on the SSE RVAA guidance, current case law and the recently published Landscape Institute Technical Note[3].

It is important to note that the assessment of residential visual amenity is separate and distinct from the assessment of visual effects. As noted in the Landscape Institute's Technical Guidance Note 2/19, it is not uncommon for the LVIA to identify significant adverse effects on views and visual amenity of people at their place of residence as a result of introducing a new development into the landscape. This does not necessarily create material development planning considerations. However, there are situations where the effect on the outlook / visual amenity of a residential property is so great, that it is not generally considered to be in the public interest to permit such conditions to occur, where they did not exist before. This is the role of the RVAA.

Effects that may be considered material to the determination of an application are defined as:

- Overbearing: Tending to overwhelm. Of such scale and dominance relative to the residential environment and views that the development can be said to be represent a fundamental change to the main views from the property and the character of the adjacent landscape that forms the setting of the property.
- Overwhelming: Impacts are of such scale and dominance relative to the residential environment and views that the development can be said to be 'overpowering and/or oppressive'. Such effects are pervasive and largely unavoidable in main views and main/principal locations in the property.
- Oppressive: Effects may be considered intolerable or of such an extent that they result in a sense of 'ill-ease' and/or 'discomfort'.
- Pervasive: Effects are ubiquitous or experienced widely throughout the property and associated accesses.

Thirty-three residential properties within the 500 m study area have potential views of option 1.

3.1.3 Setting Impact Appraisal

The preliminary setting assessment considered potential effects on key heritage assets within 2 km of the preferred alignment within Strath Orchy (between Dalmally Substation and Duncan Ban MacIntyre Monument). One potential significant operational effect of moderate significance has been predicted on the setting of Duncan Ban MacIntyre Monument (LB12167).

Analysis of the bare-earth ZTV indicated that there would be theoretical visibility of the one or more components of the preferred alignment from a total of four Scheduled Monuments (Castles Farm, Dun SM3772, Glenorchy Parish Church SM3810, Barr A'Chaistealain Dun and Township SM3858 and Kilchurn Castle SM90179), one of which (SM90179) is also a Property in Care; one Category A Listed Building (Glenorchy Kirk LB12192), and three Category B Listed Buildings (Duncan Ban MacIntyre Monument LB12167, Dalmally Bridge LB12193 and Glenorchy Manse LB13808) within the study area.

3.2 Preferred Alignment Cost Information

Option 1: Overhead Line from Creag Dhubh to Dalmally (Route 6) is the preferred option identified in 2018. The cost of this option is 20% higher than the lowest cost of the route options assessed in 2018. However, Route 6 was selected as it presented the lowest environmental and engineering constraints. To evaluate the cost of the alternative options 2 and 3 (see Sections 4 and 5), the cost of Option 1: Overhead Line from Creag Dhubh to Dalmally is used as a baseline and the percentage above or below this baseline cost is utilised for the cost assessment of Option 2 and Option 3.

[3] Landscape Institute (2019). Technical Guidance Note 2/2019 Residential Visual Amenity Assessment (RVAA)

4. OPTION 2 – OVERHEAD LINE FROM CREAG DHUBH COMBINED WITH UNDERGROUND CABLE CONNECTION FROM CROFTINTUIME TO DALMALLY SUBSTATION

4.1 Introduction

In recognition of the feedback received (and in combination with previous comments dating back to 2016), SHE Transmission committed to explore an underground cable crossing the Strath of Orchy. Consequently, three route options for an underground cable were identified.

4.2 Study Area

The study area for identification of underground cable route options was defined as the broad area around Strath of Orchy, i.e. between the Dalmally substation in the north, Loch Awe to the west, commercial forestry to the south, and residential properties in Dalmally to the east (Figure 2).

4.3 Identification of Route Options

Route options were identified which sought to take account of the following factors:

- The route must be secure and technically viable.
- The route must be financially viable, in terms of both installation and maintenance.
- The route must have the minimum possible effect on the environment, and on users of the waters or landfall areas through which it passes.
- The route must be acceptable to the owners or leaseholders of land through which it passes.

Three route options (routes A2, A3 and A5) were identified. However, following more detailed consideration of technical constraints, route A3 was discounted from further consideration. Route A3 would require extensive groundworks and rock cutting, with potential risks to slope stability and visual impact at Stronmilchan. Route A3 is the longest route and in addition to the technical and environmental challenges meant this route is not economically viable. It did not offer any advantage over the other routes. Therefore, only route options A2 and A5 (as shown on Figure 2) were considered in detail.

Both route options A2 and A5 would start at a sealing end compound, which would be located to the south west of Croftintuime, south of the Oban to Crianlarich railway. The precise location of the sealing end compound would be determined partly by technical (e.g. ground conditions and terrain) and environmental issues (e.g. habitats affected, potential visual effects).

4.3.1 Underground Cable Route Option A2

Underground cable route option A2 is approximately 2.8 km in length, from the proposed OHL termination tower to Dalmally substation. The route option starts south west of Croftintuime. From here it progresses northwards, passing under the railway, the A85 and the River Orchy into the open fields west of Whitehouse, west of the B8077 at Stronmilchan. It lies parallel to and west of the B8077, crossing open fields and the forestry area south of the River Strae, then crosses the River Strae to reach Dalmally substation.

4.3.2 Underground Cable Route Option A5

Underground cable route option A5 is approximately 3.8 km in length from the proposed termination tower to Dalmally substation. The route option starts south west of Croftintuime and is wider in this location than route A2 to allow consideration of alternative locations for crossing the railway and the A85. For this reason, the route follows the railway and A85, progressing north west to a point south of the confluence of the Rivers Strae and Orchy. From here, it progresses northwards crossing open fields west of the River Strae. It then includes a section of the B8077 between the Allt Mhoilie and the Dalmally substation.

4.4 Environmental Appraisal of Underground Cable Route Options

Table 4.1 includes the summary of the environmental appraisal of underground cable route options. The comparative analysis of the environmental and consenting constraints concludes that there a marginal preference for Underground Cable Route Option A5.

Table 4.1: Environmental Appraisal and Red/Amber/Green (RAG) Rating of Underground Cable Routes (Ramboll, July 2019)

Guidance Criteria Environmental	Option A2	Option A5.1	Option A5.2	Summary of Environmental Preference
Natural Heritage - Designations				Neither route option would directly impact on the integrity of a national or international designated site. Where there is potential for indirect impacts, these could be effectively mitigated. No preference
Natural Heritage – Protected Species				Both routes are similar in terms of potential habitat for protected species. More woodland habitat is found within Option A5, hence the amber rating. No preference
Natural Heritage - Habitats				The suite of habitats present along each cable option is similar, although there are more areas of semi-natural broadleaved woodland within Option A5. No preference
Natural Heritage - Ornithology				Both options would have a similarly low potential for impact on ornithological receptors. No preference
Natural Heritage – Hydrology / Geology				Option A2 would crosses a smaller extent of land classified as having high flood risk and is therefore marginally preferred with regards to flood risk. Option A5 would likely avoid the direct disturbance of potential Class 1 and 2 peatland habitats. Option A2 will pass through an area of potential Class 1 Peat to the west of the Old Military road at Stronmilchan. This area is mapped predominantly as B5 Marshy Grassland in the Phase 1 habitat mapping (Figure 3.1c). Although this area of B5 marshy grassland has been impacted by grazing and by tree colonisation, it includes areas of highly ground water dependant habitat (M6, M11, M23, W4 and W7) and moderately dependent habitat (M15 and M25). In contrast, the areas of B5 Marshy Grassland habitat identified in the Phase 1 habitat mapping of Option A5 are all Juncus dominated rush pastures (likely M23 or MG10), which could be avoided at the alignment stage. Option A5 is therefore preferred with regards to peat and supply to Ground Water Dependent Terrestrial Ecosystems (GWDTE). No preference was identified between Options A2 and A5 with regards to PWS. Option A5 is preferred with regards to peat and supply to GWDTE.

