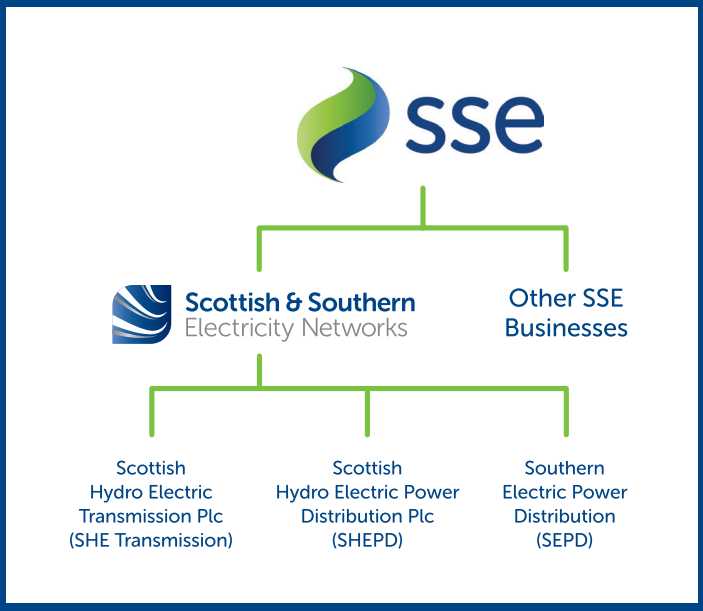
Kintore 400kV GIS Substation

May 2020

Scottish & Southern
Electricity Networks

Who we are

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



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.

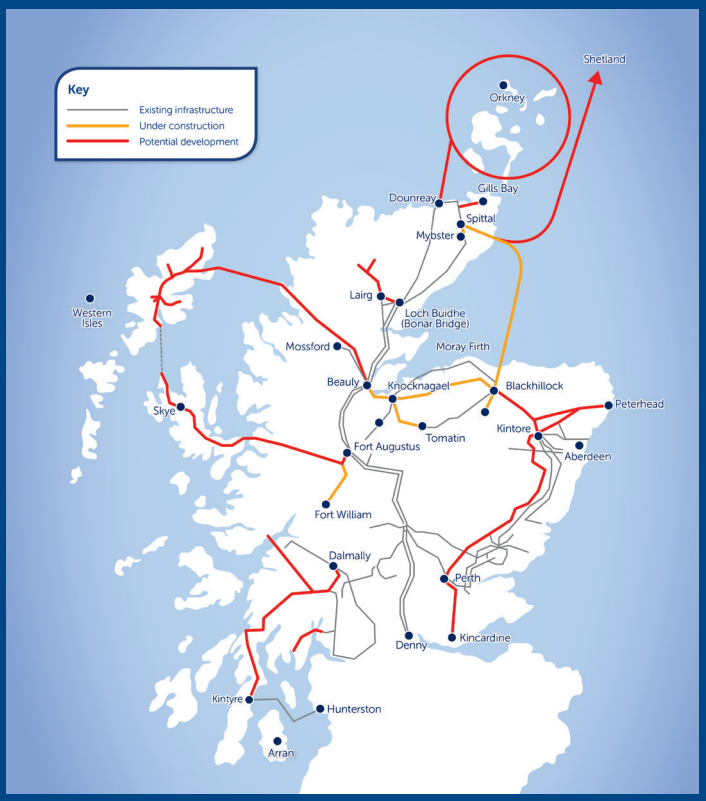
Our licence stipulates that we must develop and maintain an efficient, co-ordinated and economical system of electricity transmission.

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



Coronavirus: Covid-19 Pandemic

As transmission network operator in the north of Scotland, we play a vital role in powering the country, providing a safe and reliable supply of electricity at local, regional and national level, on which the people and organisations whose work is critical to the Coronavirus response depend. Our employees are working 24/7 to keep the network running, providing an essential service transporting energy to where it is needed. Working in some of the remotest parts of the UK, our employees and supporting contractors need to be able to move around the UK to ensure this work continues.

The Covid-19 outbreak and the necessary social measures introduced by government are unprecedented in recent times and we know that for the customers and the communities we serve, this may lead to concerns about the essential services we all rely on. Since the outbreak we have been collaborating daily with UK and Scottish Governments and local authorities across our network to ensure the continued safe and reliable supply of electricity.

