

Melgarve Cluster

Alignment Consultation Booklet

February 2023



Scottish & Southern
Electricity Networks

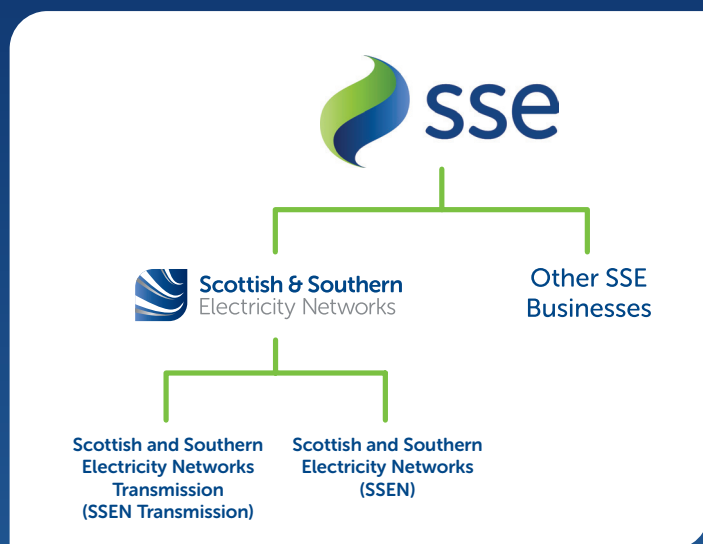
TRANSMISSION

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Who we are

We are Scottish and Southern Electricity Networks Transmission (SSEN Transmission), operating under licence as Scottish Hydro Electric Transmission Plc (SHE Transmission) for the transmission of electricity in the north of Scotland.



About us

Following a minority stake sale which completed in November 2022, we are now owned 75% by SSE plc and 25% by Ontario Teachers' Pension Plan Board. We are responsible for the electricity transmission network in the north of Scotland, maintaining and investing in the high voltage 132kV, 220kV, 275kV and 400kV electricity transmission network. Our network consists of underground and subsea cables, overhead lines on wooden poles or steel towers, and electricity substations. It extends over a quarter of the UK's land mass, crossing some of its most challenging terrain.

Our first priority is to provide a safe and reliable supply of electricity to our communities. We do this by taking the electricity from generators and transporting it at high voltages over long distances through our transmission network for onwards distribution to homes and businesses in villages, towns and cities.

Our operating area is home to vast renewable energy resources, and this is being harnessed by wind, hydro and marine generation. Working closely with National Grid, the GB transmission System Operator, we also enable these electricity generators to connect to the transmission system by providing their connections and allowing the electricity generated by them to be transported to areas of demand across the country.

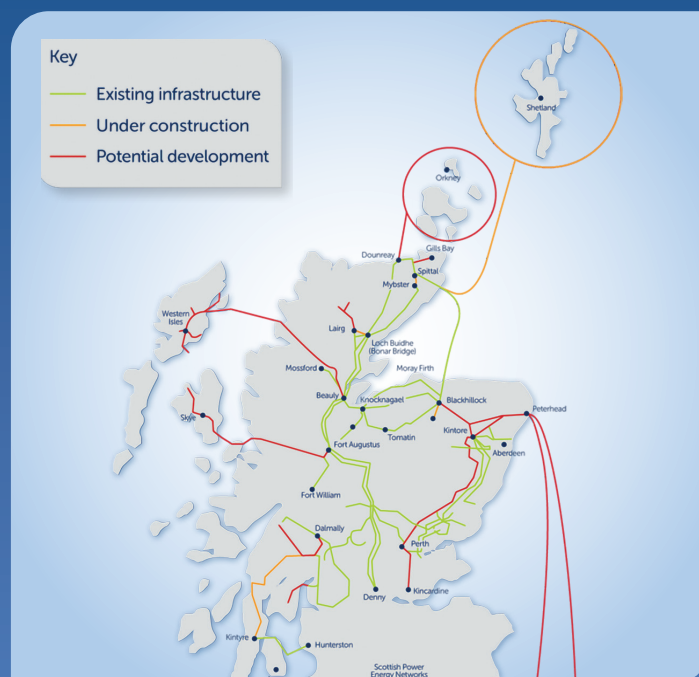
Scotland's transmission network has a strategic role to play in supporting delivery of the UK and Scotland's Net Zero targets. We're already a mass exporter of renewable energy, with around two thirds of power generated in our network area exported to demand centres further south. By 2050, the north of Scotland is expected to need 40GW of low carbon energy capacity to support net zero delivery. For context, we currently have around 7GW of renewable generation connected in the north of Scotland.

What is the difference between Transmission and Distribution?

Electricity Transmission is the transportation of electricity from generating plants to where it is required at centres of demand. The Electricity Transmission network, or grid, transports electricity at very high voltages through overhead lines, underground cables and subsea cables. Our transmission network connects large scale generation, primarily renewables, to central and southern Scotland and the rest of Great Britain. It also helps secure supply by providing reliable connection to the wider network of generation plans.

The Electricity Distribution network is connected into the Transmission network but the voltage is lowered by transformers at electricity substations, and the power is then distributed to homes and businesses through overhead lines or underground cables.

Overview of Transmission projects



As a natural monopoly, we are closely regulated by the GB energy regulator, Ofgem, who determines how much revenue we are allowed to earn for constructing, maintaining and renovating our transmission network in the north of Scotland. These costs are shared between all those using the transmission system, including generation developers and electricity consumers. As a stakeholder-led business, SSEN Transmission is committed to inclusive stakeholder engagement, and we conduct this at an 'Advanced' level as assessed by AccountAbility, the international consulting and standards firm.

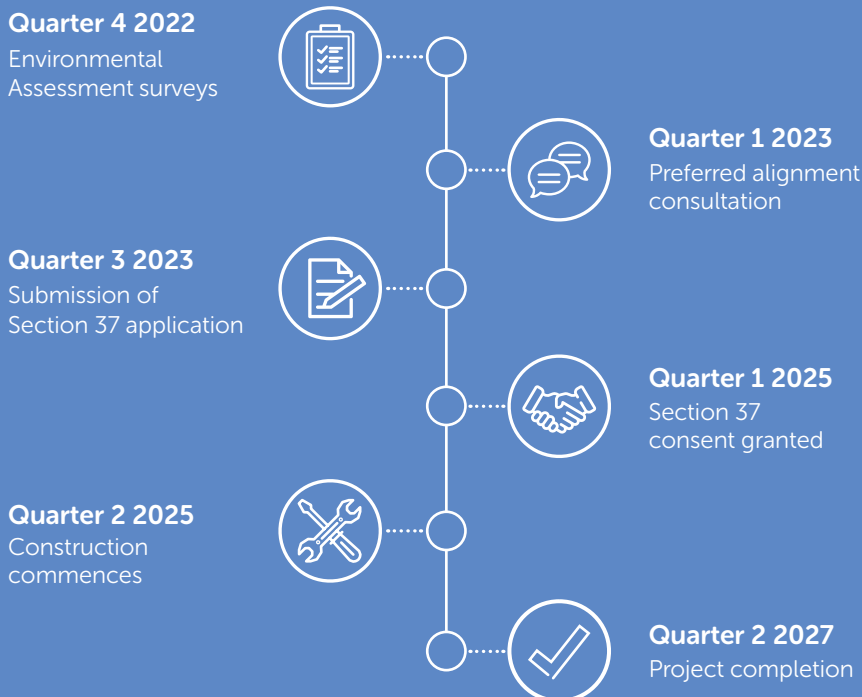
Project need and updates

This project is needed to connect the Cloiche wind farm (200MW) and the Dell wind farm (49.8MW) into the existing Melgarve 400/132kV substation to enable export of the electricity from these wind farms into the SSEN Transmission system.

