Scottish & Southern Electricity Networks

TRANSMISSION

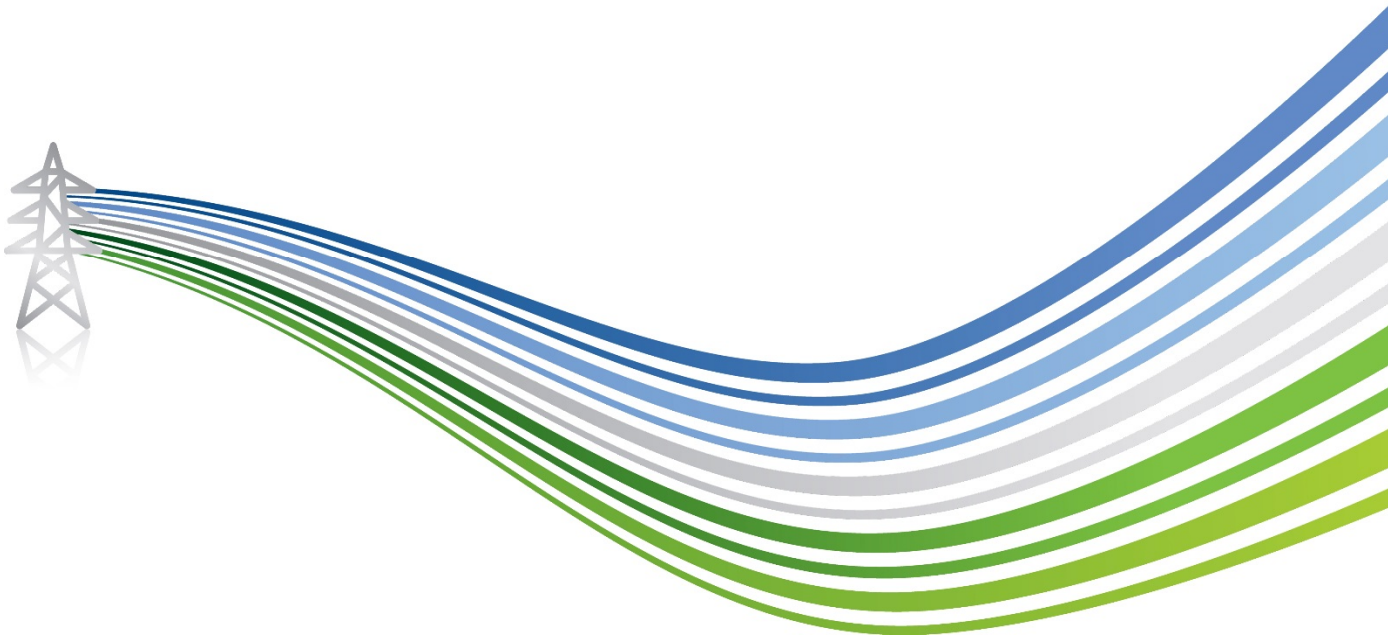
Consultation Document

Substation Site Selection

Argyll and Kintyre 275 kV Substations – An Suidhe, Crarae, Craig Murrail and Crossaig North

Reference: LT000288 and LT000289

June 2021



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GLOSSARY

1T0 busbar	1T0, is industry standard nomenclature for an incoming circuit breaker associated with an SGT lower voltage winding and its associated busbar (33 kV in respect of applications herein)
33 kV Substation	33 kilo-volt capacity substation an establishment equipped with distribution switching apparatus utilised for the control of electrical power.
33 kV Export Circuit	33 kilo-volt circuit used to allow windfarm generation to be exported into the wider transmission system.
132 kV Substation	132 kilo-volt substation an establishment equipped with transmission switching apparatus utilised for the control of electrical power.
132 kV Overhead Line	132 kilo-volt capacity electricity power line
275 kV	275 kilo-volt capacity electricity power line
AOD	Above Ordnance Datum
APQ	Areas of Panoramic Quality
ABC	Argyll & Bute Council
BGS	British Geological Survey
CAWL	Core Areas of Wild Land – Now classified as Wild Land Areas since 2014. these were extensive areas of high wildness as defined by Scottish Natural Heritage.
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.
DNO Connection	Distribution Network Operator Connection: A connection made to SSEN Distribution, typically at high voltage (>1000 V) to provide ancillary power for substation domestic consumption.
EIA	Environmental Impact Assessment
GDL	Gardens and Designed Landscapes are defined within Historic Environment Scotland's Inventory of Designed Landscapes in Scotland (2012) as "grounds that are consciously laid out for artistic effect".
GCR	Geological Conservation Review site - The geological features selected by the GCR range from rocks, minerals and fossils, to landform features formed during the Ice Age, modern rivers and coasts

GIS	Geographic Information System
GWDTE	Groundwater Dependent Terrestrial Ecosystem
ha	Hectares
HER	Historic Environment Record
IAE/AEPR	Overhead line circuit designations
Kilovolt (kV)	One thousand volts
LCT	Landscape Character Type exhibiting distinctive pattern of elements and features
LVAC	Low voltage alternating current <1000 V RMS (root mean squared)
MCA	Multi-Criteria Analysis - an evaluation of the technical and environmental constraints undertaken in the form of desk-based analysis, field work, consultation, and liaison with the wider project team. These constraints are transferred to a project Geographic Information System (GIS) for analysis.
Mitigation	Term used to indicate avoidance, remediation, or alleviation of potential adverse impacts.
NatureScot	Formerly known as Scottish Natural Heritage, is the public body responsible for Scotland's natural heritage, especially its natural, genetic and scenic diversity. It advises the Scottish Government and acts as a government agent in the delivery of conservation designations, i.e. national nature reserves, local nature reserves, national parks, Sites of Special Scientific Interest (SSSIs), Special Areas of Conservation, Special Protection Areas and National Scenic Areas.
NETS SQSS	National Electricity Transmission System Security and Quality of Supply
NSA	National Scenic Area - The Planning etc. (Scotland) Act 2006 gives a statutory basis to NSAs and defines them as “areas of outstanding scenic value in a national context”.
NSR	Non-Statutory Designated sites, these are heritage features classified in the Historic Environment Record (HER) as being potentially of national importance (Codes C and V)
Overhead Line (OHL)	An electricity line installed above ground, usually supported by lattice steel towers or poles.
Planning application	An application for planning permission under the Town and Country Planning (Scotland) Act 1997, as amended by the Planning etc. (Scotland) Act 2006. It should be noted that consent under section 37 of the Electricity Act 1989 usually carries with it deemed planning permission from the Scottish Ministers under Section 57 of the Town and Country Planning (Scotland) Act 1997.
Preferred	A site for the substation taken forward to stakeholder consultation following a

Site Option	comparative appraisal of Site Options.
Proposed Site Option	A site taken forward to consent application. It comprises a defined centre line for the overhead line and includes an indicative support structure (tower or pole) schedule, also specifying access arrangements and any associated construction facilities
PWS	Private Water Supply
RAG rating	Each topic within the environmental, technical and cost categories should be considered in terms of the potential for the development to be constrained and a Red/Amber/Green (RAG) rating applied as appropriate.
Site Selection Study	The study undertaken to assess the potential environmental impacts of the Site Options and to identify a preferred Site Option based upon the potential environmental impacts identified.
Section 37 (s37) application	An application for development consent under section 37 of the Electricity Act 1989
SAC	Special Area of Conservation - designated under Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora (known as - The Habitats Directive)
SF6	Sulfur Hexafluoride
SGT	Super Grid Transformer (400 or 275 kV connected)
SM	Scheduled Monument - monuments of national importance which have been afforded legal protection under the Ancient Monuments and Archaeological Areas Act 1979
SEPA	Scottish Environment Protection Agency
SPA	Special Protection Area – designated under Directive 2009/147/EC on the conservation of wild birds (the Birds Directive)
SSEN Distribution	Scottish and Southern Electricity Networks Distribution
SSEN Transmission	Scottish and Southern Electricity Networks Transmission
SSSI	Site of Special Scientific Interest – designated by SNH under the Nature Conservation (Scotland) Act 2004
Stakeholders	Organisations and individuals who can affect or are affected by SSEN Transmission works.
Study Area	The Study Area for identification of Site Options for each proposed new

	substation was developed with reference to the location of the Inveraray – Crossaig 275 kV OHL as well as the existing substations at An Suidhe, Crarae and Crossaig
VP	Vantage Point
Volts	The international unit of electric potential and electromotive force.
VTs	Voltage Transformer, utilised to provide measurements for control and protective apparatus.
Wild Land Areas (WLA)	Those areas comprising the greatest and most extensive areas of wild characteristics within Scotland, as classified by SNH (2014).
ZTV	Zone of Theoretical Visibility - the theoretical visibility of a Proposed Development across a specific Study Area.

PREFACE

This Consultation Document has been prepared by Ramboll on behalf of Scottish & Southern Electricity Networks Transmission (SSEN Transmission) to seek comments from all interested parties on the preferred sites identified for four (4) new substations proposed at An Suidhe, Crarae, Craig Murrail and Crossaig.

The Consultation Document is available online at – https://www.ssen-transmission.co.uk/projects/argyll-and-kintyre-275kv-substations .

Our virtual consultation room will launch on 14th July 2021, where further information regarding our proposals will be available alongside opportunities to join the project team for interactive text chat sessions.
A link to view the virtual consultation platform will be available on the project webpage from 14th July 2021.

Date of event	**Website address to join consultation**
Wednesday 14th July: 10am – 1pm & 5pm - 7pm	https://www.ssen-transmission.co.uk/projects/argyll-and-kintyre-275kv-substations
Thursday 15th July: 10am – 1pm & 5pm - 7pm	
Thursday 29th July: 10am – 1pm & 5pm - 7pm	

Comments on this document should be sent to:

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All comments are requested by 9th July 2021.

EXECUTIVE SUMMARY

This Consultation Document invites members of the public, statutory consultees and other key stakeholders to provide comment on the Site Options for 275 kV substations at four locations along the recently constructed Inveraray to Crossaig 275 kV OHL (overhead line).

There are four locations at which a new substation is required, namely, An Suidhe, Crarae, Craig Murrail and Crossaig North.

To allow the identification of potential site options for the proposed new substations, a Study Area was defined with the following parameters:

- a distance of up to 1 km on either side of the Inveraray-Crossaig 275 kV OHL; and
- a distance of up to 3 km from the existing substations for An Suidhe and Crarae and 20 km to the north of the existing Crossaig substation.

Within the Study Area, five Site Options for An Suidhe, six Site Options for Crarae and seven Site Options for Crossaig North have been identified.

For Craig Murrail, a site selection exercise was undertaken in 2015. At that time, four substation Site Options were identified and compared. A preference for two of the four sites was identified, subject to further site investigation. Based on a civil engineering desk study, an amendment to one of the two preferred sites was made and this amended site was ultimately selected as the Preferred Site. Some limited further design work was undertaken; however, no site surveys were completed as the project was then put on hold.

In order to ensure that the site selection process is completed in line with the current SSEN Transmission site selection guidance, an additional Site Selection Study has been undertaken in respect of the five substation Site Options considered in 2015.

The summary of options is as follows:

An Suidhe

Overall, Site Option AS1 is considered to be the Preferred Site Option on the basis of least potential for environmental, engineering and cost constraints.

Crarae

Overall, Site Option CE5 is considered to be the Preferred Site Option on the basis of least potential for environmental and engineering and cost constraints.

Craig Murrail

Overall, the Preferred Site identified in 2015 remains the preferred site on the basis of least potential for environmental, engineering and cost constraints.

Crossaig North

Overall, Site Option CG2 is considered the be the preferred site on the basis of least potential for environmental and cost engineering constraints.

This report presents the comparative analysis of environmental, engineering and cost criteria of the Site Options for An Suidhe, Crarae, Craig Murrail and Crossaig North.