In the absence of specific guidance and with companies understandably expected to use their judgement on what is critical, we are currently deeming critical activity to include work that is essential to the safe and reliable supply of electricity in the medium term, which includes meeting our regulatory obligations until the end of the coming winter. In conducting this critical work, there will be the need to be active on certain construction sites. We will continue to engage constructively with all relevant authorities, adapting our advice in line with what is clearly an evolving situation.

Whilst we are still present at some sites, all staff that can work remotely are now working from home, actively reducing the number of staff onsite. We are mindful of the current environment and our numbers and activities are much reduced as a consequence of this. For those based at site, increased hygiene and social distancing measures are being adhered to as per Scottish Government guidelines.

It is also for this reason that we cannot arrange a secondary formal public consultation at this time regarding our proposals. However we do still wish to engage with all our local partners and take on feedback wherever possible throughout the process.

In addition to this, we also deem it critical to ensure that we continue to submit planning applications for future developments which are deemed essential to operating the transmission network in a safe and secure manner for the future. It is for this reason that we are continuing with our current timescales regarding the proposed Kintore 400kV substation.

We are committed to continuing quality engagement with all our stakeholders as we all respond to the challenges facing us in the weeks and months ahead. You have our commitment that we will keep you up to date on what this means for our customers, communities and stakeholders.

Project Overview – Kintore 400kV substation

A number of significant projects connecting to the transmission network has triggered the need for a 400kV substation extension at Leylodge, Kintore.

Each year the electricity system operator National Grid (ESO) assesses all proposed networks reinforcements across Great Britain and provides a recommendation on whether these proposals should proceed. This is called the Networks Options Assessment (NOA). The NOA in 2018 and 2019 has provided "Proceed" signals for the East Coast and North East network to be reinforced to 400kV operation. To allow this, the north east and east coast networks require reinforcement via a new substation at Kintore. This involves a phased development of a new substation operating at 400kV, with 'Phase 1' completed to tie in with the network north of Kintore in October 2023 and 'Phase 2' completed for the network south of Kintore energising to 400kV operation in 2026.

To ensure the security and quality of supply of electricity in the transmission network we are proposing several upgrades and reinforcements across the north east and east coast of Scotland. More information on all these developments and the drivers for these proposed works can be found at:
https://www.ssen-transmission.co.uk/information-centre/north-east-east-coast-works

Following visits to Kintore in December 2019 and a public consultation event in March 2020, we have made amendments to our proposed design for a new 400kV substation at Leylodge, Kintore. In March we presented information on an Air Insulated Switchgear (AIS) solution, whilst introducing the possibility of a Gas Insulated Switchgear (GIS) alternative. It is our current view, with respect to the review of technical, economic and stakeholder information to proceed with a GIS solution.

Early 2020	Autumn/Winter 2019/2020	Spring/Summer 2020	Autumn/Winter 2020	Spring 2021 – Autumn 2026	Spring 2021 – Summer 2026	Autumn 2023 – Autumn 2026
Proposal of Application Notice	Surveys	Planning and Section 37 submission	Planning and Section 37 determination	Substation construction works (Phase 1 - Phase 2)	Overhead line works (Phase 1 - Phase 2)	Final commissioning and energisation (Phase 1 - Phase 2)