This will involve the following elements of work which have been collectively termed as the Melgarve Cluster.

Project timeline

The design and construction to connect the Cloiche and Dell wind farms into the existing Melgarve 400/132kV substation by Spring 2027 will be undertaken under the following timeline:



Glenshero wind farm connection

Earlier consultation had referred to a connection to the proposed Glenshero wind farm. However, this has since been refused consent and the connection proposals are no longer required.

In the interest of transparency, we are presenting these two projects together to ensure all local community members are aware of the full extent of the proposals and are invited to comment on the development of each.

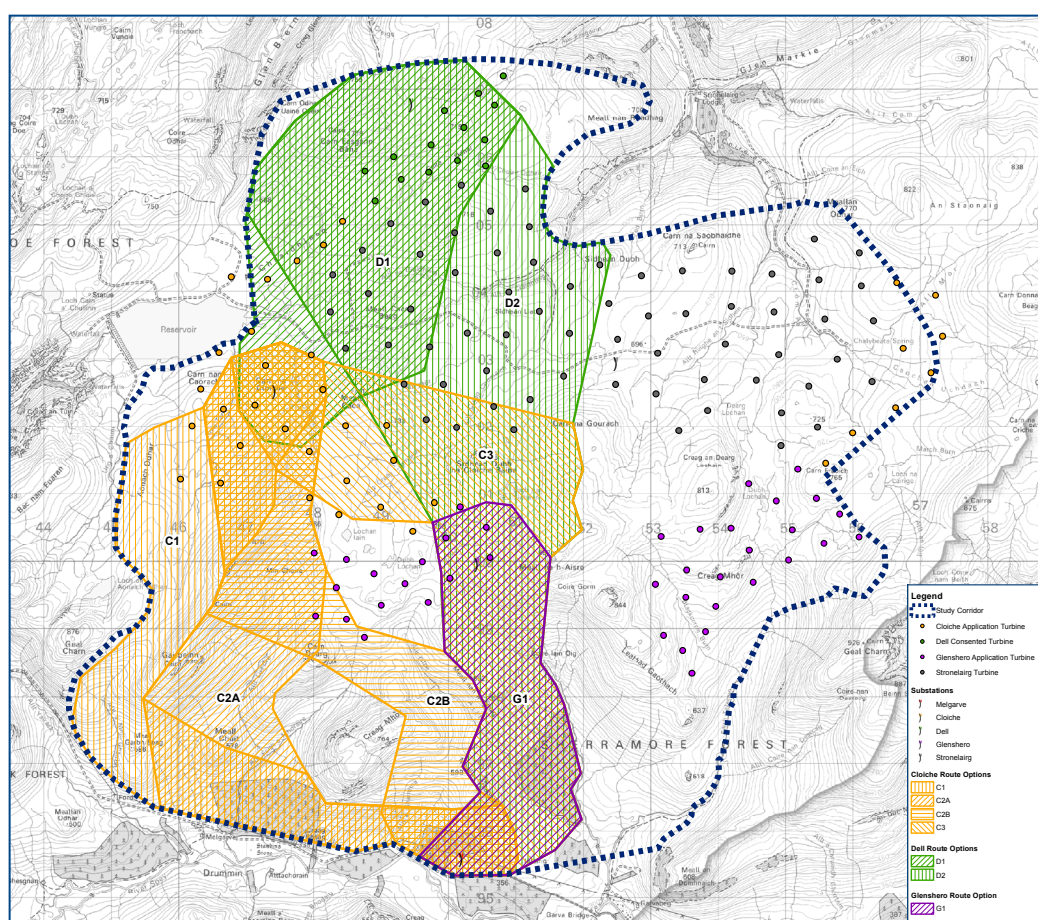
Melgarve substation

Previously it was expected that an extension would be required to the existing Melgarve 400/132kV substation. However, following detailed investigations it will now only be necessary to make changes within the substation to accommodate additional equipment and linkages into the substation. These internal works would not require planning permission and linkages into the substation would be dealt with via the Cloiche and Dell proposals.

Feedback from routing consultation process

SSEN Transmission published a route consultation document in November 2021. This followed on from a detailed routing process and identified broad (typically 1km wide) routes through which a connection to the wind farms might be located.

A number of different routes were considered taking into account physical and development constraints identified, namely the topography and the operational wind farm and proposed wind farms within the area. The preferred route selected is Route D1-C3 as identified below, chosen as it had the least technical and environmental constraints such as topography, access, cultural heritage, sensitive habitats and landscape character. This was broadly agreed with the Statutory Consultees to be a suitable route for more detailed alignment assessment to occur within. Detailed comments were received which have been considered at the alignment stage and will be considered as the detailed design progresses.



Key feedback

- Design to be sensitive to the landscape and natural heritage of the area;
- Suitable visual, habitat and specialist ornithological surveys required to understand baseline and avoid impact/ provide mitigation;
- Further consideration on wider use of UGC;
- Opportunities to rationalise infrastructure to be explored;
- Use of existing tracks to be maximised—noting this may have impacts on existing/ proposed wind farms;
- Transport/road impacts to be assessed/mitigated—including construction traffic;
- Impact on tourism (shooting/ long distance paths) to be considered;
- Impact on flooding/ drainage considered.

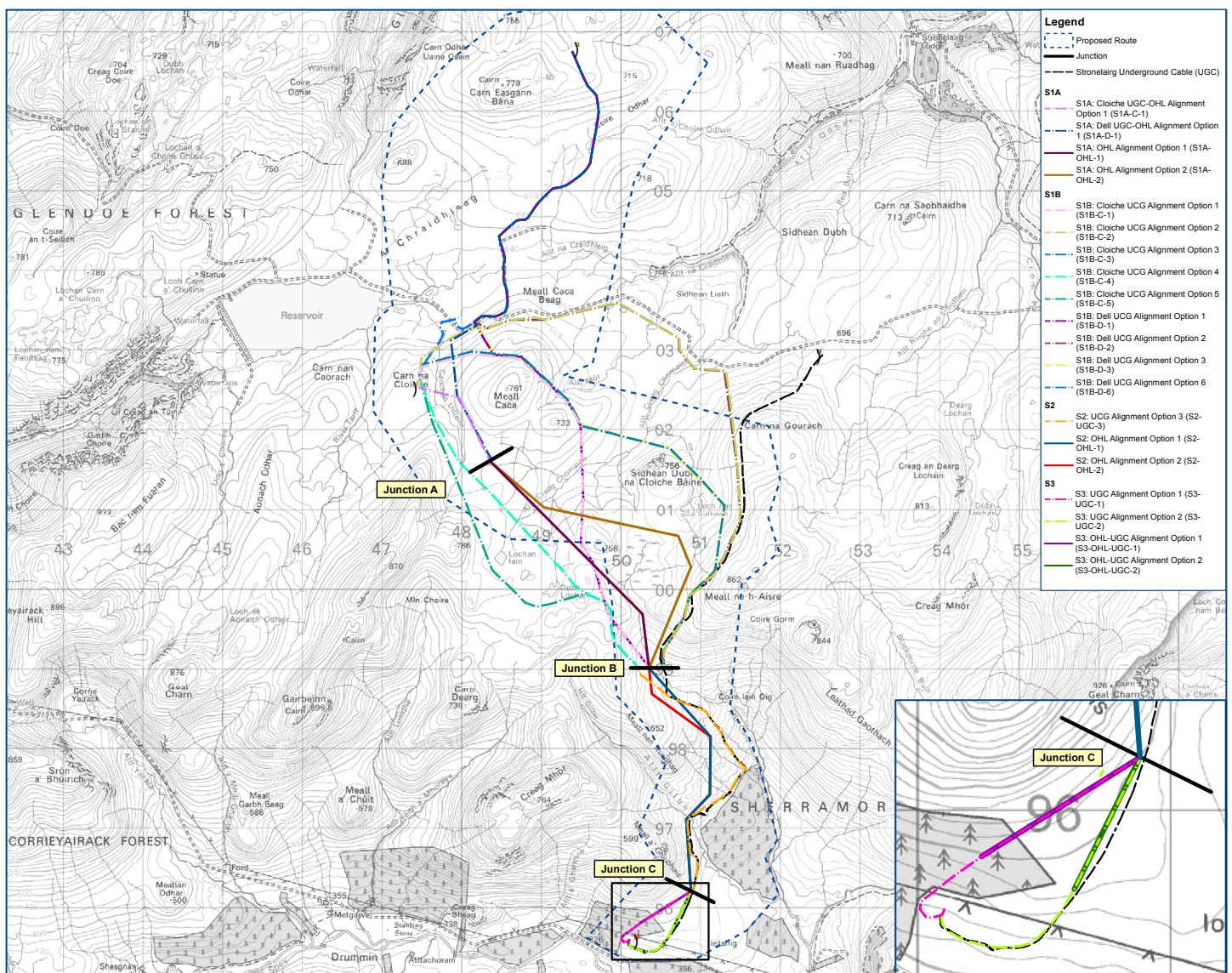
These comments have been given careful consideration through the alignment stage and in arriving at a Preferred Alignment. Comments are invited on this process in the section below.