Cultural Heritage - Designations				No preference.
Cultural Heritage – Cultural heritage assets				There is little difference between the routes as the cultural heritage recorded within each route is generally low density and most assets are discreet features that could readily be avoided during the alignment selection stage. Taking into consideration the number of cultural heritage assets within each route the preferred route would be Option A2. Option A2 preferred due to fewer cultural heritage assets and distance from Kilchurn Castle.
People – Proximity to Dwellings				Option A5 is preferred due to the lesser potential for impact on residential properties, which would likely be at greater distances from the cable alignment. Option A5 is preferred due to the lesser potential for impact on residential properties.
Landscape and Visual - Designations				An Area of Panoramic Quality (APQ) is defined in the Argyll & Bute Local Development Plan (2015) as: areas of regional importance in terms of their landscape quality which were previously identified as 'Regional Scenic Areas' in the former Strathclyde Structure Plan. The aim of this policy is to provide locally important landscapes in Argyll and Bute, with adequate protection against damaging development that would diminish their very high scenic value. Both route options would have direct and indirect impacts upon this designated area; however due to the temporary nature of construction effects and limited operational effects, these are unlikely to significantly affect the high scenic value of the designated area. No preference.
Landscape and Visual - Landscape Character				Option A5 is marginally preferable due to the proximity to existing linear infrastructure and slightly greater landscape scale. However, each Landscape Character Type has varying abilities to accommodate development of this nature without significantly changing its character. The sensitivity of a landscape character type to an underground cable is dependent on a range of factors, for instance the presence of woodland cover that would have to be removed, the extent of temporary construction works necessary and the ease of which the landscape can be restored to its pre-construction condition. Detailed alignment selection studies should seek to ensure that vegetation removal is minimised and that the cable is located within areas where restoration time would occur over a short time period (i.e. agricultural fields) where there would be reduced impacts on landscape character. Care should be taken at the alignment selection stage to ensure effects arising as a result of removal of roadside trees on the A82 are minimised. Option A5 is marginally preferable due to the proximity to existing linear infrastructure.

Landscape and Visual - Visual				Option A2 is favourable due to the limited range of non-residential receptors which would be affected by the construction works. Option A5 would impact a greater variety of receptors such as road users, railway users, users of the golf club and visitors to Kilchurn Castle during construction. Care should be taken when selecting the cable alignment to ensure effects arising as a result of removal of roadside trees on the A82 are minimised. This will ensure operational/ long term effects are reduced. Care should also be taken in determining the position of the terminal tower and sealing end compound. Option A2 preferred due to fewer affected non-residential receptors.
Land Use - Agriculture				Both options would only affect lower quality agricultural land, graded 3b and below. No preferred option is identified based on agricultural land classification. Option A5 is preferred as it avoids adverse impacts to areas used for crofting.
Land Use - Forestry				Both route options pass through areas of commercial forestry. The extent of loss of woodland to tree-felling and wayleave clearance activities would depend on the final alignment. However, the construction of a cable has the potential to compromise the commercial viability of forestry operations within a limited area surrounding the alignment. No preference.
Land Use - Recreation				Option A2 avoids direct interaction with core paths and Dalmally Golf course and is therefore the preferred option with regards to recreational routes and features. Both routes would cross the River Orchy and have the potential to have a short-term adverse effect on the commercial viability of fishing activity in the river during construction. If appropriate mitigation measures are implemented, the commercial viability of fishing activity in the River Orchy should not be compromised under a normal operational scenario for either route therefore no preferred option is identified with regards to commercial highland sports. No preference.
Planning				Both routes have been brought forward in full compliance with national, regional and local planning policy. Option A5 is marginally preferred as it avoids an area allocated as a settlement zone in the Argyll and Bute Local Development Plan 2015, however it is likely that the settlement zone would be largely avoided at the detailed alignment stage. No other projects or developments which may interact with either route option have been identified in the planning system. No preference.

4.5 Engineering Appraisal of Underground Cable Route Options

SHE Transmission appointed Balfour Beatty to complete an engineering and construction feasibility study and route options appraisal. This study was undertaken for illustrative underground cable alignments, rather than the cable routes; as it was necessary to define a detailed illustrative design to allow the engineering assessment to be completed through comparison of those designs. Two alignments were identified within route

A5, and one alignment within route A2, as shown in Figure 2. Table 5.2 includes the summary of the engineering appraisal of cable route options.

Table 4.2: Engineering Appraisal and RAG Rating of Underground Cable Options (Balfour Beatty, July 2019)				
Guidance Criteria Engineering	Option A2	Option A5.1	Option A5.2	Summary of Engineering Preference
Infrastructure crossings - Major crossings (132kV, 275kV, 400kV, HVDC, Rail, bridges, rivers/canals, gas or hydro pipelines)				The routes are similar in terms of major crossings. All have more than 2 major crossings and all have at least one HDD hence the red rating.
Infrastructure crossings - Road crossings				Option A2 is preferred as it has slightly less road crossings to deal with than A5.2.
Environmental Design - Contaminated Land				No preference as there is no known contaminated land for any of the routes.
Environmental Design - Atmospheric Pollution areas				No preference as the cable terminations points will not be exposed to high levels of pollution as they are located in rural areas.
Environmental Design – Flooding				In relation to operational design and maintenance Option A2 is slightly preferred as it has less of its cable route within the medium risk flood zone.
Environmental Design - Trees Root Protection Area				No preference as all options would require a similar amount of tree clearance for their cable routes.
Ground Conditions - Terrain				The Options are all very similar in terms of terrain, however Option A5.2 will be more of a challenge as it has a longer route section going through undulating terrain in forestry land.
Ground Conditions - Peat				No preference between Options A5.1 and A5.2, but Option A2 has 28% of its cable route located within deep peat. The section along Stronmilchan is where most peat is encountered. The peat varies in depth as the terrain below undulates. Water courses coming from above the B8077 are saturating the peat and can be seen to move visibly under pedestrian access.
Ground Conditions - Rock				Option A2 is slightly preferred as trial holes have identified no rock below 1.6m deep. For Options A5.1 and A5.2 some rock is expected within forest area, but limited opportunity to undertake trial holes.
Ground Conditions - Geology, Hydrology and Hydrogeology				Options A5.1 and A5.2 are slightly preferred as these routes were found to have less groundwater during Ground Investigation studies.

Construction - Access				Option A5.1 is marginally preferable in comparison to A5.2 as it only needs road improvements undertaken on the B817 and A85, while A5.2 needs work done on the B8077, A85 and the A819. Option A2 is not preferred as on the B8077 one of the bridges near Dalmally substation will be a problem for getting cable drums over.
Construction - Angle/Deviations (Cable Bending)				Option A2 is preferred as the majority of the route is generally quite straight with no major turns, unlike Options A5.1 and A5.2 which have 3 major 90 degree turns each.
Construction - Flooding				Option A2 is preferred as approximately 25% of cable route is at high risk of flooding, unlike Options A5.1 and A5.2 which has approximately 50%.
Construction - Surface Water				Options A5.1 and A5.2 are preferred as these routes are generally more free draining. The sand and gravels in the flood plain areas allow surface water to drain away. Option A2 has various small watercourses and drains along the route. It is very wet in the flat peat bogs and the flat nature of the peat holds surface water and prevents good drainage.
Construction - Circuit Design				Options A5.1 and A5.2 are slightly preferred as they have a cross bonded system design while Option A2 would be specially bonded.
Maintenance - Access				No preference.
Maintenance - Link Boxes				Option A2 is slightly preferred as its link boxes would be generally located a reasonable distance from watercourses, but still at risk of flooding.
Maintenance -Fault Repairs				No preference.
Proximity -Distance from constraints				No preference as there is no know constraints within 50 m of any cable route.
Proximity - Distance from existing circuits / network				Options A5.1 and A5.2 are preferred as the routes are not in the vicinity of any existing circuits. Unlike Option A2 which is in the vicinity of the existing SPEN 275kV line for approximately 300 m.
Proximity - Proximity to windfarms				No preference as there is no windfarm in the local vicinity which will be affected.
Proximity -Urban environments				Options A5.1 and A5.2 are preferred as the routes are mainly through open farmland and forestry land, unlike A2 which will impact residents and the community.

While option A2 is the shortest circuit length, it would pose the biggest challenge to construct as a large section of this route is in deep peat and would have to deal with extensive standing water caused by regular seasonal flooding. Accessing and working within areas of deep peat is difficult and is to be avoided.

Although routes A5.1 & A5.2 are longer, they would be less challenging to construct, in relative terms, than A.2. Ground conditions appear to be favourable with less peat to deal with than A2. The presence of sands and gravels within large sections of the cable routes offer good excavation and backfill materials.