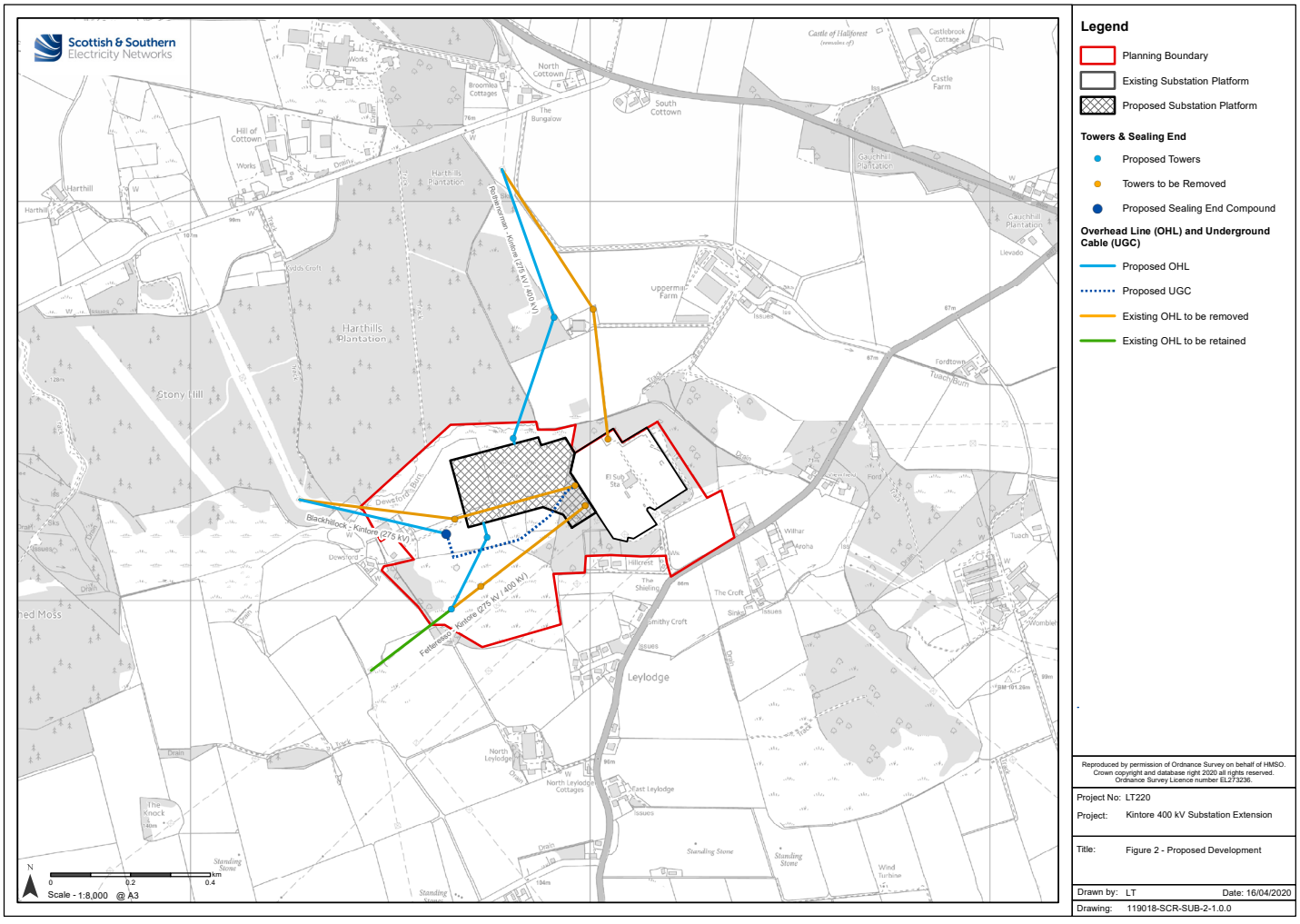
Planning Application

SHE Transmission currently has an existing consent to develop a 400kV substation at Leylodge, Kintore, which was approved in December 2012 and extended in November 2015. Since this time there have been changes to the needs of the network, which requires us to change our existing plans to ensure that we are delivering the most economic, coordinated and efficient solution for the consumer.

We have consulted with Aberdeenshire Council regarding these changes and following these discussions we will be submitting a new planning application to support our updated proposals. This will allow Aberdeenshire Council to give due consideration to the changes. It also provides an opportunity for consultees and members of the local community to provide feedback on our proposals.

We are intending on submitting our Town and Country Planning (Scotland) Act 1997 application for consent to Aberdeenshire Council in summer 2020. This will follow our review of the feedback we receive during the consultation period.

The proposed development will also require consent from the Scottish Governments Energy Consent Unit, through section 37 of the Electricity Act 1989. This will cover all aspects relating to the overhead line works associated with our proposals. These works comprise of a limited number of diversions and tie ins which relate to ongoing reinforcements associated with the wider east coast and north east transmission network.



Proposal of Application Notice Boundary

Our Proposed Solution

Proposed solution

Our chosen site for the proposed new substation is on the land north west of Leylodge, Kintore, Aberdeenshire. This site was chosen as it is adjacent to the existing substation in Kintore to which our proposals must electrically connect with.