As part of the consultation exercise, comments are sought from members of the public, statutory consultees and other key stakeholders on the Preferred Site Options.

A Report on Consultation will be produced which will document the consultations received, and the decisions made in light of these responses.

1. INTRODUCTION

1.1 Purpose of Document

SSEN Transmission is proposing to construct and operate four (4) new 275 kV electricity substations at the following locations:

- in the vicinity of the existing An Suidhe substation;
- in the vicinity of the existing Crarae substation;
- in the vicinity of Craig Murrail, north of Lochgilphead; and
- in the vicinity of the existing Crossaig substation.

This Consultation Document invites comments from all interested parties on the Preferred Site Options that are under consideration.

Transmission licensees, such as SSEN Transmission, are required to comply with the National Electricity Transmission System Security and Quality of Supply Standards[1] (NETS SQSS), which set out criteria and methodologies for planning and operating the GB Transmission System. New generation connection requests from renewable energy projects throughout Argyll and Kintyre exceed the capacity of the existing transmission system in the area. As such, in order to meet the license obligations relating to security of supply as set out in the NETS SQSS, there is need to provide four new 275 kV electricity substations to accommodate the recently constructed Inveraray – Crossaig OHL.

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

All comments received will inform SSEN Transmission's selection of Preferred Site Options to take forward.

1.2 Document Structure

This report is comprised of the following sections:

- The Proposals – describes the project need and provides an overview of the proposals and consultation history;
- The Comparative Appraisals for the four new substations – describes the Site Options identified for each of the proposed new substations and provides a summary of the environmental, engineering and cost appraisal and a description of the preferred Site Options;
- Consultation on the Proposals – invites comments on the preferred option process, the identification of preferred site and next steps.

The main body of this document is supported by a series of figures within Appendix 1.

1.3 Next Steps

As part of the consultation exercise, comments are sought from members of the public, statutory consultees and other stakeholders on the preferred site options put forward in this report.

A Report on Consultation will be produced which will document the consultation responses received, and the decisions made in light of these responses.

[1] URL: https://www.ofgem.gov.uk/licences-industry-codes-and-standards/standards/security-and-quality-supply-standard-sqss (Accessed 04/03/2021)

2. THE PROPOSALS

2.1 Project Need

Due to the projected increase in renewable energy generation stations in Argyll and Kintyre, a need has been identified for the upgrade and reinforcement of the electricity transmission network on the Argyll peninsula to ensure supply and support the transition to net zero emissions. This includes the construction of four new 275 kV electricity substations located in the vicinity of the existing substations at An Suidhe, Crarae and Crossaig, as well as a further substation to the north of Lochgliphead at Craig Murrail.

2.2 Proposals Overview

The proposals would comprise the construction of four new 275 kV substations, with the following characteristics:

- a maximum area of 8 hectares (ha) has been identified for each site option, to allow for the installation of either an air-insulated substation (AIS) or a gas-insulated substation (GIS) structure, as well as allowing space for ancillary works, construction laydown areas, access requirements and potential landscaping; and
- an estimated maximum gantry height of 15 m.

The substations would resemble the existing substations as shown in Photo 1.1.

Photo 1.1: Typical Substation design

2.3 Consultation History

The Study Area for the new OHL between Inveraray and Crossaig was presented to consultees in March 2014. A public exhibition was then held in October 2014 providing the potential route option. The preferred route corridor now under construction has been developed as a result of the responses received from that communication, where a clear preference was indicated for it. From this, the locations of the proposed four substation locations have been identified.

The Preferred OHL Route and associated Craig Murrail substation Study Area was also presented to the statutory consultees in September 2015. Following this, the initial four Craig Murrail substation site options (CM1-4) were presented for public consultation in March 2016 whereby comments were invited from the community, landowners and key stakeholders on these proposals.

This will be the first consultations undertaken for the other three substation sites.

3. COMPARATIVE APPRAISAL

3.1 Introduction

The comparative appraisal for each Site Option has been completed in accordance with the methodology set out in SSEN Transmission guidance. The guidance states that each Site Option should be evaluated with reference to agreed environmental, engineering and cost criteria and should be considered in terms of the potential for the Proposed Development to be constrained. A Red/Amber/Green (RAG) rating has been applied to each criterion to indicate the potential for each Site Option to be constrained, with RED indicating a high potential for constraint, amber indicating intermediate potential for constraint and GREEN indicating low potential for constraint. It should be noted that a RED or AMBER rating does not necessarily indicate that the Site Option would be unacceptable in planning terms, but rather indicates the need for further consideration of the potential to mitigate potentially adverse effects.

3.1.1 Identification of Site Options

To allow the identification of potential site options for the proposed new substations, a Study Area was defined with the following parameters:

- a distance of up to 1 km on either side of the Inveraray-Crossaig 275 kV OHL; and
- a distance of up to 3 km from the existing substations for An Suidhe and Crarae and 20 km to the north of the existing Crossaig substation.

The smaller Study Area for An Suidhe and Crarae is to reduce the extent of movement of the existing wind farm connection. For Crossaig North, a Study Area extending to south of Tarbert was considered, due to the locations of potential existing and potential future windfarms all being north of Crossaig but south of Tarbert.

The Multi-Criteria Analysis (MCA) process is undertaken following the identification of the Study Areas, which has used Geographical Information Systems (GIS) to analyse available digital datasets on environmental and technical constraints. The outputs of the MCA are heat maps which indicate the least constrained locations for the Site Options. Within the Study Area, five Site Options for An Suidhe, six Site Options for Crarae and seven Site Options for Crossaig North have been identified.

For Craig Murrail, a site selection exercise was undertaken in 2015. At that time, four substation Site Options were identified and compared within a Site Selection Report[2], based on earlier environmental analysis[3]. A preference for two of the four sites was identified, subject to further site investigation. Based on a civil engineering desk study[4], an amendment to one of the two preferred sites was made and this amended site was ultimately selected as the preferred site. Some limited further design work was undertaken; however, no site surveys were completed as the project was then put on hold.

In order to ensure that the site selection process is completed in line with the emerging SSEN Transmission site selection guidance, an additional Site Selection Study has been undertaken in respect of the five substation Site Options considered in 2015 via the MCA process.

The locations of the Study Areas and Site Options are shown on Figures 1A-1D in **Appendix 1**.

3.2 Comparative Appraisal – An Suidhe

3.2.1 Environmental Topics

Site Option AS1

[2] Scottish & Southern Energy Power Distribution (December 2015) *LT155-SSSR-02: Port Ann Substation Site Selection Report*

[3] ASH design + assessment (November 2015) *Port Ann Substation Options Appraisal*

[4] Scottish & Southern Energy Power Distribution (September 2015). LT000155: Port Anne Substation Site Selection Desk Study

Site Option AS1 involves the removal of up to 8 ha of commercial forestry and semi-natural broadleaved woodland which also acts as a screen to the Argyll and Bute APQ and limited surrounding dwellings. Depending on the level of screening retained or provided, the setting of Category B listed Claonairigh House and of two non-designated heritage assets within approximately 1 km and 2 km, respectively, may potentially be impacted. Class 5 peat deposits lie beneath the Site Option, although the area does not support peatland habitats. Additionally, three watercourses cross the Site Option and there is some limited potential for downstream connection to the Kilbride Chalet PWS.

Site Option AS2

An area of mature conifer woodland may be removed which includes the potential for red squirrel (a protected species) as well as 5 ha of commercial forestry. The construction of this Site Option may impact the settings of three Historic Environment Record (HER) sites which are located within 200 m of Site Option AS2 and a number of cultural heritage assets or designations within 3 km. Class 5 peat deposits lie beneath the Site Option, although the area does not support peatland habitats. Additionally, two watercourses cross the Site Option and there is some limited potential for downstream connection to the Kilbride Chalet PWS.

Site Option AS3

There is some limited potential for downstream connection to the Kilbride Chalet PWS and the Allt Doire nan Tarbh flows in a south westerly direction through the centre of Site Option AS3. Construction of Site Option AS3 would require the removal of 3 ha of commercial forestry and there is potential for adverse impacts on the settings of one HER site which is located within 200 m of Site Option AS3 and a number of cultural heritage assets or designations within 3 km. Class 5 peat deposits also lie beneath the Site Option, although the area does not support peatland habitats.

Site Option AS4

An area of mature conifer woodland may be removed which includes the potential for red squirrel (a protected species) as well as 7.5 ha of commercial forestry. The construction of this Site Option may impact the settings of three Historic Environment Record (HER) sites, one of which is of high sensitivity, located within 200 m and a number of cultural heritage assets or designations within 3 km. Class 5 peat deposits lie beneath the Site Option, although the area does not support peatland habitats. Additionally, two watercourses cross the Site Option and there is the potential for water quality effetcs to the Saunach Kennels PWS which lies 800 m away. The Site Option would also likely be visible from within the Argyll and Bute APQ, from the Ardkinglas and Strone GDL and a from number of selected viewpoints due to its elevation above the landscape extending the intervisibility across Loch Fyne.

Site Option AS5

Site Option AS5 has the potential to adversely impact the settings of a number of cultural heritage assets or designations within 3 km. There would also be varying degrees of visibility from the Argyll and Bute APQ, Inveraray Castle GDL, the Ardkinglas and Strone GDL as well as a number of selected viewpoints due to its elevation above the landscape extending the intervisibility across Loch Fyne. Two watercourses cross Site Option AS5 and there is the potential for water quality effects to the Saunach Kennels PWS which lies 1 km downstream. Class 5 peat deposits lie beneath the Site Option, although the area does not support peatland habitats. Additionally, 7.5 ha of commercial forestry would likely be removed.

Table 3.1 below summarises the environmental appraisal RAG ratings for Site Options AS1 – AS5. Environmental features are shown on Figures 2A, 3A, 4A and 5A in **Appendix 1.**

Table 3.1: Environmental Comparison Table – Site Options AS1-AS5

Site Option	RAG Impact Rating – Environmental																
	Natural Heritage						Cultural Heritage		People	Landscape and Visual			Land Use			Planning	
	Designations	Protected Species	Habitats	Ornithology	Hydrology	Geology	Designated	Non-designated	Proximity to	Designations	Character	Visual	Agriculture	Forestry	Recreation	Policy	Proposals
AS1	G	G	A	G	A	A	A	A	G	G	G	G	G	A	G	G	G
AS2	G	A	G	G	A	A	A	A	G	G	G	G	G	A	G	G	G
AS3	G	G	G	G	R	A	A	A	G	G	G	G	G	A	G	G	G
AS4	G	A	G	G	A	A	A	A	G	A	G	A	G	A	G	G	G
AS5	G	G	G	G	A	A	A	A	G	A	G	A	G	A	G	G	G

3.2.2 Engineering Topics

Site Option AS1

There are four issues assessed as AMBER for Site Option AS1, these key issues are:

- **Future Development Possibilities**: Site Option AS1 could be extended along the same axis in a north west direction for approximately 200 m; however, the existing overhead line alignment precludes extension to the southeast. Extension to the south west is constrained by forestry.
- **Salt Pollution**: Site Option AS1 is 2.6 km from the coast of Loch Fyne; therefore, an AMBER rating is given.
- **Elevation**: The formation level of the existing 132 kV outdoor compound is 170 m AOD; therefore, an AMBER rating is given.
- **Noise**: Site Option AS1 has been assessed as RAG rating AMBER through use of the SSEN Substation Site Noise Screening Tool[5].