Cloiche and Dell alignment selection consultation

SSEN Transmission is consulting on the selection of a preferred alignment in February 2023. The consultation document posted on the project website provides the detailed justification for the preferred alignment presented.

Overhead lines and underground cables are subject to a detailed alignment selection process. This ensures the preferred alignment selected provides a balance between meeting technical requirements, causing the least practical impact on the environment, being cost effective and avoiding disturbance to those living, working or visiting the area.

As explained earlier, at the Route Consultation stage (in December 2021/January 2022) feedback was received suggesting that due to landscape and ornithological impacts, SSEN Transmission should revisit the rationale for using overhead lines (OHL) and consider using underground cables (UGC) as an alternative. This has been considered at the Alignment stage, and where feasible, both these options are considered side by side. There is no opportunity to route an OHL through the existing Stronelairg wind farm due to proximity issues with the turbines, or for it to cross the existing Beaulay–Denny line near Melgarve substation. All options considered are shown below.

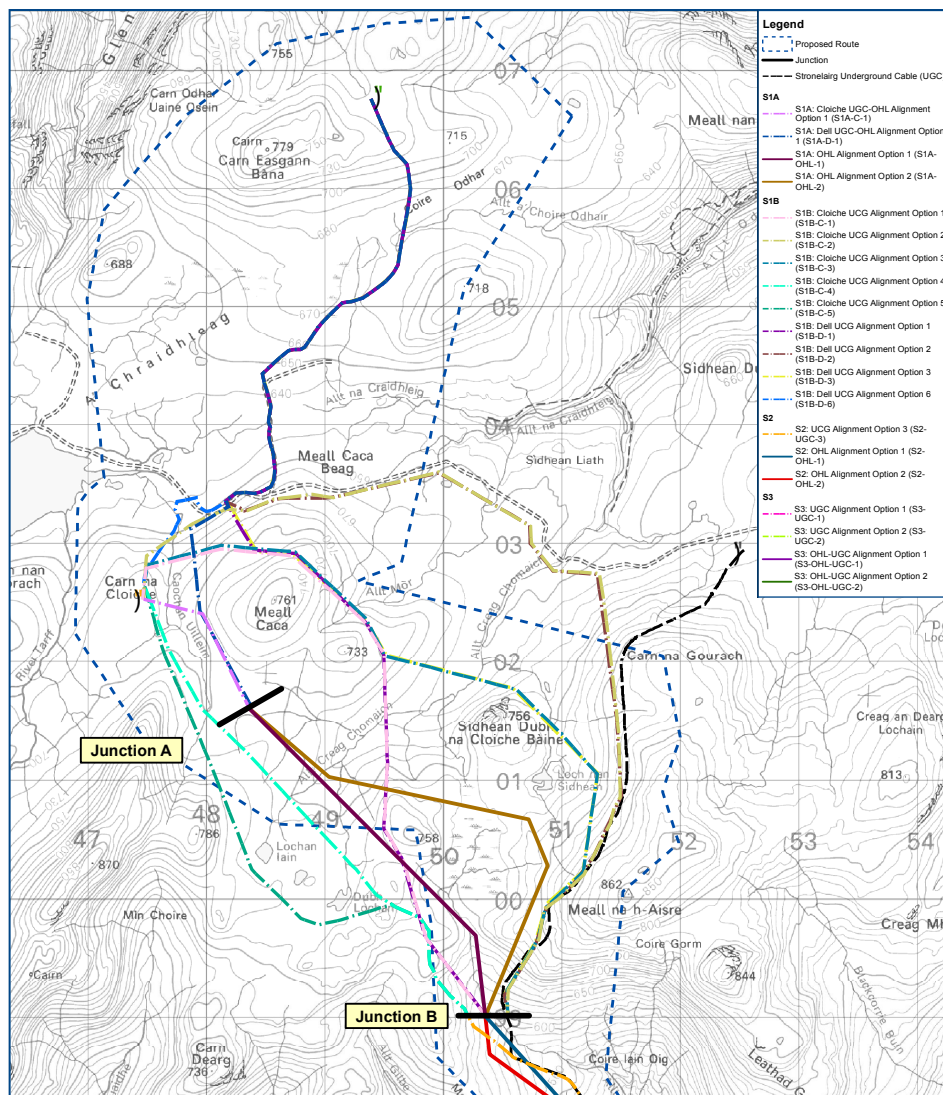


Alignment options considered

The plan above shows the differing routes which were considered in the alignment process. This includes both OHL and UGC options. To assist assessment this has been broken down into Sections (1, 2 and 3) and 'Junctions' where routes intersect. Junction A is where the UGC through the wind farms transition to OHL, however not all options pass through Junction A so assessment is considered in terms of the various sections above.

Dell/Cloiche to Junction B (Section 1)

Includes some combined UGC–OHL/UGC only options



The alignment represents a balance of a number of considerations.

Section 1A - Cloiche and Dell via Junction A (combination UGC–OHL options only)

UGC from Dell/Cloiche can utilise existing/proposed access tracks to minimise any impacts. OHL options having varying landscape/visual and ornithological impacts. The southerly OHL option (S1A-OHL-1) is most direct, has fewer more dominant angle towers and therefore least impactful in these terms.

Section 1B - Cloiche and Dell direct to Junction B (UGC options only)

Solely UGC options which bypass Junction A and take diverse routes to Junction B in terms of elevation, length/directness, reliance on existing/proposed access tracks, peatland, protected habitats and water courses. Routes maximising use of existing access tracks have a lesser environmental impact, but these are significantly longer/technologically constrained through the wind farm.

