



Scottish & Southern  
Electricity Networks

TRANSMISSION

# North East Information Booklet

August 2022



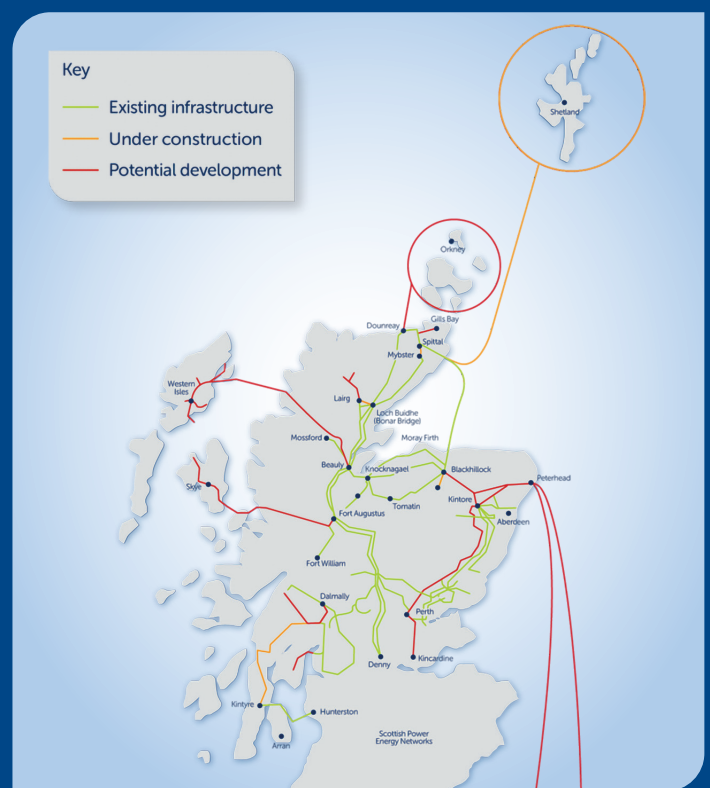
# Who We Are

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 together with our sister companies, Scottish Hydro Electric Power Distribution (SHEPD) and Southern Electric Power Distribution (SEPD), who operate the lower voltage distribution networks in the north of Scotland and central southern England.



As the Transmission Network Owner we maintain and invest in the high voltage 132kV, 275kV, 400kV and HVDC electricity transmission network in the North of Scotland. Our network consists of underground cables, overhead lines on wooden poles and steel towers, and electricity substations, extending over a quarter of the UK's land mass, crossing some of its most challenging terrain. We power our communities by providing a safe and reliable supply of electricity. We do this by taking the electricity from generators and transporting it at high voltages over long distances through our transmission network for distribution to homes and businesses in villages, towns and cities.

## Overview of Transmission Projects



# Background

As the Transmission Network Owner for the North of Scotland, Scottish and Southern Electricity Networks Transmission (SSEN Transmission) is responsible for the maintenance and development of the transmission network in an economic, efficient and coordinated manner.

Due to a vast increase in connections of renewable sources of energy in this region, there is now a requirement to upgrade the transmission network to cope with this.

In the past decade there have been significant changes to the energy landscape of Great Britain. Renewable energy policy and targets, which have been set with the aim of decarbonising the economy and achieving net-zero, have helped support rapid growth in renewable energy generation. There has also been an overall reduction in electricity and gas demand.

As the electricity network owner in the North of Scotland, our primary focus of the last decade has been the economic and efficient delivery of the additional capacity and connections required for renewable energy generation, whilst ensuring reliability of supplies for our network users and consumers.

Understanding how the energy system could develop in the future is very important. Future developments in the energy system influence the network developments that are required in the north of Scotland, now and going forwards.

Looking from now out to 2050, as we work to deliver a network for net zero, the analysis shows that the East and North-East of Scotland and the Highlands will be leading the way to support the UK and Scotland's legally binding net zero targets.