Site Option AS2

There are seven issues assessed as AMBER for Site Option AS2, these key issues are:

- **Operation and Maintenance**: Site Option AS2 total off highway access is 2.25 km. An AMBER rating is given when the site is between 1 km and 3 km from a well maintained road.
- **Future Development Possibilities**: Western elevation would intersect with the Inveraray-Crossaig 275 kV OHL; therefore, an AMBER rating is given.
- **Interface with SSEN Distribution** Constraints with building in close proximity to Distribution assets results in an AMBER rating.
- **Adjacent Land Use**: Site Option AS2 is encumbered on three elevations. Where the surrounding land use could create challenges to accommodate ancillary infrastructure an AMBER rating is given.
- **Elevation**: The formation level of the existing 132 kV outdoor compound is 170 m AOD Where the site is between 100 m and 200 m AOD an AMBER rating is given.

[5] The SSEN Substation Site Noise Screening Tool is a 2D modelling assessment undertaken for each proposed Site Option using a number of conservative assumptions, including background noise levels and sound power levels of the noise sources to predict the impacts of noise and the likelihood for a requirement of mitigation for each location.

- **Salt Pollution**: Site Option AS2 is 2.6 km from the coast of Loch Fyne. Where the Site Option is between 2 km and 6 km from the coast an AMBER rating is given.
- **Noise**: Site Option AS2 has been identified as “Medium Risk” through a noise selection screening tool, therefore an AMBER rating is given.

Site Option AS3

There are four issues assessed as AMBER for Site Option AS3, these key issues are:

- **Future Development Possibilities**: Extension on all four elevations is possible into felled forestry area. Western elevation will intersect with Inveraray-Crossaig 275 kV OHL alignment, therefore an AMBER rating is given.
- **Interface with SSEN Distribution**: Constraints with building in close proximity to Distribution assets results in an AMBER rating.
- **Elevation:** The formation level of the existing 132 kV outdoor compound is 170 m AOD. Where the site is between 100 m and 200 m AOD an AMBER rating is given.
- **Salt Pollution:** Site Option AS2 is 2.6 km from the coast of Loch Fyne therefore an AMBER rating is given.

Site Option AS4

There are five issues assessed as AMBER for Site Option AS4, these key issues are:

- **Operation and Maintenance:** Site Option AS4 total off highway access is 2.5 km. An AMBER rating is given when the Site Option is between 1 km and 3 km from a well maintained road.
- **Interface with SSEN Distribution:** Constraints with building in close proximity to Distribution assets results in an AMBER rating.
- **Elevation**: The formation level of the existing 132 kV outdoor compound is 170 m AOD. Where the site is between 100 m and 200 m AOD an AMBER rating is given.
- **Salt Pollution:** Site Option AS4 is 2.6 km from the coast of Loch Fyne. Where the Site Option is between 2 km and 6 km from the coast an AMBER rating is given.
- **Noise**: Site Option AS4 has been identified as “Medium Risk” through a noise selection screening tool, therefore an AMBER rating is given.

Site Option AS5

There are three issues assessed as AMBER and one as RED for Site Option AS5, these key issues are:

- **Operation and Maintenance**: Site Option AS5 total off highway access is 2.7 km. An AMBER rating is given when the Site Option is between 1 km and 3 km from a well maintained road.
- **Interface with SSEN Distribution**: Significant constraints with proximity to existing Distribution and Generation assets results in a RED rating as this Site Option is furthest from the existing point of connection.
- **Elevation**: The formation level of the existing 132 kV outdoor compound is 170 m AOD Where the site is between 100 m and 200 m AOD an AMBER rating is given.
- **Salt Pollution:** Site Option AS5 is 2.6 km from the coast of Loch Fyne. Where the Site Option is between 2 km and 6 km from the coast an AMBER rating is given.

Table 3.2 below summarises the engineering appraisal RAG ratings for Site Options AS1 – AS5.

Table 3.2: Engineering Comparison Table – Site Options AS1- AS5

Site Option	RAG Impact Rating- Engineering																			
	Access & Connectivity						Footprint Requirements			Hazards		Ground Conditions		Environmental Conditions						
	Construction Access	Operation & Maintenance	Existing Circuits/Networks	Future Development Possibilities	Interface with SSEN Distribution	DNO Connection	Technology	Adjacent Land Use	Space Availability	Unique Hazards	Existing Utilities	Topography	Geology	Elevation	Salt Pollution	Flooding	Carbon Footprint	SF6	Contaminated Land	Noise (proximity to dwellings/ residential properties
AS1	G	G	G	A	G	G	G	G	G	G	G	G	G	A	A	G	G	G	G	A
AS2	G	A	G	A	A	G	G	A	G	G	G	G	G	A	A	G	G	G	G	A
AS3	G	G	G	A	A	G	G	G	G	G	G	G	G	A	A	G	G	G	G	G
AS4	G	A	G	A	A	G	G	G	G	G	G	G	G	A	A	G	G	G	G	A
AS5	G	A	G	A	R	G	G	G	G	G	G	G	G	A	A	G	G	G	G	G

3.2.3 Cost

Site Option AS1

Site Option AS1 has the lowest Construction cost of the five Site Options. It has a RED RAG rating for tree felling costs, due to the area of forestry to be felled when compared to the lowest cost Site Option. Site Option AS1 has the lowest Total Project Cost of the five Site Options.

Site Option AS2

Site Option AS2 has the third highest Construction cost of the five Site Options. It has a RED RAG rating for tree felling costs, due to the area of forestry to be felled when compared to the lowest cost Site Option. Site Option AS2 has the third highest Total Project Cost of the five Site Options.

Site Option AS3

Site Option AS3 has the second lowest Construction cost of the five Site Options. It has a GREEN RAG rating for tree felling costs because this Site Option has comparatively low tree felling requirements when compared to the other Site Options. Site Option AS3 has the second lowest Total Project Cost of the five Site Options.

Site Option AS4

Site Option AS4 has the second highest construction cost of the five Site Options. It has a RED RAG rating for tree felling costs, due to the area of forestry to be felled when compared to the lowest cost Site Option. It has an AMBER RAG rating for Land Assembly costs. Site Option AS4 has the second highest Total Project Cost of the five Site Options, with an AMBER RAG rating in this criterion.

Site Option AS5

Site Option AS5 has the highest Construction cost of the five Site Options. It has a RED RAG rating for tree felling costs, due to the area of forestry to be felled when compared to the lowest cost Site Option. It

has an AMBER RAG rating for Land Assembly costs. Site Option AS5 has the highest Total Project Cost of the five Site Options, with an AMBER RAG rating in this criterion.

Table 3.3 below summarises the economic appraisal RAG ratings for Site Options AS1 – AS5.

Table 3.3: Cost Comparison Table – Site Options AS1 – AS5

Site Option	RAG Impact Rating – Cost (capital)								
	Construction	Diversions	Public Road Improvement	Tree Felling	Land Assembly	Consent Mitigations	Inspections	Maintenance	Total Project Cost
AS1	G	G	G	R	G	G	G	G	G
AS2	A	G	G	R	G	G	G	G	G
AS3	G	G	G	G	G	G	G	G	G
AS4	A	G	G	R	A	G	G	G	A
AS5	A	G	G	R	A	G	G	G	A

3.3 Conclusions of Comparative Appraisal

The selection of the preferred Site Option comprises consideration of the environmental, engineering and cost considerations described above. This is summarised in the sections below.

3.3.1 Site Option AS1

Site Option AS1 has potential for environmental constraint primarily with respect to sensitive habitats (semi natural broadleaved woodland) and to watercourses on and around the site which have the potential to interact with a PWS. In addition, there would be the potential for visual amenity effects to designated and non-designated heritage assets, including Claonairigh House. Site Option AS1 would be constrained technically as a result of existing forestry and the existing OHL alignment which precludes any potential extension to the south-east. This Site Option does sit on slightly elevated ground and also has a moderate risk from salt pollution due to its proximity to the coast of Loch Fyne. Site Option AS1 would have the lowest total project cost.

3.3.2 Site Option AS2

Site Option AS2 has potential for environmental constraint primarily with respect to the potential for red squirrel protected species to be present, watercourses on the site which have potential to interact with a PWS and the potential for effects on the settings of heritage assets. This Site Option would require additional access track to be developed given its distance from the existing highway, and a new 33 kV switchboard would need to be built in closer proximity to the substation. In addition, it is limited on three sides to accommodate any future infrastructure due to the surrounding terrain. This Site Option does also sit on slightly elevated ground and also has a moderate risk from salt pollution due to its proximity to the coast of Loch Fyne. Site Option AS2 has the third highest total cost of the five Site Options.

3.3.3 Site Option AS3

Site Option AS3 has potential for environmental constraint primarily with respect to a watercourse crossing the site and the potential for interaction with a PWS. There is also the potential for effects to the settings of one heritage asset. Site Option AS1 would be constrained technically as a result of constructing a new 33 kV switchboard in close proximity to distribution and generation assets. This Site Option does also sit on slightly elevated ground and also has a moderate risk from salt pollution due to its proximity to the coast of Loch Fyne. Site Option AS3 has the second lowest construction cost of the five Site Options.

3.3.4 Site Option AS4

Site Option AS4 has potential for environmental constraint primarily with respect to potential for red squirrel species to be present and to watercourses on the site which have the potential to interact with a PWS. In addition, there would be the potential for visual amenity effects to the Argyll and Bute APQ and to three heritage assets. This Site Option would require additional access track to be developed given its distance from existing highway and would be technically constrained by the requirement for a new 33 kV switchboard to be built close to distribution and generation assets. This Site Option does also sit on slightly elevated ground and also has a moderate risk from salt pollution due to its proximity to the coast of Loch Fyne. Site Option AS4 has the second highest construction cost of the five Site Options.

3.3.5 Site Option AS5

Site Option AS5 has potential for environmental constraint primarily with respect to watercourses on the site which have the potential to interact with a PWS. In addition, there would be the potential for visual amenity effects to the Argyll and Bute APQ and to the settings of a number of heritage assets. This Site Option would require additional access track to be developed given its distance from existing highway and would require a new 33 kV switchboard to be built close to existing distribution and generation assets. It is also the furthest site from the point of connection. This Site Option does also have a moderate risk from salt pollution due to its proximity to the coast of Loch Fyne. Site Option AS5 has the highest construction cost of the five Site Options.

3.4 Preferred Site - An Suidhe

The analysis of the Site Options above has identified that the preferred Site Options are AS1 and AS2 on the basis of the least potential for environmental and technical constraints. Site Option AS1 has the lowest construction cost with Site Option AS2 being the third lowest cost. Considering the environmental, technical and cost criteria, Site Option AS1 is the preferred Site Option and is being taken forward for consultation (Appendix 1, Figure 6 and 7A). It is acknowledged that a number of environmental and engineering constraints remain, and that further studies and consultation could result in changes to the preferred Site Option.

3.5 Comparative Appraisal – Crarae

3.5.1 Environmental Topics

Site Option CE1

An area of blanket bog is present on Site Option CE1, which is classed as an Annex 1 habitat and has been given protection status under EU legislation. Class 2 peatland lie beneath the Site Option, which is considered high quality peatland habitat and may contain areas of deep peat. There also is potential for downstream connection to the Garvachy Farm PWS, however mitigation measures are considered to manage this effectively. Site Option CE1 lies in an area of open moorland which forms the backdrop and context to the landscape of Loch Fyne (the Rocky Coastland LCT) and would be visible in this context, as well as to a number of other views including from the southern part of Minard, from scattered properties along the eastern shore of Loch Fyne and from water vessels on Loch Fyne. The Site Option would also likely be visible in views of the Crarae Gardens GDL and could potentially result in a significant and adverse impact its setting. Additionally, the Site Option would also be visible from the remains of a pre-improvement farmstead (HER site of local importance).

