

Balallan 132kV Switching Station and Balallan - Stornoway 132kV overhead line replacement

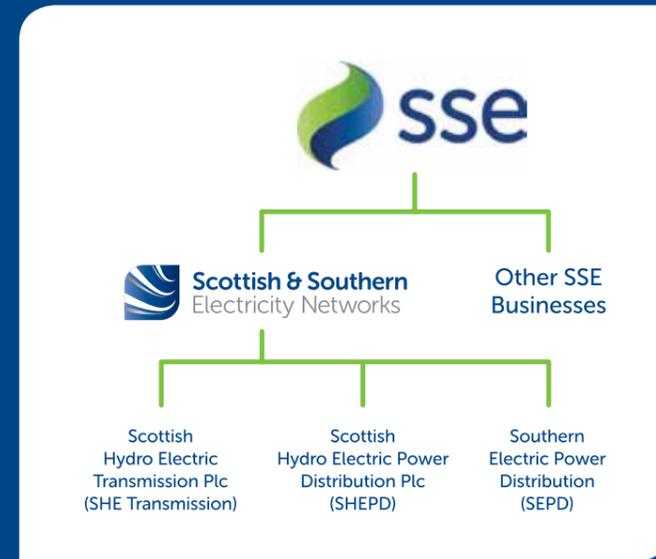
Tuesday 18 September 2018



Scottish & Southern
Electricity Networks

Who we are

We are Scottish and Southern Electricity Networks, operating under license as Scottish Hydro Electric Transmission Plc (SHE Transmission) for the transmission of electricity 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. The transmission network connects large scale generation, primarily renewables, to central and southern Scotland and the rest of Great Britain.

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



In total we maintain about 5,000km of overhead lines and underground cables – easily enough to stretch across the Atlantic from John O’Groats all the way to Boston in the USA.

Our network crosses some of the UK’s most challenging terrain – including circuits that are buried under the seabed, are located over 750m above sea level and up to 250km long.

The landscape and environment that contribute to the challenges we face also give the area a rich resource for renewable energy generation. There is a high demand to connect from new wind, hydro and marine generators which rely on Scottish and Southern Electricity Networks to provide a physical link between the new sources of power and electricity users. Scottish and Southern Electricity Networks is delivering a major programme of investment to ensure that the network is ready to meet the needs of our customers in the future.

Our responsibilities

We have a licence for the transmission of electricity in the north of Scotland and we are closely regulated by the energy regulator Ofgem.

Our licence stipulates that we must develop and maintain an efficient, co-ordinated and economical system of electricity transmission.

Project Need and Overview

The development of onshore renewables on Lewis, particularly in the onshore wind sector, has driven a requirement to reinforce the electricity network on the island to cater for the increased generation capacity and to allow for the export of this power to the mainland.

To support the connection of the Uisenis wind farm, located to the south of Stornoway, the following works have been identified:

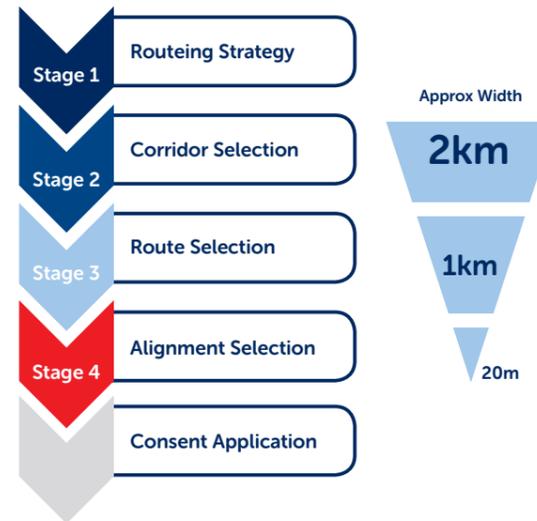
- The construction of approximately 25km of new 132kV Overhead Line to replace the uprated section between Balallan and Stornoway of the line linking Lewis, Harris and Skye
- The construction of a new Gas Insulated Switching Station near Balallan, to facilitate the connection of the Uisenis wind farm onto the electricity transmission network
- Connections of the new Overhead Line to Balallan, Stornoway Grid Supply Point and the new Arnish Substation. The connection at Arnish facilitates the transfer of electricity to the mainland via the proposed HVDC link
- The removal of the existing 132kV Overhead Line between Balallan and Stornoway Grid Supply Point.