The following additional factors were considered during the site selection appraisal review of the site for suitability including, ecology, drainage, topography, flood risk, ground conditions, access constraints and proximity to the existing transmission network. These were reviewed also, in line with our proposed Gas Insulated Switchgear (GIS) solution.

Construction of the substation will require plant and machinery, along with vehicles to transport materials and workers to site.

We are currently considering options for our substation design. It is the current view that a GIS substation will be the preferred solution.

Project Drivers

There are several key drivers which are triggering the need to amend our current proposals at Kintore. Over the coming years we will be proposing several ambitious projects and network reinforcements as we play our part in helping Great Britain transition towards achieving a Network for Net Zero.

There are a number of large renewable energy developments such as Moray East Offshore Windfarm, Moray West Offshore Windfarm, the NorthConnect HVDC Interconnector and Caithness-Moray HVDC link among others, which are driving the need to ensure that the transmission network in the north of Scotland can take energy from the source of generation to centres of demand in Scotland and across the rest of Great Britain.

As introduced, all of our proposed major reinforcements are assessed annually by the GB Electricity System Operator, National Grid ESO, as part of its Networks Options Assessment (NOA). Each year the NOA process will recommended whether a project should go ahead or not. The NOA process is one of the ways in which we ensure that the projects we proceed with are necessary.

Example of GIS equipment used at Beauly substation

Other works at Kintore

As part of our license condition, we are required to ensure the transmission network is operated as efficiently as possible. As we undertake regular assesment of our assets, we have identified a need to replace infrastructure which form part of the Kintore 132kV substation due to their age and condition. These works are required to be completed before 2026.

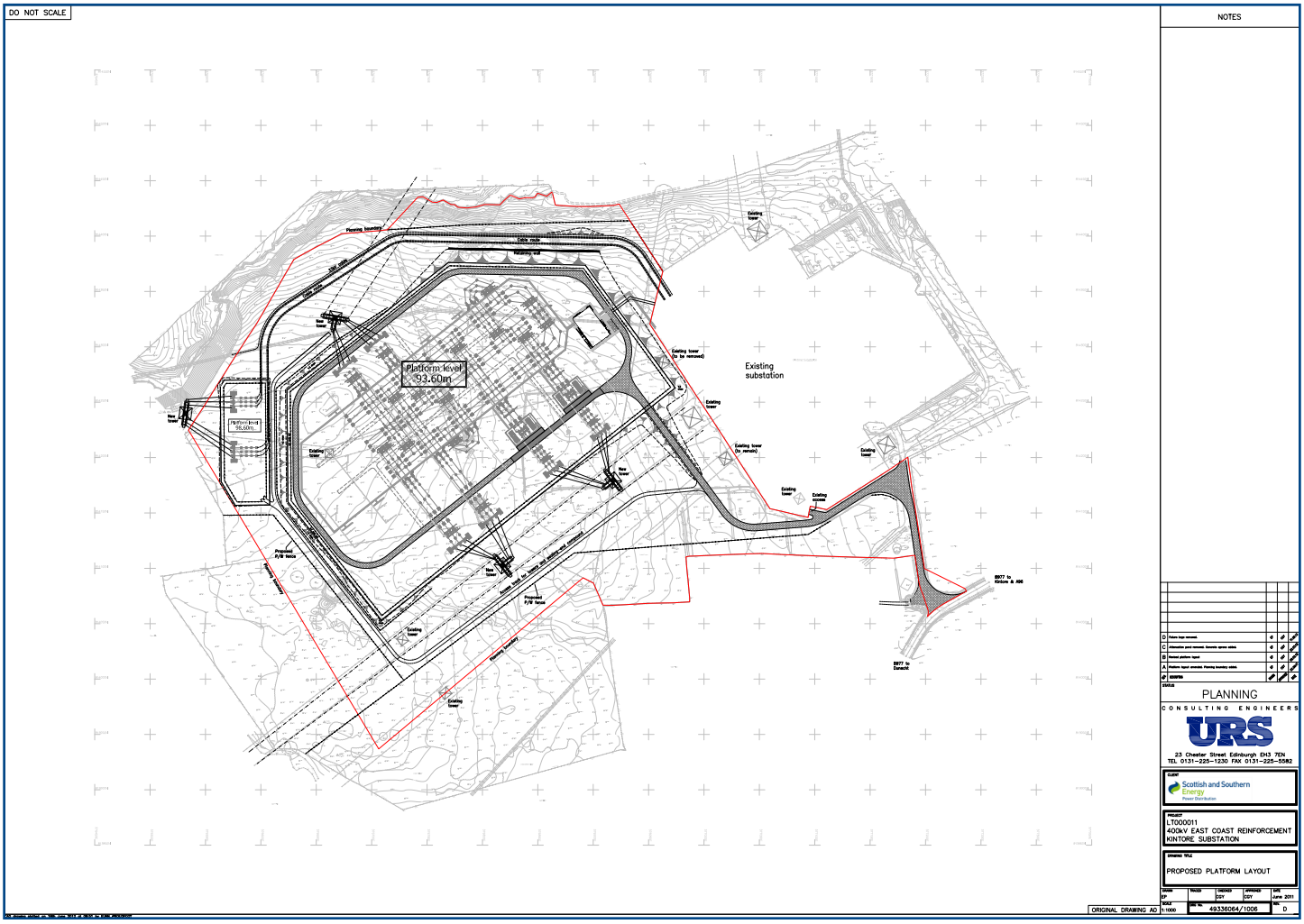
A number of options are being reviewed and it is likely that we will look to develop a new 132kV substation in close proximity to the existing 132kV substation site. The site options are currently being considered to ensure the most suitable location for replacement of the 132kV assets.