In summary, from an Engineering perspective, it is concluded that while each route option is feasible, with a marginal preference for A5. Each underground cable option has significant challenges and specific risks, such that, the preference would be to find an alternative overhead line connection option.

4.6 Cost Appraisal of Underground Cable Route Options

The underground cable cost assessment uses Option 1: Overhead Line from Creag Dhubh to Dalmally to represent the baseline cost option for comparison. The baseline section of the preferred overhead alignment between Tower 38 and Dalmally substation represents the equivalent section for comparison with the two cable routes, as each cable route begins at a cable sealing end compound located in the vicinity of Tower 38, near Croftintuime. Table 4.3 includes this summary of the cost comparison of Option 2 cable routes with Option 1.

The cost comparison is assessed as a percentage of the baseline cost, based on the following RAG criteria:

- Baseline: Least Cost Option
- Green: < 120% of least cost option
- Amber: 120 – 140 % of least cost option
- Red: > 140% of least cost option

Table 4.3: Summary Cost Appraisal and RAG Rating for Option 1 and Option 2 from Croftintuime

	% of baseline cost	RAG
Option 1: OHL alignment Croftintuime to Dalmally switching station	100	
Option 2: Underground Cable Route A2 (from Croftintuime)	446	
Option 2: Underground Cable Route A5 (from Croftintuime)	558	

Underground cable option A2 is the shortest route with the least number of joint bays and least number of exceptional engineering difficulties identified. Underground cable option A5 is the longest, it has a higher number of exceptional engineering crossings. The Options ranked from the least cost to the highest cost for the section from Croftintuime to Dalmally are:

1. Option 1: OHL alignment Croftintuime to Dalmally switching station;
2. Option 2: Underground Cable Route A2 (from Croftintuime); and
3. Option 2: Underground Cable Route A5 (from Croftintuime).

An alternative method of comparing Option 2 underground cable route with Option 1: Overhead Line from Creag Dhubh to Dalmally is to compare the whole project cost. Table 4.4 includes this summary of the cost comparison of Option 2 cable routes with Option 1, using whole project costs.

Table 4.4: Summary Cost Appraisal and RAG Rating for Option 1 and Option 2 using whole project costs		
	% of baseline cost	RAG
Option 1: Overhead Line from Creag Dhubh to Dalmally substation	100	
Option 2: Overhead Line from Creag Dhubh combined with Underground Cable Connection A2 from Croftintuime to Dalmally substation	118	
Option 2: Overhead Line from Creag Dhubh combined with Underground Cable Connection A5 from Croftintuime to Dalmally substation	124	

The Options ranked from the least cost to the highest cost for the section from Croftintuime to Dalmally are:

1. Option 1: Overhead Line from Creag Dhubh to Dalmally substation
2. Option 2: Overhead Line from Creag Dhubh combined with Underground Cable Connection A2 from Croftintuime to Dalmally substation
3. Option 2: Overhead Line from Creag Dhubh combined with Underground Cable Connection A5 from Croftintuime to Dalmally substation

5. OPTION 3 - OVERHEAD LINE FROM CREAG DHUBH TURNING EAST AT DUNCAN BAN MACINTYRE MONUMENT TO A NEW SWITCHING STATION IN GLEN LOCHY

5.1 Introduction

Following on from the underground cable route options and feasibility assessment reporting in section 4 above, an alternative overhead line connection option was identified in Glen Lochy. The proposed 275 kV overhead line from Creagh Dhubh substation would tie into the existing Dalmally to Inverarnan 275 kV circuit via a new switching station. This option will utilise parts of the preferred alignment between Creag Dhubh and Dalmally substation (see Figure 3).

5.2 Study Area

The study area for identification of overhead line route options was defined as the area between tower 33 of the preferred overhead alignment and the existing Dalmally to Inverarnan 275 kV overhead line, south of the Strath of Orchy (see Figure 3).

5.3 Identification of Overhead Line Route Options

Four potentially feasible overhead line route sections were identified by SHE Transmission for consideration, as illustrated in Figure 3. Route options were identified which sought to take account of the following technical/physical/environmental factors:

- minimise the potential interaction with settlements and individual properties;
- minimise the extent of new transmission assets and cost, for example, by minimising the length of conductors and the number of support structures;
- the presence of railway or major river crossings;
- reduce angles of deviation to a minimum, of approximately 45°;
- minimise electricity outages on the existing transmission and distribution networks during construction;
- minimise the potential interaction with existing infrastructure and with other proposed transmission projects in the study area and environs;
- ensure a direct approach for substation entry, as far as possible; and
- ensure sufficient working area is available and minimising construction effort on-site.

5.4 Environmental Appraisal of Duncan Ban MacIntyre Monument to Glen Lochy Overhead Line Route Options

Table 5.1 includes the summary of the environmental appraisal of the Glen Lochy overhead line route options. The comparative analysis of the environmental and consenting constraints concludes that there is a preference for Route Option B1.

Overall, without consideration of technical or cost factors, option B1 is the preferred overhead line route option. Further detailed analysis of the route and potential alignment options should focus on finding a route/alignment that minimises potential effects on the Duncan Ban MacIntyre monument.

Table 5.1: Environmental Appraisal & RAG Rating of Duncan Ban MacIntyre Monument to Glen Lochy Route Options					
Guidance Criteria Environmental	A1	A2	B1	B2	Summary of Environmental Preference
Natural Heritage - Designations					No preference. All routes have been rated as green for designations (terrestrial ecology) i.e. low potential for option 1 to be constrained. Routes do not directly pass through any area subject to statutory designation for terrestrial ecology. Potential impacts on ornithological designations are discussed below. It is noted that this appraisal does not include consideration of Ancient Woodland or the West Coast of Scotland Important Plant Area (IPA), which are evaluated as part of the Switching Station Site Selection.
Natural Heritage – Protected Species					No preference. All routes have been rated as amber for protected species (intermediate potential for the development to be constrained.) Updated baseline surveys should be undertaken throughout the selected route to identify the presence of these protected species (i.e. sightings, field signs, nests, burrows, holts, setts, dreys etc) and determine appropriate mitigation if required.
Natural Heritage - Habitats					No preference. All routes have been rated as amber for habitats (intermediate potential for the development to be constrained). Further survey would be required to identify any areas of Annex 1 habitats such as blanket bog. Watercourses and stands of ancient woodland may also present a constraint.
Natural Heritage - Ornithology					No preference. All routes have been rated as amber for ornithology (intermediate potential for the development to be constrained). All routes are situated between the northern and southern component areas of the Glen Etive and Glen Fyne SPA potentially acting as a barrier to connectivity between these sites. Golden eagle, the target species for this SPA, utilise a maximum range of 9 km out with SPA designations, it is therefore likely that eagles will be utilising the area covered by the proposed routes for foraging and during the breeding season. Breeding surveys are due to commence in this area as of April 2020, in addition to ongoing VP surveys which will determine eagle usage and activity in the area.
Natural Heritage – Hydrology / Geology					Option B1 is preferred. In relative terms, route B1 would have the least interaction with the water environment. The number of watercourse crossings is low, and the topography relatively subdued. As a result, route B1 has been rated green (Low potential for the development to be constrained). Route A1 and A2 would traverse some challenging slopes with a high concentration of burns draining into the Teatle Water and River Lochy. Route B2 would introduce a number of additional interactions with the water environment. On this basis, these