Key benefits of these works will include the facilitation of connecting local renewables, planned and future, onto the network, as well as improving the security of the electricity network on Lewis.

Overhead Line Routeing

SHE Transmission's approach to identifying where a new OHL is to be routed follows the four stages illustrated below:



This project is currently at Stage 4 – Alignment Selection. Each stage in the process is iterative, increasing in detail and resolution to find the best balance of economic, technical and environmental considerations. This staged process leads to the eventual identification of a proposed alignment to be taken to consent application stage.

The objective of Stage 4 is to identify a 'preferred alignment'. When replacing existing lines, unless there are significant economic, technical or environmental constraints, we endeavour to route the new line as close to the original as possible (usually around 50m to allow for safe construction).

This defines our corridor and route, enabling us to concentrate on getting the best alignment taking cognisance of environmental issues including:

- Visual amenity
- Landscape character
- Nature conservation
- Land use and recreation
- Archaeology
- Soils and geology
- Hydrology

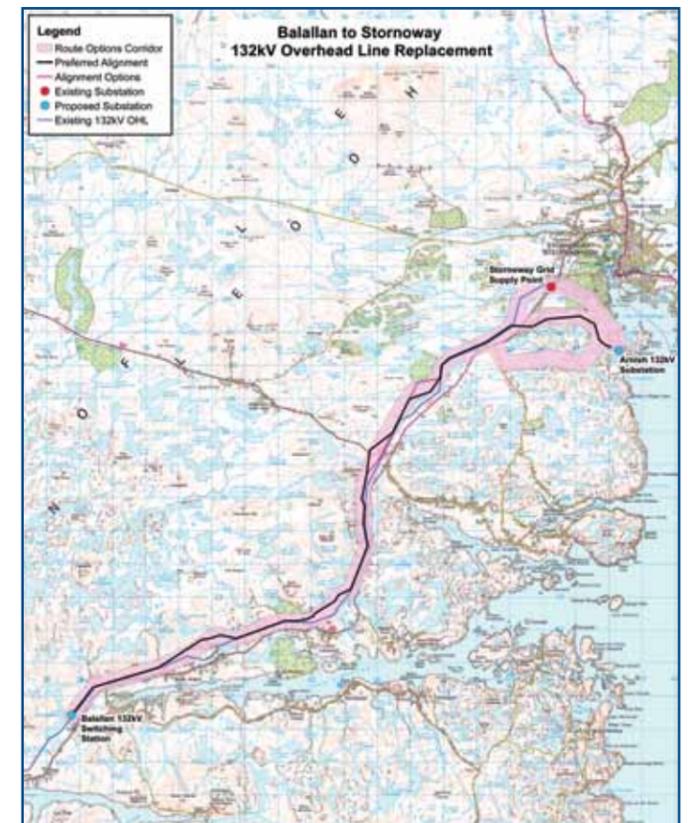
During Stage 4 the engineering, land and environmental teams systematically evaluate a variety of alignment options. The preferred alignment is the option considered to present the best opportunity to achieve an economically viable, technically feasible and environmentally acceptable alignment for consent application.

For the majority of the route we are able to follow the existing 132kV OHL, siting the new line further to the west in many cases to reduce its visibility from the road. However, the existing line terminates at Stornoway substation, whereas the new line is required to connect a Grid Supply Point (GSP) to the new substation and convertor station at Arnish. In order to achieve this, three route options were identified leading into Arnish, which were appraised and compared.