This booklet provides an overview of projects currently being delivered and also in development within the North East region.



# Project details



As referenced in the map over the central pages of this booklet, there are several projects which make up the overall picture of proposed works across the North East of Scotland. Below is a summary of what each of these individual projects involve and the need for each project.

There will be a consultation process held for each individual project in development, this will involve the SSEN Transmission team visiting various locations to provide more in- depth information and technical knowledge about each project and how it may impact the local community in each affected area.

## Development projects



### Peterhead 275kV Substation Refurbishment

Works Begin – July 2024

Works Completed – December 2025

- 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 south west of the existing substation.



### St Fergus 132kV Switchgear Replacement

Works Begin – June 2024

Works Completed – June 2025

- Due to asset condition and a secondary driver of network resilience, the project proposes building a new indoor substation to maintain the SAGE (Scottish Gas Evacuation System) gas terminals connection to the network, as well as installing circuit breakers at St Fergus Switching station to improve network resilience.



### Fetteresso 400kV Upgrade

Works Begin – Summer 2024

Works Completed – March 2026

- The existing Fetteresso substation was fully constructed in 2016 to operate at a voltage of 275kV, with the intention of upgrading to 400kV in the future. The aim of this new project is to now upgrade the substation to operate at 400kV.



### Willowdale GSP Upgrade

Works Begin – 2023

Works Completed – Early 2025

- We will be replacing the existing 132kV switchgear and two grid transformers at Willowdale Grid Supply Point (GSP), which is close to Mounthooly roundabout in Aberdeen. The transformers were installed in 1967 and now require replacement, with the 132kV switchgear suffering from exposure to the coastal environment.
- The new 132kV switchgear will improve the operation of the network by being able to be controlled remotely from our main control room. All of the main plant items will be housed indoors, which will protect them from the coastal environment and will improve the appearance of the site.



### Blackhillock PSTs

Works Begin – 2024

Works Completed – 2025

- In preparation for the East Coast 400kV upgrade, two Phase-Shifting Transformers (PSTs), or equivalent equipment, will be installed at Blackhillock on the 275kV double circuit overhead line between Knocknagael and Blackhillock. The PSTs on these circuits will provide an element of control of the east and west power flows, optimising sharing and enhancing power transfer across the B4 boundary. The Blackhillock substation site was developed with space provision allowed for these units.



### Beauly - Blackhillock - New Deer - Peterhead

Works Begin – TBC

Works Completed – 2031

- Following extensive system studies Beauly – Blackhillock – New Deer - Peterhead has been identified as a key corridor in establishing the required reinforcement, to connect the continued growth in onshore and offshore renewables across the north of Scotland. A 400kV connection is needed between these key SSEN Transmission substation sites to connect these new renewable power sources and transport it from source to areas of demand across the country.
- Work is now underway to identify and understand key environmental and engineering constraints along the corridor study area prior to extensive consultation and stakeholder engagement which will help inform design, technology and develop route options for the project going forward.
- Over the coming months SSEN Transmission shall be actively engaging with Statutory Consultees and stakeholders across the study area to further understand constraints and identify potential opportunities, developing 'heatmaps' for further discussion and review at stakeholder and community events at the end of Summer, which will provide opportunity for valued feedback. We shall advertise these events when dates and locations are confirmed.