OHL benefits - environmental

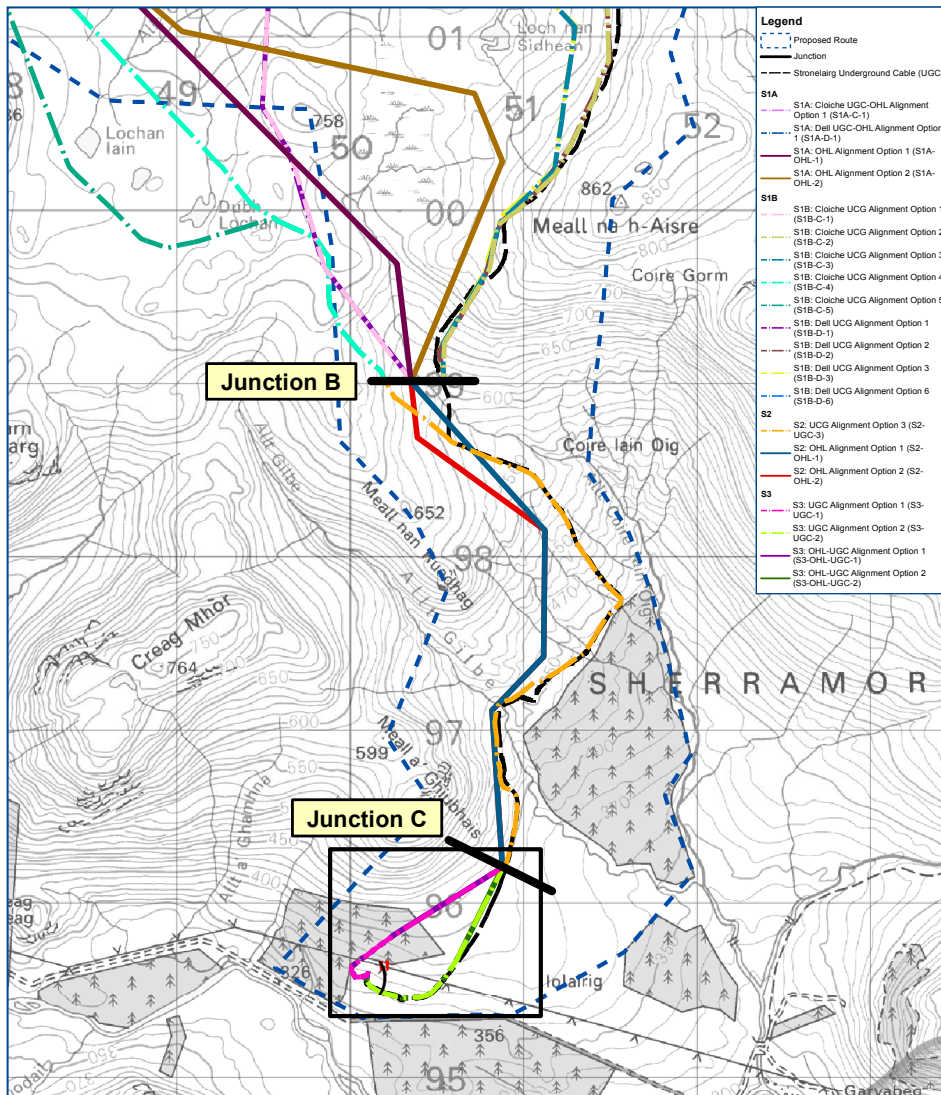
- Ability to span over sensitive habitats—UGC disturbs 30m corridor during construction;
- Ability to span over protected species—UGC disturbs 30m corridor as above;
- Ability to reduce Biodiversity Net Gain (BNG) impact by spanning over sensitive/irreplaceable habitats.



UGC benefits - environmental

- Buried underground so only temporary impact in Landscape/character terms;
- Buried underground so only temporary impact in Visual impact terms;
- Temporary impacts on Ornithology as buried underground.

Junction B southwards



The alignment represents a balance of a number of considerations.

Section 2

UGC and OHL options exist from Junction B–C. These are in proximity of the Stronelairg access track and have a greater level of commonality. The western OHL option (S2-OHL-2) have fewer more dominant angle towers, and so are less visible/impactful. UGC routes have varying impacts on water courses depending on their route.

Section 3

UGC and UGC–OHL options from Junction C–Melgarve. Divergance of routes here to access via the east/west side of the substation. Access tracks exist to the easterly route which is also flatter and less interface with nearby woodland.

This consultation seeks views from the public, statutory authorities and other interested stakeholders on the preferred alignment identified for the connection of Cloiche and Dell wind farms.

OHL benefits - engineering

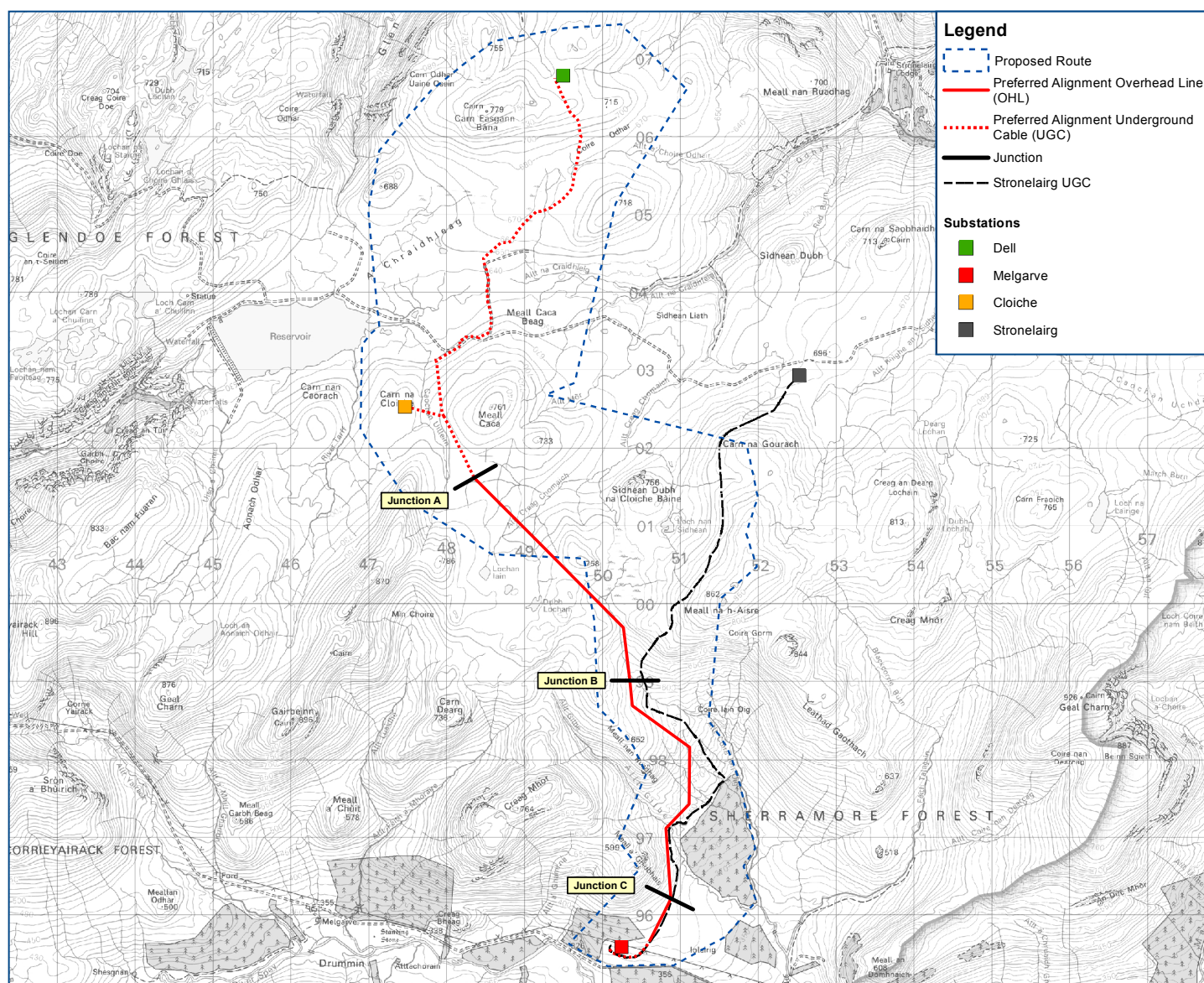
- Can span over steep/peaty terrain;
- Less constrained by obstacles (e.g. rivers/roads) as can span over these;
- Easier for maintenance purposes;
- Cheaper and more reliable technology in challenging terrain;
- Potential for less disturbance for construction access;
- Less losses through the network.