					routes have been rated as Amber (Intermediate potential for the development to be constrained).
Cultural Heritage - Designations					No preference. In terms of cultural heritage, there is little difference between the route study areas, as the known cultural heritage baseline within each is generally of low density and all four routes contain at least one Scheduled Monument. Taking into consideration the distance of the Route Options from Category B Listed Duncan Ban MacIntyre Monument (LB12167), a sensitive local landmark, either Option A1 or Option A2 would be marginally preferred, as either option would better preserve the setting of the Listed Building in accordance with the directive in Section 59 of the Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997.
People – Proximity to Dwellings					Route B1 and B2 marginally preferred. Routes A1 and A2 have the potential to impact the property at Blarchaorain and the Shepherds house at Barran. Certain potential effects may be mitigated through careful consideration of the alignment. Route B1 and B2 have the potential to impact Brackley farm, again these could be mitigated through careful consideration of the alignment. Route B1 and B2 are deemed marginally preferable to route A1 and A2 due to possibility of alignment to mitigate effects and limited sensitive receptors.
Landscape and Visual - Designations					No preference. All four routes would be located wholly within the North Argyll Area of Panoramic Quality (APQ). The routes would be seen below the skyline, within an area characterised by a mosaic of coniferous woodland plantations and open grass moorland. Therefore, the proposed routes would be back-clothed and filtered (or partially screened) in views. Nationally important designations are unlikely to be impacted significantly, due to limited intervisibility, as indicated by the Zone of Theoretical Visibility (ZTV) and existing areas coniferous woodland. On this basis, these routes have been rated as Green (Low potential for the development to be constrained).
Landscape and Visual - Landscape Character					Marginal preference for A1 and B1. A1 and B1 are marginally preferable due to the reduced route length, limiting option 1 to one Landscape Character Type (LCT) (Craggy Uplands LCT), thus reducing the impact on other adjacent LCTs. Notably, the Steep Ridges and Mountains LCT, into which alignments A2 and B2 encroach, is a large-scale landscape, which has the ability to accommodate development of this nature without compromising the characteristic qualities of the LCT. On this basis, the routes have been rated as Green (Low potential for the development to be constrained.
Landscape and Visual - Visual					Preference for B1. All options would theoretically be visible, according to the bare-earth ZTV. Given, the distances of the non-residential receptors from the propose routes and the

					intervening forestry plantations, it is unlikely that there would be significant effects on visual receptors from any of the alignments. On this basis all options are given a green rating. It is noted however, that route options A1 and A2 are located on higher ground and on steep slopes, therefore there is the potential for a greater proportion of the towers to be visible in views. Tower bases and tracks would require significant civil engineering earthworks to 'bench' into the slope, creating visible scarring on the landscape. From the perspective, B1 and B2 would be preferable. With B1 having less impact due to its shorter length. It is important to note, that care should be taken to minimise visual effects arising from the removal of coniferous forestry plantations by reducing tree removal as far as possible. On this basis, the routes have been rated as Green (Low potential for the development to be constrained.
Land Use - Agriculture					B1 and B2 marginally preferred. All options would affect lower quality agricultural land. No preferred option is identified based on agricultural land classification. With regards to impact on croft land, routes B1 and B2 may be deemed marginally preferable due to the routes avoiding sheepfolds compared to routes A1 and A2 which cross two sheepfolds at Blarchaorain and Barran respectively. On this basis, the routes have been rated as Green (Low potential for the development to be constrained.
Land Use - Forestry					A1 and B1 slightly preferable. All route options pass through areas of commercial forestry and ancient woodland (of semi natural origin) to differing extents. Ancient woodland (of semi-natural origin) - Through sensitive positioning of the alignment it is possible for routes A1 and A2 to avoid all ancient woodland and for route B1 to sever only a small section. Route B2 will result in the loss of significantly more ancient woodland than all other options, regardless of alignment. Commercial forestry - All routes pass through areas of commercial forestry however routes B2 and A2 pass through significantly larger areas of commercial forestry than routes A1 and B1. Routes A1 and B1 are deemed slightly preferable to route A2 due to the substantially lower levels of commercial forest lost.
Land Use - Recreation					No preference. None of the routes would compromise the recreational use of features e.g. core paths or other recreational routes. On this basis, route options have been rated as Green (Low potential for the development to be constrained), with no preference defined.
Planning					B1 and B2 slightly preferable. Route options B1 and B2 would be considered slightly preferable as the majority of the route is in a Countryside Zone and avoids the SPA and 'Very Sensitive Countryside' as defined in the Local Development Plan.

The shorter options (A1 and B1) offer the potential to reduce environmental effects through the reduction in infrastructure and avoidance of woodland removal. Although unverified at this stage, options A1 and B1 would avoid potential effects in the vicinity of Succoth Lodge. Option B1 would avoid likely significant effects during construction through avoiding interactions with the water environment, option A1/A2 are considered slightly preferable due to reduced effect on the setting of the Duncan Ban Macintyre monument. Option B1 would reduce the overall extents of visibility, based on a review of the ZTV maps. Options A1 and A2 are located on higher ground and steep slopes and as a result, a greater vertical proportion of each tower would potentially be visible. In addition, the steep slopes would require significant civil engineering earth works to 'bench' working areas and tracks into the hillside, resulting in potentially visible scarring during construction and for a medium-term period following construction and reinstatement as the disturbed areas gradually recover and revegetate.

5.5 Engineering Appraisal of Duncan Ban MacIntyre Monument to Glen Lochy Overhead Line Route Options

Table 5.2 includes the summary of the engineering appraisal of the Glen Lochy route options. The comparative analysis of the engineering constraints concludes that there is a preference for Route Option B1.

Table 5.2: Engineering Appraisal & RAG Rating of Duncan Ban MacIntyre Monument to Glen Lochy Route Options

Guidance Criteria Engineering	A1	A2	B1	B2	Summary of Engineering Appraisal
Environmental Design - Altitude					B1 is preferred as it is situated at the lowest altitude at 139m Above Ordnance Datum (AOD). Routes A2 and B2 are at the highest altitude at 281m and 347m respectively. A1 is at 231m.
Topography - Terrain					Undulating terrain of up to 50% of the route for all routes.
Topography - Waterbodies					A1 and A2 cross ten tributaries of Teatle Water and three other watercourses; Allt Mhaluidh, Allt Fearna, and Allt Fhuaran. B1 and B2 are preferred as they avoid the tributaries of Teatle Water.
Topography - Slope					Route B1 and B2 are preferred as they have the lowest slope percentage of 12.4% and 17.1% respectively.
Ground Conditions - Peat					Based from the map from BGS website, all the proposed route options are at low risk of potential peat.
Ground Conditions - Rock					Based from the map from BGS website, all the proposed route options are at low risk of potential shallow rock.
Ground Conditions - Flooding					Routes A1 and A2 are at risk of river flooding at the eastern section of the route whilst Routes B1 and B2 are at low risk of river and surface flooding.

Access - Road Networks					All routes are between 1-3 km from the nearest road networks.
Access Tracks					A1 and A2 cross ten tributaries of Teatle Water and three other watercourses; Allt Mhaluidh, Allt Fearna, and Allt Fhuaran, therefore in excess of 15 culverts would be required required B1 and B2 are preferred as they avoid the tributaries of Teatle Water, therefore less than 5 culverts are required.
Existing Infrastructure – road crossings					All routes avoid crossing public road network
Existing Infrastructure - Railway Crossing					All routes cross the Oban to Crianlarich railway.
Existing Network - LV/HV Crossings					Route A1 and A2 crosses an existing 33kV. Interface with Scottish Hydro Electric Power Distribution (SHEPD) required for permanent undergrounding of the sections affected.
Operations and Maintenance					All routes considered low risk upon Electricity Safety, Quality and Continuity Regulations (ESQCR) evaluation.

5.6 Cost Appraisal of Route Options

The cost appraisal for the Glen Lochy route options assessment is provided on a combined basis together with the switching station selection comparison in Section 6.

6. OPTION 3 - SWITCHING STATION SITE SELECTION – GLEN LOCHY

A separate switching station site selection study was completed to identify a preferred location in Glen Lochy (see Figure 3). The approach adopted in identifying and assessing potential switching station sites is consistent with relevant SHE Transmission guidance[4].

6.1 Study Area

The study area for identification of site options was defined by the area broadly adjacent to the Dalmally to Inverarnan 275 kV overhead line, south of the Strath of Orchy. The switching station site options are situated parallel to the OHL between Brackley and Meall nan Gabhar (see Figure 3), with the surrounding landscape dominated by ancient woodland and commercial forestry interspersed with areas of grassland.

6.2 Identification of Site Options

The switching station will require a level platform sitting within a land take of approximately 6 hectares. The maximum height of equipment and plant within the switching station compound would be in the region of 15 m, with gantries located near the perimeter to allow the overhead line to enter the switching station. The switching station would also contain a building. The site will be surrounded by a security fence. Space around the outside of the security fence will be used for landscaping and visual improvements.

Six different sites were initially identified, although Site 5 was discounted from further assessment due to very steep terrain and therefore has not been included in the consultation materials. Through analysis of the environmental and engineering constraints, as outlined on the table below, Site 6 has been identified as the preferred option.