### Keith Substation Upgrade

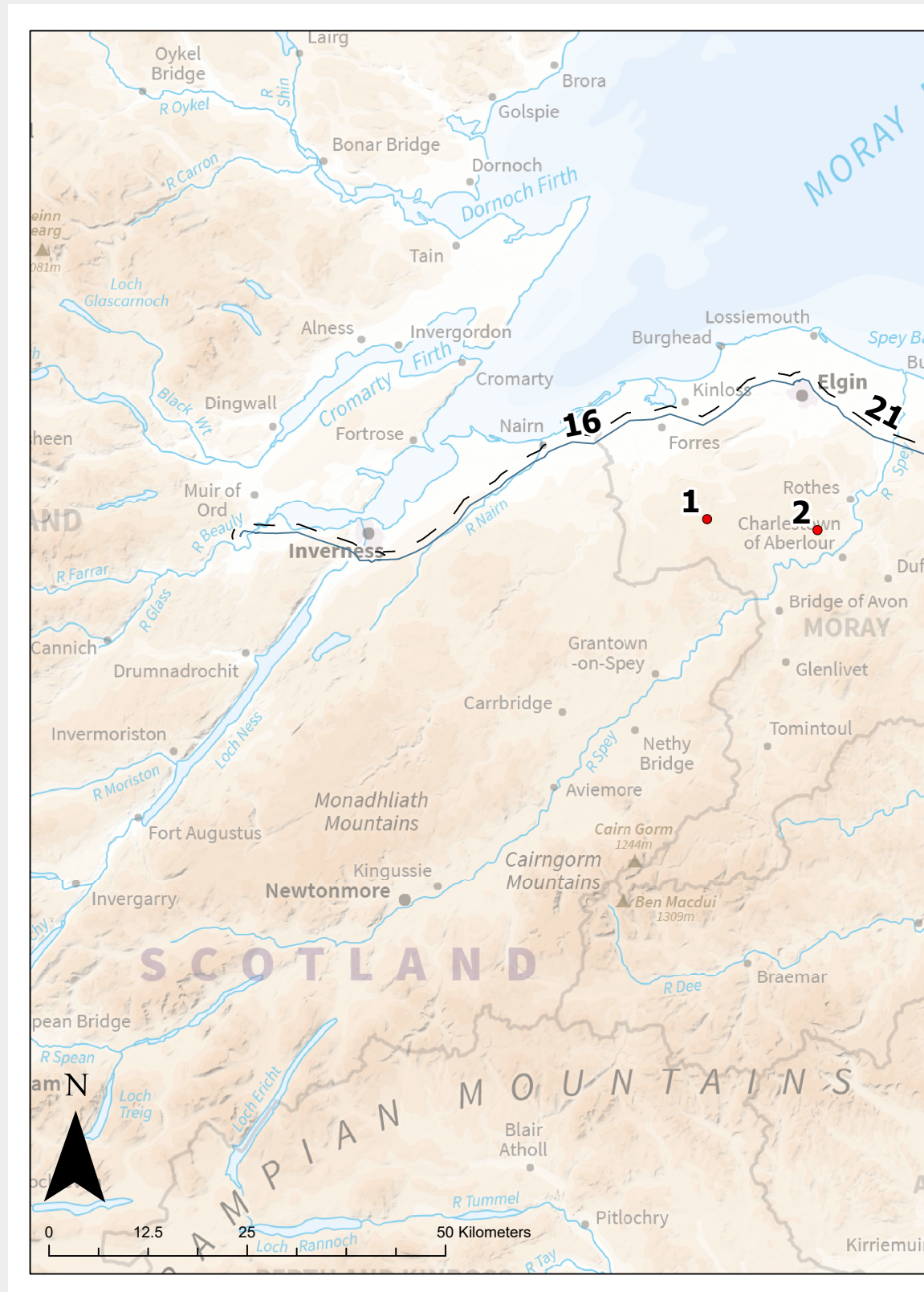
Works Begin – July 2024

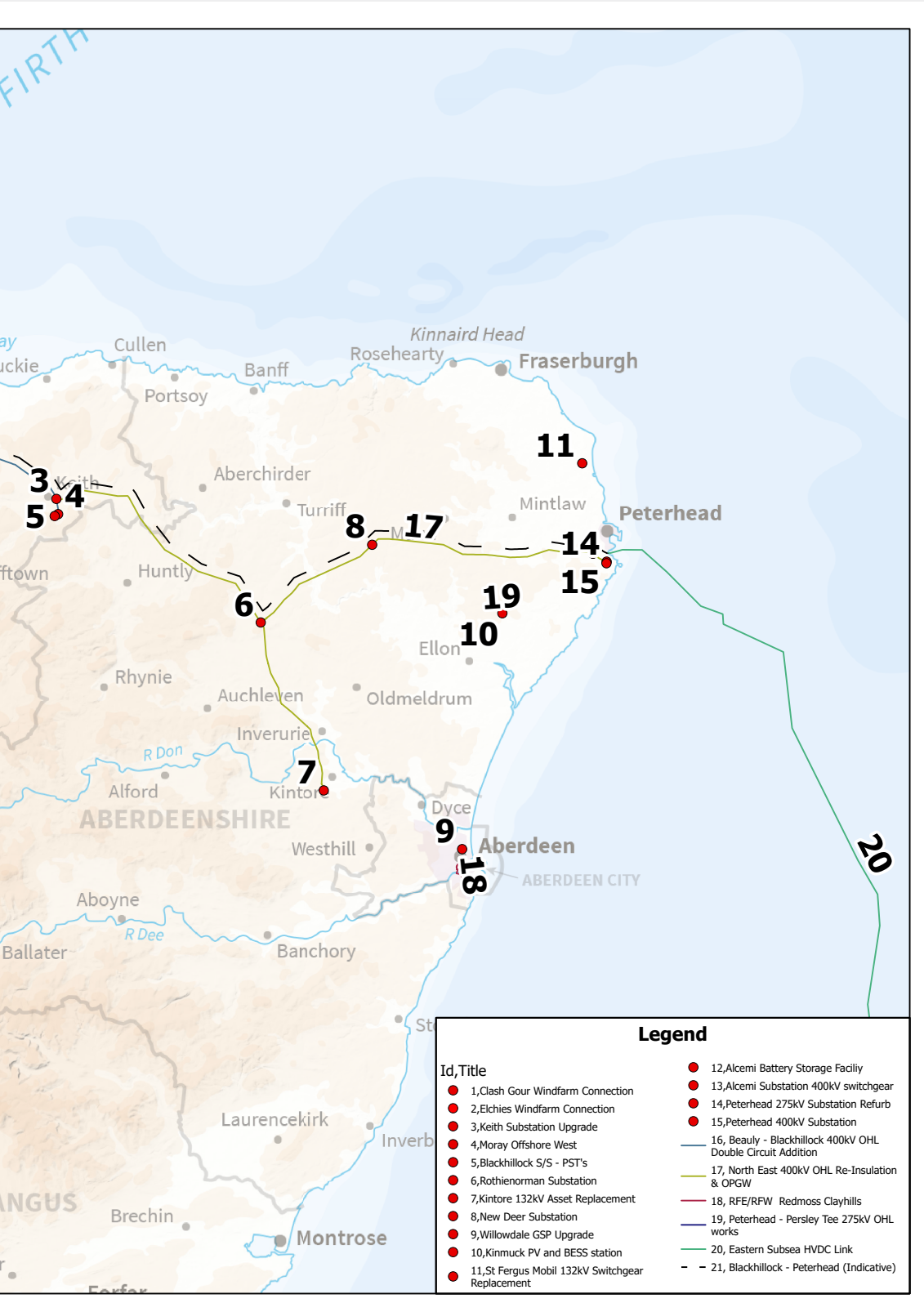
Works Completed – July 2025

- Due to asset condition and a secondary driver of network resilience, the project proposes to install a two bay extension to the existing substation on the Eastern side and replacing 3 of the existing terminal towers with two new towers out with the substation.