UGC benefits - engineering

- Can traverse through existing wind farms;
- Likely to have fewer maintenance points required (just at junction/link boxes);
- Little above ground infrastructure required.

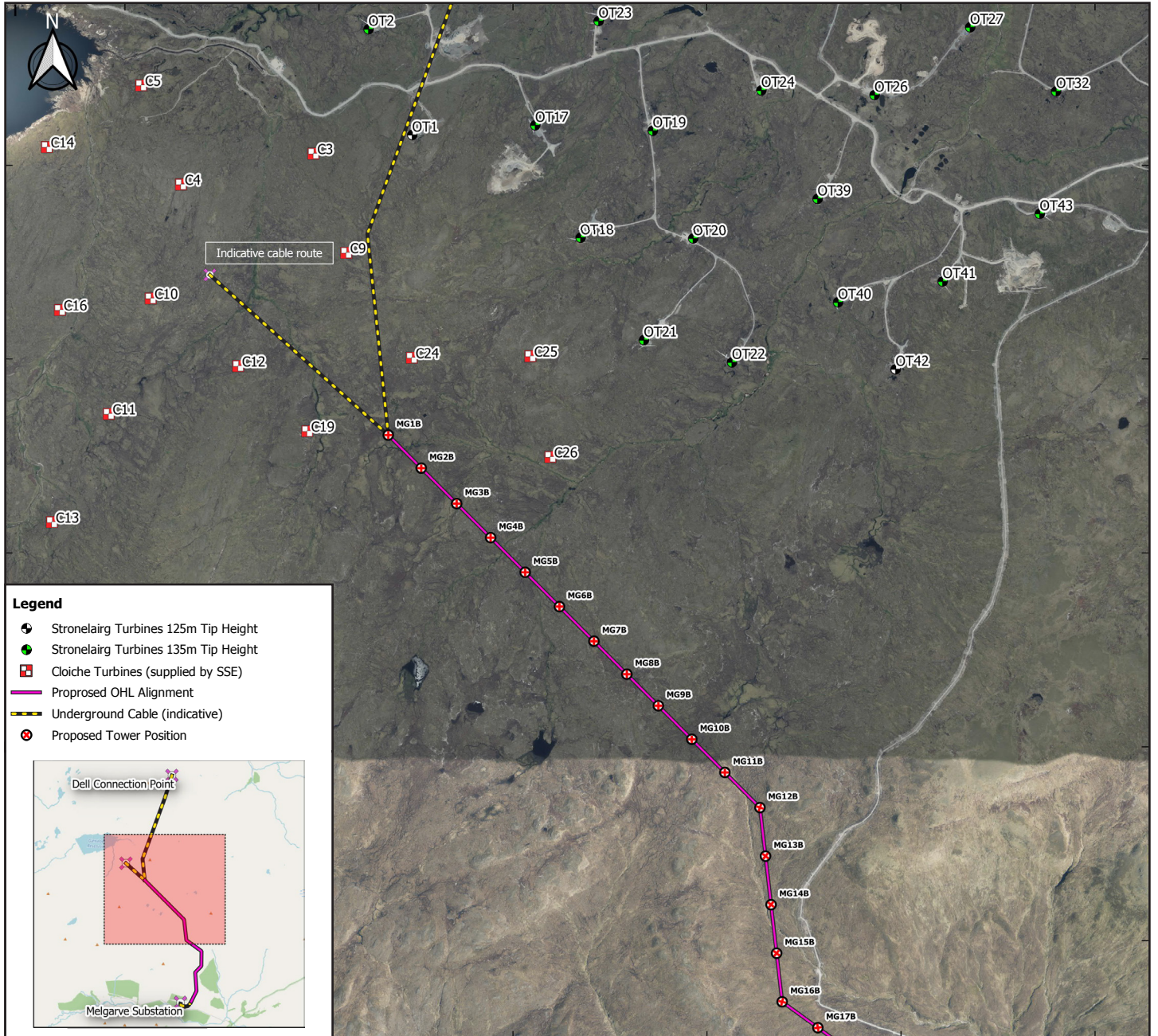
Following detailed consideration of the various options SSEN Transmission have selected the following preferred alignment (which is shown on the map below):

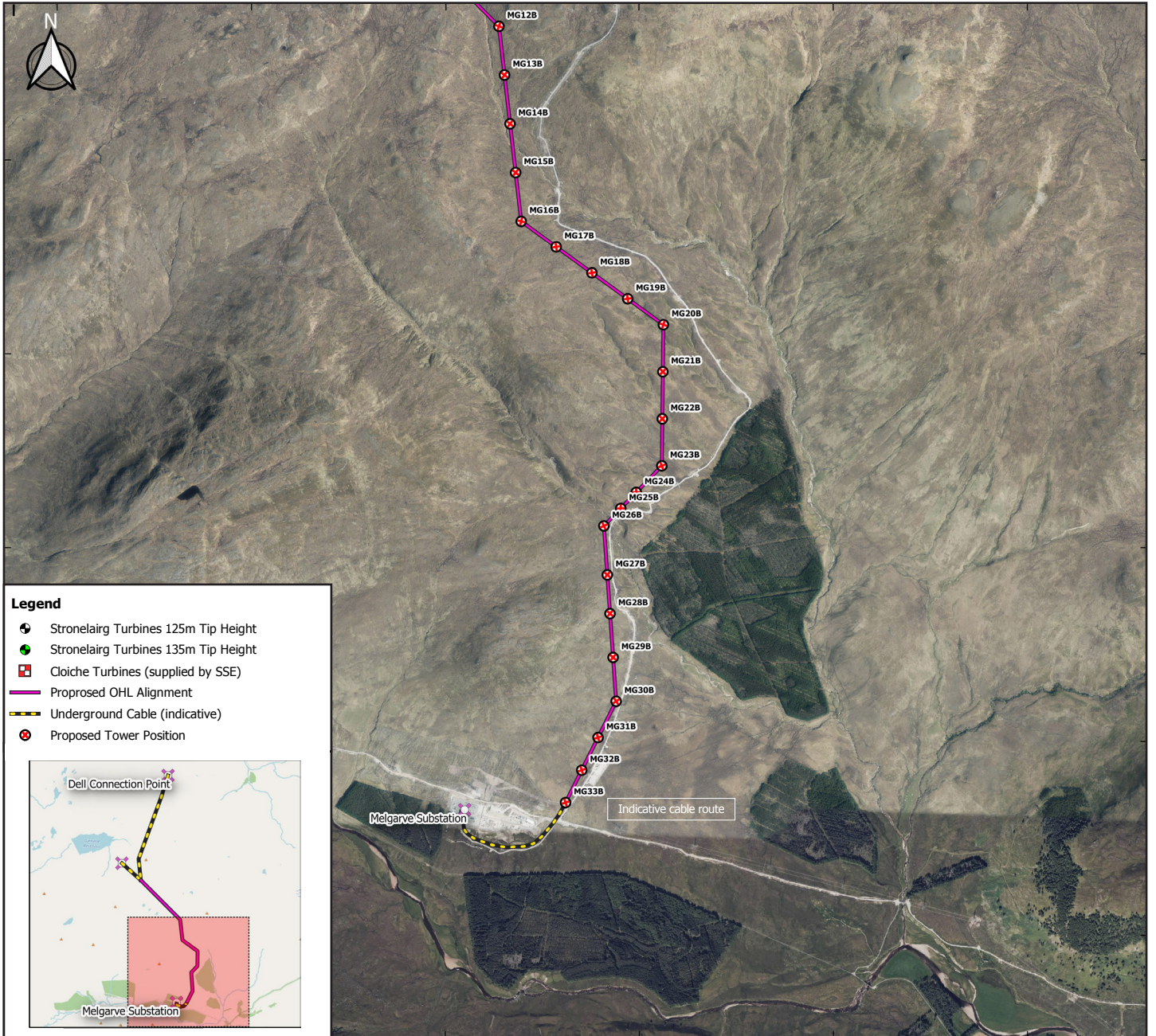


This includes a mixture of UGC (through the existing Stronelairg wind farm where it is proposed to run alongside the existing/proposed access roads from Dell to Cloiche) and OHL from Junction A off the plateau, on the more direct southerly alignment (S1-OHL-1A). The route will continue via OHL between Junction B and C on the western alignment before reverting to UGC to cross under the Beaulay–Denny powerline on the approach to Melgarve substation.