Site Option CE2

This Site Option does not contain any significant ecological features. It is underlain by Class 2 peatland, which is considered high quality peatland habitat and may contain areas of deep peat. As such consideration would need to be given to ensure that the Proposed Development would not lead to drying out or a reduction in water quality to the surrounding peatland area. This Site Option would be the least preferred in terms of it potential effects on the landscape character, particularly to the east of Loch Fyne, given its location on steep topography and with extensive cut and fill required to form a flat substation platform. The Site Option would also be visible from the far side of Loch Fyne and on the hillside above Crarae Gardens GDL which could affect the setting of the GDL as well as from residential properties at Garvachy and Strone.

Site Option CE3

The historical designation of Crarae Gardens GDL lies 300 m from Site Option CE3, which would result in a likely significant and adverse effect on its setting when viewed from the far (east) side of Loch Fyne. The Site Option would also be visible from Minard, scattered properties along the eastern shore of Loch Fyne and from the road as it passes along the eastern shore of Loch Fyne. Effects on the West Loch Fyne APQ and on the East Loch Fyne APQ are considered likely. The Site Option contains a section mature conifer woodland which has the potential for red squirrel, which is a protected species, to be present. Class 5 peat deposits also lie beneath the Site Option although whilst this does not support peatland habitats, there may be some potential to constrain development if deep peat is encountered.

Site Option CE4

This Site Option does not contain any significant ecological features. A small watercourse is present which is most likely a minor land drain leading from an existing access track and potential effects to this feature would likely be effectively managed by mitigation measures. Given Site Option CE4's location within an area of open moorland, it would be visible from Crarae Gardens GDL from the opposite side of Loch Fyne, potentially affecting its setting. A number of residential properties in Strone, Minard, from scattered properties along the eastern shore of Loch Fyne and from along the road as it passes along the eastern shore of Loch Fyne would also be able to see this Site Option.

Site Option CE5

A section of mature conifer woodland is present on Site Option CE5, with the potential for red squirrel, which is a protected species. A watercourse also runs across the north west of the Site Option CE5 which drains to a lochan 20 m west. Class 5 peat deposits lie beneath the Site option and although peat in this area does not support peatland habitats there may be some potential to constrain development if deep peat is encountered.

Whilst this Site Option is located within a landscape considered able to accommodate some degree of development, impacts on visual amenity would relate to those on the more elevated areas of the East Loch Fyne APQ are considered likely in more elevated areas of the APQ, from scattered properties along the eastern shore of Loch Fyne and from the road as it passes along the eastern shore of Loch Fyne between Lachlan Bay and Lephinmore Point. Given its location within an area of forestry and its position away from the edge of the glen of Loch Fyne, the influence of the Proposed Development across the wider LCT would be the most reduced.

Site Option CE6

Key issues for Site Option CE6 relate to the potential for the development to have a significant impact on the setting of Allt na Dubhair fort (regional importance and medium sensitivity), as well as direct impacts on a number of heritage assets that lie on Site Option itself, which effects would not likely all be avoided through careful micro-siting. A watercourse crosses the centre of Site Option CE6 draining in a westerly direction to the catchment of Abhainn Bheag an Tunns and River Add which would not likely be avoided and would require mitigation. Ecological features relating to the Site Option include an active badger sett identified in close proximity and the potential to impact an area of flush/spring habitat which is a GWDTE.

Table 3.4 below summarises the environmental appraisal RAG ratings for Site Options CE1 – CE6. Environmental features are shown on Figures 2B, 3B, 4B and 5B in **Appendix 1.**

Table 3.4: Environmental Comparison Table – Site Options CE1-CE6

Site Option	RAG Impact Rating - Environmental																
	Natural Heritage						Cultural Heritage		People	Landscape and Visual			Land Use			Planning	
	Designations	Protected Species	Habitats	Ornithology	Hydrology	Geology	Designated Heritage Assets	Non-designated Heritage Assets	Proximity to Dwellings	Designations	Character	Visual	Agriculture	Forestry	Recreation	Policy	Proposals
CE1	G	G	R	G	A	A	A	A	G	A	A	A	G	G	G	G	G
CE2	G	G	G	G	A	A	A	G	A	A	R	A	G	A	G	G	G
CE3	G	A	G	G	A	A	R	G	G	A	A	A	G	A	G	G	G
CE4	G	G	G	G	A	G	A	G	A	A	A	A	G	G	G	G	G
CE5	G	A	G	G	A	A	G	A	G	A	A	A	G	A	G	G	G
CE6	G	A	A	G	R	G	G	R	G	G	A	G	G	G	G	G	G

3.5.2 Engineering Topics

Site Option CE1

There are three issues assessed as AMBER and six as RED for Site Option CE1, these key issues are:

- **Existing Circuits/ Networks**: Site Option CE1 is located on the opposite side of the Inverary-Crossaig OHL to the circuit that is required to be connected to thereby seriously complicating the connection topology. The intended platform will impact the existing wind farm 33 kV substation and 33 kV export circuit therefore a RED rating has been given.
- **Future Development Possibilities:** Eastern elevation Site Option CE1 is restricted by a forestry access track and existing 132 kV OHL alignment. The elevation to the south of Site Option CE1 is restricted by

existing 132kV substation platform, therefore an AMBER rating has been given.

- **Adjacent Land Use:** The eastern elevation of Site Option CE1 is constrained by the existing 132kV substation platform and OHL alignment therefore an AMBER rating has been given.
- **Unique Hazards**: Site Option CE1's platform area is known to have significant depth of peat therefore a RED rating has been given.
- **Geology**: Site Option CE1 is located on an area surveyed in 2015 where peat greater than or equal to 5 m was recorded therefore a RED rating has been given.
- **Elevation:** Existing site is at 190 m AOD therefore an AMBER rating has been given.
- **Salt Pollution**: Site Option CE1 is located less than 2 km from Loch Fyne therefore a RED rating has been given.
- **Carbon Footprint**: Site Option CE1's platform area is known to have a significant depth of peat requiring substantial removal and import of material, which will increase construction effort. Therefore, a RED rating has been given.
- **Noise**: Site Option CE1 has been identified as 'High Risk' through a noise selection screening tool and therefore a RED rating has been given.

Site Option CE2

There are three issues assessed as AMBER and five as RED for Site Option CE2, these key issues are:

- **Future Development Possibilities**: The eastern elevation of Site Option CE2 is restricted by falling relief while the western elevation is restricted by the existing 132 kV OHL alignment therefore an AMBER rating has been given.
- **Adjacent Land Use**: The western elevation of Site Option CE2 is constrained by the existing 132 kV substation platform and OHL alignment therefore an AMBER rating has been given.
- **Unique Hazards**: Site Option CE2's platform area is known to have significant changes of level across its footprint therefore a RED rating has been given.
- **Topography**: Slopes across Site Option CE2 are greater than 15% gradient therefore a RED rating has been given.
- **Elevation**: Existing site is at 190 m AOD therefore an AMBER rating has been given.
- **Salt Pollution**: Site Option CE2 is located less than 2 km from Loch Fyne therefore a RED rating has been given.
- **Carbon Footprint**: Site Option CE2 is located on a significant fall in relief which will require a substantial cut and fill operation. This will significantly increase construction efforts therefore a RED rating has been given.
- **Noise**: Site Option CE2 has been identified as 'High Risk' through a noise selection screening tool and therefore a RED rating has been given.

Site Option CE3

There are four issues assessed as AMBER and three as RED for Site Option CE3, these key issues are:

- **Existing Circuits/ Networks**: Site Option CE3 is located on the correct side of the OHL [IAE/AEPR] to the circuit that is required to be connected to thereby simplifying the connection topology. However, as the distance is 550 m from the existing OHL alignment, to turn in both circuits would require revised OHL alignment and s37 application in the future therefore an AMBER rating has been given.
- **Future Development Possibilities**: The east and west elevations of Site Option CE3 are bordered by amber heat map areas. The north and south elevations are bounded by read heat map areas therefore a RED rating has been given.
- **Interface with SSEN Distribution**: In order to maintain the generation connection, a new cable circuit will

be required from the existing windfarm crossing the access road and traveling downhill to the CE3 platform area. A cable circuit will be a challenge for installation in areas with little or no cover over the underlying rock formations. In addition, in peat areas the cable rating is compromised by the thermal proprieties of the peat, therefore a RED rating has been given.

- **Topography**: Site Option CE3 is characterised by rolling, undulating terrain with slopes across Site Option CE3 being between 5-15% therefore an AMBER rating has been given.
- **Elevation**: OS maps show Site Option CE3 is located in an area of moderately compacted contours therefore an AMBER rating has been given.
- **Salt Pollution**: Site Option CE3 is located less than 2 km from Loch Fyne therefore a RED rating has been given.
- **Noise:** Site Option CE3 has been identified as 'Medium Risk' through a noise selection screening tool and therefore an AMBER rating has been given.

Site Option CE4

There are two issues assessed as AMBER and seven as RED for Site Option CE4, these key issues are:

- **Existing Circuits/ Networks**: Site Option CE4 is located on the opposite side of the OHL to the circuit that is required to be connected to thereby seriously complicating the connection topology. To turn in both circuits would require revised OHL alignment and s 37application in the future. The intended platform will impact the existing wind farm 33 kV substation and 33 kV export circuit therefore a RED rating has been given.
- **Future Development Possibilities**: Site Option CE4 is restricted by the existing 132 kV OHL alignment to the south and west therefore an AMBER rating has been given.
- **Interface with SSEN Distribution**: In order to expedite construction, an enabling project would need to be undertaken to divert the 33 kV windfarm line outside of the construction area. This would need to be undertaken to the north of the site to prevent any entanglement with the existing OHL route. However, the geology to the north shows significant risk of boggy ground which would significantly complicate any OHL structures design, similarly cable installation into such an environment would be problematic therefore a RED rating has been given.
- **Unique Hazards**: Site Option CE4 is close to the area covered by the 2015 peat survey which revealed peat depths of up to 5 m therefore a RED rating has been given.
- **Geology**: Site Option CE4 is adjacent to the area surveyed in 2015 which showed areas of peat greater than or equal to 5 m therefore a RED rating has been given.
- **Elevation:** Proximate to existing site at 190 m AOD therefore an AMBER rating has been given.
- **Salt Pollution**: Site Option CE4 is located less than 2 km from Loch Fyne therefore a RED rating has been given.
- **Carbon Footprint**: Site Option CE4's platform area is known to have a significant depth of peat requiring substantial removal and import of material, which will increase construction effort. Therefore, a RED rating has been given.
- **Noise**: Site Option CE2 has been identified as 'High Risk' through a noise selection screening tool and therefore a RED rating has been given.

Site Option CE5

There are four issues assessed as AMBER and one as RED for Site Option CE5, these key issues are:

- **Future Development Possibilities**: Site Option CE5 is restricted by the existing 132 kV OHL alignment to the northwest therefore an AMBER rating has been given.
- **Geology:** Site Option CE5 is in the general direction of an area of known peat.

- **Elevation:** OS maps show Site Option CE5 is located in an area of moderately compacted contours therefore an AMBER rating has been given.
- **Salt Pollution**: Site Option CE5 is located less than 2 km from Loch Fyne therefore a RED rating has been given.
- **Noise**: Site Option CE5 has been identified as 'Medium Risk' through a noise selection screening tool and therefore an AMBER rating has been given.

Site Option CE6

There are four issues assessed as AMBER and two as RED for Site Option CE6, these key issues are:

- **Future Development Possibilities**: Site Option CE6 is restricted by the existing 132 kV OHL alignment to the north and west therefore an AMBER rating has been given.
- **Interface with SSEN Distribution**: The distance from Site Option CE6 to the existing 33 kV switchboard is prohibitive requiring a new 33 kV switchroom to be built therefore a RED rating has been given.
- **Topography**: Site Option CE6 is characterised by rolling, undulating terrain with slopes across Site Option CE3 being between 5-15% therefore an AMBER rating has been given.
- **Geology:** Site Option CE6 is in the general direction of an area of known peat.
- **Elevation**: OS maps show Site Option CE6 is located in an area of closely compacted contours circa 180 m AMSL therefore an AMBER rating has been given.
- **Salt Pollution**: Site Option CE6 is located less than 2 km from Loch Fyne therefore a RED rating has been given.