Switching station site options were identified which sought to take account of the following technical/physical/environmental factors:

- Consider the relationship of towers and switching station structures with background and foreground features, to reduce the prominence of structures from main viewpoints;
- take account of the potential effects of line connections that will need to be made;
- minimise the potential interaction with existing infrastructure and with other proposed transmission projects in the Study Area and environs;
- ensure a direct approach for switching station entry, as far as possible;
- consider ground form with the appropriate use of site layout and levels to avoid intrusion into surrounding areas;
- minimise the potential interaction with settlements and individual properties; and
- the presence of railway or major river crossings.

6.3 Environmental Appraisal of Site Options

Table 6.1 includes the summary of the environmental appraisal of the Glen Lochy switching station options. The comparative analysis of the environmental and consenting constraints concludes that there is a preference for site 6.

[4] Scottish and Southern Electricity Networks (March 2018) *PR-NET-ENV-501: Procedures for Routeing Overhead Lines of 132kV* and Scottish and Southern Electricity Networks (Jan 2014) *PR-PS-453: Substation Site Selection Guidelines for Voltages at or above 33kv*

Table 6.1: Environmental Appraisal and RAG Rating of Switching Station Site Options						
Guidance Criteria Environmental	Site 1	Site 2	Site 3	Site 4	Site 6	Summary of Environmental Preference
Natural Heritage - Designations						Preference for site 4 and 6. Sites 4 or 6 would be the preferred option. Switching stations 4 or 6 are unlikely to have any adverse impacts on ecological designations (statutory or non-statutory). Sites 1 and 2 would have impacts on Ancient Woodland. Site 3 would have impacts on the West Coast of Scotland IPA and Ancient Woodland.
Natural Heritage – Protected Species						Preference for site 2 and 6. None of sites are considered to propose changes to the baseline environment that would result in material impacts on maintaining the favourable conservation status of the protected species present. Switching station 2 and 6 would be considered preferable as they have a lower baseline sensitivity given that they have been substantially cleared of woodland recently, thereby resulting in less woodland removal and reduced construction phase impact on habitat suitable for protected species.
Natural Heritage - Habitats						Preference for sites 4 and 6. Annex 1 habitats are considered unlikely to be present. High sensitivity GWDTE[5] are also considered unlikely to be present. In terms of notable habitat, sites 1, 2 and 3 would result in removal of Ancient woodland. Of the 3 locations, site 3 is considered more sensitive given the presence of riparian habitats. Switching Station 4 and 6 are preferable as selection would not involve or require the removal of Ancient Woodland (semi-natural origin).
Natural Heritage - Ornithology						Marginal preference for site 6. All switching station sites are situated within 10km of Glen Etive and Glen Fyne SPA, designated for golden eagle. Disturbance to this species caused by the construction and operation of a switching station is unlikely. All options are unlikely to compromise the conservation status of Schedule 1 bird species or their habitats and therefore all sites are rated low risk. None of the sites would be likely to compromise the conservation status of a population of a red or amber listed species or essential breeding, passage or wintering birds. There would be a marginal preference for the site with least felling proposed (site 6).

[5] GWDTE – Ground Water Dependent Terrestrial Ecosystems

Natural Heritage – Hydrology						Preference for site 4. Switching stations 1, 2, and 6 have moderate potential for constraint as watercourses are all located within 50 m of these switching station options. Construction activities therefore have the potential to impact water quality, and these stations could be considered at risk of flooding (although the burns are not included within the SEPA Flood Maps). Switching station 3 is located over a watercourse and would therefore have a high potential for constraint. Switching station 4 is the preferred option as it is located > 50 m from a watercourse and therefore has the least potential for adverse effects on the water environment.
Natural Heritage - Geology						No Preference.
Cultural Heritage						No Preference.
People – Proximity to Dwellings						No preference between sites 2, 3, 4 and 6. Proposed switching station 1 has the potential to impact the property Brackley Farm, due to the proximity of the structure and lack of screening. There is no material basis upon which to differentiate between the sites 2, 3, 4 and 6 in terms of impacts on amenity at dwellings at this stage.
Landscape and Visual - Designations						No Preference. All five of the proposed switching stations would be wholly located within the North Argyll APQ. The switching stations would be seen below the skyline, within an area characterised by a mosaic of coniferous forestry plantations and open grass moorland. Therefore, the proposed switching station would be backclothed and generally screened in views.
Landscape and Visual - Landscape Character						Sites 1, 4 and 6 marginally preferable. Overall each of the sites would result in local impacts to landscape character however the integrity of the overall LCTs would not be affected by the proposed switching station, resulting in each site being given a Green rating. Switching stations 1,4 and 6 are marginally preferable, as option 1 would be limited to one LCT (Craggy Uplands LCT and Steep Ridges and Mountains LCT), thus reducing the impact on other adjacent LCTs (this is reflected in the comparative scoring).

Landscape and Visual - Visual						No Preference. Given the overall distances of the non-residential receptors from the proposed switching stations and the intervening coniferous forestry plantation vegetation, it is unlikely that there would be significant impacts on visual receptors from any of the proposed switching station locations, hence the Green rating given to each site. There is no material basis upon which to differentiate between sites in terms of visual amenity.
Land Use - Agriculture						No Preference. All options would only affect lower quality agricultural land, graded 3b and higher. No preferred option is identified based on agricultural land classification
Land Use - Forestry						Preference for site 1. Switching station 1 would result in small areas of ancient woodland (semi-natural origin) being lost, however no commercial forestry would be lost. Switching station 2, 3, 4 and 6 would each result in the removal of land available for forestry, although this is unlikely to compromise the overall commercial viability of the forest. As such they are each rated Amber. Switching station 1 would be considered preferable in terms of commercial forestry.
Land Use - Recreation						No preference.
Planning						Sites 1, 2 and 6 are preferred. Switching Station 4 is located entirely within an area classified as Very Sensitive Countryside and the majority of Switching Station 3 is in an area classified as Very Sensitive Countryside. Switching Stations 1, 2 and 6 are located entirely within an area classified as Countryside Zone and therefore deemed most preferable.

6.4 Engineering Appraisal of Switching Station Site Options

The Glen Lochy Switching Station Site Selection engineering appraisal was completed in two phases. Phase 1 concluded that Sites 1, 2 and 6 should be considered in further detail as these sites are appraised to offer fewer technical and environmental constraints. Sites 3 and 4 have been discounted. Site 3 has potential significant impacts to ancient semi-natural woodland and riparian habitats and would be positioned over a watercourse. Site 4 is located on a steep slope requiring extensive technical groundworks to accommodate a switching station.

The specific location of all Site Options considered are illustrated in Figure 3.

Table 6.2 includes the summary of the engineering appraisal of the Glen Lochy route options. The comparative analysis of the engineering constraints concludes that Site 6 is preferred.

Table 6.2: Environmental Appraisal and RAG Rating of Switching Station Site Options						
Guidance Criteria Engineering	Site 1	Site 2	Site 3	Site 4	Site 6	Summary of Engineering Analysis
Health and safety						Site 2 and 4 would require a significant length of access track with very steep gradients in places increasing potential health and safety risk. Site 1 and 6 are preferred.
Timescales						Site 2, 3 & 4 would require the access to pass under the Oban-Glasgow Railway, presenting additional engineering (and construction) risk;
Availability						Electrically the availability is the same for all options when considering the wider network. Site 2 and 3 has a significantly reduced availability given risk of restricted emergency access with Site 4 more so due to hi likely hood of sustained periods of heavy snow at this altitude. Sites 1 and 6 are preferred.
Maintenance requirement						No preference between sites.
Flexibility						Site 6 is preferred as it provides flexibility for potential future extension should transformers need to be added at a future date. Option 2, 3 and 4 would be significantly constrained by the railway bridge with limited access for abnormal indivisible loads. Site 1 could be constrained for future changes due to its proximity to the settlement of Dalmally and individual dwellings.

6.5 Cost Appraisal of Glen Lochy Route Options and Switching Station Options

The Option 3 Glen Lochy cost assessment uses Option 1: Overhead Line from Creag Dhubh to Dalmally as the baseline cost option for comparison. The baseline section of the preferred overhead alignment between Tower 33 (near Duncan Ban MacIntyre Monument) and Dalmally substation represents the equivalent section for comparison with overhead line connection to Glen Lochy switching station sites; Site 1, Site 2 and Site 6. Table 6.3 includes this summary of the cost comparison of Option 3 Glen Lochy switching station sites with Option 1.