We have not concluded our options for a change of the Kintore 132kV busbar and we will be developing our technical solution and programme to meet the asset replacement timescales.

Our Consented Design

The below image depicts the approved proposals for an AIS substation, which we previously obtained planning permission for (please see page 6 for further information).

Our new proposal would be located at the same site and replace this existing planning consent with a new GIS proposal.



Our proposal – Design evolution

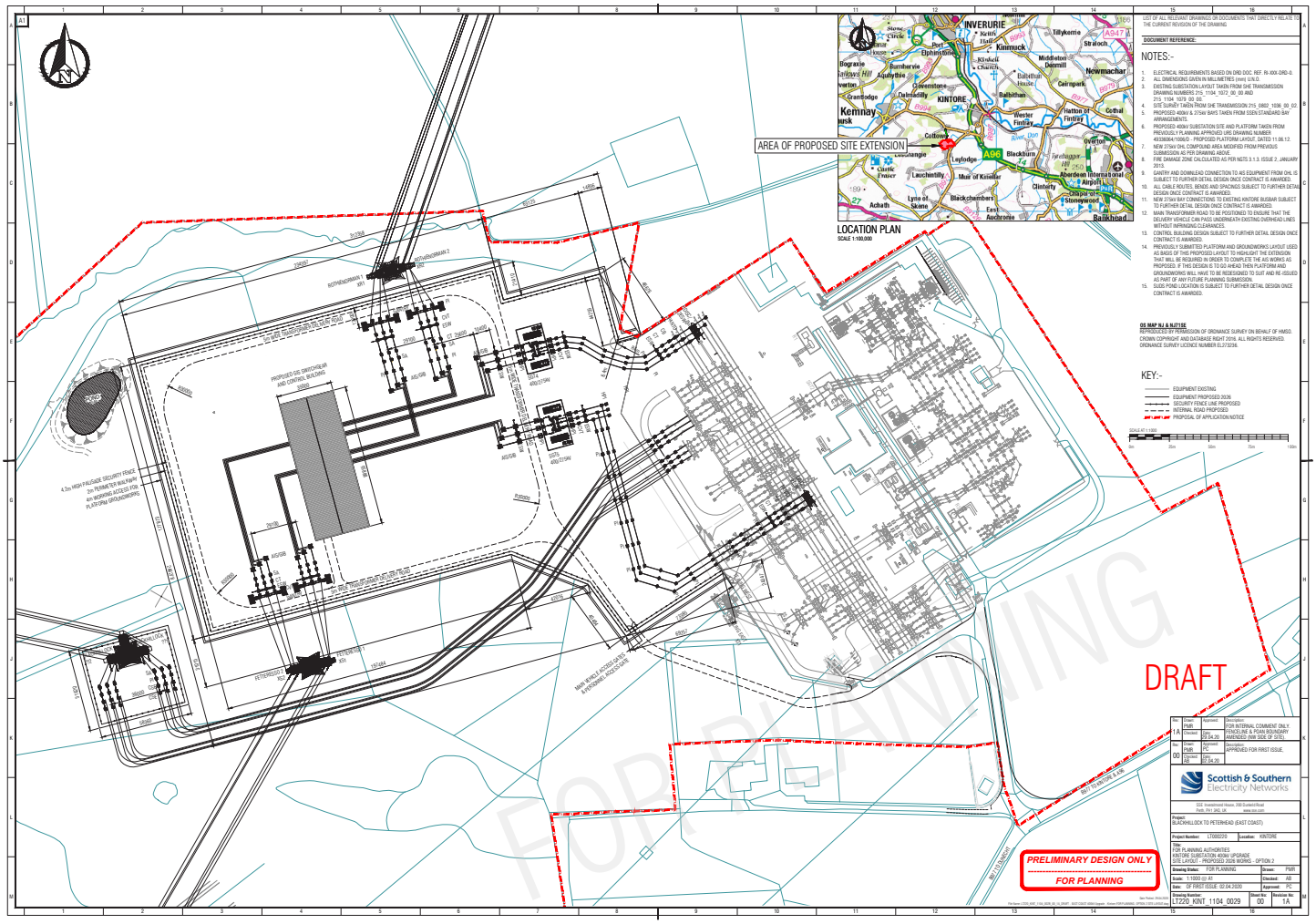
Since our March consultation we have been working through more detailed considerations with respect to installing a GIS solution. Our consultation feedback has provided a strong indication that a GIS option would be preferred over traditional AIS solutions.