Table 3.5 below summarises the engineering appraisal RAG ratings for Site Options CE1 – CE6.

Table 3.5: Engineering Comparison Table – Site Options CE1- CE6

Site Option	RAG Impact Rating- Engineering																			
	Access & Connectivity						Footprint Requirements			Hazards		Ground Conditions		Environmental Conditions						
	Construction Access	Operation & Maintenance	Existing Circuits/Networks	Future Development Possibilities	Interface with SSEN Distribution	DNO Connection	Technology	Adjacent Land Use	Space Availability	Unique Hazards	Existing Utilities	Topography	Geology	Elevation	Salt Pollution	Flooding	Carbon Footprint	SF6	Contaminated Land	Noise (proximity to dwellings/ residential properties
CE1	G	G	R	A	G	G	G	A	G	R	G	G	R	A	R	G	R	G	G	R
CE2	G	G	G	A	G	G	G	A	G	R	G	R	G	A	R	G	R	G	G	R
CE3	G	G	A	R	R	G	G	G	G	G	G	A	G	A	R	G	G	G	G	A
CE4	G	G	R	A	R	G	G	G	G	R	G	G	R	A	R	G	R	G	G	R
CE5	G	G	G	A	G	G	G	G	G	G	G	G	A	A	R	G	G	G	G	A
CE6	G	G	G	A	R	G	G	G	G	G	G	A	A	A	R	G	G	G	G	G

3.5.3 Cost

Site Option CE1

Site Option CE1 has the second highest Construction cost of the six Site Options, with an AMBER RAG rating

in this criterion. Site Option CE1 has the highest Total Project Cost of the six Site Options, with a GREEN RAG rating in this criterion.

Site Option CE2

Site Option CE2 has the lowest Construction cost of the six Site Options. Site Option CE2 has the lowest Total Project Cost of the six Site Options.

Site Option CE3

Site Option CE3 has the second lowest Construction cost of the six Site Options. It has a RED RAG rating for tree felling costs, due to the area of forestry to be felled when compared to the lowest cost Site Option. It has an AMBER RAG rating for Consent Mitigations, due to tree replanting costs. Site Option CE3 has the second lowest Total Project Cost of the six Site Options.

Site Option CE4

Site Option CE4 has the highest Construction cost of the six Site Options, with an AMBER RAG rating in this criterion. It has an AMBER RAG rating for Land Assembly costs. Site Option CE4 has the second highest Total Project Cost of the six Site Options, with a GREEN RAG rating in this criterion.

Site Option CE5

Site Option CE5 has a median Construction cost of the six Site Options. It has a RED RAG rating for tree felling costs, due to the area of forestry to be felled when compared to the lowest cost Site Option. It has an AMBER RAG rating for Consent Mitigations, due to tree replanting costs. Site Option CE5 has a median Total Project Cost of the six Site Options.

Site Option CE6

Site Option CE6 has a median Construction cost of the six Site Options. Site Option CE6 has a median Total Project Cost of the six Site Options.

Table 3.6 below summarises the economic appraisal RAG ratings for Site Options CE1 – CE6.

Table 3.6: Cost Comparison Table – Site Options CE1 – CE6

Site Option	RAG Impact Rating – Cost (capital)								
	Construction	Diversions	Public Road Improvement	Tree Felling	Land Assembly	Consent Mitigations	Inspections	Maintenance	Total Project Cost
CE1	A	G	G	G	G	G	G	G	G
CE2	G	G	G	G	G	G	G	G	G
CE3	G	G	G	R	G	A	G	G	G
CE4	A	G	G	G	A	G	G	G	G
CE5	G	G	G	R	G	A	G	G	G
CE6	G	G	G	G	G	G	G	G	G

3.6 Conclusions of Comparative Appraisal

3.6.1 Site Option CE1

Site Option CE1 has potential for environmental constraint primarily with respect to sensitive habitats (blanket bog), to one PWS located downstream of the Site Option and to cultural heritage in terms of both potential direct impacts to archaeological remains on the Site Option itself and potential indirect impacts on the setting of Crarae Gardens GDL, in views of the GDL from the opposite side of Loch Fyne. In addition, visual amenity in

Minard, along the eastern shore of Loch Fyne and from the B8000 may be affected. Site Option CE1 would also be constrained technically as a result of the existing network, since it is located on the opposite side of the 275 kV OHL to the circuit that is required to be connected. In addition, Site Option CE1 would be constrained as a result of an existing forestry track and the existing 132 kV OHL alignment, which would preclude any potential extension to the east. In addition, there is known from surveys undertaken in 2015 to be deep peat on Site Option CE1. This Site Option also has a high risk from salt pollution due to its proximity to the coast of Loch Fyne and it has been identified as 'High Risk' using a noise selection screening tool. Site Option CE1 would have the highest total project cost of the six Site Options.

3.6.2 Site Option CE2

Site Option CE2 has potential for environmental constraint primarily with respect to sensitive habitats (Class 2 peatland) and to cultural heritage in terms of potential indirect impacts on the setting of Crarae Gardens GDL, in views of the GDL from the opposite side of Loch Fyne. In addition, Site Option CE2 would be present in views from residential properties in Garvachy and Strone and, due to the topography of the Site Option., the influence of operational infrastructure on landscape character would be widespread. Site Option CE2 would also be constrained technically as a result of the existing substation platform, which would preclude any potential extension to the west. In addition, Site Option CE2 sits at a high elevation and is known to have undulating topography across its footprint which would require substantial cut and fill to create the platform. This Site Option also has a high risk from salt pollution due to its proximity to the coast of Loch Fyne and it has been identified as 'High Risk' using a noise selection screening tool. Site Option CE2 would have the lowest total project cost of the six Site Options.

3.6.3 Site Option CE3

Site Option CE3 has potential for environmental constraint primarily with respect to sensitive habitats (mature conifer woodland) and to cultural heritage in terms of potential indirect impacts on the setting of Crarae Gardens GDL, in views of the GDL from the opposite side of Loch Fyne. In addition, Site Option CE3 would be present in views from residential properties in Minard, from along the eastern shore of Loch Fyne and from the B8000. Site Option CE3 would also be constrained technically as a result of its distance from the existing 275 kV OHL alignment, its requirement for a new cable circuit from the existing windfarm apparatus building to the Site Option CE3 platform area. In addition, Site Option CE3 sits at a high elevation and is known to have undulating topography across its footprint which would require substantial cut and fill to create the platform. This Site Option also has a high risk from salt pollution due to its proximity to the coast of Loch Fyne and it has been identified as 'Medium Risk' using a noise selection screening tool. Site Option CE3 would have the second lowest total project cost of the six Site Options.

3.6.4 Site Option CE4

Site Option CE4 has potential for environmental constraint primarily with respect to cultural heritage in terms of potential indirect impacts on the setting of Crarae Gardens GDL, in views of the GDL from the opposite side of Loch Fyne. In addition, Site Option CE4 would be present in views from residential properties in Strone and in Minard, from along the eastern shore of Loch Fyne and from the B8000. Site Option CE4 would also be constrained technically as a result of the existing network, since it is located on the opposite side of the 275 kV OHL to the circuit that is required to be connected. In addition, Site Option CE4 would be constrained as a result of the requirement for an enabling project to divert the existing 33 kV windfarm OHL outside of the site option area. This would need to be undertaken to the north; however, the geology to the north shows significant risk of boggy ground which would complicate any OHL structures design. In addition, there is known to be deep peat on Site Option CE4. This Site Option also has a high risk from salt pollution due to its proximity to the coast of Loch Fyne and it has been identified as 'High Risk' using a noise selection screening tool. Site Option CE4 would have the second highest total project cost of the six Site Options.

3.6.5 Site Option CE5

Site Option CE5 has potential for environmental constraint primarily with respect to sensitive habitats (mature conifer woodland) and to hydrology on the site itself. In addition, Site Option CE5 would be present in views from along the eastern shore of Loch Fyne and from the B8000. Site Option CE5 would also be constrained technically as a result of the existing 132 kV OHL alignment, which would preclude any potential extension to the north. In addition, Site Option CE5 is located on relatively steep ground and is located in an area of known peat. This Site Option also has a high risk from salt pollution due to its proximity to the coast of Loch Fyne and it has been identified as 'Medium Risk' using a noise selection screening tool. Site Option CE5 would have a median total project cost of the six Site Options.

3.6.6 Site Options CE6

Site Option CE6 has potential for environmental constraint primarily with respect to sensitive habitat (potential GWDTEs) and protected species, as well as cultural heritage in terms of potential indirect impacts on the setting of Allt na Dubhair fort, as well as direct impacts on a number of heritage assets that lie on the site itself. Site Option CE6 would also be constrained technically as a result of the existing 132 kV OHL alignment, which would preclude any potential extension to the north and west. Site Option CE6 would also be constrained technically as a result of its distance from the existing 33 kV switchboard, requiring a new 33 kV switchroom to be built. In addition, Site Option CE6 is located on undulating ground and in an area of known peat. This Site Option also has a high risk from salt pollution due to its proximity to the coast of Loch Fyne. Site Option CE6 would have a median total project cost of the six Site Options.

3.7 Preferred Site - Crarae

The analysis of the Site Options above has identified that the Preferred Site Option is CE5 on the basis of the least potential for environmental and technical constraints, with Site Option CE4 as the second most preferred. Site Option CG5 has a median total project cost, while Site Option CE4 would have the second highest total project cost. Therefore, Site Option CE5 is the preferred Site Option being taken forward for consultation (Appendix 1, Figure 6 and 7B). It is acknowledged that a number of environmental and engineering constraints remain, and that further studies and consultation could result in changes to the preferred Site Option.

3.8 Comparative Appraisal – Craig Murrail

3.8.1 Environmental Topics

Preferred Site 2015

An area of mature conifer woodland is present on the Site Option which includes the potential for red squirrel, a protected species. The Site Option is underlain by an aquifer classed of Low productivity and Class 5 peat deposits, although the area does not support peatland habitats. As the Site Option is located within the Plateau Moor and Forest – Argyll LCT and there would be some visibility from the settlements of Ardrishaig, from the northern edge of Lochgilphead and from a number of Core Paths. There is also potential for effects on the setting of Auchoish, long cairn Scheduled Monument.

Site Option CM1

As with the Preferred Site 2015, an area of mature conifer woodland is present, and an aquifer of Low productivity and Class 5 peat deposits lie beneath the Site Option. Effects on visual amenity and to designated heritage assets would also be similar to those outlined for the Preferred Site 2015. However, at this Site Option a tributary of the Dippin Burn lies to the west.

Site Option CM2

There are more ecological features at this Site Option with an area of semi-natural broadleaved woodland present, which is of higher ecological importance than the surrounding conifer habitat, and an area of marshy grassland which has the potential to be GWDTEs as well as an area of mature conifer woodland. There is also the potential for disturbance impacts on breeding red-throated diver and black grouse lek and a tributary of the Dippin Burn also lies to the west. Effects on visual amenity would be similar to that of the Preferred Site as the Site Option is also located within the Plateau Moor and Forest – Argyll LCT, and there would be some visibility from the settlements of Ardrishaig, from the northern edge of Lochgilphead and from Core Paths.

Site Option CM3

This Site Option includes an area of semi-natural broadleaved woodland, an area of marshy grassland and an area of mature conifer woodland. The Site Option is situated adjacent to tributaries forming headwaters of Allt Oigh to the south and a tributary to the Cuilarstich Burn to the north west. An aquifer of Low productivity and Class 5 peat deposits lie beneath the Site Option. The Site Option is also located within the Plateau Moor and Forest – Argyll LCT with potential visibility from the settlements of Ardrishaig, from the northern edge of Lochgilphead and from Core Paths which would affect visual amenity.

