

Peterhead Net Zero 2030 Developments

Consultation Booklet

January 2023



Scottish & Southern
Electricity Networks

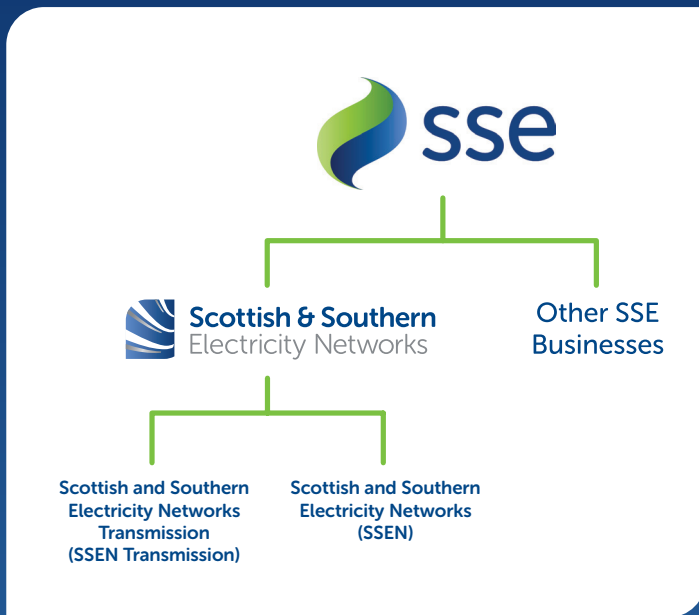
TRANSMISSION

Contents

- 03 Who we are
- 04 The Pathway to 2030
Holistic Network Design
- 05 Project need and overview
- 06 Substation and Converter
station site selection process
- 07 Site options
- 08 Project timeline
- 09 Our consultation process
- 10 Environmental and
social considerations
- 11 Working with
landowners and occupiers
- 12 Other projects in
the Peterhead area
- 13 Connection projects
- 14 What happens now and
how do I have my say?
- 15 Your feedback

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.



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

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.

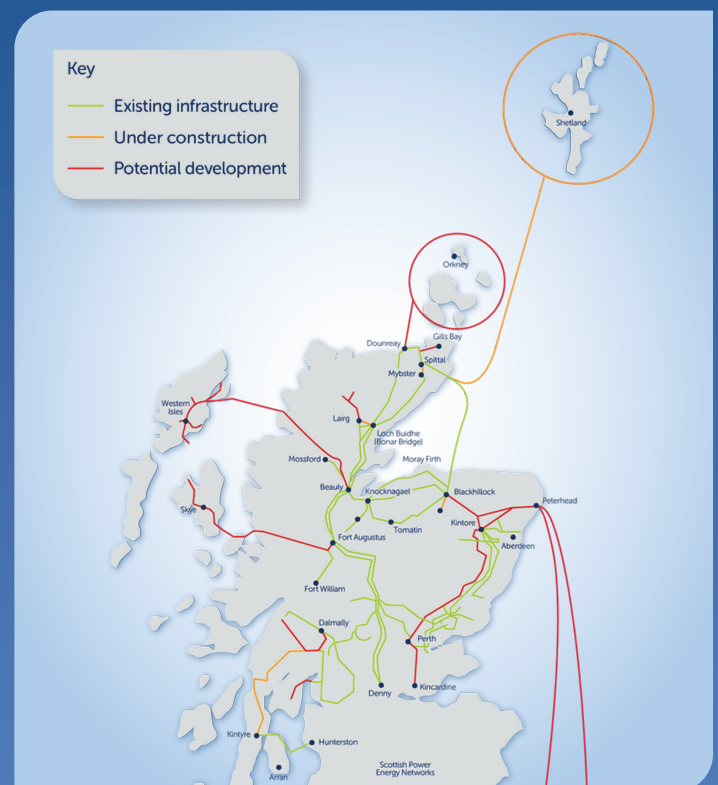
Our network crosses some of the UK’s most challenging terrain—including circuits that are buried under the seabed, are located over 750m above sea level and up to 250km long.

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.