In balance with this feedback, we have considered elements of its feasibility, including building orientation, positioning, dimensions and how it interacts with our existing infrastructure.

Our commitments to reach a Network for Net Zero has also been a key factor in the design evolution. The lower carbon switchgear options that are available to us make use of GIS technology. GIS substations have the considerable advantage of a much reduced scale of equivalent infrastructure.

Recent advancements and innovation of switchgear technology has provided SHE Transmission with an opportunity to consider a lower carbon potential GIS substation. This would allow SHE-Transmission to not only deliver a core part of infrastructure in a responsible, environmentally conscious manner, but also to reduce the size of our substation footprint and extent of the associated works, which would have been proposed under an AIS solution.

As a result we have been able to balance all of these considerations into the design we are proposing.



The main benefits of the GIS solution include the reduced footprint of the substation and its impact upon the local landscape and overhead line infrastructure and also the lower carbon potential of the substations construction and operation using a lower carbon solution

Project Details

The phased delivery of the Kintore 400kV substation sees two reinforcement projects whose creation includes formation and construction of an electricity substation and associated overhead line works and tie ins. Explanation of project elements in greater details are below.

Substation

Phase 1: Completion in 2023

- Enabling works and site clearance
- Formation of site and operational access
- Full platform earthworks
- Installation of two-line connected 1200MVA 400/275kV super grid transformers into the 275kV busbar
- Construction and installation of a Substation Control Building and GIS Hall

Phase 2: Completion in 2026

- Completion of the substation platform and civil engineering design for Phase 2
- Installation of the remaining 400kV bays that make up the double busbar
- Transition of Super Grid Transformers (SGTs) from the 275kV busbar into the new 400kV busbar

Cable and Overhead Line

Phase 1: Completion in 2023

- Temporary diversion of required overhead lines
- Installation of two new 400kV steel lattice towers
- Associated overhead line tie in works

Phase 2: Completion in 2026

- Formation and installation of a cable sealing end compound to permanently divert the Cairnford 275kV circuit
- Installation of 275kV cable around the perimeter of the substation
- Temporary diversion of overhead lines (Fetteresso - Kintore and Blackhillock - Kintore) Installation of two new 400kV overhead line towers

Key Considerations

Landscape and visual

A landscape and visual impact appraisal (LVIA) is currently being undertaken using detailed design information. The LVIA will be one element that informs the final substation design, as well as ensuring appropriate mitigation is incorporated. This can include designing an appropriate site level, using the existing landform features and creation of sympathetic landscaping, for example earth bunds and planting. A detailed landscaping plan will be submitted as part of the planning application. SSEN have committed to an interim target to avoid Net Loss of Biodiversity on all projects gaining consent from 2020 onwards as one of our main sustainability goals. Any planting will be designed to take this into account by utilising native species to screen and enhance the site.