The cost comparison is assessed as a percentage of the baseline cost, based on the following RAG criteria:

- Baseline: Least Cost Option
- Green: < 120% of least cost option
- Amber: 120 – 140 % of least cost option
- Red: > 140% of least cost option

Table 6.3: Summary Cost Appraisal and RAG Rating for Option 1 and Option 3 from Duncan Ban MacIntyre Monument		
	% of baseline cost	RAG
Option 1: OHL alignment from Duncan Ban MacIntyre Monument to Dalmally substation	100	
Option 3: OHL alignment from Duncan Ban MacIntyre Monument to Glen Lochy switching station Site 1	376	
Option 3: OHL alignment from Duncan Ban MacIntyre Monument to Glen Lochy switching station Site 2	391	
Option 3: OHL alignment from Duncan Ban MacIntyre Monument to Glen Lochy switching station Site 6	376	

The Options ranked from the least cost to the highest cost for the section from Duncan Ban MacIntyre Monument are:

1. Option 1: OHL alignment from Duncan Ban MacIntyre Monument to Dalmally substation
2. Option 3: OHL alignment from Duncan Ban MacIntyre Monument to Glen Lochy switching station Site 1 or Site 6
3. Option 3: OHL alignment from Duncan Ban MacIntyre Monument to Glen Lochy switching station Site 2

An alternative method of comparing Option 3 with Option 1, is to compare the whole project cost. Table 6.4 includes this summary of the cost comparison of Option 2 cable routes with Option 1 using whole project costs.

Table 6.4: Summary Cost Appraisal and RAG Rating for Option 1 and Option 3 using whole project costs		
	% of baseline cost	RAG
Option 1: OHL alignment from Duncan Ban MacIntyre Monument to Dalmally substation	100	
Option 3: OHL alignment from Duncan Ban MacIntyre Monument to Glen Lochy switching station Site 1	139	
Option 3: OHL alignment from Duncan Ban MacIntyre Monument to Glen Lochy switching station Site 2	141	
Option 3: OHL alignment from Duncan Ban MacIntyre Monument to Glen Lochy switching station Site 6	139	

The Options ranked from the least cost to the highest cost using whole project costs are:

1. Option 1: OHL alignment from Duncan Ban MacIntyre Monument to Dalmally substation
2. Option 3: OHL alignment from Duncan Ban MacIntyre Monument to Glen Lochy switching station Site 1 or Site 6
3. Option 3: OHL alignment from Duncan Ban MacIntyre Monument to Glen Lochy switching station Site 2

7. SUMMARY OF OPTIONS

7.1 Option 1: Overhead Line from Creag Dhubh to Dalmally

Option 1 comprises an overhead line connection (see Figure 1) between Creag Dhubh substation and the existing Dalmally substation. This option was described as the preferred option in the consultation completed in 2018.

Consultation feedback received since 2018 for this option, identified concerns regarding the visual impact of the overhead line and the impact on residential visual amenity, specifically where it crosses the Strath of Orchy. Further analysis has confirmed that there would be locally significant effects on visual receptors; however, no properties were identified as experiencing effects that would be overbearing or pervasive.

Following consultation feedback, which confirmed continued objection to the preferred option, SHE Transmission committed to further assess undergrounding across the Strathy of Orchy. Detailed assessment of the potential underground cable connection options was completed in 2019.

Option 2: Overhead Line from Creag Dhubh combined with Underground Cable Connection from Croftintuime to Dalmally Substation

Option 2 comprises an overhead line connection from Creag Dhubh substation to Croftintuime on the preferred alignment (part of Option 1), where it would transition, via a sealing end compound, to an underground cable to cross the Strath of Orchy and connect to Dalmally substation (see Figure 2). This option would address the concerns raised through consultation, regarding visual impacts within the Strath of Orchy.

This report presents a comparative analysis of engineering, environmental and economic criteria of two underground cable route options. While both options would be feasible from an engineering perspective, the comparative analysis identified specific engineering and environmental risks and significantly increased cost associated with all underground cable options. The risks caused by the underground cable within the Strath of Orchy are a combination of ground conditions (including peat), regular seasonal flooding and the potential for pollution during both the construction and operation of the underground cable.

As a result, SHE Transmission decided to evaluate alternative options, that would address visual concerns raised by the community, without the risks associated with an underground cable connection. An alternative solution was identified comprising an overhead line connection to a new switching station, adjacent to the existing Scottish Power overhead line in Glen Lochy (Option 3).

Option 3: Option 3: Overhead Line from Creag Dhubh turning east at Duncan Ban MacIntyre Monument to a new Switching Station in Glen Lochy

Option 3 comprises an overhead line connection from Creag Dhubh to the Duncan Ban MacIntyre Monument on the preferred alignment (part of Option 1), where it would connect via an overhead line route (alignment still to be developed) to a new switching station in Glen Lochy, adjacent to the existing Dalmally to Inverarnan 275 kV overhead line (see Figure 3). The existing Dalmally to Inverarnan 275 kV overhead line is owned by Scottish Power.

This option would address the concerns regarding visual impacts within the Strath of Orchy and provide a preferable engineering alternative to the underground cable option. The additional risks caused by the underground cable options are not caused by option 3. However, option 3 has a significantly increased cost compared to option 1, as it requires a new switching station to be built.

8. CONSULTATION ON THE PROPOSALS

When providing your comments and feedback, SHE Transmission would be grateful for your consideration of the five questions below.

1. **Has the need for the project been clearly explained? Please provide an explanation of your answer.**

2. **Do the alternative connection options presented at this consultation (Option 2 and Option 3) respond to any concerns you had over the project? Please provide an explanation of your answer.**

3. **Which of the three Options would you consider the best option for SSEN Transmission to develop? Please provide an explanation of your answer.**

4. **Which of the three Options would you consider the least preferable option for SSEN Transmission to develop? Please provide an explanation of your answer.**

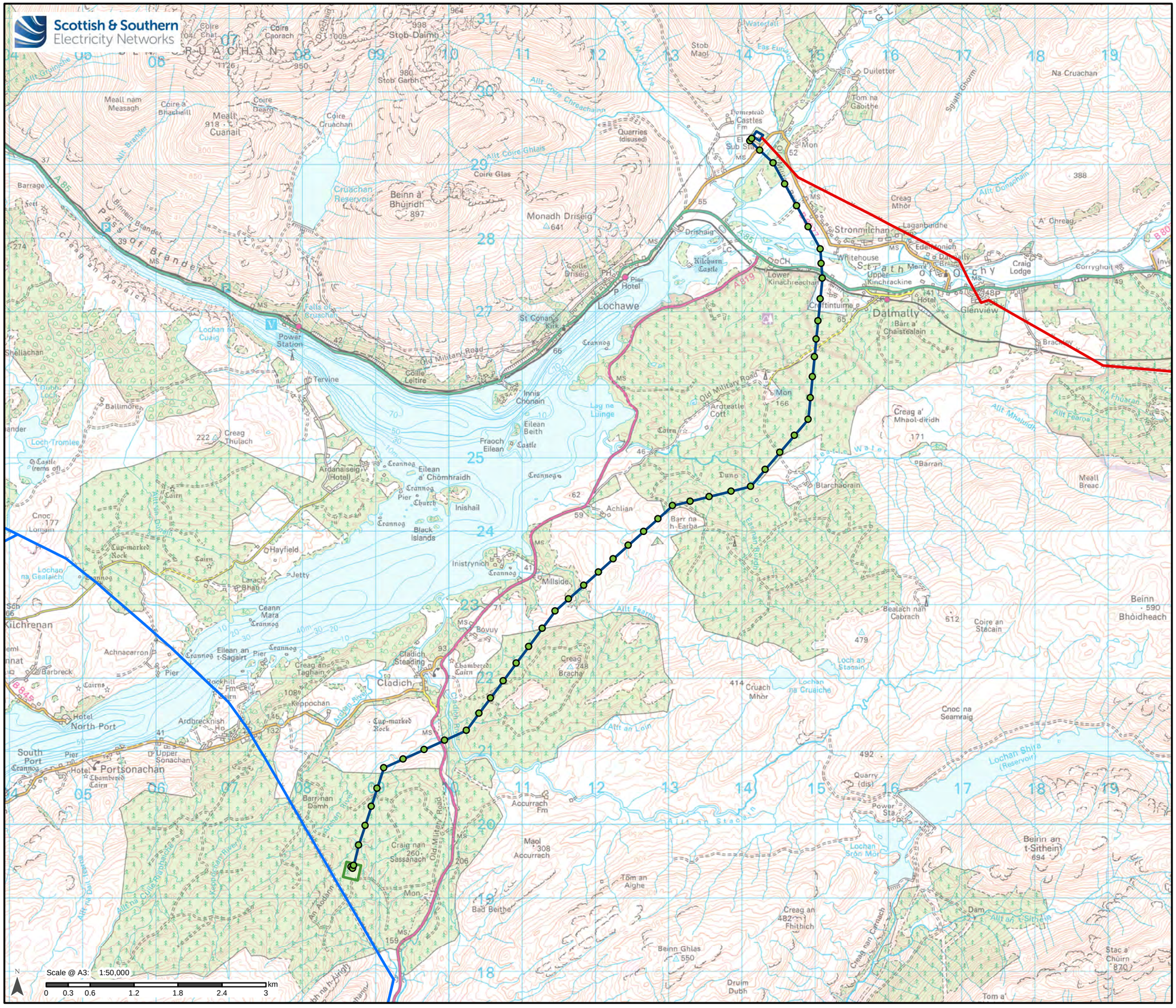
5. **Are there any potential risks or benefits associated with this project, that you believe have not been included in the Consultation Document?**