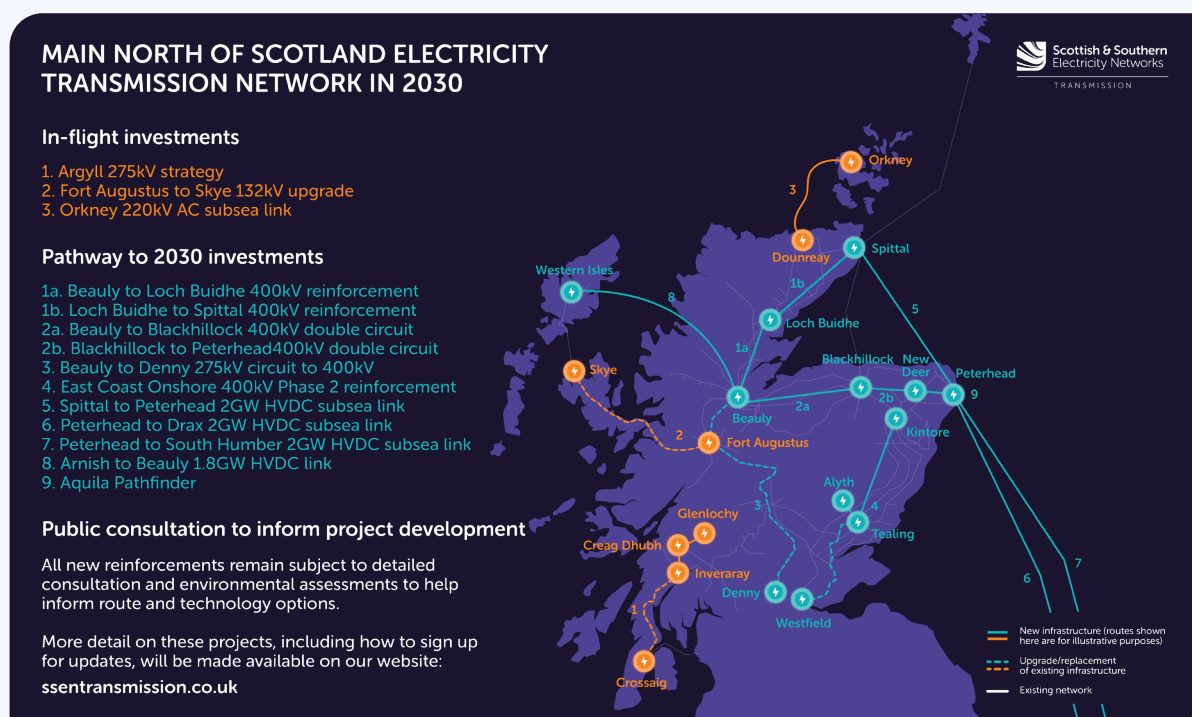
Our licence stipulates that we must develop and maintain an efficient, co-ordinated and economical system of electricity transmission.



The Pathway to 2030 Holistic Network Design

In July 2022, National Grid, the Energy System Operator (ESO) published their 'Pathway to 2030 Holistic Network Design', setting out the blueprint for the electricity transmission network infrastructure required to enable the forecasted growth in renewable electricity across Great Britain, including the UK and Scottish Governments 2030 offshore wind targets of 50GW and 11GW respectively.

For the north of Scotland, this confirms the need for over £7bn of investment in onshore electricity transmission infrastructure to deliver 2030 targets and a pathway to net zero, requiring accelerated development to meet 2030 connection dates. This need is further underlined within the British Energy Security Strategy which sets out the UK Government's plans to accelerate homegrown power for greater energy independence.



What does this mean for the North and North East of Scotland specifically?

Extensive studies informing the ESO's Pathway to 2030 Holistic Network Design confirmed the need to reinforce the onshore corridors between Beauly and Peterhead, Beauly and Spittal and an offshore subsea cable between Spittal and Peterhead.