This preferred alignment has been selected on the basis that they are considered to provide an optimum balance of environmental, technical and other factors. Environmentally whilst the OHL sections of this alignment may be less preferable from a landscape and ornithological standpoint, it would minimise potential disturbance to peatland habitats and watercourses by the OHL spanning over sensitive areas. Environmentally, the differences between alignments and technology choices are subtle due to these competing benefits/disbenefits. Engineering-wise this represents a technologically feasible, constructable and reliable solution which can make use of existing access roads as far as junction B, and from Cloiche northwards. The differences between alignments in engineering terms are more absolute. Some issues have been experienced with cabling in this vicinity and future maintenance issues would be minimised by this technology choice and alignment. More widely this route represents value for money, whilst respecting all the technological and environmental constraints of the area.

Proposed tower positions





Technical considerations

OHL technology

The connection of Dell and Cloiche wind farms into Melgarve substation were initially proposed to be via two new 132kV single circuit OHLs but following stakeholder feedback, and due to technical constraints within the wind farm, it is now proposed the connections are via a combined solution of UGC and a new 132kV double circuit lattice tower OHL.

An underground cable connection from Dell and Cloiche substation is required due to the proximity and wake effect of the wind turbines on the OHL. Both UGC connections will merge to one point out of the wake effect zone and need to transition onto to a Double circuit OHL (at Junction A).

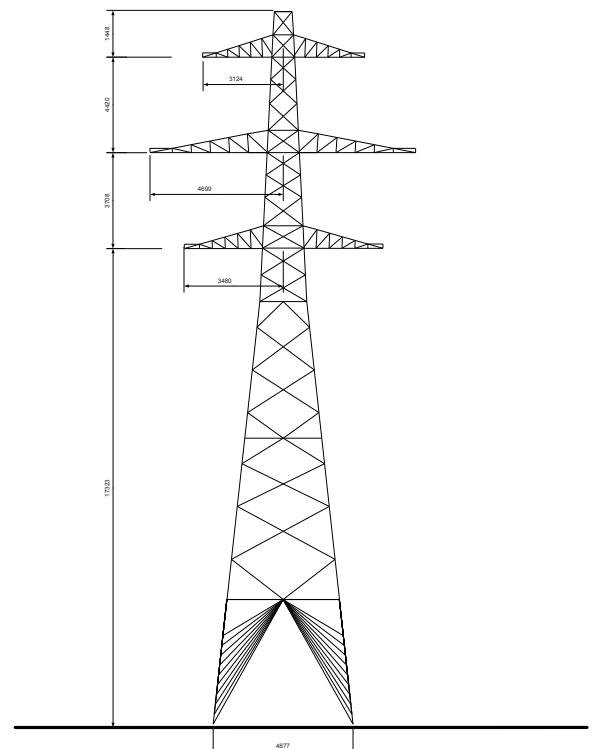
An example of the proposed tower type is shown on the right. As Cloiche and Dell wind farms follow the same preferred alignment, this gave the opportunity to combine both onto one OHL. This tower type was selected due to the high altitude involved. 132kV circuits can be strung on wood pole trident structures, which are smaller and less visible in the landscape. However, these structures are not suitable for these connections, due both to the high capacity of the connection required and the high wind, ice and snow loadings that they would be subjected to.



For construction, access roads are likely to be required to each tower location and these will be predominantly made of stone to allow safe access to the construction sites. Design development will establish the extent of permanent access tracks required. Concrete foundations will then be installed at each leg and covered over with soil and turf. The tower steelwork will then be delivered and assembled on site and erected using a crane. The conductor and earth wire will then be installed in sections before connecting into the proposed UGC sealing end compounds.

The Dell and Cloiche connections will then need to transition onto an UGC again to cross underneath the existing Beaulay–Denny OHL and connect into Melgarve substation. It is proposed that the OHL will terminate into cable sealing end compounds* and then UGCs will be installed into the Melgarve substation (*this consists of a terminal tower that allows the OHL conductor to connect onto a UGC).

The preferred OHL alignment has the benefit of an existing access track that can be utilised for construction for some of its length, is more direct and the terrain is generally less steep than other routes.



The overhead line route options were evaluated in terms of the following engineering considerations:

- Major crossings such as overhead lines (132kV, 275kV, 400kV, HVDC), rail, bridges, rivers, canals, oil and gas pipelines or hydro pipelines;
- Road crossings;
- Elevation;
- Contaminated land;
- Flooding;
- Terrain;
- Peat;
- Access;
- 132kV Angle Towers;
- Proximity (inc. to existing wind farms)

Underground cable

Cloiche and Dell wind farm connection

The Cloiche and Dell wind farms connect to the OHL circuit via the use of underground cable to junction A where both will enter a cable sealing end compound and transition onto OHL. Cable is being used for this section due to the potential impact of wake on OHL circuits when they are within three rotor diameters of wind turbines.

The Dell cable is expected to be approximately 6.2km in length and use a single cable per phase* 630mm² aluminium cable**. The Cloiche cable is expected to be 1.3km in length and use a single cable per phase* 2000mm² copper cable**.

