

Site Selection Consultation Document – Beauly – Denny 2nd Circuit Upgrade Fasnakyle

September 2023



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Glossary

Term	Definition
Alternating Current (AC)	Type of electrical current in which the direction of flow of electrons switches back and forth at regular intervals or cycles.
Area of Search (Study Area)	A broad geographical area within which possible sites might be capable of identification within approximately 5km of the required connectivity point; usually determined by geographical features such as coastlines or hill/mountain ranges, or designation boundaries, such as National Park boundaries.
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.
Distribution Network Operator (DNO)	A licensed company that owns and operates the network of cables, transformers and towers that provide electricity.
Gigawatt (GW)	A unit of electrical power equal to one billion watts.
High Voltage Direct Current (HVDC)	HVDC is an effective way to transmit electricity and is primarily transmitted in this form by overhead lines or underground cables.
Holistic Network Design (HND)	Detailed report identifying the electricity network needs to enable connection of 23GW of offshore wind, including the needs associated with the offshore and onshore transmission network, facilitating the UK government offshore wind target of 50 GW by 2030.
Kilovolt (kV)	A unit of electrical power equal to one thousand volts.
Kilowatt	A unit of electrical power equal to one thousand watts.
Local Development Plan (LDP)	LDP's are usually prepared by the Local Planning Authority and set out the proposals for future development and use of land in their area.
Megawatt (MW)	A unit of electrical power equal to one million watts.
National Planning Framework 4 (NPF4)	The national spatial strategy for Scotland. It sets out the spatial principles, regional priorities, national developments and national planning policy. It replaces NPF3 and Scottish Planning Policy.
Preferred Site	The Option that is the preferred choice, following Stage 2 – Detailed Site Selection based on environmental, engineering and cost perspectives and post consultation.
Overhead line (OHL)	An electric line installed above ground, usually supported by lattice steel structures or poles.
Stakeholders	Organisations and individuals who can affect or are affected by SSEN Transmission works.
Substation	A node on the network to allow safe control of the electricity network. This could include convergence of multiple circuits, transformation of voltage or other functions to maintain and operate the electricity network.
The National Grid	The electricity transmission network in Great Britain.
Volts	The international unit of electric potential and electromotive force.
Watts	The unit of measurement for the rate at which electrical energy is transferred or used.
Works	Constructing new transmission infrastructure such as substations, overhead lines, underground cables, major refurbishment of these, the dismantling and removal of any parts of the system; and associated works, which may include formation of access tracks, bridge and road improvements, tree cutting, drainage etc.

1 Introduction

This document has been prepared by Scottish and Southern Electricity Networks Transmission (SSEN Transmission). SSEN Transmission, operating under licence held by Scottish Hydro Electric Transmission plc, owns, operates and develops the high voltage electricity transmission system in the north of Scotland and remote islands. This document invites comments from all interested parties on the Preferred Site for a new 400 kilovolt (kV) substation (hereafter referred to as the 'Proposed Development') is required at Fasnakyle, near Cannich.

This document describes the site selection process followed, site options identified, the appraisal undertaken, the alternatives considered during the selection of options and the suggestion for a Preferred Site. This document supports the information made available to the public and statutory authorities as part of ongoing consultation. This Consultation Document, along with project details, is available online at the project website:

[Beaully Denny 400kV Upgrade - SSEN Transmission \(ssen-transmission.co.uk\)](https://www.ssen-transmission.co.uk)

An ArcGIS Story [maps](#) site and has been prepared in order to provide a more detailed overview of the process that we've followed to reach the current stage in the project. In publishing this document, we aim to facilitate a more standardised format for the public and statutory consultees alike to access the information previously presented and one which enables a wide range of information about the project to be easily downloaded.

1.1 Project Background and Need

As a result of the Scottish and UK Governments' Net Zero climate change targets, together with requirements set out in the British Energy Security Strategy (BESS) (April 2022) and subsequently in National Grid's, the Electricity System Operator (ESO), "Pathway to 2030" Holistic Network Design (HND) (July 2022), significant increases in renewable generation capacity are required across the UK, resulting in significant investment in new transmission network infrastructure to transport this energy and reinforce the network.

The BESS sets out the UK Government's plans to secure the country's future energy independence by reducing the dependence on, and price exposure to, volatile global wholesale gas markets. This will be achieved by accelerating the deployment of homegrown and affordable low carbon electricity generation, together with accelerating the enabling electricity network infrastructure required to connect and transport this power. The BESS included an increased ambition for offshore wind generation of 50 gigawatt (GW) by 2030, up from the previous target of 40 GW.

To enable the connection of that 50 GW of offshore wind by the 2030 target date, the National Grid (the ESO), working in collaboration with the three Great Britain Transmission Owners, developed what is known as the 'Holistic Network Design' (the HND). This sets out the onshore and electricity transmission infrastructure required across Great Britain to deliver this UK Government target, including projects in SSEN Transmission's Licence Area across the north of Scotland.

The Central Highlands is home to some of Scotland's best onshore wind resources and the existing electricity transmission network in the region is at full capacity, meaning the planned new renewable energy generation required by BESS cannot connect without significant network reinforcement.

As part of the wider UK network reinforcements detailed in the BESS and HND, Scottish Hydro Electric Transmission plc (SHE Transmission) is proposing to upgrade the existing Beaully-Denny 275 kV circuit to 400 kV to mirror the ratings of the existing 400 kV circuit which runs along the route. This upgrade can make use of the existing overhead line (OHL) infrastructure but requires alterations/additions to the associated substations along the route, namely at Beaully, Fasnakyle, Fort

Augustus, Tummel/Errochty/Kinardochy and Braco West. Whilst the project will be considered as one (with common timescales programmed) there are 5 distinct sites requiring works, each with differing scopes, requirements, and therefore consenting types and timescales. See Figure 1, below.

In December 2022, the energy regulator, Ofgem, approved the need for these projects as part of its Accelerated Strategic Transmission Investment (ASTI) framework decision.

These projects, alongside several other major network upgrades planned in the north of Scotland, are therefore part of a Great Britain wide programme of works that are required to meet UK and Scottish Government energy targets; there is a clear expectation from Government and the energy regulatory, Ofgem, that these projects will be delivered by 2030. More specifically, these projects are needed to deliver Government 2030 renewable targets set out in the BESS.