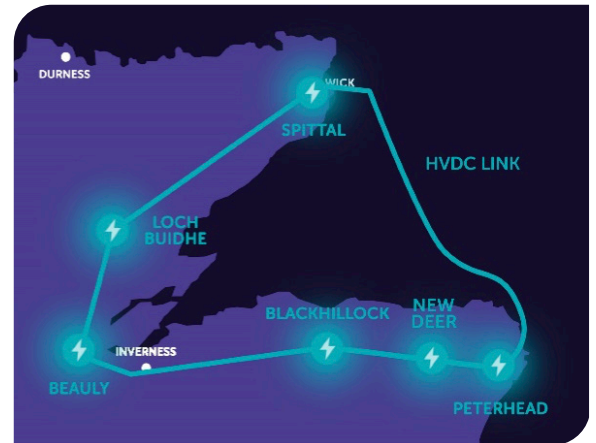
Providing a 400kV overhead line and 525kV subsea cable connection between these sites provides the significant capacity required to take power from large scale onshore and offshore renewable generation (mainly wind farms) to the north east mainland of Scotland. From there, it will be transported to demand centres throughout the UK via subsea High-Voltage Direct Current (HVDC) links. To enable these new connections, new 400kV substations are also required at key locations as shown on the map above. At Spittal, Beauly and Peterhead, high voltage Alternating Current/ Direct Current (AC/DC) converter stations are also required to convert AC electricity to DC (and vice versa), from offshore subsea connections from the Western Isles, between Spittal and Peterhead and Peterhead to England. These 'hub' areas will also allow offshore and onshore renewable generation to connect to the reinforced electricity network.

As such, these projects have been highlighted as critical to enable the delivery of the UK and Scottish Governments targets, with a requirement for accelerated development and delivery.

Project need and overview

Project need

To achieve the Peterhead Net Zero 2030 Developments, there is a requirement to develop a second 400kV substation and a second 132kV substation at Peterhead. Furthermore, to facilitate the power transmission from new generators in the north of Scotland to the demand centres throughout the UK, a further HVDC link is required between Peterhead and South Humber. This doubles the export capacity of the existing scheme already in development between Peterhead and Yorkshire. This further link is also interconnected with the HVDC link between Spittal and Peterhead, resulting in a DC network to allow for the high capacity of onshore and offshore connections required to deliver 2030 targets. An area of approximately 100 Hectares is required to facilitate the project with the aim to keep all elements of the project within the one site to help minimise impact to the local community.



Project overview

Peterhead 400kV Substation 2

A second 400kV substation is required in the Peterhead area to support offshore and onshore electricity generation connections as well as onshore and offshore transmission infrastructure in the area. The substation, similar to the first 400kV substation, due to be commissioned in 2023, will be based on an enclosed Gas Insulated Switchgear (GIS) solution.

Peterhead 132kV Substation 2

A second 132kV substation is required in the Peterhead area to support further future generation and storage connections from third party developers. The substation, similar to the existing 132kV substation will be based on an enclosed Gas Insulated Switchgear (GIS) solution.

Spittal to Peterhead HVDC Link Converter Station

A 2GW bi-pole, 525kV HVDC link between Spittal, Caithness and Peterhead. This enables the efficient high volume power transmission from generators in the far north of Scotland to the network at Peterhead for further transmission to demand centres as appropriate. This project element consists of 2 HVDC converter stations, one at each end of the link with approximately, 220km of subsea and underground DC cable route along with the associated AC cable to the connecting substations.

Peterhead to South Humber HVDC Link Converter Station

A 2GW bi-pole, 525kV HVDC link between Peterhead and South Humber. This enables the efficient high volume power transmission from generators in the north east of Scotland to demand centres in the south of England. This project element consists of 2 HVDC converter stations, one at each end of the link with approximately, 640km of subsea and underground DC cable route along with the associated AC cable to the connecting substations.

HVDC Switching Station

Due to the high number of DC links, and the potential need to support future DC customer connections, system studies have informed the need for a DC switching station at Peterhead. This project's ultimate aim is to deliver a interoperable 525kV Direct Current switching station (DCSS) which is required to facilitate the co-ordinated connection of offshore links and wind farms. This would reduce the required footprint for future DC connections and deliver a material net benefit to the community, environment, and consumers. The project also provides the opportunity to unlock the potential for full HVDC network interoperability which is a world first outside of China.

Substation and converter station site selection process

Overview of the substation site selection process

SSEN Transmission has developed and implemented a formal process for the selection of sites for new substations and converter stations. The main aim of the process is to provide a consistent approach to the selection of new substation sites, underpinned by our statutory obligations to:

Develop and maintain an efficient, co-ordinated and economical electricity transmission system within our licensed area and in doing so, to have regard to the desirability of preserving the natural beauty, of conserving flora, fauna and geological and physiographical features of special interest and protecting sites, buildings and objects of architectural, historic or archaeological interest; and do what we reasonably can to mitigate any effect which the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites buildings or objects as part of the Electricity Act 1989, Section 9 (2) and b.