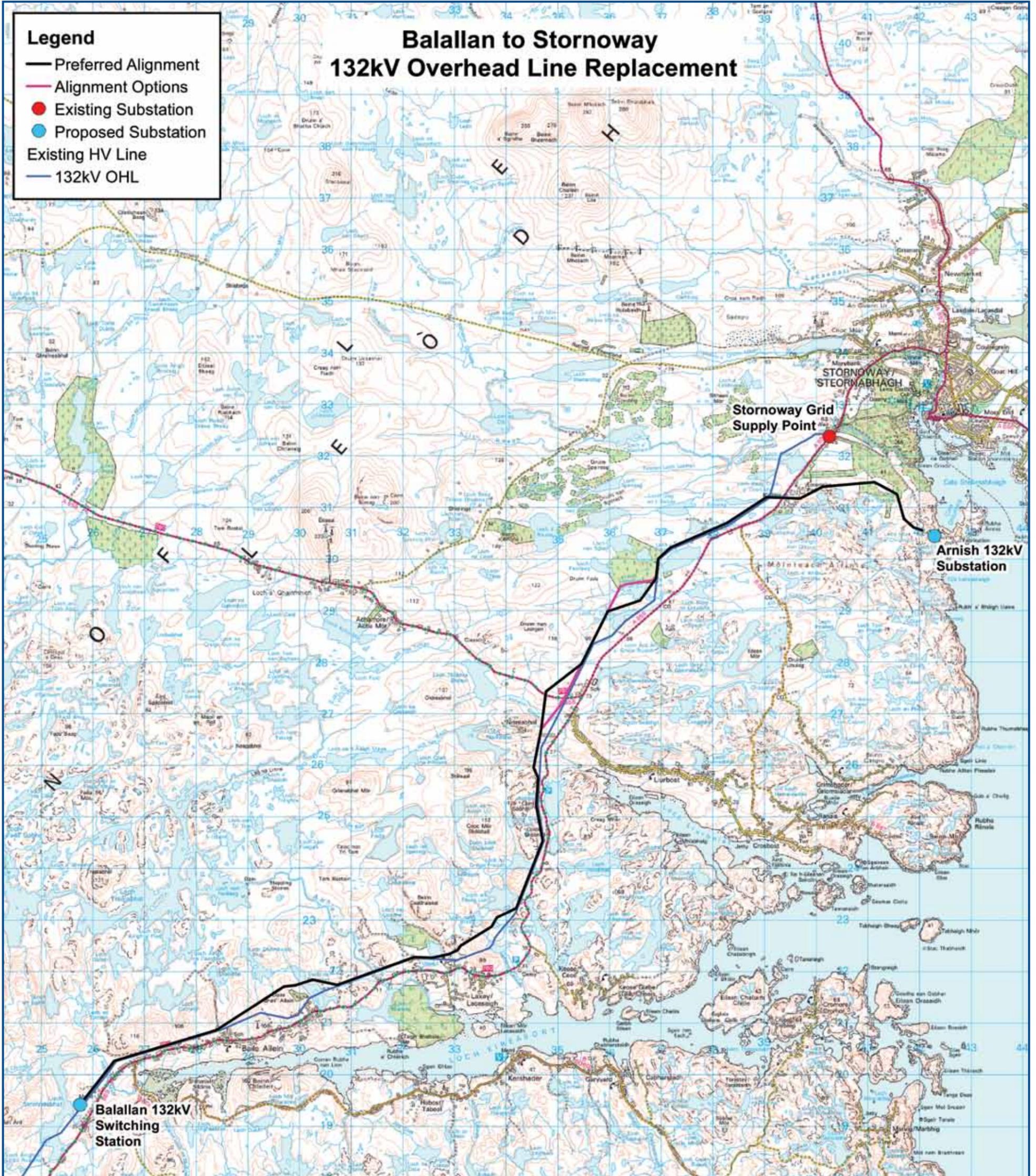
Assessment of the three routes showed that the most southerly route had technical challenges and significant potential ornithology constraints so was ruled out.

The northerly route follows an existing line and will likely be required for Druim Leathann's connection.

The central corridor was the least constrained and was therefore selected as the preferred route to be taken forward to the alignment stage.



Preferred Alignment Map



Wood Pole Line

The proposed technology for the Overhead Line is to be Wood Poles in a H Pole Configuration, carrying a single three phase 132kV circuit and a fibre optic cable.



Construction of an overhead wood pole line

The wooden H poles will require the construction of foundations consisting of granular material, securing the pole via surrounding an anchor on the end of it, the erection of the poles themselves and the stringing of the lines with the electrical conductors and fibre optic for communications. Methods of accessing the pole locations will vary dependent on terrain and ground conditions, with permanent or temporary stone access tracks, temporary track using ground mats, all terrain vehicles or helicopters used as required.

These will facilitate the delivery of materials such as aggregates for the foundations, the poles themselves, insulators, the electrical conductors and construction plant to the required locations. Foundations will be dug out by excavator, with the required granular material placed by hand and excavator.

The poles themselves can be erected through the use of telehandlers, cranes or helicopters to place them onto their foundations.

The conductors are strung through using winches located between spans of the poles, which assist in pulling the conductors from one pole to the next. Temporary working areas will need to be created at selected pole locations to allow the set up of the winch equipment.

Once construction is complete infrastructure identified as temporary is removed and reinstated to allow the natural vegetation to grow again.