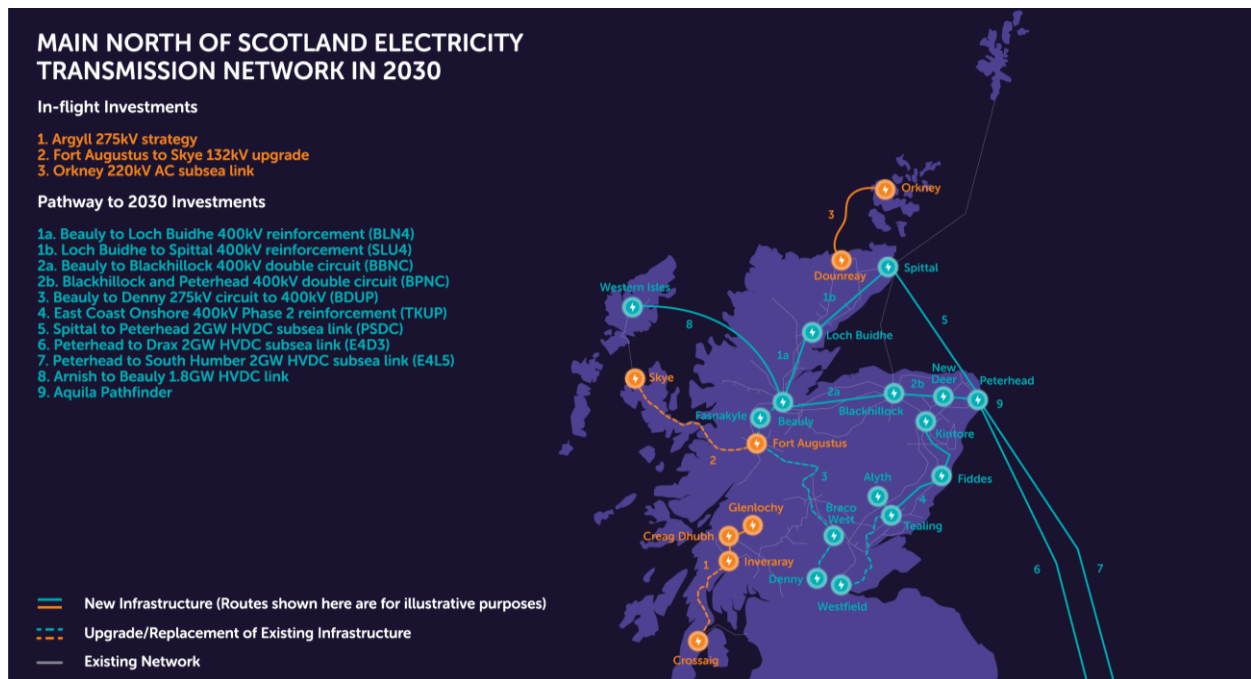


Figure 1 Proposed New and Upgraded/Replacement Infrastructure as part of the Pathway to 2030

1.2 Project Overview

SSEN Transmission is proposing to upgrade the existing Beauly-Denny 275kV circuit to 400kV to mirror the ratings of the existing 400kV circuit which runs along the route. The upgrade can make use of existing OHL infrastructure but requires alterations/additions to several associated substations including at Fasnakyle.

SSEN Transmission is therefore proposing a new substation site as there is insufficient space on the existing site at Fasnakyle site to accommodate the additional equipment associated with the wider 400kV upgrade. The new substation site is required to be in proximity of the existing substation and to tie back into the nearby Fasnakyle power station. Whether this will be via OHL or underground cable (UGC) has not yet been determined, however there is likely to be a requirement for existing cables to be diverted.

1.3 Strategic Considerations

Implementing the proposed development of a new substation in proximity to the existing Fasnakyle Substation to house the equipment required to enable the large-scale upgrade will comprise the following:

- 400kV transformers and a new 400kV double busbar.
- Current indicative platform size for an AIS solution, of approximately 402m x 293m. These sizes are taken to comprise a working ‘worst case scenario’ for site selection at this stage. Earthworks will be required in developing the platform.
- Overhead line tie ins from the new substation to the existing Beauly – Denny overhead line.
- Upgrade existing or provide new access tracks, temporary construction compounds and construction layout areas to facilitate the development.

1.4 Site Selection Process

The site selection process has followed formal internal guidance to enable a consistent and rigorous selection of alignments and sites for new substations, switching stations and converter stations. The site selection process has three key stages, each increasing in detail and definition. Technical, environmental, and cost considerations are brought together in a way which seeks the best balance in accordance with SSEN’s Transmission Network Operator’s Licence and the Electricity Act 1989. This staged process leads to the identification of a finalised proposed substation site, which will be taken forward for planning. An overview of the Substation Site Selection Process is provided in **Figure 2**.

Pre-Site Selection Activities: The starting point in all substation site selection projects is to establish the need for the project and to select potential engineering options that can deliver this need. This process will be triggered by the preparation of several internal assessments and documents.

Stage 1: Initial Site Screening: This stage seeks to identify technically feasible, economically viable and environmentally acceptable site options within a defined area. The search area may vary

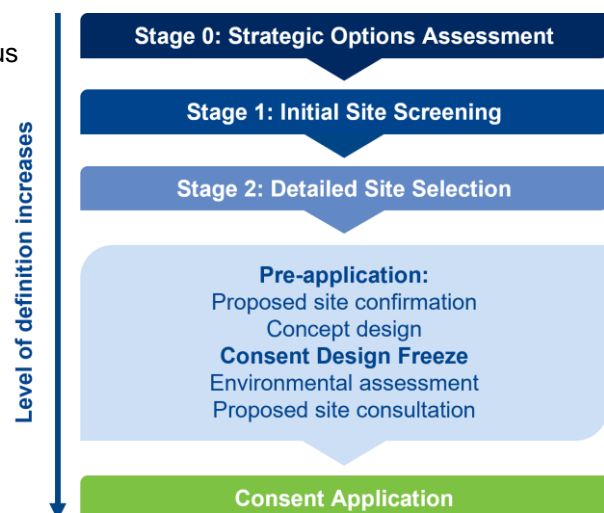


Figure 2 Overview of the Optioneering Process

depending on terrain, other infrastructure, designated areas and features and connection options. The aim is to identify several potential sites which are initially assessed for suitability and to identify which of the identified sites can be shortlisted for further assessment.

Stage 2 Detailed Site Selection: This stage seeks to identify a preferred substation site, which avoids where possible physical, environmental and amenity constraints, is likely to be acceptable to stakeholders and is economically viable, taking into account engineering and connection requirements.

2 Stage 0: Strategic options assessment

A strategic options assessment has been undertaken by SSEN Transmission. The outcome of this strategic options assessment identified the following key requirements for the new sites:

- Proximity to the existing Fasnakyle substation site in order to tie back into it. This was set nominally at 5 km for an effective Search Area;
- Large enough to accommodate the estimated size of development outlined in section 1.3;
- In areas which do not contain environmental designations and minimise impacts on local environmental receptors; and
- Additional capacity for future connections addressing the potential need for UGC.

The outcome of the strategic options assessment informed the identification of sites to take forward as part of the Stage 1: Initial Site Screening Stage.

2.1 Stage 1: Initial Site Screening

In this section, fourteen different options were identified as part of site selection, all within a 2.5km search window either side of the Beauly-Denny overhead line running north along the line to Corrimony and south to Dundreggan. These sites were assessed for suitability via Multi Criteria Analysis (MCA), Geographic Information System (GIS), site walkovers, desk studies and field reconnaissance.

Of the fourteen options 5, 6, 7, 8, 13 and 14 were discounted early in the process due to feasibility issues in terms of space constraints, environmental, reputation or local stakeholder impact. Early Red, Amber, Green (RAG) matrix scoring was undertaken for the remaining options. The Red, Amber, Green (RAG) matrix is shown as **Figure 3** below.

Performance	Comparative Appraisal
Most preferred ↓	Low potential for the development to be constrained.
	Intermediate potential for the development to be constrained.
Least preferred	High potential for the development to be constrained.

Figure 3 Overview of the RAG Matrix ratings

High level environmental considerations of the options are listed on the following two pages. Due to options 5, 6, 7, 8, 13 and 14 being discounted at an early stage, environmental considerations are not listed for these sites.

Option 1

- Option 1 is located approximately 1.5 km from natural heritage designations: Glen Affric SSSI, Strathglass Complex SAC, Glen Affric to Strathconon SPA, and Glen Affric National Nature Reserve.
- Option 1 is located approximately 30 m from Ancient Woodland Inventory Areas.
- River Glass runs both to the northwest and south/southwest of Option 1 and is rated Good overall by the Water Framework Directive (WFD)
- Scheduled Monuments exist within approximately 1.35 km and 2.45 km.
- Option 1 is situated on Landscape Character Type ‘Farmed Strath – Inverness’, characterised by; open farmed valley floors and a central meandering river contained within steep, mainly forested, and wooded slopes.
- Residential settlements exist within approximately 500 m.
- Highland Council Core Path IN95.11 exists within 1 km.
- Planning proposal 23/01025/SCRE and 17/00062/SCRE exist within the boundaries of Option 1 with several other proposals existing within close proximity.