Our site selection process ensures the design, consenting, construction and operation of a substation is done in a manner that is technically feasible and financially viable whilst, on balance, creating the least disturbance during construction and operation to the environment and the people who live, work, and use it for recreation. We aim to consult on this at various stages, ensuring key stakeholders have the opportunity to feed in to the process.

For most new projects following pre-site selection activities, the approach follows two principal stages, each iterative and increasing in detail and resolution, bringing cost, technical and environmental considerations together in a way which seeks the best balance at both stages. This staged process leads to the identification of a preferred site, which will be consulted on and assessed further before determining the optimal arrangement.

Key site selection stages

Pre-site selection activities:

The starting point in all site selection projects is to establish the need for the project and to select the preferred engineering option to deliver it. This is the purpose for establishing the Peterhead projects. This process will be triggered by the preparation of several internal assessments and documents.

Stage 1 - Initial site screening:

This stage has identified technically feasible, economically viable and environmentally acceptable site options within a defined area. The search area selected was dependant on terrain, other infrastructure, designated areas and features and connectivity. The aim is to identify several potential sites which can be further assessed for suitability.

Stage 2 - Detailed site selection:

This stage seeks to confirm, refine and thereafter finalise the preferred substation site options taken forward. This includes, seeking to avoid physical, environmental and amenity constraints where possible, being acceptable to stakeholders, and remaining economically viable; all whilst taking into account engineering and connection requirements.

Following further public and associated stakeholder consultation at Stage 2, the preferred site options being pursued will be updated to include any feedback and feasible modifications and refinements reflected in advance of taking forward to a planning application submission.

What happens next: the planning application process

The outcome of the above site selection process will culminate in seeking planning consent under the Town and Country Planning (Scotland) Act. The application will identify:

- The site boundary (the planning red line site 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 and electrical features, such as transformers.
- Any required landscape and biodiversity proposals (both in situ and remote to the proposed sites) will also be identified and detailed as part of each planning submission. In some cases, the application will be subject to Environmental Impact Assessment (EIA) under the Town and 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.

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

Site options

To identify potential sites for locating the required 2030 developments at Peterhead in support of the UK's net zero targets, the project team began with a search radius of approximately 10km from the existing Peterhead 275kV substation. Following initial site mapping and layout requirements an area of approximately 100 hectares was identified as necessary to efficiently collocate the proposed facilities, which after study of the existing geography within or close to the search area identified 13 identified potential locations.

These 13 sites were then taken forward to stage 1 of SSEN Transmission's site selection process. The process assessed aspects such as natural and cultural heritage, landscape and visual impacts, land use, environmental conditions, footprint requirements, hazardous ground conditions, access for connectivity as well as construction and maintenance.