Site Option CM4

An area of mature conifer woodland is present on the site and red squirrel dreys have been recorded on the site boundary. An aquifer of Low productivity and Class 5 peat deposits lie beneath the Site Option. Similar to the other Site Options, this Site Option Is also located within the Plateau Moor and Forest – Argyll LCT and there would be some visibility of the site from the settlements of Lochgair and Achnaba and views from Core Paths.

Construction of all the Site Options would require the removal of approximately 8 ha of commercial forestry.

Table 3.7 below summarises the environmental appraisal RAG ratings for the Site Options. Environmental features are shown on Figures 2C, 3C, 4C and 5C in **Appendix 1.**

Table 3.7: Environmental Comparison Table – Site Options Preferred Site 2015, CM1-CM4

Site Option	RAG Impact Rating - Environmental																
	Natural Heritage						Cultural Heritage		People	Landscape and Visual			Land Use			Planning	
	Designations	Protected Species	Habitats	Ornithology	Hydrology	Geology	Designated Heritage	Non-designated Heritage	Proximity to Dwellings	Designations	Character	Visual	Agriculture	Forestry	Recreation	Policy	Proposals
Preferred Site 2015	G	A	G	G	G	A	A	G	G	G	A	A		A	A	G	G
CM1	G	A	G	G	A	A	A	G	G	G	A	A		A	A	G	G
CM2	G	A	A	A	A	G	G	G	G	G	A	A		A	A	G	G
CM3	G	A	A	G	A	A	G	G	G	G	A	A		A	A	G	G
CM4	G	A	G	G	G	G	G	G	G	G	A	A		A	A	G	G

3.8.2 Engineering Topics

Preferred Site 2015

The Preferred Site 2015 is assessed as RAG rating GREEN for Health and Safety, Access and Connectivity and for Flexibility. Site Option CM1 and the Preferred Site 2015 are assessed as RAG rating AMBER for Construction Timescales, Availability and Maintenance Requirements.

Site Option CM1

Site Option CM1 is assessed as RAG rating GREEN for Health and Safety, Access and Connectivity and for Flexibility. Site CM1 and the Preferred Site 2015 are assessed as RAG rating AMBER for Construction Timescales, Availability and Maintenance Requirements.

Site Option CM2

Site Option CM2 is assessed as RAG rating AMBER for Health and Safety, Construction Timescales, Access and Connectivity, Maintenance Requirements and for Flexibility. Site Option CM2 is assessed as RAG rating RED for Availability.

Site Option CM3

Site Option CM3 is assessed as RAG rating AMBER for Access and Connectivity, Availability, Maintenance Requirements and for Flexibility. Site Option CM3 is assessed as RAG rating RED for Health and Safety, Construction Timescales.

Site Option CM4

Site Option CM4 is assessed as RAG rating GREEN for Availability. Site Option CM4 is assessed as RAG rating AMBER for Health and Safety, Access and Connectivity, Maintenance Requirements and for Flexibility. Site Option CM4 is assessed as RAG rating RED for Construction Timescales.

Table 3.8 below summarises the 2015 engineering appraisal RAG ratings for the Site Options.

Table 3.8: 2015 Engineering Comparison Table – Site Options Preferred Site 2015, CM1-CM4

	RAG Impact Rating – Engineering					
Site Option	Health and Safety	Construction timescales	Access and connectivity	Availability	Maintenance Requirements	Flexibility
Preferred Site 2015	G	A	G	A	A	G
CM1	G	A	G	A	A	G
CM2	A	A	A	R	A	A
CM3	R	R	A	A	A	A
CM4	A	R	A	G	A	A

The Preferred Site for the development of an AIS substation is CM1 or Preferred Site. This Site Option had three GREEN RAG assessments and no RED RAG assessments; therefore, it is preferable to the other sites.

3.8.3 Cost

Preferred Site 2015

The Preferred Site 2015 is assessed as RAG rating GREEN. It is the lowest cost Site Option.

Site Option CM1

Site Option CM1 is assessed as RAG rating GREEN. It is the lowest cost Site Option.

Site Option CM2

Site Option CM2 is assessed as RAG rating GREEN. It is the second highest cost Site Option, being 7% greater than the lowest cost Site.

Site Option CM3

Site Option CM3 is assessed as RAG rating GREEN. It is the highest cost Site Option, being 13% greater than the lowest cost Site.

Site Option CM4

Site Option CM4 is assessed as RAG rating GREEN. It is the second lowest cost Site Option, being 6% greater than the lowest cost Site.

Table 3.9 below summarises the cost appraisal RAG ratings for the Site Options.

Table 3.9: Cost Comparison Table – Site Options Preferred Site 2015, CM1-CM4

	RAG Impact Rating – Cost (capital)
Site Option	Total Cost
Preferred Site 2015	G
CM1	G
CM2	G
CM3	G
CM4	G

The lowest cost Site Option is Site CM1 and the Preferred Site 2015, so these would be considered the Preferred Site when considering only Costs. However, all of the Sites are assessed as Cost RAG rating GREEN.

3.9 Conclusions of Comparative Appraisal

3.9.1 Preferred Site 2015

The Preferred Site 2015 has potential for environmental constraint primarily with respect to sensitive habitats (mature conifer woodland) and to cultural heritage in terms of potential impacts on the setting of Auchoish long cairn. In addition, the site would be present in views from Ardrishaig, Lochgilphead and from a number of core paths. The Preferred Site 2015 would be constrained technically in terms of construction timescales and maintenance requirements. The Preferred Site 2015 has the lowest total project cost of the five Site Options.

3.9.2 Site Option CM1

Site Option CM1 has potential for environmental constraint primarily with respect to sensitive habitats (mature conifer woodland) and to cultural heritage in terms of potential impacts on the setting of Auchoish long cairn. In addition, the site would be present in views from Ardrishaig, Lochgilphead and from a number of core paths and would require the removal of an area of commercial forestry. Site Option CM1 would be constrained technically in terms of construction timescales and maintenance requirements. Site Option CM1 has the lowest total project cost of the five Site Options.

3.9.3 Site Option CM2

Site Option CM2 has potential for environmental constraint primarily with respect to sensitive habitats (mature conifer woodland), protected species and to breeding red-throated diver and black grouse lek. In addition, the site would be present in views from Ardrishaig, Lochgilphead and from a number of core paths and would require the removal of an area of commercial forestry. Site Option CM2 would be constrained technically in terms of health and safety, construction timescales, access and connectivity, maintenance requirements and for flexibility. Site Option CM2 has the second highest total project cost of the five Site Options.

3.9.4 Site Option CM3

Site Option CM3 has potential for environmental constraint primarily with respect to sensitive habitats (mature conifer woodland) and protected species. In addition, the site would be present in views from Ardrishaig, Lochgilphead and from a number of core paths and would require the removal of an area of commercial forestry. Site Option CM3 would be constrained technically in terms of health and safety, construction timescales, access and connectivity, maintenance requirements and for flexibility. Site Option CM3 has the highest total project cost of the five Site Options.

3.9.5 Site Option CM4

Site Option CM4 has potential for environmental constraint primarily with respect to sensitive habitats (mature conifer woodland) and protected species. In addition, the site would be present in views from Ardrishaig, Lochgilphead and from a number of core paths and would require the removal of an area of commercial forestry. Site Option CM3 would be constrained technically in terms of health and safety, construction timescales, access and connectivity, maintenance requirements and for flexibility. Site Option CM4 has the second lowest total project cost of the five Site Options.

3.10 Preferred Site – Craig Murrail

The analysis of the Site Options above has identified that the Preferred Site 2015 remains the Preferred Site Option, on the basis of the least potential for environmental, technical and cost constraints, with Site Option CM1 as the second most preferred. Therefore, the Preferred Site 2015 is the preferred Site Option being taken forward for consultation (Appendix 1, Figure 6 and 7C). It is acknowledged that a number of environmental and engineering constraints remain, and that further studies and consultation could result in changes to the preferred Site Option.

3.11 Comparative Appraisal – Crossaig North

3.11.1 Environmental Topics

Site Option CG1

There are limited key ecological features at this Site Option with the exception of a section of mature conifer woodland which represents a suitable habitat for red squirrel, a protected species. A PWS is located to the south, although based on the limited permeability of the underlying geology, it is unlikely that the supply would be affected by the Proposed Development. Class 5 peat deposits lie beneath the Site Option, although the area does not support peatland habitats. Due to the extent of cut and fill that would be required on the coastal escarpment, the Site Option would be visible from the Arran NSA, the North Arran WLA and the North Arran SLA at distances of over 4 km. It may also influence the landscape and seascape character from the coastlines of the Kilbrannan Sound and Arran, which are also popular tourist destinations, and there would be intermittent views of the Site Option for users of the Campbeltown to Cloanaig Core Path (also part of the National Cycle Network). Construction of this Site Option could involve the removal of approximately 8 ha of commercial forestry.

Site Option CG2

This Site Option also include an area of mature conifer woodland as well as being underlain by Class 5 peat deposits. A watercourse is located at the south west corner of Site Option CG2 which could be avoided through careful micro-siting. A PWS is located to the south of Site Option CG2, associated with an existing substation, although, based on the limited permeability of the underlying geology, it is unlikely that the supply would be affected by the Proposed Development. Due to the extent of cut and fill that would be required on the coastal escarpment, the Proposed Development would be visible from the Arran NSA, the North Arran WLA and the North Arran SLA, at distances of over 4.5 km, however the existing Crossaig substation would shield these views slightly. Effects on visual amenity would also be experienced from the coastlines of the Kilbrannan Sound and from Arran which are popular tourist destinations as well as for users of the Campbeltown to Cloanaig Core Path. Therefore, its influence on landscape and seascape character could be significant. Site Option CG2 is also located within an area of commercial forestry, up to 8 ha of which could be lost.

Site Option CG3

Key issues for Site Option CG3 relate to effects on the landscape character and visual amenity. Considerable cut and fill that would be required on the coastal escarpment due to its steep topography which would mean the Proposed Development would be notably visible from the Arran NSA, the North Arran WLA and the North Arran SLA, at distances of over 5 km. Key views would also be affected from the Kilbrannan Sound and from Arran which are popular tourist destinations, from the Kintyre Way and from a number of Core Paths. The setting of a group of shieling hut remains which lie within the Site Option would also likely be affected.

There is the presence of areas of blanket bog, which is classed as an Annex 1 habitat type and has been given protection status under EU legislation as well as the potential for GWDTEs to be present. There is known hen harrier territory within 500 m of Site Option CG3 and nesting songbirds will be present in summer months. Hydrological features relating to the Site Option include an unnamed watercourse present although detailed design may allow a suitable buffer from the watercourse. A PWS lies approximately 500 m to the south. Class 3 peat soils lie beneath the Site Option which may include peatland habitat.

Site Option CG4

Key issues for Site Option CG4 relate to effects on visual amenity and to hydrological features. One watercourse crosses the centre of Site Option CG4, while Claonaig Water lies adjacent to the east and further smaller watercourses lie adjacent to the north and south. Due to the topography of the Site Option, extensive cut and fill is likely to be required for construction which would impact the character of the glen and contribute to the gradual erosion of its character. There are other large scale infrastructure developments in the vicinity, to which the Site Option would contribute to cumulative visual amenity issues. Views of Site Option CG4 would be

seen from the road and the Kennacraig to Skipness Core Path (which is also part of the National Cycle Network) at a distance of at least 400 m.