Option 2

- Option 2 is located approximately 2 km from natural heritage designations: Glen Affric SSSI, Strathglass Complex SAC, Glen Affric to Strathconon SPA, and Glen Affric National Nature Reserve.
- Ancient Woodland Inventory Areas are within approximately 30 m.
- The River Glass is directly adjacent to the northwest of Option 2 (Good Overall WFD status).
- Scheduled Monuments exist within approximately 1 km and 2.75 km.
- Option 2 is situated on Landscape Character Type ‘Farmed Strath – Inverness’, characterised by; open farmed valley floors and a central meandering river contained within steep, mainly forested, and wooded slopes.
- A residential settlement exists within Option 2, with the next closest settlement situated approximately 600 m to the northeast.
- Highland Council Core Path IN05.11 exists within approximately 1 km.
- Planning proposal 16/05754/OHL exists within the boundaries of Option 2 with several other proposals existing within close proximity.

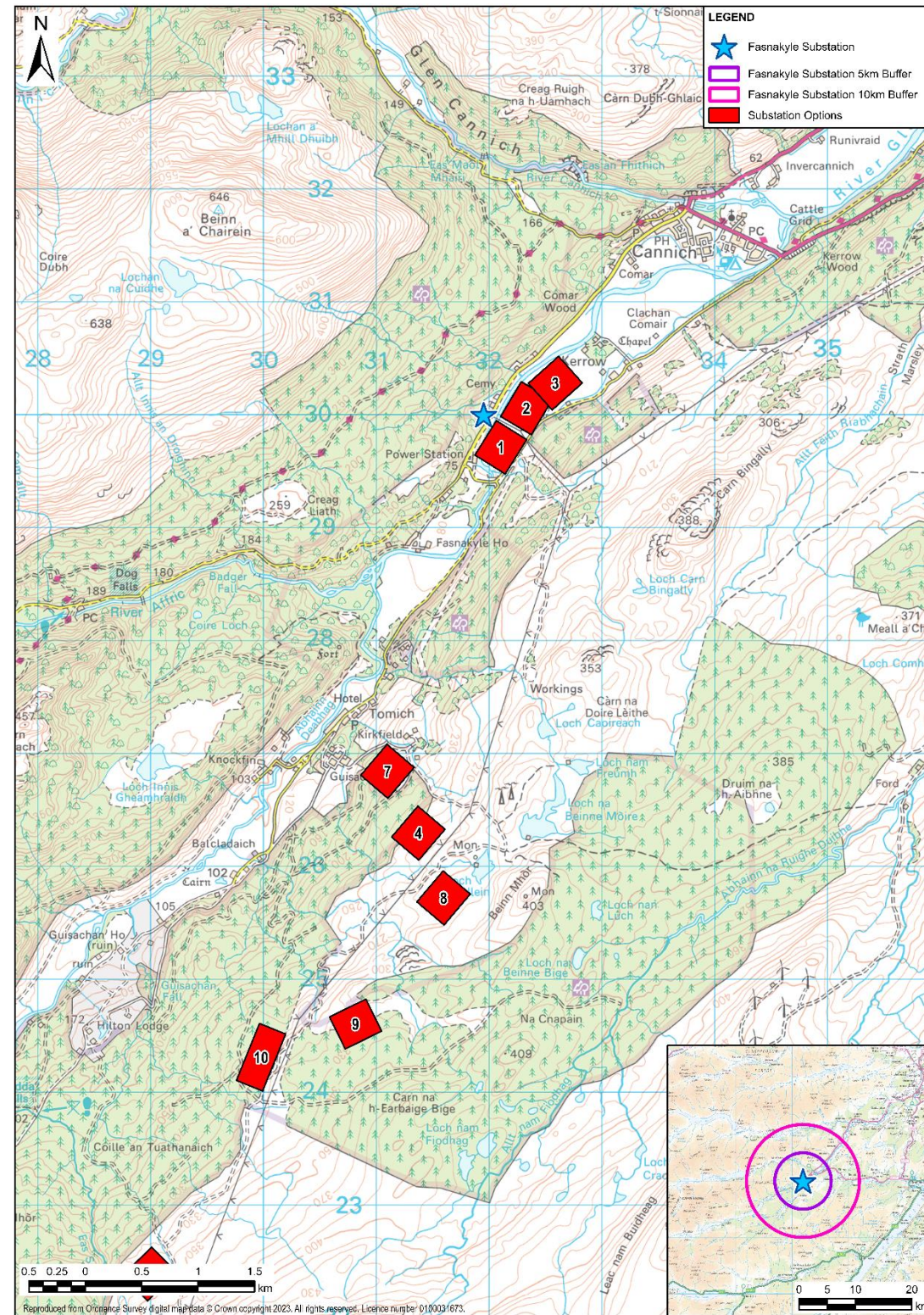


Figure 4 Locations of options for the initial site screening

Option 3

- Option 3 is located close to natural heritage sites: approximately 2.4 km from Glen Affric SSSI and Strathglass Complex SAC, and approximately 2 km from Glen Affric to Strathconon and Glen Affric National Nature Reserve.
- Ancient Woodland Inventory Areas are located within approximately 50 m.
- The River Glass is directly adjacent to the northwest of site (Overall Good WFD status).
- Scheduled Monuments exist within approximately 700 m and 3 km of Option 3.
- Option 3 is situated on Landscape Character Type ‘Farmed Strath – Inverness’, characterised by; open farmed valley floors and a central meandering river contained within steep, mainly forested, and wooded slopes.
- A residential settlement exists within Option 3, and within approximately 300 m of Option 3.
- Highland Council Core Path IN05.11 exists within approximately 1 km.
- Planning proposal 16/05754/OHL exists within the boundaries of Option 3 with several other proposals existing within close proximity.

Option 4

- Option 4 is located approximately 1.5 km from natural heritage designations: Glen Affric SSSI, Strathglass Complex SAC, Glen Affric to Strathconon SPA, and Glen Affric National Nature Reserve.
- Ancient Woodland Inventory Areas exist within approximately 500 m.
- Scheduled Monuments exist within approximately 2.4 km and 4.8 km.
- Sites and Monument Record Entries exist approximately 35 m and 500 m from Option 4.
- Tomich Village Conservation Area, and associated Listed Buildings, are located approximately 1 km from Option 4.
- Situated on Landscape Character Type ‘Farmed Strath – Inverness’, characterised by; open farmed valley floors and a central meandering river contained within steep, mainly forested, and wooded slopes.
- Residential and tourism properties are within approximately 1 km of Option 4.
- Highland Council Core Paths IN05.02 and IN05.03 are located approximately 200 m and 900 m from Option 4 respectively.
- Approximately 1.2 ha of Native Woodland exists within the boundaries of Option 4.
- Several planning proposals exist within proximity of Option 4, with proposal 19/05046/SCOP existing approximately 500 m east and southeast.

Option 9

- Option 9 is located approximately 2.3 km from Tomich village.
- Option 9 is located in proximity of natural heritage designations: approximately 1.5 km from Glen Affric NNR, and 3km from Glen Affric SSSI, Strathglass Complex SAC, and Glen Affric to Strathconon SPA.
- Ancient Woodland Inventory Areas are located approximately 500 m at its closest point.
- A Scheduled Monument exists approximately 3.8 km from Option 9.
- Option 9 is located on Landscape Character Type 'Rocky Moorland Plateau – Inverness', characterised by; gently rolling, open, undulating moorland plateaux, with distinct edges.
- Highland Council Core Path IN05.03 is located approximately 200m from Option 9.
- Planning proposal 19/05046/SCOP exists within the boundaries of Option 9 with several other proposals existing within proximity.