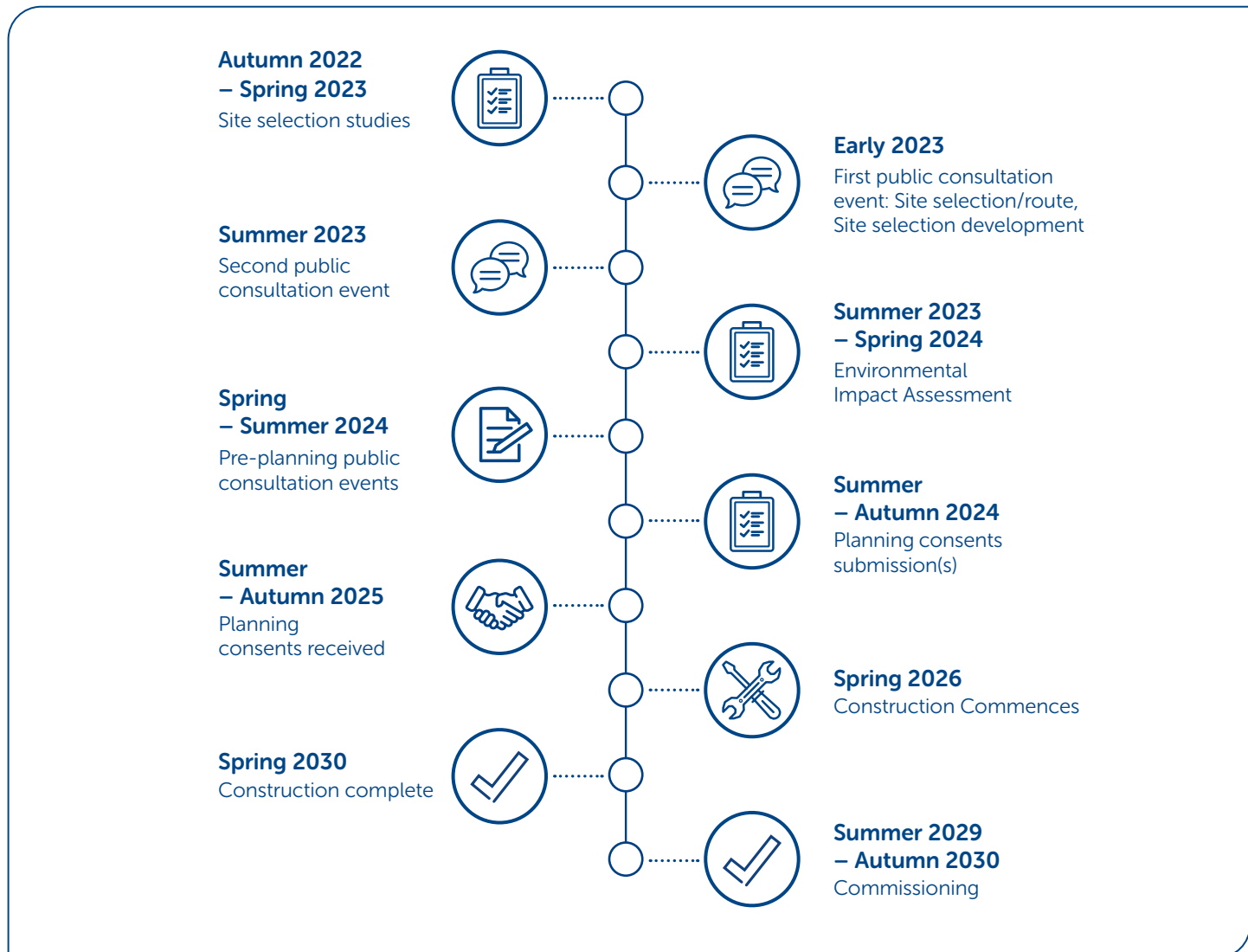
The results from the stage 1 process allowed us to narrow our initial 13 sites down to 4, as outlined in green on the OS map below, for further analysis as part of the stage 2 site selection process.



Next steps

Further studies will now be undertaken on sites 4, 7, 8 and 9 before a preferred site is selected. We aim to ensure the preferred site reflects the views of local stakeholders and are therefore keen to receive feedback regarding the remaining sites under consideration.

Project timeline





Our consultation process

At SSEN Transmission, we are committed to delivering a robust and transparent consultation process underpinned by inclusion and accessibility. As a stakeholder led business, we understand the importance of involving communities and key stakeholders throughout each stage of our development process.

This period of engagement in the development phase is vital in shaping our proposals and to do this effectively, we need to capture feedback from stakeholders, harness local knowledge to identify risks in key areas and explore potential community benefit opportunities. Today we are presenting our approach to developing these projects, including technology options, environmental considerations, the routing process, corridor selection and replace with site selection process and presenting maps which aim to give stakeholders and community members a better visual representation of the work on the project to date.



What we're consulting on today

Desktop surveys and early analysis have enabled us to identify our preferred technology and preferred sites within our study area. Sharing our approach to developing these projects and the rationale behind our early proposals, we are keen to hear stakeholder views regarding our preferred technology options, your thoughts on our preferred site options and if there are further considerations you believe need to be taken into account during the next stage of the development process.

Who we're consulting with

We are keen to hear feedback from a broad range of stakeholders including but not limited to local residents, landowners, businesses, non-statutory consultees and statutory consultees such as local authorities, Nature Scot, SEPA, Historic Environment Scotland and Scottish Forestry.

Environmental and social considerations

Environmental assessments and site surveys will be undertaken as we move through the stages of site selection to preferred site and consenting. This includes assessing landscape, visual and recreational amenity; ecology, habitats and ornithology; geology, hydrogeology and hydrology and cultural heritage of the potential options and then preferred sites. An assessment of environmental impact will be required as part of the Town and Country Planning consent application which will be subject to further rounds of consultation events.



Ecology, habitats and ornithology

Protected species and sensitive habitats could be present within the project area. However the short list of potential site options have been selected to avoid environmental designations and known sensitive habitats. The project will assess the risk to species and habitats as it moves through the stages of site selection, aiming to select a site with the least risk to the environment overall. Achieving a Biodiversity Net Gain for the site will be an overall objective of the preferred sites.