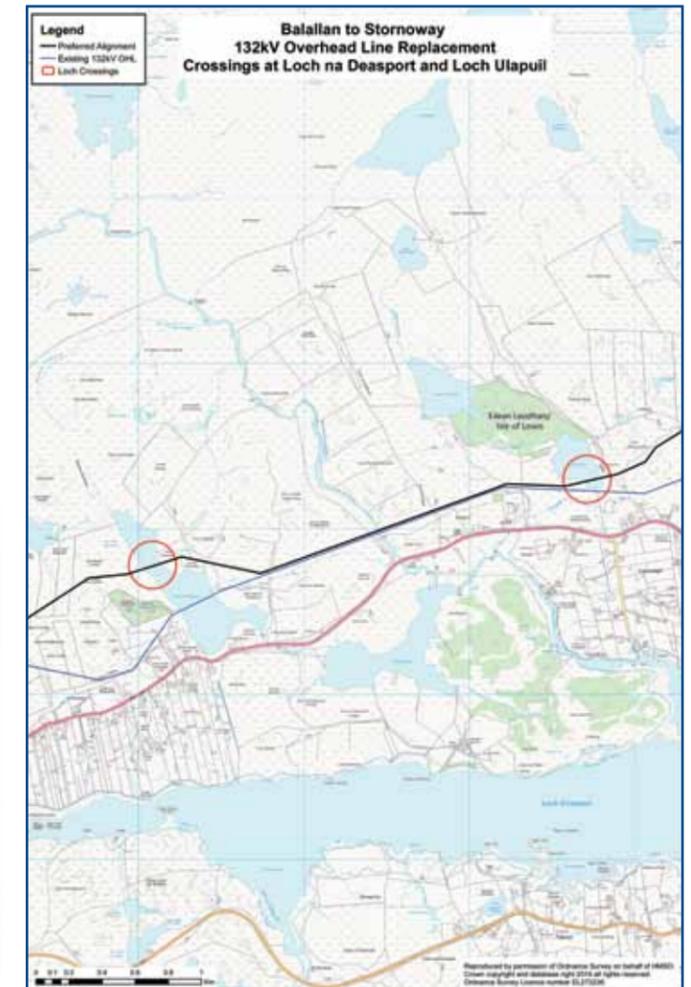
Composite Poles

Owing to the lengths of the spans required to cross Loch na Deasport and Loch Ulapuil, composite poles are required. The rest of the line will be built using wood pole overhead line.



Due to the length of crossing at Loch na Deasport and Loch Ulapuil, where a wooden H pole does not have the capacity to support the span of conductor required, it is proposed to use composite poles at these two locations. Composite poles can be constructed of resin infused fibre glass or using steel poles with composite fittings.

The construction techniques and appearance are very similar to that of a wood pole, with a black or brown external coating, but their properties allow larger spans to be accommodated to overcome challenging terrain, hence their proposal to cross the two identified lochs. Four poles in total will be required to be composite.



Balallan 132kV Switching Station

The Switching Station will house all the required Gas Insulated Switchgear (GIS) and accommodate the 132kV overhead line connection from Uisenis and the 132kV overhead line connections to Harris and to Arnish.

The Switching Station will enable the Uisenis wind farm to connect onto the new 132kV Overhead Line and export to the National Grid. To reduce the size of the footprint required, Gas Insulated Switchgear (GIS) has been utilised which provides a footprint approximately 2/3 smaller than that of traditional Air Insulated Switchgear. A permanent access road will be built into the site from the A859.

Preliminary outline building dimensions are expected to be 27m (long) x 12m (wide) x 12m (high) within an overall switching station plot measuring approximately 50m x 50m.