The remains of one possible shieling hut which lies within the footprint of Site Option and may be directly affected during construction. In addition, Site Option CG4 is underlain by Class 4 and Class 5 peat deposits, although the area does not support peatland habitats and approximately 8 ha of commercial forestry may be permanently lost.

Site Option CG5

As with Site Option CG4, the key issues relate to effects on visual amenity and to hydrological features. Whilst this Site Option is located within a landscape considered able to accommodate some degree of development of the type proposed, the Site Option would be visible within the LCT as well as in views from the road and Kennacraig to Skipness Core Path. An unnamed watercourse runs across the centre of the Site Option and a second unnamed watercourse is present in the southern part of the Site Option. In addition, an area of mature conifer woodland is present which represents a suitable habitat for red squirrel, Class 3 peat soils lie beneath the Site Option that may include peatland habitat and approximately 8 ha of commercial forestry may be lost.

Site Option CG6

At this Site Option a red squirrel drey was recorded during the site walkover, as well as potential for pine marten den; these would have the potential to be impacted during construction works. Class 5 peat deposits lie beneath the Site Option, although the area does not support peatland habitats. Whilst Site Option CG6 is located within a landscape considered able to accommodate some degree of development of the type proposed, the Proposed Development would need to be sited sensitively in relation to the surrounding elevated moorland which forms the backdrop and context to the landscape/ seascape of Loch Fyne and the eastern end of West Loch Tarbert, including the village of Tarbert. The Site Option would be visible from selected views from the hills and along roads around West Loch Tarbert, from water vessels on the Loch and from a number of Core Paths. Cumulative visual impacts may arise with other operational, consented or proposed transmission infrastructure within the Study Area, such as in the Inveraray-Crossaig 275 kV OHL. Additionally, approximately 8 ha of commercial forestry may be lost.

Site Option CG7

Potential impacts to the setting of Tarbert Conservation Area which lies around 1.4 km to the north of Site Option CG7 may be experienced and to the elevated moorland which forms the backdrop and context to the landscape/ seascape of Loch Fyne and the eastern end of West Loch Tarbert, including the village of Tarbert if not sited sensitively. The Site Option would also be visible from the northern edge of Tarbert, from scattered properties along the shores of West Loch Tarbert between Kennacraig and the mouth of the loch and to a lesser degree from the A83 to the north of Tarbert, and to the south of Whitehouse. In addition, Site Option CG7 would likely be partially visible from water vessels on Loch Fyne and West Loch Tarbert and views would be available from the northerly section of the Core Path as it reaches the summit of Meall Mor, which provides panoramic views across the surrounding area. As with Site Option CG6, cumulative effects on visual amenity with other infrastructure is likely. Additionally, approximately 8 ha of commercial forestry may be lost.

Table 3.10 below summarises the environmental appraisal RAG ratings for Site Options CG1 – CG7.

Table 3.10: Environmental Comparison Table – Site Options CG1-CG7

Site Option	RAG Impact Rating - Environmental																
	Natural Heritage						Cultural Heritage		People	Landscape and Visual			Land Use			Planning	
	Designations	Protected Species	Habitats	Ornithology	Hydrology	Geology	Designated Heritage Assets	Non-designated Heritage Assets	Proximity to Dwellings	Designations	Character	Visual	Agriculture	Forestry	Recreation	Policy	Proposals
CG1	G	G	G	G	G	A	G	G	G	A	A	A	G	A	A	G	G
CG2	G	G	G	G	A	A	G	G	G	A	A	A	G	A	A	G	G
CG3	G	G	A	A	A	A	G	A	A	A	R	R	G	G	A	G	G
CG4	G	G	G	G	R	A	G	A	G	G	A	R	G	A	G	G	G
CG5	G	G	G	G	R	A	G	G	G	G	A	R	G	A	A	G	G
CG6	G	A	G	G	G	A	G	G	G	G	A	A	G	A	G	G	G
CG7	G	G	G	G	G	A	A	G	G	G	A	A	G	A	G	G	G

3.11.2 Engineering Topics

Site Option CG1

There are two issues assessed as AMBER and two as RED for Site Option CG1, these key issues are:

- **Future Development Possibilities**: Elevation to the east of Site Option CG1 is restricted by forestry access track and existing 132 kV OHL alignment while the elevation to the south of Site Option CG1 is restricted by the existing 220/132 kV substation platform. Where there is space available which is outwith existing wayleaves and has low risk to any existing asset an AMBER rating is given.
- **Adjacent Land Use**: Elevation to the east of Site Option CG1 is constrained by existing 132 kV substation platform and OHL alignment. Significant amber zone areas as defined in heat map are available hence an AMBER rating is given.
- **Salt Pollution**: Site Option CG1 is less than 2 km from the coast of the Kilbrannan Sound; therefore, a RED rating is given.
- **Noise**: Site Option CG1 has been identified as 'High Risk' using a noise selection screening tool, therefore a RED rating is given.

Site Option CG2

There are two issues assessed as AMBER and two as RED for Site Option CG2, these key issues are:

- **Future Development Possibilities**: Elevation to the south of Site Option CG2 is restricted by forestry access track and existing 132 kV OHL alignment while the elevation to the east of Site Option CG2 is restricted by the existing 220/132 kV substation platform. Where there is space available which is outwith existing wayleaves and has low risk to any existing asset an AMBER rating is given.
- **Adjacent Land Use**: Elevation to the east of Site Option CG2 constrained by existing 132 kV substation platform and OHL alignment therefore an AMBER rating is given.
- **Salt Pollution**: Site Option CG2 is less than 2 km from the coast of the Kilbrannan Sound; therefore, a RED rating is given.

- **Noise**: Site Option CG2 has been identified as 'High Risk' using a noise selection screening tool, therefore a RED rating is given.

Site Option CG3

There are four issues assessed as AMBER and one as RED for Site Option CG3, these key issues are:

- **Future Development Possibilities**: Elevation to the east of Site Option CG3 is bordered by amber heat map areas while elevations to the north and south of Site Option CG3 are bounded by red heat map areas. Elevations to the west of Site Option CG3 are bordered by existing the 132 kV OHL alignment. Where there is space available which is outwith existing wayleaves and has low risk to any existing asset an AMBER rating is given.
- **DNO Connection**: Site Option CG3 will be equipped with a neutral earing transformer with an auxiliary winding to furnish site supplies. A second supply may be derived from 275 kV power VTs. As the site is to be operated at 275 kV it will be necessary to support the LVAC by means of a standby generator to afford 72 hours of autonomy. 11 kV SSEN Distribution three phase three wire OHLs pass within 2 km of the site, therefore an AMBER rating is given.
- **Topography**: Inspection of the Ordinance Survey mapping shows several contour lines passing thorough Site Option CG3 indicating at least a 10 m fall across the site, therefore an AMBER rating is given.
- **Salt Pollution**: Site Option CG3 is less than 2 km from the coast of the Kilbrannan Sound; therefore, a RED rating is given.
- **Noise**: Site Option CG3 has been identified as 'Medium Risk' using a noise selection screening tool, therefore an AMBER rating is given.

Site Option CG4

There are four issues assessed as AMBER and one as RED for Site Option CG4, these key issues are:

- **Future Development Possibilities**: All elevations bordered by amber heat map areas while western elevation of Site Option CG4 is bordered by existing the 132 kV OHL alignment. Where there is space available which is outwith existing wayleaves and has low risk to any existing asset an AMBER rating is given.
- **DNO Connection**: Site Option CG4 will be equipped with a neutral earing transformer with an auxiliary winding to furnish site supplies. A second supply may be derived from 275 kV power VTs. As the site is to be operated at 275 kV it will be necessary to support the LVAC by means of a standby generator to afford 72 hours of autonomy. 11 kV SSEN Distribution three phase three wire OHLs pass within 2 km of the site, therefore an AMBER rating has been given.
- **Topography:** Inspection of the Ordinance Survey mapping shows several contour lines passing thorough Site Option CG4 indicating at least a 10 m fall across the site, therefore an AMBER rating has been given.
- **Salt Pollution**: Site Option CG4 is less than 6 km from the coast of the Kilbrannan Sound; therefore, an AMBER rating is given.
- **Noise**: Site Option CG4 has been identified as 'Medium Risk' using a noise selection screening tool, therefore an AMBER rating is given.

Site Option CG5

There are three issues assessed as AMBER and one as RED for Site Option CG5, these key issues are:

- **Future Development Possibilities**: All elevations bordered by amber heat map areas while western elevation of Site Option CG5 is bordered by existing the 132 kV OHL alignment. Where there is space available which is outwith existing wayleaves and has low risk to any existing asset an AMBER rating is given.
- **DNO Connection**: Site Option CG5 will be equipped with a neutral earing transformer with an auxiliary

winding to furnish site supplies. A second supply may be derived from 275 kV power VTs. As the site is to be operated at 275 kV it will be necessary to support the LVAC by means of a standby generator to afford 72 hours of autonomy. 11 kV SSEN Distribution three phase three wire OHLs pass within 2 km of the site.

- **Salt Pollution**: Site Option CG5 is less than 6 km from the coast of the Kilbrannan Sound; therefore, an AMBER rating is given.
- **Noise**: Site Option CG5 has been identified as 'Medium Risk' using a noise selection screening tool, therefore an AMBER rating is given.

Site Option CG6

There are five issues assessed as AMBER and one as RED for Site Option CG6, these key issues are:

- **Future Development Possibilities**: All elevations bordered by amber heat map areas while western elevation of Site Option CG6 is bordered by existing the 132 kV OHL alignment. Where there is space available which is outwith existing wayleaves and has low risk to any existing asset an AMBER rating is given.
- **DNO Connection**: Site Option CG6 will be equipped with a neutral earing transformer with an auxiliary winding to furnish site supplies. A second supply may be derived from 275 kV power VTs. As the site is to be operated at 275 kV it will be necessary to support the LVAC by means of a standby generator to afford 72 hours of autonomy. 11 kV SSEN Distribution three phase three wire OHLs pass within 2 km of the site, therefore an AMBER rating is given.
- **Elevation:** Inspection of the Ordinance Survey mapping of Site Option CG6 shows a "Spot Height" of 169 m above mean sea level, therefore an AMBER warning has been given.
- **Salt Pollution**: Site Option CG6 is less than 2 km from the coast of the Kilbrannan Sound; therefore, a RED rating is given.
- **Carbon Footprint**: The significant elevation of Site Option CG6 requires additional effort for vehicles to reach construction platform, therefore an AMBER rating is given.
- **Noise**: Site Option CG6 has been identified as 'Medium Risk' using a noise selection screening tool, therefore an AMBER rating is given.

Site Option CG7

There are five issues assessed as AMBER and one as RED for Site Option CG7, these key issues are:

- **Future Development Possibilities**: All elevations bordered by amber heat map areas while western elevation of Site Option CG7 is bordered by existing the 132 kV OHL alignment. Where there is space available which is outwith existing wayleaves and has low risk to any existing asset an AMBER rating is given.
- **DNO Connection**: Site Option CG7 will be equipped with a neutral earing transformer with an auxiliary winding to furnish site supplies. A second supply may be derived from 275 kV power VTs. As the site is to be operated at 275 kV it will be necessary to support the LVAC by means of a standby generator to afford 72 hours of autonomy. 11 kV SSEN Distribution three phase three wire OHLs pass within 2 km of the site, therefore an AMBER rating has been given.
- **Elevation:** Inspection of the Ordinance Survey mapping of Site Option CG7 shows a "Spot Height" of 169 m above mean sea level, therefore an AMBER warning has been given.
- **Salt Pollution**: Site Option CG7 is less than 2 km from the coast of the Kilbrannan Sound; therefore, a RED rating is given.
- **Carbon Footprint**: The significant elevation of Site Option CG7 requires additional effort for vehicles to reach construction platform, therefore an AMBER rating is given.
- **Noise**: Site Option CG7 has been identified as 'Medium Risk' using a noise selection screening tool, therefore an AMBER rating is given.