Landscape and visual amenity

The project site selection process aims to position sites in locations that minimises the effect on landscapes and visual amenity. The process being followed for the eastern hub will look at the visual impact of all the potential site options and will consider landscape designations, landscape character and residential proximity to the site locations.



Cultural heritage

Scheduled, non-scheduled cultural heritage, archaeology features will be mapped and risk assessed through the stages of site selection. The project works will be designed and constructed to ensure these features are avoided, where possible.

Where this is not possible, further site assessments will be conducted in consultation with the planning authority.



Geology, hydrology and hydrogeology

The geological and hydrological sensitivities of a site will be risk assessed throughout the stages of site selection and further refined once a preferred site is selected. The site and access points will be selected to minimise effects as far as possible.



Working with landowners and occupiers

SSEN Transmission recognises landowners and occupiers as key stakeholders in the development of our projects and is committed to consultation and engagement with all parties likely to have an interest in our proposals.

Due to the size and scale of the project, we have not been able to identify and contact all possible affected landowners at this site selection stage. However, within the next stage of site selection, we hope to have identified the vast majority of landowners and occupiers affected, and have made contact individually. As the project design develops, we will work with landowners and occupiers to mitigate the impact of our infrastructure on their properties. Our team of dedicated land managers will be on hand to answer queries and address concerns throughout. SSEN Transmission will be required to carry out various engineering and environmental surveys to inform the design process. Consent will be sought from affected landowners and occupiers in advance for these surveys.

Once we have finalised the design of the substation and HVDC infrastructure and associated works, we will be required to secure the appropriate land rights from the relevant parties. Our land managers will endeavour to reach a voluntary agreement with each party. In the event that agreement cannot be achieved, we would look to utilise our statutory powers under the Electricity Act 1989. Our statutory powers are used as a last resort, and we aim to work with landowners and occupiers in order to secure the necessary land rights voluntarily.

In the meantime, all landowners and occupiers have the opportunity to provide feedback at our in-person consultation events by submitting a feedback form. We would encourage all those with an interest to submit their views through this consultation.



Other projects in the Peterhead area

Projects in development

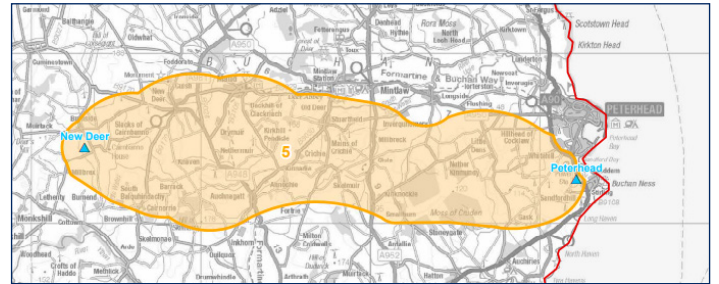
Beauly - Blackhillock - New Deer - Peterhead

This project has been identified as key to connecting the growth in onshore and offshore renewables across the north of Scotland. A 400kV overhead line connection, alongside new substations is needed to connect new renewable power sources and transport it from source to areas of demand across the country. Following initial consultation in Autumn 2022, further consultation will take place this Spring regarding route options.

Eastern HVDC Link (EGL2)

To support the ongoing growth of renewable generation in the area, SSEN Transmission propose to install a 2GW subsea High Voltage Direct Current (HVDC) link from Peterhead to Drax in Yorkshire. This will assist with reducing congestion on the onshore transmission network, by allowing the flow of energy via this subsea cable. This project is being jointly developed with National Grid Electricity Transmission and is currently progressing through the procurement and development stages.

Overhead line route corridor: New Deer to Peterhead



Peterhead 275kV Substation Refurbishment

Due to asset condition, there is a requirement to replace Super Grid Transformers SGT1 and SGT2 at Peterhead 275/132kV substation. Two new buildings will be created to house the new SGTs within a new compound to the southwest of the existing substation.