Option 10

- Option 10 is located approximately 2.2 km from Tomich village.
- Option 10 is located in proximity of natural heritage designations: approximately 450 m from Glen Affric NNR, and 2 km from Glen Affric SSSI, Strathglass Complex SAC, and Glen Affric to Strathconon SPA.
- Ancient Woodland Inventory Areas exist approximately 350 m at its closest point.
- A Scheduled Monument exists approximately 3.8km from Option 10.
- An unnamed water course is located approximately 35 m from Option 10.
- Option 10 is located on Landscape Character Type 'Farmed Strath – Inverness', characterised by; open farmed valley floors and a central meandering river contained within steep, mainly forested, and wooded slopes and 'Rocky Moorland Plateau – Inverness', characterised by; gently rolling, open, undulating moorland plateaux, with distinct edges.
- Highland Council Core Path IN05.03 exists within Option 10. An unnamed path also exists within Option 10.
- Desk-based reviews indicate that approximately 6ha of Native Woodland exists within Option 10. However, site visits have indicated that the majority of this has been felled.
- Several planning proposals exist within proximity of Option 10, with the boundary of proposal 19/05046/SCOP existing adjacent to the Option.

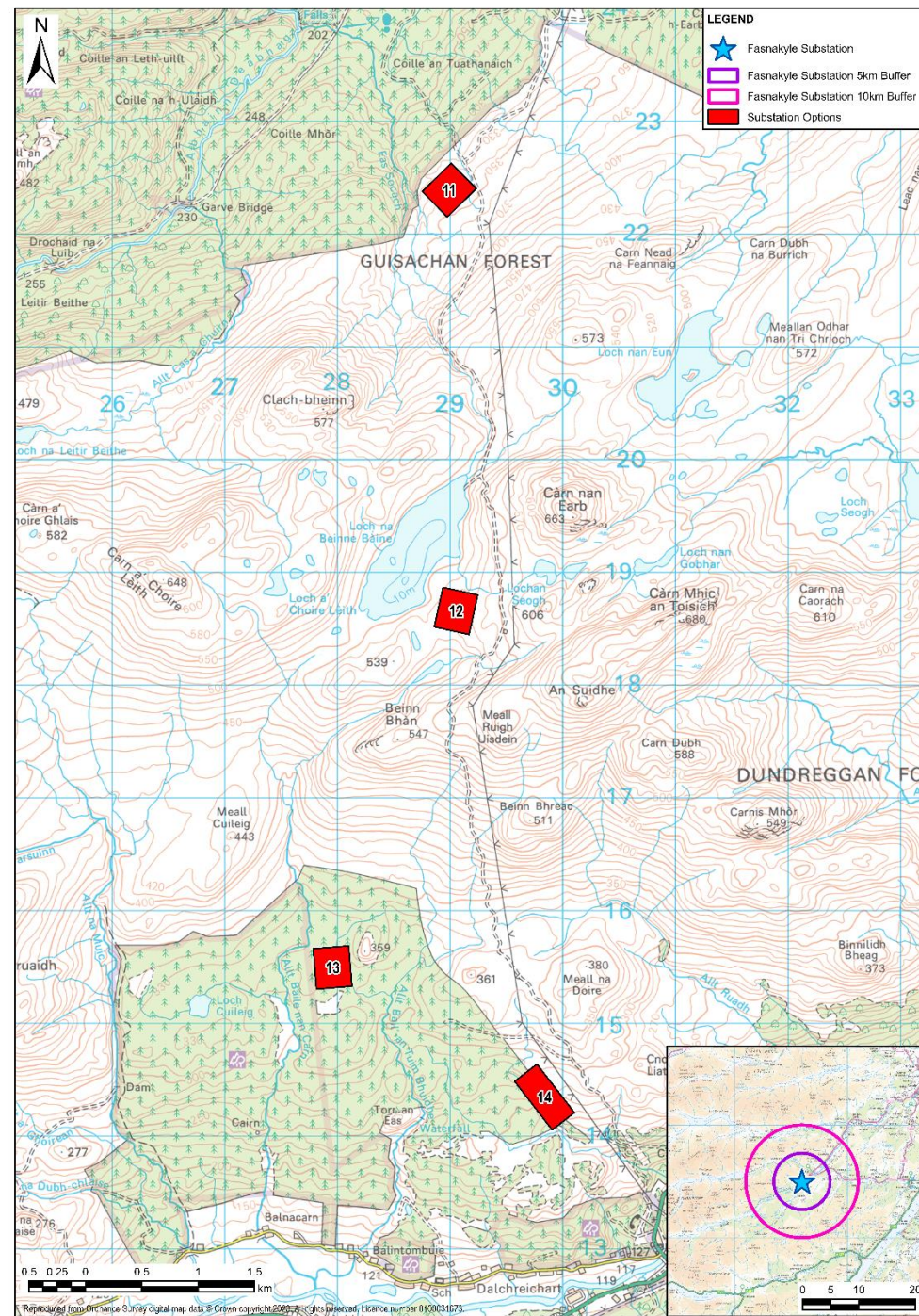


Figure 5 Locations of options for the initial site screening

Option 11

- Option 11 is located approximately 4.5 km from Tomich village.
- Option 11 is located in proximity to natural heritage designations: approximately 300 m from Glen Affric NNR, approximately 3km from Glen Affric to Strathconon SPA, and approximately 4 km from Glen Affric SSSI and Strathglass Complex SAC.
- Ancient Woodland Inventory Areas exist approximately 350 m from Option 11.
- Unnamed watercourses exist within Option 11.
- Option 11 is located on Landscape Character Type 'Farmed Strath – Inverness', characterised by; open farmed valley floors and a central meandering river contained within steep, mainly forested, and wooded slopes and 'Rocky Moorland Plateau – Inverness', characterised by; gently rolling, open, undulating moorland plateaux, with distinct edges.
- Highland Council Core Path IN05.03 exists directly adjacent to Option 11.
- Several planning proposals exist within proximity of Option 11.

Option 12

- Option 12 is located approximately 8 km from Tomich village.
- Option 12 is in proximity to natural heritage designations: approximately 3 km from Glen Affric NNR, approximately 4.5 km from Glen Affric SSSI and Glen Affric to Strathconon SAC, and approximately 5km from Glen Affric to Strathconon SPA.
- Ancient Woodland Inventory Areas exist approximately 3km at its closest point.
- Option 12 is located on Landscape Character Type 'Rocky Moorland Plateau – Inverness', characterised by; gently rolling, open, undulating moorland plateaux, with distinct edges.
- Highland Council Core Path IN05.03 exists approximately 500 m from Option 12.
- Two planning proposals exist within 5 km of Option 12.

3 Stage 2: Detailed Site Selection

Further appraisal and comparison of the shortlisted options resulted in the options 4, 9 and 10 being taken forward to Stage 2. Further details of the Stage 2 process can be found on the following pages.

Option 4

- There are no natural heritage designations within 1 km of Option 4, except for Ancient Woodland Inventory Areas approximately 500 m at its closest point.
- There is an unnamed watercourse within approximately 60 m of Option 4.
- Option 4 is the closest to any cultural heritage designations, with Scheduled Monuments situated approximately 2.5 km and 4.8 km at its closest point. Additionally, there are two Sites and Monuments Record Entries in proximity to Option 4, at approximately 35 m and 500 m. There may be some intervisibility with these heritage features and therefore some impact on their setting.
- Tomich Village Conservation Area is located approximately 1 km from Option 4 which will likely result in some intervisibility and therefore potential impact on its setting.
- Approximately 1.2ha of Native Woodland exists within the boundaries of Option 4
- Several planning proposals exist within proximity of Option 4, with proposal 19/05046/SCOP existing approximately 500 m east and southeast.

Option 9

- There are no natural heritage designations within 1 km of Option 9, except for Ancient Woodland Inventory Areas, with the closest being 500 m at its closest point.
- Of the three options, Option 9 is the furthest from any watercourse, with the nearest being approximately 200 m from Option 9.
- Option 9 is close to cultural heritage designations, with a Scheduled Monument situated approximately 3.8 km northwest. Few Sites and Monuments Record Entries exist within close proximity, indicating low potential for presence of unidentified archaeological/cultural heritage features.
- There is no identified woodland or commercial forestry in Option 9.
- Planning proposal 19/05046/SCOP exists within the boundaries of Option 9 with several other proposals existing within proximity.