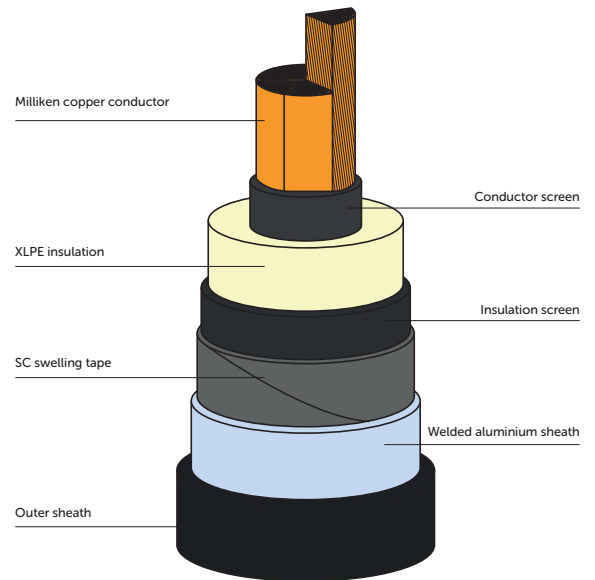
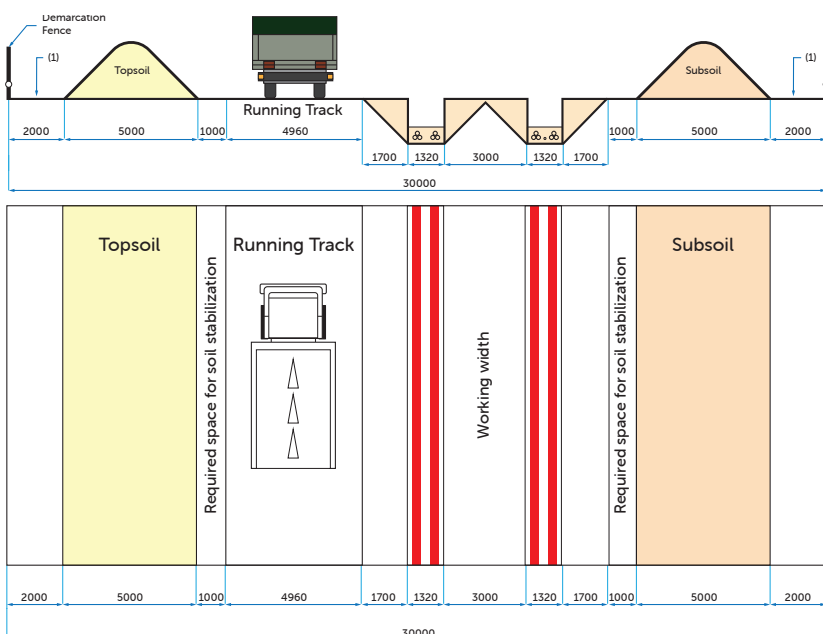
Where the OHL circuits approach Melgarve, the connection reverts to underground cable to cross under the existing Beauy Denny OHL and enter the substation. The OHL will transition to underground cable via a cable sealing end compound at Junction C and the cable*** will be approx. 1.1km in length passing to the East of Melgarve substation and loop into the site from the south.

It is proposed that the cable section near Melgarve will be accessed for construction/maintenance via the existing Stronelaig access track. Design development will establish the extent of any permanent access tracks required for operational maintenance purposes of the cable section connecting both wind farms to Junction A.

*HV circuits are comprised of 3 phases.

** Cable size/type determined based on the required load and the cable route at this stage and subject to revision as the project develops and and detailed design studies continue.

***The cable used to enter Melgarve will match that of the connections from the wind farms to Junction A.



The UGC alignment options were considered in terms of the following:

Major crossings eg. OHL (132kV and above), rail, loch, rivers/canals/streams, motorways/ major roads, pipelines/cables, bridges;

- Elevation;
- Contaminated land;
- Flooding;
- Terrain;
- Rock;
- Peat;
- Access;
- Angles of deviation;
- Cable Haul Road;
- Proximity to wind farms.

The drawing to the left shows an indicative construction corridor for a double circuit cable installation including running track for vehicles and separate storage areas for topsoil and subsoil. The 30m corridor width required is more impactful on Protected Species, habitats and watercourses than OHL. The 30m corridor width required is more impactful on protected species, habitats and watercourses than OHL.

OHL/UGC consents and environmental considerations

The Dell and Cloiche connection OHL sections into Melgarve substation require consent by the Scottish Ministers under Section 37 of the Electricity Act 1989 (as amended), referred to as “S37 consent”, prior to construction commencing.

Underground cables can be installed as Permitted Development under Class 40 of the Town & Country Planning (General Permitted Development) (Scotland) Order 1992 (as amended). Permitted development rights only apply where the works can be shown to have no significant environmental impact on designated areas and assets.

Where access tracks are required to facilitate installation of cable, planning permission will be required from the Highland Council under the Town & Country Planning (Scotland) Act 1997.

The development of SSEN Transmission’s projects is undertaken via a systematic process and includes stakeholder consultation at key stages. In this case, where notable concerns were raised about the preferred technology type, SSEN Transmission has revisited the preferred technical solution.

SSEN Transmission’s license obligations are to develop an efficient, co-ordinated and economical system of electricity transmission. As such SSEN Transmission is obliged to seek the most cost-effective solution, which is usually an OHL connection.

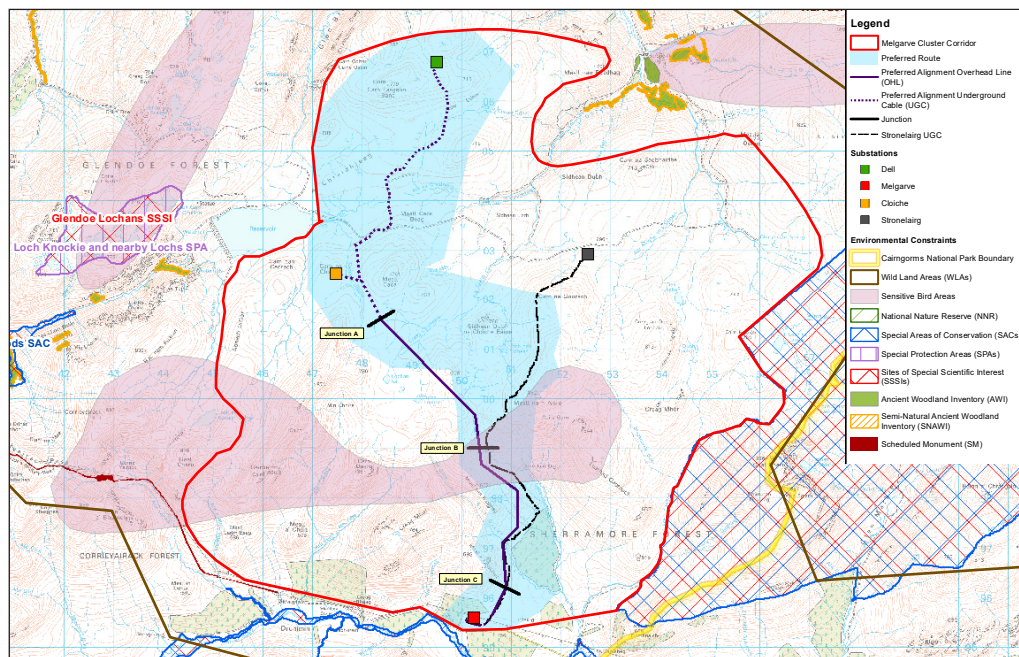
Key environmental sensitivities for the development of the Dell and Cloiche connections are potential adverse effects to landscape and visual amenity, sensitive peatland habitats,

protected species, Ornithology (including Golden Eagle and Slavonian Grebe) and cultural heritage. Whilst some issues are more impacted upon by an OHL proposals (landscape and visual/ornithological), other factors are more affected by the introduction of UGC (sensitive habitats, peatland). This makes the assessment of preferred alignments and technology choices difficult as differences are subtle, and associated with pros and cons.

Following extensive survey work and assessment of options against environmental information gathered to date, and considering engineering and other factors, our preferred alignment is however considered to balance out these competing factors and reduce impacts on peatland habitats, protected species and watercourses.

Once the proposed alignment is selected, SSEN Transmission will progress detailed engineering design and further detailed environmental assessments to identify key issues of concern, identify potential effects and mitigate those which are deemed to be significant effects through detailed alignment selection and the Environmental Impact Appraisal (EIA) process.