Projects in construction

Peterhead 400kV substation

Construction on our Peterhead 400kV substation commenced at the start of 2021 following our Principal Contractor completing their site set up in November 2020. The substation is required to facilitate the incoming North Connect HVDC Interconnector from Norway, but subsequently this will take in a connection from works included as part of the North East 400kV Reinforcements and provide a connecting point for the proposed Eastern Green Link 2. In 2022 we have erected two new 400kV overhead line steel lattice towers which will connect New Deer and the new 400kV Peterhead substation, the installation of two Super Grid Transformers (SGTs) will act as a bridge between the new and existing 275kV substation, with two 275kV underground cable circuits.



400kV Substation at Peterhead



Super Grid Transformer

Connection projects

As the transmission license holder in the north of Scotland, we have a duty under Section 9 of the Electricity Act 1989 to facilitate competition in the generation and supply of electricity. We have obligations to offer non-discriminatory terms for connection to the transmission system, both for new generation and for new sources of electricity demand.

As part of achieving Net Zero Targets and subject to planning consent, we have the obligation to connect the following contracted developments to the transmission network:

Alcemi battery storage facilities

This project is construction and wider reinforcement works for connection of two 500MW battery storage facilities in Peterhead. Overall, the project is still in the development stage with design optioneering as well as associated environmental and engineering design works ongoing. For more information on Alcemi developments please visit their website: www.alcemi.info/index.html

Salamander offshore wind farm

This project will enable the connection of Salamander wind farm to the transmission network. Overall, the project is in the early development stages with design optioneering as well as associated environmental and engineering design works ongoing. For more information on Salamander offshore developments please visit their website: www.salamanderfloatingwind.com

Central North Sea Electrification

This project will enable the connection of the Central North Sea Electrification (CNSE) project, to support the decarbonisation of offshore oil and gas platforms with a demand of 300MW, into the transmission network at

Peterhead. The project is in the early development stages with design optioneering as well as associated environmental and engineering design having just commenced.

Marram

This project will enable the connection of the Marram wind farm project into the transmission network at Peterhead. The project is in the early development stages with design optioneering as well as associated environmental and engineering design having just commenced. For more information on Marram developments please visit their website: www.marramwind.co.uk

Kinmuck solar and battery energy storage

The project is for construction and wider reinforcement works required to facilitate connection of a combined 105MW solar and battery storage and battery connection into the Peterhead area. Overall, the project is still in opportunity assessment stage where we are looking at design options, overhead line alignment options, environmental impacts and the overall best configuration to connect the solar panels and battery onto the network.



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:

- Have we adequately explained the need for these projects?
- Do you feel sufficient information has been provided to enable you to understand what is being proposed and why?
- Are you satisfied that our approach taken to site selection has been adequately explained?
- Are there any factors, or environmental features, that you consider may have been overlooked during the site selection process?
- Do you have any particular concerns or queries on the proposed projects?
- Do you have any other comments (positive or negative) or concerns in relation to the need for the projects, the transmission infrastructure requirements or about the site selection process?

Comments

Your views and comments can be provided to the project team by completing the feedback form or by writing to our Community Liaison Manager. All feedback received will be assessed and the proposed options adapted where necessary.

Feedback

We will be seeking feedback from members of the public on this exhibition until **Monday 27th February 2023**.

Feedback is welcomed throughout the development of the project. To provide comments on the proposal or to gain further information on the project, visit our virtual event or contact our Community Liaison Manager.



Dav Lynch
Community Liaison Manager



dav.s.lynch@sse.com



+44 (0) 1738 341283



Grampian House
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/peterhead-net-zero-2030-developments

Follow us on Facebook:

@ssencommunity

Follow us on Twitter:

@asetransmission

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 Have we adequately explained the need for these projects?

Yes No Unsure

Comments:

Q2 Do you feel sufficient information has been provided to enable you to understand what is being proposed and why?

Yes No Unsure

Comments:

Q3 Are you satisfied that our approach taken to site selection has been adequately explained?

Yes No Unsure

Comments:

Q4 Are there any factors, or environmental features, that you consider may have been overlooked during the site selection process?

Yes No Unsure

Comments:

Q5 Do you have any particular concerns or queries on the proposed project?

Yes No Unsure

Comments:

Q6 Do you have any other comments (positive or negative) or concerns in relation to the need for the project, the transmission infrastructure requirements or about the site selection process?

Yes No Unsure

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: Grampian House, 200 Dunkeld Road, Perth, PH1 3GH

Email: dav.s.lynch@asse.com

Online: ssen-transmission.co.uk/projects/project-map/peterhead-net-zero-2030-developments

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.