Table 3.11 below summarises the engineering appraisal RAG ratings for Site Options CG1 – CG7. Environmental features are shown on Figures 2D, 3D, 4D and 5D in **Appendix 1.**

Table 3.11: Engineering Comparison Table – Site Options CG1- CG7

Site Option	RAG Impact Rating- Engineering																			
	Access & Connectivity						Footprint Requirements			Hazards		Ground Conditions		Environmental Conditions						
	Construction Access	Operation & Maintenance	Existing Circuits/Networks	Future Development Possibilities	Interface with SSEN Distribution	DNO Connection	Technology	Adjacent Land Use	Space Availability	Unique Hazards	Existing Utilities	Topography	Geology	Elevation	Salt Pollution	Flooding	Carbon Footprint	SF6	Contaminated Land	Noise (proximity to dwellings/ residential properties
CG1	G	G	G	A	G	G	G	A	G	G	G	G	G	G	R	G	G	G	G	R
CG2	G	G	G	A	G	G	G	A	G	G	G	G	G	G	R	G	G	G	G	R
CG3	G	G	G	A	G	A	G	G	G	G	G	A	G	G	R	G	G	G	G	A
CG4	G	G	G	A	G	A	G	G	G	G	G	A	G	G	A	G	G	G	G	A
CG5	G	G	G	A	G	A	G	G	G	G	G	G	G	G	A	G	G	G	G	A
CG6	G	G	G	A	G	A	G	G	G	G	G	G	G	A	R	G	A	G	G	A
CG7	G	G	G	A	G	A	G	G	G	G	G	G	G	A	R	G	A	G	G	A

3.11.3 Cost

Site Option CG1

Site Option CG1 has a median Construction cost and a median Total Project Cost of the seven Site Options with a GREEN RAG rating for these criteria.

Site Option CG2

Site Option CG2 has a median Construction cost of the seven Site Options. It has a RED RAG rating for tree felling costs, due to the area of forestry to be felled when compared to the lowest cost Site Option. Site Option CG2 has a median Total Project Cost of the seven Site Options.

Site Option CG3

Site Option CG3 has the highest Construction cost of the seven Site Options, with an AMBER RAG rating in this criterion. It has an AMBER RAG rating for Land Assembly costs. Site Option CG3 has the highest Total Project Cost of the seven Site Options, with an AMBER RAG rating in this criterion.

Site Option CG4

Site Option CG4 has the third highest Construction cost of the seven Site Options, with a GREEN RAG rating in this criterion. Site Option CG4 has the third highest Total Project Cost of the seven Site Options, with a GREEN RAG rating in this criterion.

Site Option CG5

Site Option CG5 has the second highest Construction cost of the seven Site Options, with a GREEN RAG

rating in this criterion. It has an AMBER RAG rating for tree felling costs, due to the area of forestry to be felled when compared to the lowest cost Site Option. Site Option CG5 has the second highest Total Project Cost of the seven Site Options, with a GREEN RAG rating in this criterion.

Site Option CG6

Site Option CG6 has the second lowest Construction cost of the seven Site Options. It has an AMBER RAG rating for tree felling costs, due to the area of forestry to be felled when compared to the lowest cost Site Option. Site Option CG6 has the second lowest Total Project Cost of the seven Site Options.

Site Option CG7

Site Option CG7 has the lowest Construction cost of the seven Site Options. Site Option CG7 has the lowest Total Project Cost of the seven Site Options.

Table 3.12 below summarises the cost appraisal RAG ratings for Site Options CG1 – CG7.

Table 3.12: Cost Comparison Table – Site Option CG1 – CG7

Site Option	RAG Impact Rating – Cost (capital)								
	Construction	Diversions	Public Road Improvement	Tree Felling	Land Assembly	Consent Mitigations	Inspections	Maintenance	Total project Cost
CG1	G	G	G	G	G	G	G	G	G
CG2	G	G	G	R	G	G	G	G	G
CG3	A	G	G	G	A	G	G	G	A
CG4	G	G	G	G	G	G	G	G	G
CG5	G	G	G	A	G	G	G	G	G
CG6	G	G	G	A	G	G	G	G	G
CG7	G	G	G	G	G	G	G	G	G

3.12 Conclusions of Comparative Appraisal

3.12.1 Site Option CG1

Site Option CG1 has potential for environmental constraint primarily with respect to sensitive habitats (semi natural broadleaved woodland) and to landscape and visual amenity, as experienced from across the Kilbrannan Sound in combination with the existing Crossaig substation. There would also be potential for adverse impacts in terms of loss of commercial forestry. Site Option CG1 would also be constrained technically as a result of the existing substation and OHL alignment which precludes any potential extension to the south. This Site Option also has a high risk from salt pollution due to its proximity to the coast of the Kilbrannan Sound and it has been identified as 'High Risk' using a noise selection screening tool. Site Option CG1 would have a median Total Project Cost of the seven Site Options.

3.12.2 Site Option CG2

Site Option CG2 has potential for environmental constraint primarily with respect to sensitive habitats (semi natural broadleaved woodland) and to landscape and visual amenity, as experienced from across the Kilbrannan Sound. However, unlike Site Option CG1, Site Option CG2 would sit behind the existing Crossaig substation, thus ensuring that infrastructure development (i.e. the Proposed Development in combination with the existing substation) is consolidated in views, restricting its horizontal spread and containing it to within a similar envelope to that which currently exists. There would also be potential for adverse impacts in terms of loss of commercial forestry. Site Option CG2 would also be constrained technically as a result of the existing substation and OHL alignment which precludes any potential extension to the east. This Site Option also has a

high risk from salt pollution due to its proximity to the coast of the Kilbrannan Sound and it has been identified as 'High Risk' using a noise selection screening tool. Site Option CG2 would have a median Total Project Cost of the seven Site Options.

3.12.3 Site Option CG3

Site Option CG3 has potential for environmental constraint primarily with respect to sensitive habitats (blanket bog) and to watercourses on and around the site which have the potential to interact with a PWS. In addition, there would be the potential for direct impacts on cultural heritage features on the site and potential for adverse impacts on landscape and visual amenity, as experienced from across the Kilbrannan Sound. Site Option CG3 would also be constrained technically as a result of its location in proximity to three. 11 kV OHLs, as well as the sloping nature of the site and its proximity to the coast of the Kilbrannan Sound which presents a high risk from salt pollution. It has been identified as 'Medium Risk' using a noise selection screening tool. Site Option CG3 would have the highest Total Project Cost of the seven Site Options.

3.12.4 Site Option CG4

Site Option CG4 has potential for environmental constraint primarily with respect to watercourses on and around the site and to landscape and visual amenity as experienced from the B8001 and within the glen. In addition, there would be the potential for direct impacts on cultural heritage features on the site and adverse impacts in terms of loss of commercial forestry. Site Option CG4 would also be constrained technically as a result of its location in proximity to three. 11 kV OHLs, as well as the sloping nature of the site and its proximity to the coast of the Kilbrannan Sound which presents a medium risk from salt pollution. It has been identified as 'Medium Risk' using a noise selection screening tool. Site Option CG4 would have the third highest Total Project Cost of the seven Site Options.

3.12.5 Site Option CG5

Site Option CG5 has potential for environmental constraint primarily with respect to sensitive habitats (semi natural broadleaved woodland) and to watercourses on and around the site. In addition, there would be the potential for adverse impacts on landscape and visual amenity as experienced from the B8001 and from within the glen and adverse impacts in terms of loss of commercial forestry. Site Option CG5 would also be constrained technically as a result of its location in proximity to three 11 kV OHLs, as well as the sloping nature of the site and its proximity to the coast of the Kilbrannan Sound which presents a medium risk from salt pollution. It has been identified as 'Medium Risk' using a noise selection screening tool. Site Option CG5 would have the second highest Total Project Cost of the seven Site Options.

3.12.6 Site Option CG6

Site Option CG6 has potential for environmental constraint primarily with respect to sensitive habitats (semi natural broadleaved woodland) and species and to landscape/ seascape and visual amenity as experienced from Loch Fyne and the eastern end of West Loch Tarbert, including the village of Tarbert. There would also be potential for adverse impacts in terms of loss of commercial forestry. Site Option CG6 would also be constrained technically as a result of its location in proximity to three 11 kV OHLs, as well as the elevation of the site, which would require additional effort for vehicles to reach construction platform, and its proximity to the coast of the Kilbrannan Sound which presents a high risk from salt pollution. It has been identified as 'Medium Risk' using a noise selection screening tool. Site Option CG6 would have the second lowest Total Project Cost of the seven Site Options.

3.12.7 Site Option CG7

Site Option CG7 has potential for environmental constraint primarily with respect to cultural heritage, in terms of potential impacts on the setting of the Tarbert Conservation Area, and to landscape/seascape and visual amenity as experienced from the A83 and the northern edge of Tarbert. In addition, visual amenity from along

the shores of West Loch Tarbert, from water vessels on Loch Fyne and from the summit of Meall Mor would also be affected. There would also be potential for adverse impacts in terms of loss of commercial forestry. Site Option CG7 would also be constrained technically as a result of its location in proximity to three 11 kV OHLs, as well as the elevation of the site, which would require additional effort for vehicles to reach construction platform, and its proximity to the coast of the Kilbrannan Sound which presents a high risk from salt pollution. It has been identified as 'Medium Risk' using a noise selection screening tool. Site Option CG7 would have the lowest Total Project Cost of the seven Site Options.

3.13 Preferred Site– Crossaig North

The analysis above has identified that the Preferred Site Option is CG2 on the basis of the least potential for environmental, technical and cost constraints, with Site Option CG1 as the second most preferred. Site Options CG1 and CG2 each have a median total project cost. Therefore, CG2 is the preferred Site Option being taken forward for consultation (Appendix 1, Figure 6 and 7D). It is acknowledged that a number of environmental and engineering constraints remain, and that further studies and consultation could result in changes to the preferred Site Option.

4. CONSULTATION ON THE PROPOSALS

SSEN Transmission places great importance on, and is committed to, consultation and engagement with all parties, or stakeholders, likely to have an interest in proposals for new projects such as this. Stakeholder consultation and engagement is an essential part of an effective development process.

4.1 Questions for Consideration by Consultees

When providing your comments and feedback, SSEN Transmission would be grateful for your consideration of the questions below:

- Have we explained the need for this Project adequately?
- Have we explained the approach taken to select the preferred route adequately?
- Are there any factors, or environmental features, that you consider may have been overlooked during the preferred route selection process?
- Do you feel, on balance, that the preferred route selected is the most appropriate for further consideration at the alignment selection stage?

4.2 Next Steps

Virtual online consultation events will be held, as detailed in the preface of this document. The responses received from these consultation events, and those sought from statutory consultees and other stakeholders, will inform further consideration of the Site Options put forward, and the identification of a preferred Site Option for each substation location to take forward to the next stage in the process.

All comments are requested by 9th July 2021. A Report on Consultation will be produced which will document the consultations received, and the decisions made in light of these responses.

Following the identification and confirmation of a proposed Site Option for each of the four Proposed Developments, further technical and environmental surveys (e.g. Phase 1 Habitat / NVC surveys, Protected Species Surveys, water quality risk assessments or peat depth surveys where required and further input by landscape, ecology, cultural heritage, hydrology, and forestry specialists) would be undertaken, to determine the detailed design of the Proposed Development at each substation location.

This would also include developing the detailed design to further avoid or reduce impacts to any environmental features such as woodland areas, blanket bog or surface water features present on or around the Site Options. Screening of the substations will also be considered by retaining existing forestry, through the use of earthworks or additional planting in order to minimise visual effects to heritage or landscape features as well as any nearby residential dwellings.