Site archaeology investigation works, carried out in 2012

Transport, infrastructure and construction methods

Construction of the substation will require plant and machinery, along with vehicles to transport materials and workers to the site. We anticipate that normal construction traffic will utilise the existing road infrastructure. However, we are undertaking investigations to confirm if improvements are required. A construction traffic management plan shall be produced to outline and manage vehicle movements associated with the development. The largest plant items to be delivered to the substation will be two 400kV Super Grid Transformers.

Earthworks

Building the substation platform will require large volumes of graded stone. Our intention is to retain as much material on site as possible. This would mean there would be a mass balance of material on site to minimise vehicle movements in the local area, however local sources of stone may be required as part of our development works for the platform design. The volume of stone required and vehicle movement numbers will be established during the detailed design stage.

Screening

A Screening Opinion has been sought from Aberdeenshire Council under the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017, to determine whether the anticipated likely environmental impacts of the proposed substation are significant to such an extent to warrant classification as 'Environmental Impact Assessment (EIA) Development'.

It is the decision of Aberdeenshire Council that an EIA will not be required as part of our planning application for the substation. Nevertheless, a full voluntary Environmental Appraisal (EA) will be undertaken to support the consent applications, including a number of specialist studies to consider the potential environmental effects of the proposed substation and associated works, such as impacts upon biodiversity, cultural heritage, drainage and the water environment, and impacts on amenity.

A similar Screening Opinion has been issued to Scottish Ministers under the Electricity Works (Environmental Impact Assessment) (Scotland Regulations 2017, to determine whether the proposed overhead line works should be classified as 'EIA Development'.

Environmental Impacts

The following potential environmental effects will be assessed as part of the Environmental Appraisal (EA), which will be submitted as part of the planning application to Aberdeenshire Council and section 37 application to Scottish Ministers in summer 2020. The EA will be available for members of the public to view and comment on as part of the planning application supporting information, following submission of the consent applications.

Landscape and Visual

A Landscape and Visual Impact Appraisal (LVIA) will be carried out to understand how the proposed substation and towers will look in the surrounding area and identify potential effects. This will include how the substation and towers will be seen from residential areas and routeways. To minimise potential landscape and visual effects, landscape mitigation measures (including earthworks and tree and scrub planting) would be implemented. These will help "screen" the proposed development.

Terrestrial Ecology

The proposed substation site and surrounding area is dominated by agricultural land and woodland. The site is not located within any sites designated for their natural heritage. Protected species surveys carried out in 2019 and 2020 have confirmed that badgers, otter and red squirrel are present in the area. Species protection plans would be put in place to minimise potential effects to protected species, where required.

Forestry

Plantation forestry is present to the north of the substation site, part of which falls within the Inventory of Ancient Woodland and a small block of conifer woodland is present to the south. A tree survey will identify which trees need to be felled or monitored to accommodate the works. Any loss of trees from felling would be offset by the planting of new trees to aid visual screening and for habitat enhancement purposes.

Ornithology

Breeding bird surveys were undertaken at the site in April to July 2019. Thirty seven species were recorded, including seven species of conservation importance (house sparrow, skylark, starling, song thrush, tree pipit, wood warbler and yellow hammer) with no evidence of any protected Schedule 1 or Annex 1 species.

Cultural Heritage

The area was thoroughly investigated for the previous application, which recorded remains of a large enclosure and an adjacent building within the substation footprint. No designated sites were recorded. An archaeological appraisal of the site and its surrounding area would be undertaken to understand the potential effects on the historic environment. Consultation will be carried out with Aberdeenshire Council Archaeology Service to identify any on-site archaeological investigation that would be required before construction works commence and a Written Scheme of Investigation would be prepared which would set out a strategy for archaeological mitigation in advance of the construction works.

Environmental Impacts

Water Environment and Soils

The substation site is not in an area identified as being at risk from river flooding. Sustainable Urban Drainage Systems will be incorporated into the design to account for any increased surface water runoff resulting from the development. Previous surveys identified private water supplies in the vicinity of the site. An updated survey has been undertaken to check the private water infrastructure and groundwater abstractions in the area and ensure appropriate mitigation measures are put in place to protect these if necessary. No peat soils have been identified within the footprint of the development. There will be a loss of agricultural soil, but it would remain on site for landscape mitigation.