Option 10

- Option 10 is approximately 450 m from Glen Affric NNR at its closest point and approximately 350m from Ancient Woodland Inventory Areas at its closest point.
- Of the three options, Option 10 is the closest to a watercourse, with the nearest being approximately 35 m to the south.
- There is a Scheduled Monument within 3.8 km of Option 10. Few Sites and Monuments Record Entries exist within close proximity, indicating low potential for presence of unidentified archaeological/cultural heritage features.
- Approximately 6ha of Native Woodland exists within the boundaries of Option 10, though site visits indicate that the majority of this has been recently felled.
- Highland Council Core Path IN05.03 exists within the southeast of Option 10, though a reasonable route diversion of the Core Path could be possible.
- Several planning proposals exist within proximity of Option 10, with the boundary of proposal 19/05046/SCOP existing adjacent to the Option.

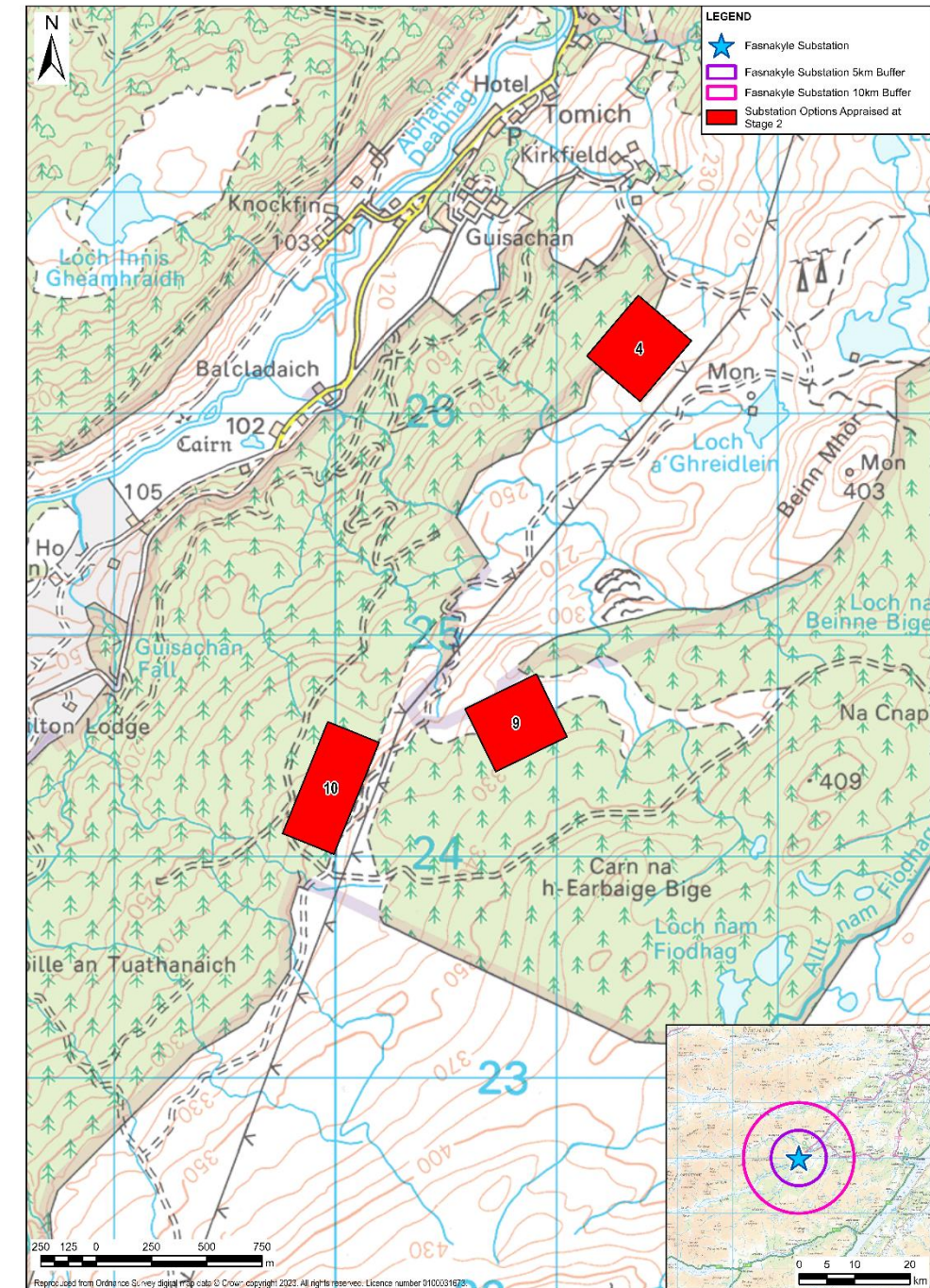


Figure 6 Location of Options for Stage 2 detailed site selection

3.1 Connections Considerations

One of the key drivers for the substation in this location is to facilitate generation connections in the greater Fasnakyle/Guisachan/Dundreggan area. This is combined with the network requirement to uprate the Beauly to Denny overhead line second circuit from 275kV to 400kV.

Due to the high prevalence of environmentally sensitive areas in the vicinity of the Fasnakyle 275kV Substation, generation connections were assessed as being very challenging to route into this area, so alternative substation site options were investigated as outlined in Section 2.

In order to most easily achieve the second objective of uprating the Beauly-Denny second circuit, a substation location very close to the overhead line was preferred and this was also factored into the site options assessed.

Figure 7 shows some proposed and potential connections from power generation projects in the Fasnakyle area. These projects are in various stages of development.