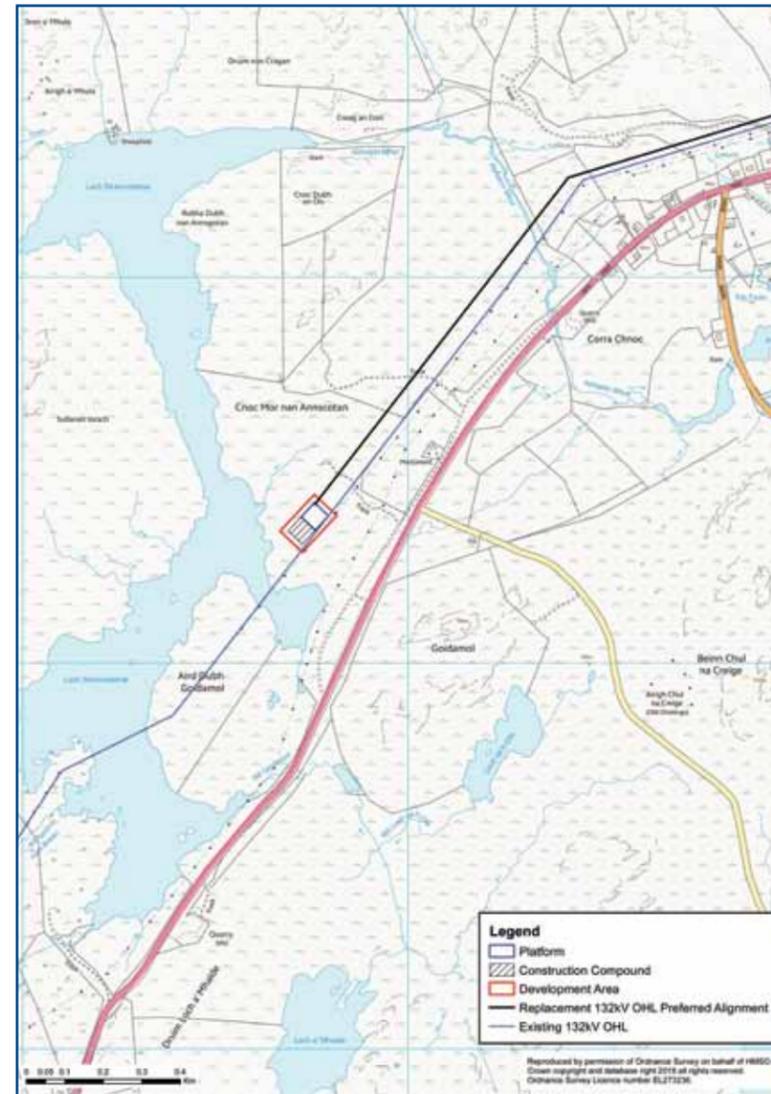
An example of a 132kV GIS Switching Station



An example of standard 132kV GIS equipment housed inside a Switching Station.

The Switching Station will also include ancillary equipment on the ground floor including control and protection panels, communication equipment, low voltage switchgear, batteries and welfare facilities.

Balallan 132kV Switching Station Location Plan

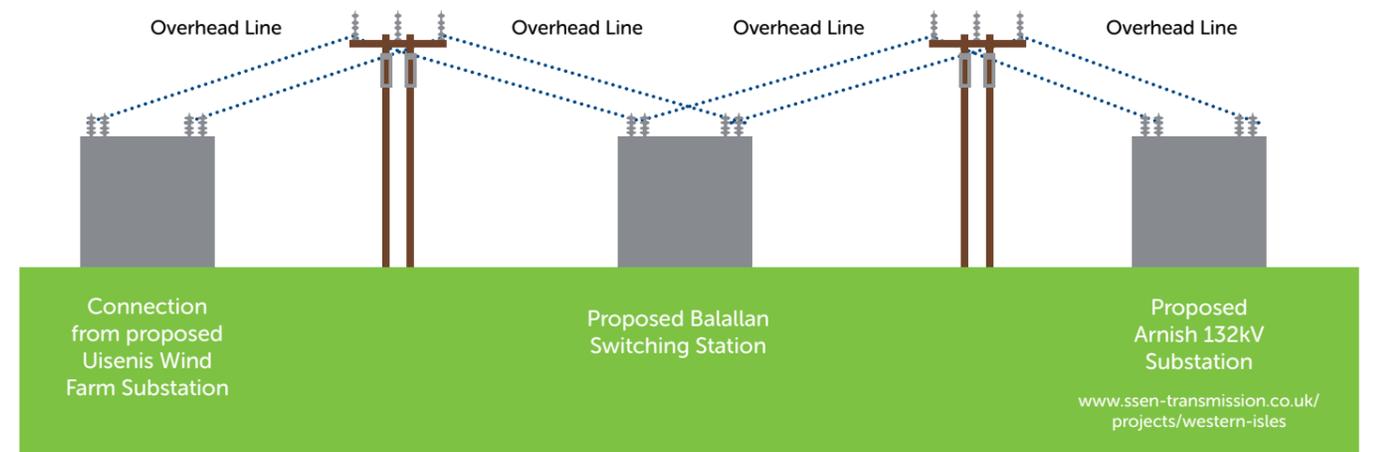


Project Timeline

Current forecasted programme subject to change



Project Diagram



www.ssen-transmission.co.uk/projects/western-isles

Wind Farm Connections

There are currently three contracted wind farm schemes on Lewis requiring connections to the Transmission network. Each of these connections is anticipated to be via a similar 132kV "Trident" wood pole overhead line between the wind farm substation and SSEN's proposed substation at Arnish.