Land Use and Recreation

The substation site is situated predominately on agricultural land with fields generally used for livestock grazing. There would be permanent loss of this land for construction of the substation and access track, along with a small area of woodland. The loss of any trees would be offset through planting of new trees for visual screening purposes.

Noise

Construction noise is considered to be short term and intermittent and can be controlled through the implementation of a noise management plan, which would include working hours agreed with Aberdeenshire Council. Baseline noise monitoring surveys have been undertaken at noise sensitive receptors within the vicinity of the substation site to inform an operational noise assessment. Appropriate mitigation measures will be considered dependent on the results of the assessment.

Traffic

The construction of the substation will require vehicles to deliver plant, machinery and workers to the site. Access would use the same junction off the B977 (Kintore to Dunecht road) as is used for the existing substation. An appropriate Construction Traffic Management Plan would be developed to ensure road safety for all other road users during the construction works for suitable management of all abnormal loads.

Electric and Magnetic Fields

Considering the locations of the proposed overhead line diversions, an assessment would be carried out to ensure that the electric and magnetic field strength complies with exposure guideline limits.

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:

- How would you rate the overall quality of information presented within this consultation brochure?
- How do you feel regarding our proposals to construct a new 400kV substation at Leylodge, Kintore?
- Has the requirement for the proposal of a new substation at Leylodge, Kintore been adequately explained?
- Do you feel the project team have given enough consideration to ensure environmental impacts associated with the project are minimised as much as possible?
- Do you have any further comments you would like the project team to consider?

Comments

Your views and comments can be provided to the project team by completing a feedback form or by writing to Gary Donlin, Community Liaison Manager. We will be seeking feedback from the members of the public and Statutory Bodies until 5 June.

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

Community Liaison Manager, Gary Donlin

gary.donlin@sse.com

07876 837 490

Gary Donlin
Scottish and Southern Electricity Networks,
1 Waterloo Street
Glasgow, G2 6AY

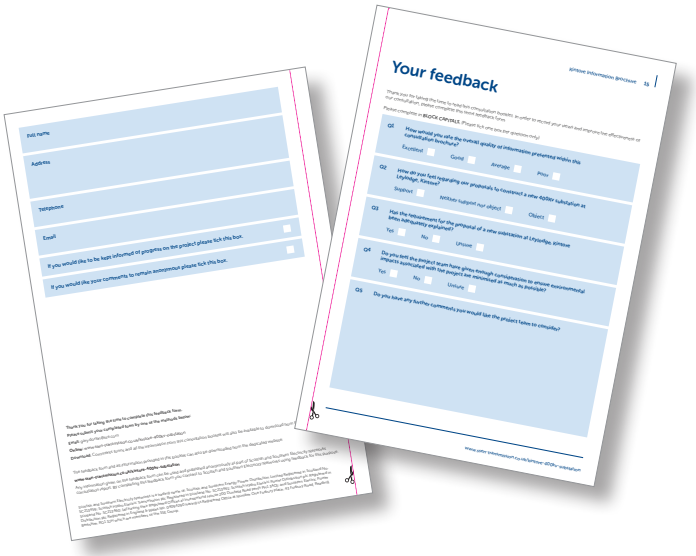
Additional information

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

Project Website:
www.ssen-transmission.co.uk/projects/kintore-400kv-substation

Follow us on Twitter:
@ssencommunity

Follow us on Facebook:
@ssencommunity



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 **How would you rate the overall quality of information presented within this consultation brochure?**

Excellent ☐ Good ☐ Average ☐ Poor ☐

Q2 **How do you feel regarding our proposals to construct a new 400kV substation at Leylodge, Kintore?**

Support ☐ Neither support nor object ☐ Object ☐

Q3 **Has the requirement for the proposal of a new substation at Leylodge, Kintore been adequately explained?**

Yes ☐ No ☐ Unsure ☐

Q4 **Do you feel the project team have given enough consideration to ensure environmental impacts associated with the project are minimised as much as possible?**

Yes ☐ No ☐ Unsure ☐

Q5 **Do you have any further comments you would like the project team to consider?**

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:

Email: gary.donlin@sse.com

Online: www.ssen-transmission.co.uk/kintore-400kv-substation

Download: Comments forms and all the information from this consultation booklet 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 dedicated website:

www.ssen-transmission.co.uk/kintore-400kv-substation

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.