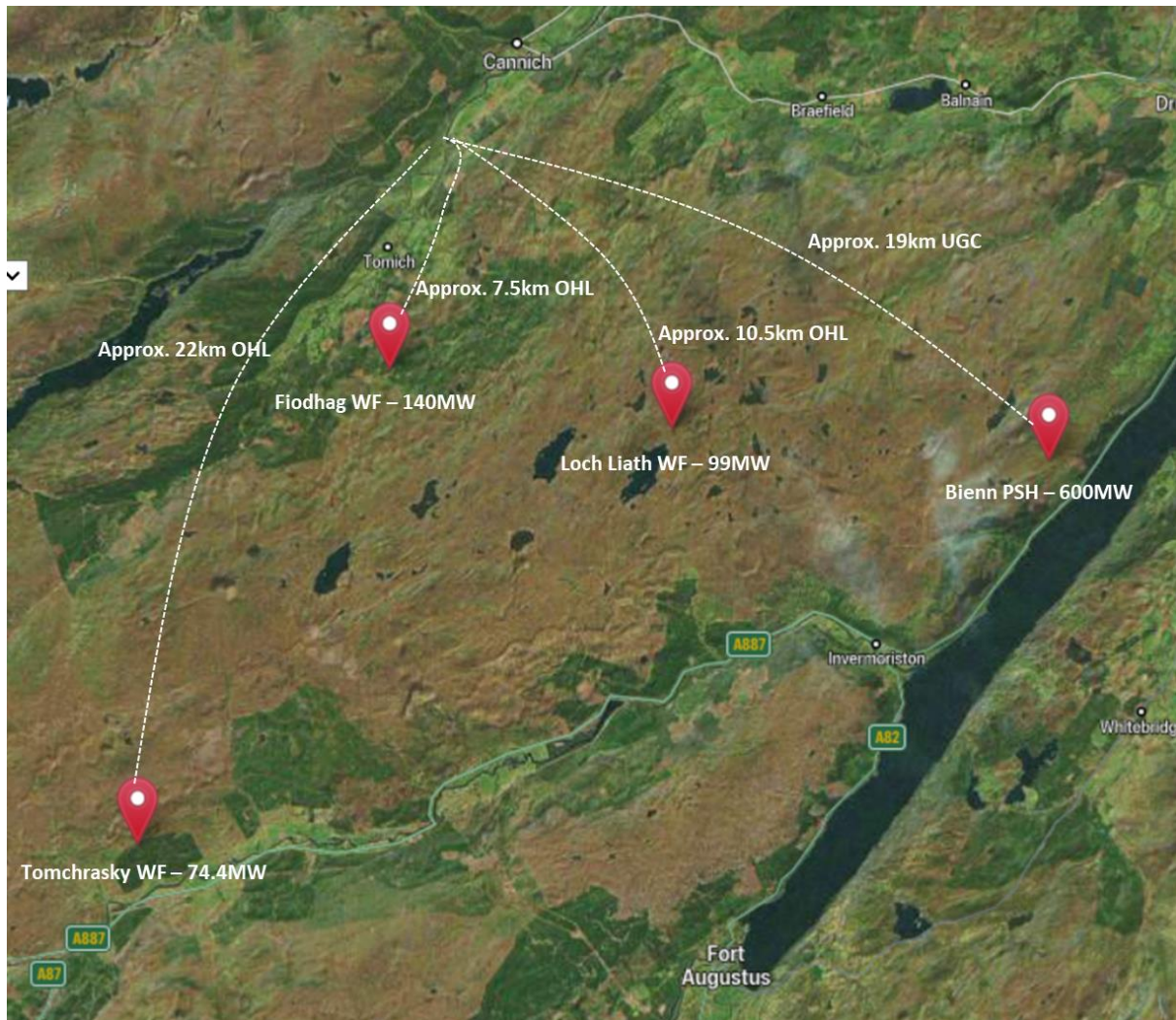


Figure 7 Generation Connections into Fasnakyle

3.2 Summary of RAGs

Tables 1, 2 and 3 below provides a summary of the key differentiating factors between each of the screened options regarding the key Engineering, Environmental and Cost criteria.

Table 1 Engineering Comparison of Shortlisted Options

Engineering Topics		Option 4	Option 9	Option 10
Connectivity - Existing circuits/ network	Distance and feasibility of connecting to the existing circuits / network (400kV)	Adjacent to existing OHL; likely to be OHL termination point	~150m from existing OHL; wrong side of line to connecting circuit; 5km back to existing Fasnakyle; near to junction tower for diversion	Adjacent to existing OHL; 6km back to existing Fasnakyle; near to junction tower for diversion
	Outages for modification to existing circuits	Straight-forward outages to connect	Straight-forward outages to connect	Straight-forward outages to connect
Connectivity - Future development possibilities	Extension of site or other circuits	Constrained on 2 sides, OHL on 3rd	Constrained by OHL on one side, topology on two more	Constrained by OHL on one side, topology on two more and access tracks on the last
Connectivity - Interface with SSE Distribution and Generation	Consideration of Business Separation and whole system requirements (Generation)	No issues	No issues	No issues
	Consideration of Business Separation and whole system requirements (Distribution)	No issues	No issues	No issues
Connectivity - DNO Connection	Proximity of LVAC supplies	Resilient site, 2 off GT ETs	Resilient site, 2 off GT ETs	Resilient site, 2 off GT ETs
Footprint Requirements - Technology	i.e., AIS/GIS or certainty of sizing on non-standard plant and equipment	Likely GIS required as insufficient space for AIS	Likely GIS required as insufficient space for AIS; elevation likely requires indoor solution	Likely GIS required as insufficient space for AIS; elevation likely requires indoor solution
Footprint Requirements - Adjacent Land use	Availability for ancillary infrastructure like welfare compounds, laydown areas (Temporary)	No constraints	No constraints	No constraints
	Availability for ancillary infrastructure like screening and SuDS infrastructure. (Permanent)	No constraints	No constraints	No constraints
Footprint Requirements - Space Availability	Non-standard substation configurations to accommodate site specific considerations	modifications to layout may be required	modifications to layout may be required	modifications to layout very likely
Hazards	Unique Hazards	No unique hazards identified	No unique hazards identified	No unique hazards identified
	Existing Utilities	No issues	No issues	No issues

Ground Conditions	Topography	Steep hillside, >15% gradient	c.10% gradient	<10% gradient
	Geology (Superficial Deposits – Peat)	No peat evident from site visit	Potential peat and rock	No peat evident from site visit
	Geology (Site testing to verify properties)	Not assessed	Not assessed	Not assessed
Environmental Conditions	Elevation	c.300m	c.320m	c.300m
	Salt Pollution	30km from coast	30km from coast	30km from coast
	Flooding	outwith 1000yr area	Limited 10 year surface flooding	Limited 10 year surface flooding
	SF6	Not calculated	Not calculated	Not calculated
	Contaminated Land	SF6 alternative GIS	SF6 alternative GIS likely	SF6 alternative GIS likely
	Noise (proximity to dwellings / residential properties)	No known or expected contamination	No known or expected contamination	No known or expected contamination
Construction Access	Substation Access Road (from public road)	Not assessed, assume high	Not assessed, but distant from receptors	Not assessed, but distant from receptors
	Transformer Delivery Route	Medium distance along existing track from public road	Long run-in from public road along steep and weaving access track	Long run-in from public road along steep and weaving access track
	Customer access disruption during construction	Minor road, potential for significant improvements required	Minor road, potential for significant improvements required, OHL access track very steep at points	Minor road, potential for significant improvements required, OHL access track very steep at points
Operation and Maintenance	Access	>5km along minor public roads and access tracks from A road	>8km along minor public roads and access tracks from A road	>8km along minor public roads and access tracks from A road

Table 2: Environmental Comparison of Shortlisted Options

Environmental Comparison of Shortlisted Options		Option 4	Option 9	Option 10
Designations	International European or National Designations (e.g., SAC, SPA RAMSAR, National Parks, SSSI, Ancient Woodland)	Option 10 is ~450m from Glen Affric NNR. Ancient Woodland Inventory Areas are ~500m from Options 4 and 9, and ~350 from Option 10. As such, each option has been rated amber for its potential to compromise the natural heritage designations due to proximity.		
	Regional designations (e.g., Local Nature Reserves, Wildlife Sites, RIGS)	Each of the options have been rated green as no Regional Designations were identified within 5km of any option.		
Hydrology/Geology	SG Drinking Water Protected Areas (Over 10m ³ per day or supplies over 50 people)	Each of the options are within Drinking Water Protected Areas for surface water and groundwater. As such, each of the options have been rated amber for their potential to compromise the quality and/or quantity of surface or ground water which provides public supply.		
	Aquifer providing regional resources e.g., Abstractions for small public or private water supply.	Each of the options are located on aquifer classification 2C – low productivity aquifer.		
	Hydrological supply to GWDTE	Each of the options are within 5km of private water supplies, though none are closer than 1km. The options have therefore been rated amber for their potential to compromise the quality and/or quantity of surface or groundwater of regional importance.		
	Surface waters	An unnamed watercourse is located ~60m from Option 4 and the River Abhainn Deabhag (Good Overall WFD status) is located ~1.3km from Option 4. An unnamed watercourse is located ~200m from Option 9. As Options 4 and D are >50m from these watercourses, a green rating has been assigned.		An unnamed watercourse is located ~35m from Option 10. As Option 10 is between 30m-50m from this watercourse, an amber rating has been assigned.
Cultural Heritage	Designations (World Heritage Sites, Scheduled Monuments, Inventory Gardens and Designed Landscapes, Inventory Battlefields)	Option 4 is located ~2.5km and ~4.8km from two Scheduled Monuments. Options 9 and 10 are located ~3.8km from a Scheduled Monument. Each of the Options have been rated amber as there would likely be no direct interaction with the designating features, but it may compromise their setting.		
	Cultural heritage assets: Listed buildings, A, B & C	Tomich Village Conservation Area is located ~1km from Option 4. The	Tomich Village Conservation Area is >2km from Options 9 and 10. There are no Listed Buildings within 1km of either option.	