9. NEXT STEPS

A virtual public exhibition will be held, as detailed in the preface of this document. The responses received from the public exhibitions, and those sought from statutory consultees and other key stakeholders, will inform further consideration of the route options put forward, and the identification of a proposed route option to take forward to the next stage in the process (Alignment selection).

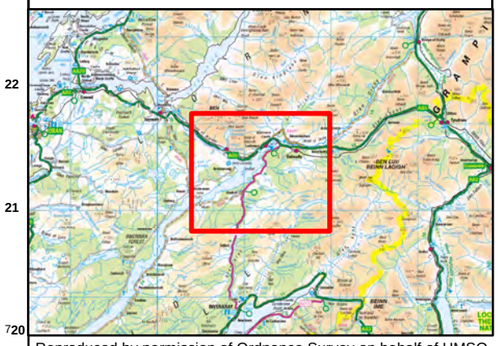
All comments are requested by Friday 25th September 2020. A Report on Consultation will be produced before the end of October, which will document the consultation comments received, and the responses by SHE Transmission to those comments.

APPENDIX 1: FIGURES



Legend

- Preferred Tower Locations (2018 Consultation)
- Preferred OHL Alignment (2018 Consultation)
- Existing 275kV Overhead Line (Scottish Power)
- Existing 132 kV Overhead Line (SHE Transmission)
- Creag Dhubh Substation
- Dalmally Switching Station (Scottish Power)



Project No: 1700003673

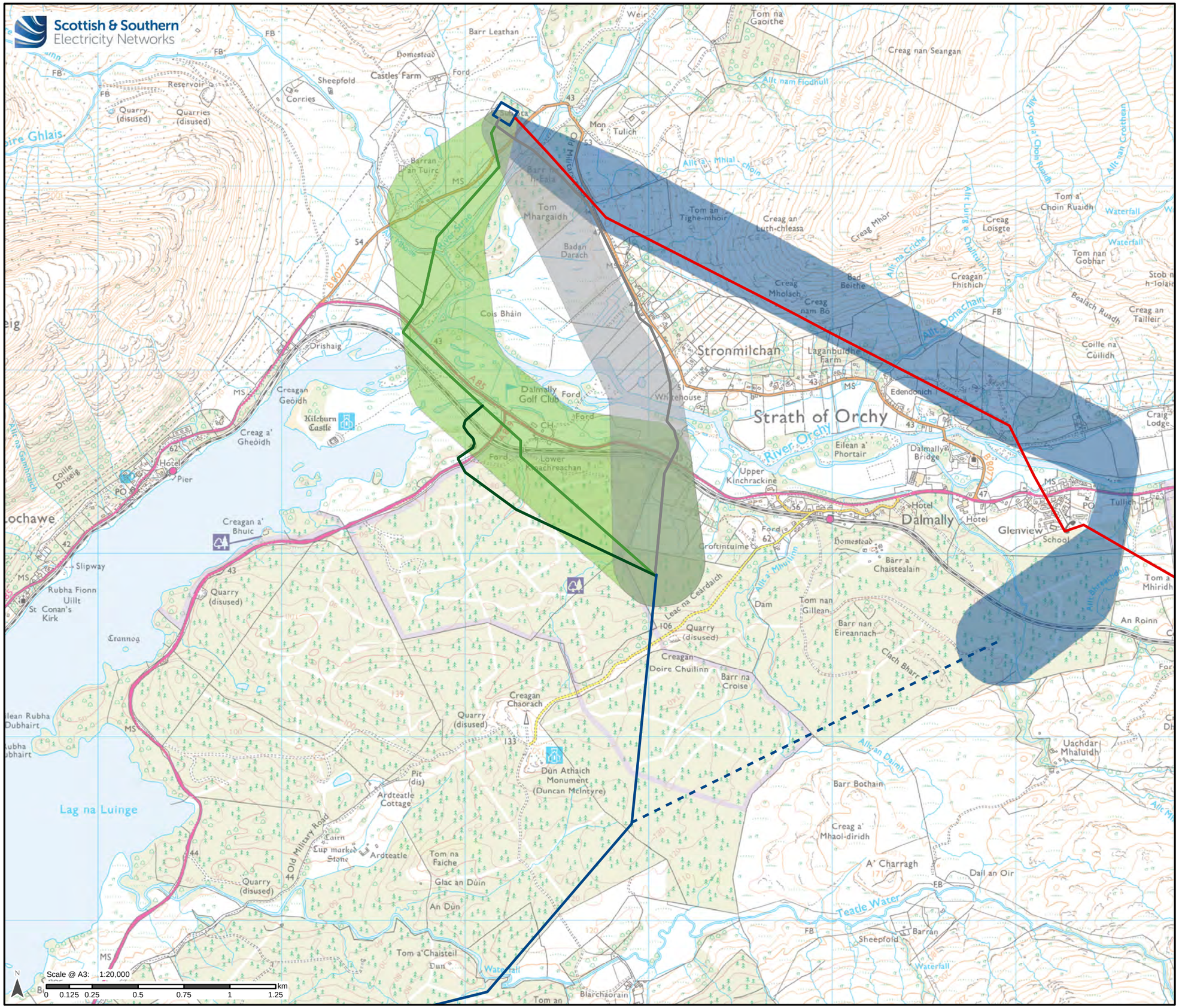
Project Name:
Creag Dhubh (North Argyll) substation to Dalmally

Figure Title: Figure 1 - Preferred Overhead Line Alignment (2018 consultation)

Drawn by: GM

Date: 07/08/2020

Drawing: R170_3673_Fig1_Consult_OverheadLine_D



Legend

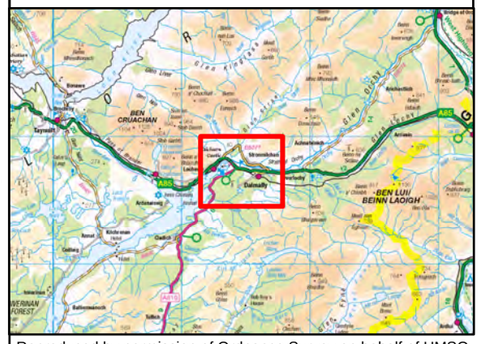
- Indicative OHL Alignment (2018 Consultation)
- Indicative OHL Alignment Deviation (to connect to option A3)
- Existing 275kV Overhead Line (Scottish Power)
- Dalmally Switching Station (Scottish Power)