The design and development of the overhead line routes will be undertaken over the next 12-15 months and will follow our routing process.

The routing assessment work will involve inputs from land, environmental and engineering teams. Further consultation with statutory bodies, the public and landowners will be undertaken on these projects in 2019.

1 Druim Leathann wind farm

Druim Leathann Windfarm is located west of Tolsta and 16km north east of Stornoway.

- Generation **49MW**

www.forsaenergy.com

2 Stornoway wind farm

The Stornoway wind farm is located to the west of Stornoway

- Generation **129.6MW**

www.stornowaywind.co.uk

3 Uisenis wind farm

Uisenis wind farm is located at Muaitheabhal on the Isle of Lewis.

- Generation **162MW**



Notes

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 requirement for the project been clearly explained?
- Have we explained the approach taken to select the proposed route adequately?
- Have we explained the approach taken to select the proposed Switching Station site adequately?
- Are there any additional factors, or environmental features, that you consider important and should be brought to the attention of the project team?
- Do you have any other comments about the proposed route?
- Do you have any other comments about the Switching Station?
- Following review of the provided information, how would you describe your understanding of the Balallan to Stornoway Connection Project?
- Overall how do you feel about the Balallan to Stornoway Connection Project?
- And finally, from your experience to date, can you rate the quality of the consultation undertaken on the Balallan to Stornoway Connection Project.

Comments

Your views and comments can be provided to the project team by completing a feedback form or by writing to Lisa Marchi-Grey, Community Liaison Manager.

We will be seeking feedback from members of the public and Statutory Bodies until Friday 26th October 2018.

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

Community Liaison Manager Lisa Marchi-Grey



lisa.marchi@sse.com



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Inverness, IV1 1SN



www.ssen-transmission.co.uk/projects/balallan-switching-station-and-132kv-ohl

Additional Information

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

Project Website:

www.ssen-transmission.co.uk/projects/balallan-switching-station-and-132kv-ohl

Find us on Facebook:

SSEN Community

Follow us on Twitter:

@ssencommunity



Your Feedback

Thank you for taking the time to attend this consultation event. 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 requirement for the project been clearly explained?

Yes No Unsure

Q2a Have we explained the approach taken to select the proposed route adequately?

Yes No Unsure

Q2b Have we explained the approach taken to select the proposed Switching Station site adequately?

Yes No Unsure

Q3 Are there any additional factors, or environmental features, that you consider important and should be brought to the attention of the project team?
COMMENTS:

Q4a Do you have any other comments about the proposed route?
COMMENTS:

Q4b Do you have any other comments about the Switching Station?
COMMENTS:



Q5 Following review of the provided information, how would you describe your understanding of the Balallan to Stornoway Connection Project?

- I am very well informed Know a lot Know a little
 Know very little Know nothing at all

Q6 Overall how do you feel about the Balallan to Stornoway Consultation Project?

- Support Neither support or object Object

Q7 And finally, from your experience to date, can you rate the quality of the consultation undertaken on the Balallan to Stornoway Connection Project.

- Excellent Quite good Neither good not poor
 Poor Very poor

Please use the space below to provide further comments:

Full name

Address

Postcode

Telephone

Email

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

We would like to send you relevant communications via email such as invitations to stakeholder events, surveys, updates on projects, services and future developments from the Scottish and Southern Electricity Networks group listed below. If you are happy to receive email updates please opt in by ticking the box below. You can unsubscribe at any time by contacting us at unsubscribe@ssen.co.uk or by clicking on the unsubscribe link that will be at the end of each of our emails.

For information on how we collect and process your data please see our privacy notice available at today's event. This can also be obtained online at www.ssen.co.uk/PrivacyNotice/.

Would you like to sign up for email updates?

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

Please hand your completed form in at the event or alternatively by one of the methods below:

Post: Lisa Marchi-Grey, Scottish and Southern Electricity Networks, 10 Henderson Road, Inverness, IV1 1SN **Email:** lisa.marchi@sse.com

Closing date for feedback is 16:00, Friday 26th October 2018.

The feedback form and all information provided at the event can also be downloaded from the dedicated website:

www.ssen-transmission.co.uk/projects/balallan-switching-station-and-132kv-ohl

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.

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