	<p>Non-inventory GDL Conservation areas</p>	<p>Conservation area, and properties in the immediate vicinity contain multiple Category B and C Listed Buildings.</p> <p>Option 4 has been rated amber as it is likely to compromise the integrity of the Conservation Area and may impact the setting of Category B and C Listed Buildings.</p>	<p>Options 9 and 10 have been rated green as they are unlikely to compromise the integrity of the Conservation Area and Listed Buildings.</p>	
	<p>Sites & Monument Record (SMR) Entries</p>	<p>Option 4 is located ~35m and ~500m from SMR entries.</p> <p>Option 4 has been rated amber due to its proximity, and therefore potential, to compromise SMR Entries.</p>	<p>Few SMR entries are in close proximity to Option 9. This indicates low potential for presence of unidentified archaeological/cultural heritage features and Site D has therefore been rated green.</p>	<p>Option 10 is located ~350m from an SMR entry.</p> <p>The lack of SMR entries in close proximity to Option 10 may be taken as an indication of moderate/low potential for the presence of previously unidentified archaeological/cultural heritage features. Option 10 has therefore been rated green.</p>
<p>Landscape and visual:</p>	<p>Landscape Character as defined in published charter assessments (e.g., NatureScot National Assessments)</p>	<p>Option 4 is located on Landscape Character Type LCT 227 – Farmed Strath – Inverness which is characterised by; open farmed valley floors and a central meandering river contained within steep, mainly forested, and wooded slopes.</p> <p>Option 9 is located on Landscape Character Type LCT 222 – Rocky Moorland Plateau – Inverness which is characterised by; gently rolling, open, undulating moorland plateaux, with distinct edges.</p> <p>Option 10 is located across both of these Landscape Character Types.</p> <p>There is no substantial difference between the three options in terms of landscape character. Each option may compromise the characteristic elements of the Landscape Character Types, and as such, each of the options have been rated amber.</p>		

	<p>Nation or Regional Designations: National Parks, National Scenic Areas, Inventory Gardens and Designed Landscape (GDL)</p>	<p>There is a variety of different types of Landscape Designations surrounding the three sites: Central Highlands Wild Land Area, Glen Affric NSA, Ancient Woodland Inventory Areas, and Strathconon, Monar and Mullardoch SLA (Options D & E only). However, there will be no direct impact to the landscape designations though the sites may be visible from within the landscape designations. Potential impacts would be limited to the setting and perceptual qualities, and changes to the relative sense of wildness would be very small across each site. As such, each of the sites have been rated green.</p>		
	<p>Visual Settlements and residential properties, key transportation and recreational routes utilised by tourists and visitors to an area, vantage points and tourist destinations from where views and landscape appreciation is important.</p>	<p>Residential and tourism properties exist within 5km of each of the options, with the nearest being 1km from Option 4. Several Core Paths are located within close proximity to each of the three options, and within Option 10. Each of these Core Paths are likely to be impacted to enable access.</p> <p>The potential for visual change must also be considered for potential obstructed views along walking paths and summits within landscape designations in particular the Glen Affric NSA and Strathconon, Monar and Mullardoch SLA such as Meallan na Ceardaich summit.</p> <p>Each of the options have been rated amber as they have the potential to compromise important views or visual amenity.</p>		
<p>Land use:</p>	<p>Agriculture (National Scale Land Capability for Agriculture)</p>	<p>Option 4 contains Agricultural Land Classifications 5.2 and 6.3. Option 9 contains Agricultural Land Classification 6.3. Option 10 contains Agricultural Land Classifications 5.3 and 6.3.</p> <p>Each of the three options represent low quality for agricultural production capability, with uses likely only available for pasture and grazing options with limited potential for cultivation. The options therefore would only affect lower quality agricultural land, with the need for further specific assessment of agricultural impacts unlikely. Each of the options have therefore been rated green.</p>		
	<p>Woodland</p>	<p>Approximately 1.2ha of Native Woodland exists within Option 4. The dominant habitat of this woodland being upland birch.</p>	<p>There is no identified woodland in Option 9 and this option has therefore been rated green.</p>	<p>Desk-based reviews indicate that approximately 6ha of Native Woodland exists within Site E. The dominant habitat of this woodland being native pinewood, upland birch, and Caledonian Forest. However, site visits have indicated that the majority of this has been felled.</p>

	Commercial Forestry	There is no identified commercial forestry associated with any of the options and as such, they have each been rated green.	
Recreation	Public Footpaths, National Cycle Routes etc	<p>Highland Council Core Paths exist within 200m of both options.</p> <p>There are no National Cycle Routes identified within proximity of either option.</p> <p>As both options avoid interaction with public footpaths and National Cycle Routes, both options have been rated green.</p>	<p>A Highland Council Core Path exists within Option 10. An unnamed path also exists within Option 10.</p> <p>There are no National Cycle Routes identified within proximity of Option 10.</p> <p>As Option 10 will interact with the Core Path and may compromise its recreation use, Option 10 has been rated amber.</p>
	Commercial Highland Sports, fishing, stalking	There are no commercial highland sports identified within proximity of any of the options. As each of the options avoids interaction with areas known to be used for commercial highland sports, a green rating has been assigned to each.	
Planning	Policy: National/Regional/Local planning policy within the Local Development Plan	<p>The three options would be considered National Development – Part 2 National Planning Policy, under the Strategic Renewable Electricity Generation and Transmission Infrastructure strategy.</p> <p>The following classes of development that are captured by the policy are described below:</p> <p>b) New and/or replacement high voltage electricity lines and interconnectors of 132kv or more; and</p> <p>c) New and/or upgraded infrastructure directly supporting high voltage electricity lines and interconnectors including converter stations, switching stations and substations.</p> <p>At a high level, there is national and local planning policy support for the principle of all three developments. All three options are located within close proximity to one another therefore the spatial designations and environmental constraints are similar across all options. At this stage and in the absence of detailed assessments and design mitigation, the proposals may conflict with a number of planning policies. As such, each of the options have been rated amber.</p>	
	Proposals: Existing information in the Planning Portal	All options have been assigned an amber rating as there are multiple third party development proposals within proximity of the options. As such, there is a risk of each of the options being inconsistent with other third party proposals known to the planning system.	

Table 3 Cost Comparison of Shortlisted Options

Cost Topics	Option 4	Option 9	Option 10
Capital	<p>Land development for Option 4 would be slightly higher than the other Options due to the fact that it's located on a slope and additional civil works would be required.</p> <p>Peat may be present at all options, so the options are equal in this regard.</p> <p>This option is in close proximity to the existing OHL but is closer to the existing Fasnakyle substation so connection costs would be slightly lower for this.</p>	<p>Land development for Option 9 would be slightly lower as it's in a shallower area in comparison to Option 4.</p> <p>Peat may be present at all options, so the options are equal in this regard.</p> <p>This option is in close proximity to the existing OHL but is further away from the existing Fasnakyle substation so connection costs would be slightly higher.</p>	<p>Land development for Option 10 would be slightly lower as it's in a shallower area in comparison to Option 4.</p> <p>Peat may be present at all options, so the options are equal in this regard.</p> <p>This option is in close proximity to the existing OHL but is further away from the existing Fasnakyle substation so connection costs would be slightly higher.</p>
Operational	<p>Like the other Options, Option 4 would be accessed via one of two forestry tracks, both of which pose challenges. Both tracks pass through the village of Tomich, which has narrow streets not designed for heavy construction traffic. The route to the north is extremely steep and the route to the south has tight switchbacks. Both tracks would require significant alteration and, reinforcement to make them traversable by transformer delivery vehicles.</p>	<p>Like the other Options, Option 9 would be accessed via one of two forestry tracks, both of which pose challenges. Both tracks pass through the village of Tomich, which has narrow streets not designed for heavy construction traffic. The route to the north is extremely steep and the route to the south has tight switchbacks. Both tracks would require significant alteration and, reinforcement to make them traversable by transformer delivery vehicles.</p>	<p>Like the other Options, Option 10 would be accessed via one of two forestry tracks, both of which pose challenges. Both tracks pass through the village of Tomich, which has narrow streets not designed for heavy construction traffic. The route to the north is extremely steep and the route to the south has tight switchbacks. Both tracks would require significant alteration and, reinforcement to make them traversable by transformer delivery vehicles.</p>

3.3 Summary of Comparative Assessment

3.3.1 Environmental

When considering the Stage 2 substation options in isolation, based on the results of the detailed study and comparative analysis, from an environmental perspective Option 9 is the best on balance option. The proximity of the options to each other means the results of the comparative assessment across much of the environmental criteria were similar. However, a best on balance option is still recommended based on the following.