The drawing below provides the environmental setting and the preferred alignment:



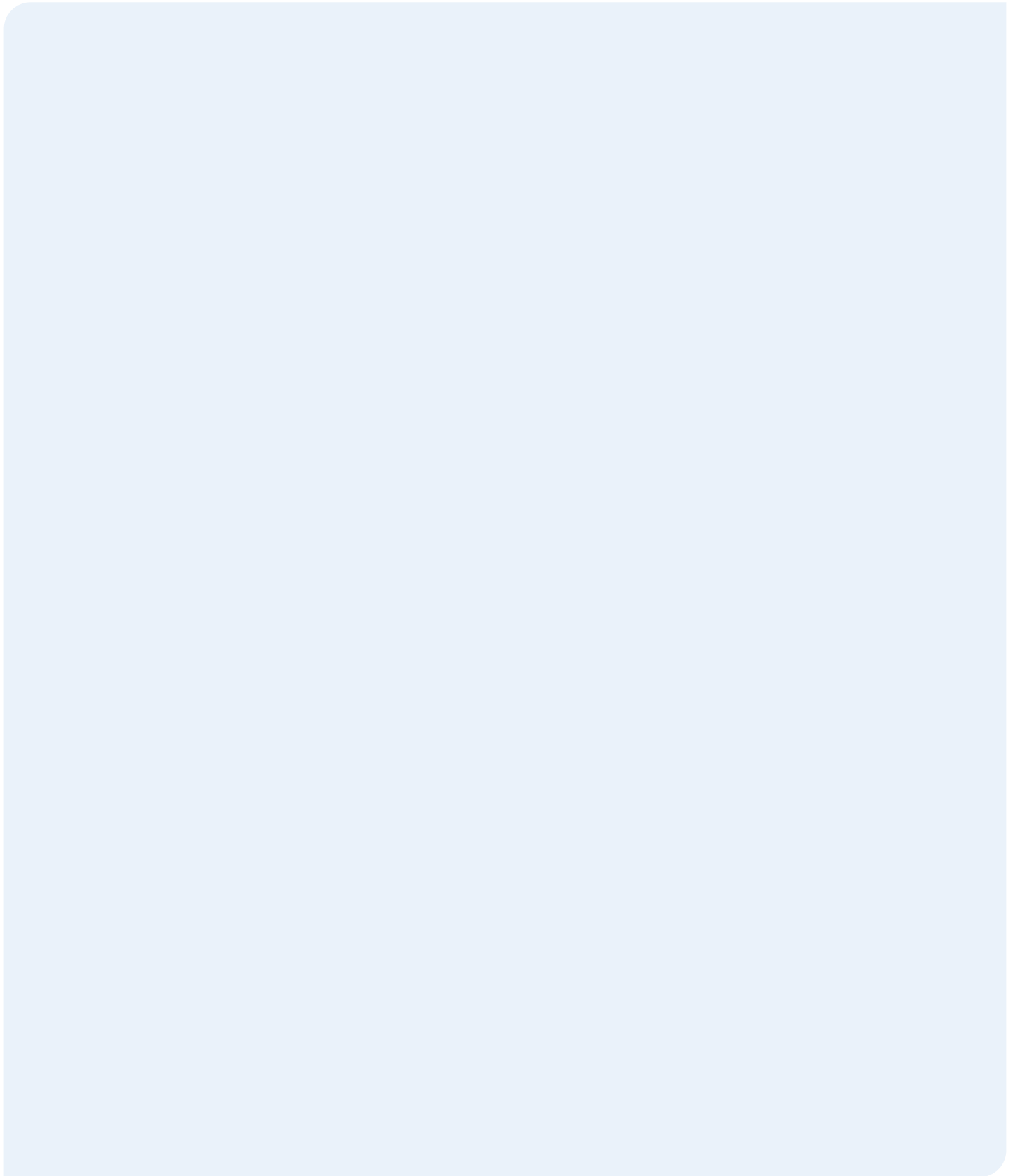
The next steps in the consenting process are to:

- Conclude alignment options assessment;
- Undertake EIA screening and scoping (if EIA required);
- Undertake detailed environmental assessments and reporting on the preferred technical solution;
- Submit an application to the Scottish Ministers for S37 consent for Dell and Cloiche;
- Submit planning applications for access tracks where required.

Notes

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Notes



Notes

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What happens now and how do I have my say?

We understand and recognise the value of the feedback provided by members of the public during all engagements and consultations. Without this valuable feedback, the project development team would be unable to progress projects and reach a balanced proposal.

We are keen to receive your views and comments in regards to the following questions:

- Has the need for the project been clearly explained?
- Are there any additional factors, or environmental features, that you consider important and should be brought to the attention of the project team?
- Have we been clear in providing the reasons for selecting our preferred alignment?
- Have we explained the approach taken to select the preferred alignment adequately?
- Do you have any other comments regarding the alignment?
- Overall, how do you feel about the Melgarve Cluster project?



To support everyone online, we provide accessibility and language options on our website through 'Recite Me'. The accessibility and language support options provided by 'Recite Me' include text-to-speech functionality, fully customisable styling features, reading aids, and a translation tool with over 100 languages, including 35 text-to-speech.

Please select "Accessibility" on our website to try out our inclusive toolbar."

Comments

Your views and comments can be provided to the project team by completing a feedback form or by writing to Louise Anderson, Community Liaison Manager.

We will be seeking feedback from the members of the public and Statutory Bodies by **10 March 2023**.

All received feedback will be assessed and the proposed options adapted where necessary.


Feedback


Feedback can be submitted online via the project website or via the project Community Liaison Manager:



Louise Anderson
Lead Community Liaison Manager

 louise.anderson@sse.com

 **T:** +44(0)1738 457 495
M: +44(0) 7384 454 233

 SSEN Transmission,
200 Dunkeld Road,
Perth, PH1 3GH

Additional information

Information will also be made available via the project webpage and social media channels:

Project website:

ssen-transmission.co.uk/projects/project-map/melgarve-cluster/

Follow us on Facebook:

[@assencommunity](https://www.facebook.com/assencommunity)

Follow us on Twitter:

[@assetransmission](https://twitter.com/assetransmission)

Your feedback

Thank you for taking the time to read this consultation booklet. In order to record your views and improve the effectiveness of our consultation, please complete this short feedback form.

Please complete in **BLOCK CAPITALS**. (Please tick one box per question only)

Q1 Has the need for the project been clearly explained?

Yes No Unsure

Comments:

Q2 Are there any additional factors, or environmental features, that you consider important and should be brought to the attention of the project team?

Yes No Unsure

Comments:

Q3 Have we been clear in providing the reasons for selecting our preferred alignment?

Yes No Unsure

Comments:

Q4 Have we explained the approach taken to select the preferred alignment adequately?

Yes No Unsure

Comments:

Q5 Do you have any other comments regarding the alignment?

Yes No Unsure

Comments:

Q6 Overall, how do you feel about the Melgarve Cluster project?

Support Object Neither support nor object

Comments:

Full name

Address

Telephone

Email

If you would like to be kept informed of progress on the project please tick this box.

If you would like your comments to remain anonymous please tick this box.

Thank you for taking the time to complete this feedback form.

Please submit your completed form by one of the methods below:

Post: 200 Dunkeld Road, Perth, PH1 3GH

Email: louise.anderson@sse.com

Online: ssen-transmission.co.uk/projects/project-map/melgarve-cluster/

Download: Comments forms and all the information from today's event will also be available to download from the project website.

The feedback form and all information provided in this booklet can also be downloaded from the project websites.

Any information given on the feedback form can be used and published anonymously as part of Scottish and Southern Electricity Networks consultation report. By completing this feedback form you consent to Scottish and Southern Electricity Networks using feedback for this purpose.

Scottish and Southern Electricity Networks is a trading name of: Scottish and Southern Energy Power Distribution Limited Registered in Scotland No. SC213459; Scottish Hydro Electric Transmission plc Registered in Scotland No. SC213461; Scottish Hydro Electric Power Distribution plc Registered in Scotland No. SC213460; (all having their Registered Offices at Inveralmond House 200 Dunkeld Road Perth PH1 3AQ); and Southern Electric Power Distribution plc Registered in England & Wales No. 04094290 having its Registered Office at Number One Forbury Place, 43 Forbury Road, Reading, Berkshire, RG1 3JH which are members of the SSE Group.