Indicative Cable Route Options

- A2
- A3
- A5

Indicative Cable Alignments

- Alignment A2
- Alignment A5.1
- Alignment A5.2



Project No: 1700003673

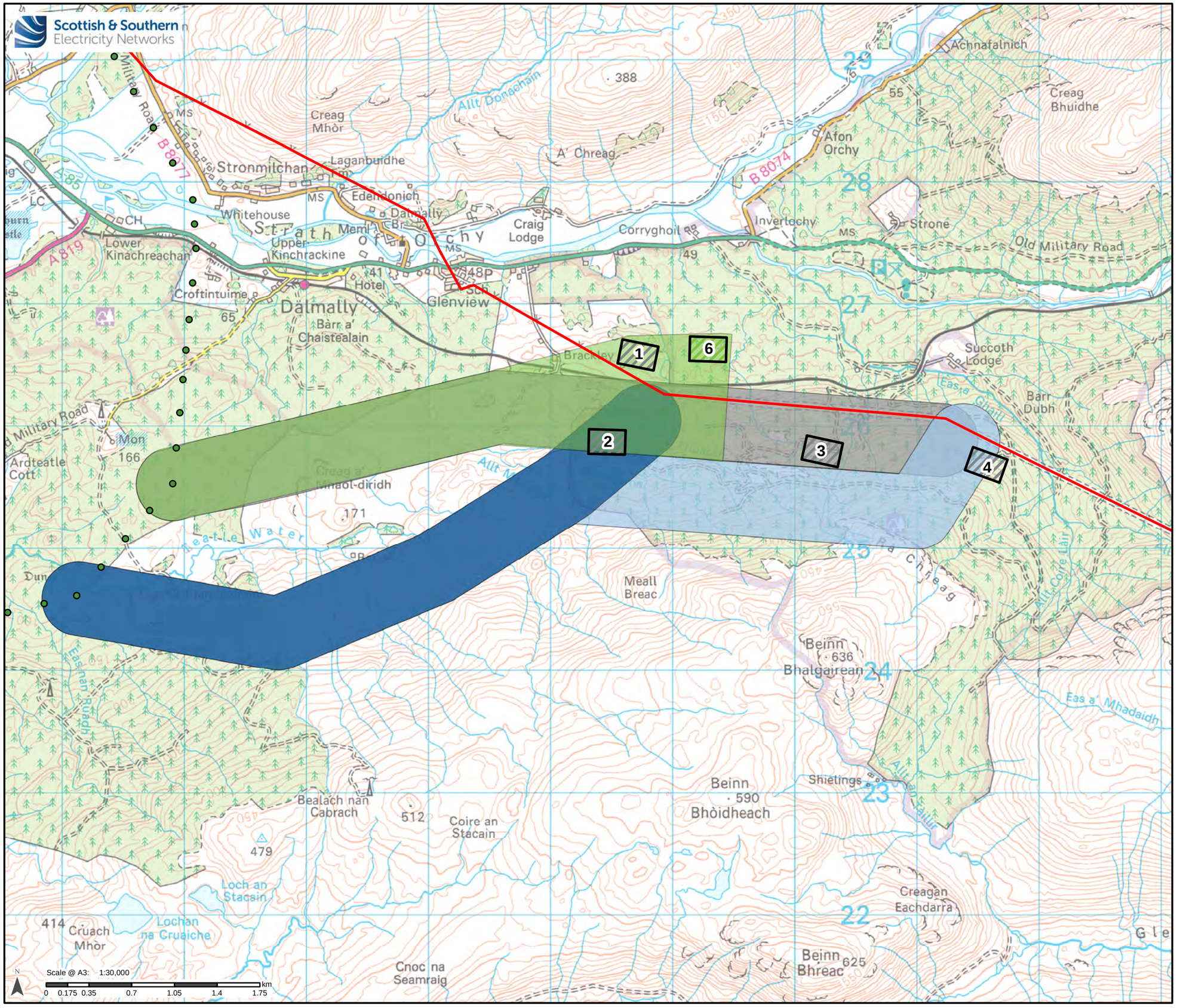
Project Name:
Creag Dhubh (North Argyll) substation to Dalmally

Figure Title: Figure 2 - Indicative Cable Route Options

Drawn by: GM

Date: 07/08/2020

Drawing: R170_3673_Fig2_CableOptions_D

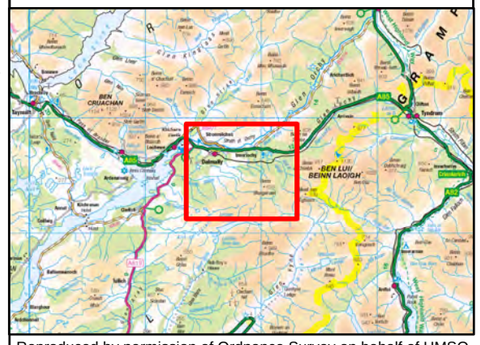


Legend

- Preferred Tower Locations (2018 Consultation)
- Existing 275kV Overhead Line (Scottish Power)
- Switching Station Options
- Preferred Switching Station Option 6

Overhead Line Route Options

- A1
- A2
- B1 (Preferred Option)
- B2



Project No: 1700003673

Project Name:
Creag Dhubh (North Argyll) substation to Dalmally

Figure Title: Figure 3 - Glen Lochy Overhead Line Route Options and Switching Station Site Options

Drawn by: GM

Date: 07/08/2020

Drawing:
R170_3673_Fig3_GlenLochyRouteOptions_SubSiteSelect_E

APPENDIX 2: ROUTE SELECTION PROCESS – OVERVIEW OF METHODOLOGY

Guidance Document

The approach to overhead line route selection was informed by SHE Transmission's guidance[6]. This guidance ensures environmental, technical and economic considerations are identified and appraised at each stage of the routeing process and helps SHE Transmission plc to meet its obligations under Schedule 9 of the Electricity Act 1989, which requires transmission license holders:

- to have a 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 interests; and
- to do what they reasonably can to mitigate any effect that the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects.

In line with the guidance, in the development of this project, SHE Transmission is following a three-stage approach, as follows:

- Stage 1: corridor/route selection;
- Stage 2: alignment selection; and
- Stage 3: consenting process.

Route Selection

The objective of this stage is to identifying potential route options for further appraisal. Typically this includes the following:

- identifying route options of approximately 1 km width, although these may be narrower/wider in specific locations in response to identified pinch points/constraints;
- systematically, robustly and proportionately evaluating each route option in turn against a consistent set of considerations; and
- identifying a preferred route which is considered to provide the optimal opportunity to achieve an economically viable, technically feasible and environmentally sound alignment within it. Note that the preferred route may not be one of the original route options identified at the outset, but might arise as a variant or as a combination of two or more options due to the iterative process.

Appraisal Method

Appraisal of route options has involved systematic consideration against environmental, technical and economic topic areas in line with SHE Transmission guidance, as follows

Environmental

- Natural Heritage (designations, protected species, habitats, ornithology and geology, hydrogeology and hydrology).
- Cultural Heritage (designations and cultural heritage assets).
- Proximity to dwellings (residential properties and other sensitive receptors).
- Landscape and Visual (designations, character and visual amenity).
- Land Use (agriculture, forestry and recreation).
- Planning (policy and proposals)

Engineering

- Infrastructure Crossings (major crossings, road crossings)

[6] Scottish and Southern Electricity Networks (March 2018) *PR-NET-ENV-501: Procedures for Routeing Overhead Lines of 132 kV and above, unpublished*

- Environmental Design (elevation, pollution areas, flooding);
- Ground Conditions (terrain, peat);
- Construction and maintenance (access and angle towers);
- Proximity (clearance distances, wind farms, urban environments).

Cost

- Capital (construction, diversions, public road improvements, felling, land assembly and consent mitigations);
- Operational (inspections and maintenance)

The Underground Cable, OHL and Switching Station assessment criteria differ across the engineering RAG tables. Undergrounding a cable presents a different set of challenges when compared to building overhead lines and these two linear developments differ again from a single site location required for a Switching Station. Therefore, each engineering RAG assessment utilises a set of criteria relevant for the infrastructure being assessed and are in accordance with SHE Transmission assessment guidance.

Allocating a Rating

Each topic within the environmental, technical and cost categories was considered in terms of the potential for the development to be constrained and a Red/Amber/Green (RAG) rating applied as appropriate. The RAG rating applied to each topic may take account of opportunities for mitigation by design and standard working practices that, if implemented, could overcome the identified constraint. This ensures the evaluation is based on likely outcomes as opposed to the 'worst case'.

The table below defines the high level convention used for assigning RAG ratings across the environmental, technical and cost disciplines, allowing comparison across a broad range of unrelated parameters.

Performance	**Appraisal**
Most Preferred	No potential for the development to be constrained
	Low potential for the development to be constrained
	Intermediate potential for the development to be constrained
Least Preferred	High potential for the development to be constrained

Comparison of Options

The RAG ratings for each topic are used to examine differentiators between the options being considered and reach a reasoned conclusion, on balance across all topics, as to the preferred option.