Option 10 is the most environmentally constrained in terms of surface waters due to an unnamed watercourse being located within approximately 35 m of the option. Options 4 and 9 are located greater than 60 m from watercourses in both cases.

Options 9 and 10 are more favourable in terms of cultural heritage features. Though each of the options are located in proximity to Scheduled Monuments, Option 4 is located in close proximity to Tomich Village Conservation Area which also contains Category B and C Listed Buildings.

Although there is no substantial difference between each of the options in terms of Landscape Character Type, Option 4 may result in greater loss of trees than Options 9 and 10 which have more recently been subject to felling.

Option 9 is the least environmentally constrained in terms of Native Woodland, with none present within the option boundary. Option 4 contains approximately 1.2 ha of Native Woodland and desk-based review has shown Option 10 to contain approximately 6 ha, however site visits have indicated the majority of this has been felled. Options 4 and 10 are thus deemed less suitable than Option 9.

In respect to recreational constraints, Option 10 is the least favourable due to existing across a Core Path. Options 4 and 9 do not directly interact with any recreational amenity features.

Overall, Option 9 was selected as the best on balance option from an environmental perspective. Option 9 is less constrained by watercourses and recreational aspects than Option 10. Option 9 is also more favourable than Option 4 in terms of proximity to cultural heritage features. Native Woodland located on Options 4 and 10 also render Option 9 the least environmentally constrained from this perspective.

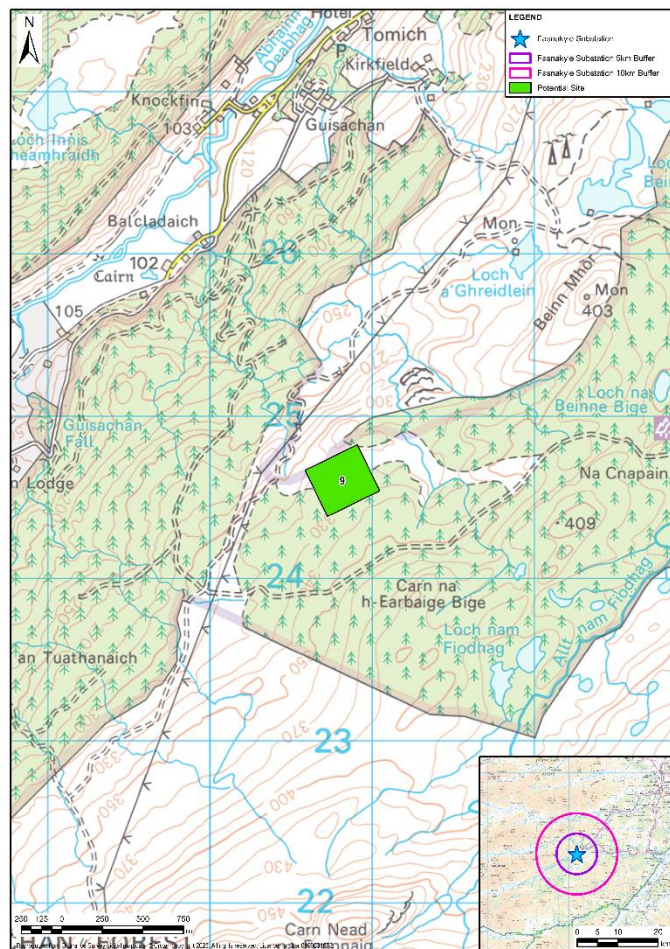


Figure 8 Location of the preferred option - Option 9

3.3.2 Engineering

The main risk for these substation locations will be the access, both during construction and delivery of equipment and during ongoing maintenance. The access route is either very steep or very winding, so will require significant improvements to be traversable, particularly for transformer delivery. All three Options taken to Stage 2 are predicted to utilise the same access route, so this risk is fairly neutral between them. Of the three, Site 4 has the shortest length of this access route, though still equally challenging in form.

Option 10 is the most constrained from the perspective of constructability, with access tracks and the existing OHL close by on three sides. A non-standard substation layout would likely be required to be able to construct here. Options 4 and 9 are fairly similar in this regard, but Option 4 is more constrained by the topology, which is around 15% gradient on average across the site, where Option 9 is around 10% gradient.

Where the Options diverge the most is in their relative convenience of connecting generation connections. By situating Option 9 on the south-east side of the Beauly-Denny overhead line, it is more centrally located for connections, which means fewer circuits need to pass beneath the Beauly-Denny line to reach the substation. Note that the circuit connection for Tomchrasky, as shown in Figure 7, would very likely need to pass beneath the Beauly-Denny line in order to be routed further north, as environmental and local wildlife charity operations in that area would very likely preclude it being routed directly north from the Wind Farm location. Situating on this side of the line does present other challenges in terms of the energisation sequence of the connection, as it is not connection to the same circuit as the existing Fasnakyle substation, but on balance these are outweighed by the benefits for generation connectivity.

Site 4 is closest to the town of Tomich, so is predicted to have the highest risk of noise impact from the substation upon local receptors.

3.3.3 Cost

Capital costs such as construction, diversions, felling, public road improvements, etc. and Operational costs including inspections and maintenance were compared for each of the options. While Option 4 had lower costs in terms of connectivity to the existing substation, it had higher civil costs as it is located on a slope. Therefore, all the Options are balanced.

3.3.4 Conclusion

Option 9 is preferred for environmental and engineering factors for the reasons set out in this consultation document and is neutral between options for cost. As such, Option 9 is the current overall best on balance option as shown on **Figure 8**.

4 Next Steps

A public consultation event is to take place to help inform the final selection of a proposed Site Option and to consult on the current best on balance Site Option. The responses received from the consultation event, and those sought from statutory consultees and other key stakeholders will inform further consideration of the best on balance Site Option.

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

The outcome of the site selection process will be a development for which a proposed site option will be confirmed and consent under the Town & Country Planning (Scotland) Act 1997 sought. The application will identify:

- The site boundary clearly shown in red (the Planning Red Line Boundary) including any access route (up to the public road including junction improvements).
- The Proposed Development in relation to the site boundary with dimensions of all permanent structures, buildings, perimeter fencing, and any key drainage features e.g. SuDS pond and key electrical features, such as transformers.

The application may be subject to EIA under the Town & Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017. This may result in further alterations to the Proposed Development to reflect outcomes of the EIA consultation process. Should the Proposed Development be deemed non-EIA (due to its scale or number and significance of potential environmental effects), a voluntary Environmental Appraisal would be carried out to support the application.

Where overhead line elements (including tie-ins from proposed development to existing overhead line) are required, a similar application is made to the Scottish Ministers under Section 37 of the Electricity Act 1989.

Further public and stakeholder consultation will be undertaken to present our proposals ahead of submitting a planning application.