# Project locations







### **Kintore 132kV Asset Replacement**

Works Begin – March 2023

Works Completed – March 2026

- There is a requirement to replace the 132kV section of Kintore substation as the asset has reached the end of its operational capabilities and is displaying multiple condition-related issues.
- Kintore 132kV substation is the connection point of a range 132kV Grid Supply Points (GSP) in the Aberdeen area. It is the sole point of connection to the GSP which feeds Aberdeen Airport and also Aberdeen Bay substation which provides Aberdeen Offshore wind farm with a connection to the wider network. The replacement of this asset will ensure security of supply and continuity of the network are maintained.
- The works will involve constructing a new GIS substation within a building in land adjacent to the existing site. Replacing the three Super Grid Transformers (SGT) on the site with new models that will be housed in a specially designed enclosure to minimise noise and demolition of the existing 132kV equipment. As such, the majority of the works will take place within the footprint of the existing site.



### **Alcemi Battery Storage Facility**

Works Begin – October 2026

Works Completed – June 2029

- The project is construction and wider reinforcement works for connection of a 500MW battery storage facility onto Peterhead – Persley 275kV overhead line. Overall, the project is still in the development stage with design optioneering as well as associated environmental and engineering design works going on. Alcemi substation 400kV switchgear project is part of this project.



### **Kinmuck PV and BESS station**

Works Begin – March 2024

Works Completed – March 2027

- The project is for construction and wider reinforcement works required to facilitate connection of 105MW solar PV and battery connection onto the local 275kV Peterhead – Persley overhead line network. Peterhead – Persley 275kV Tee overhead line works are part of this project. Overall, the project is still in Opportunity Assessment stage where we are looking at design options, overhead line alignment options, environmental impacts and overall best option to connect the PV and battery facility onto the network.





### Redmoss/Clayhills UGC Replacement

Works Begin – Start 2023

Works Completed – End 2023

- There is the need to replace the existing cables and replacement will provide greater efficiency and environmental advantages. The existing cables are oil filled whilst the new cables are not. The replacement will re-energise the Aberdeen ring circuit and provide greater resilience towards 100% connectivity at all times.



### Clash Gour Wind Farm Connection

Works Begin – Early 2024

Works Completed – October 2026

- To facilitate EDF Energy Renewables Ltd 210MW Clash Gour Wind Farm development. SSEN Transmission will install two 275/132kV transformers to facilitate the connection to the 275kV system. It is also proposed to erect two new 275kV towers close to the existing tower 190 of the existing Knocknagael - Blackhillock 275kV double circuit tower line.



### Elchies Wind Farm Connection

Works Begin – March 2024

Works Completed – June 2025

- To facilitate Elchies Windfarm Ltd connection application for their prospective 99MW windfarm development at Elchies, SSEN Transmission will construct a 24km 132kV single circuit trident wood pole overhead line connecting from the Elchies 132/33kV substation to the Blackhillock 132kV substation.
- We will also establish a new 132/33kV outdoor substation at Elchies windfarm site.



### Eastern HVDC Link

Works Begin – 2024

Works Completed – 2029

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 on-shore transmission network, by allowing the flow of energy via this subsea cable.

This will be the third HVDC link in SSEN Transmission's network.

This project is being jointly developed with National Grid Electricity Transmission and is currently progressing through the procurement and development stages.





## Construction projects



### St Fergus East

Works Began – January 2021

Works Completed – End of 2023

- St Fergus gas station substation forms an important part of the SSEN Transmission network in the North of Scotland. The existing 132/11kV grid transformers were manufactured in 1975 and are reaching the peak of their operational capabilities, triggering the need for them to be replaced.
- Significant progress has been made at site with the construction activities now complete and commissioning works of the substation nearing completion.
- The next milestone of the project will involve the delivery of the first 132kV Grid Transformer (GT2) which we anticipate will be delivered in September 2022, followed by GT1 in January 2023. The new grid transformers will become fully operational in April/May 2023, with decommissioning of the old existing St Fergus equipment to be completed by the end of 2023.



### Rothienorman Substation

Phase 1 Works Began – March 2019

Phase 1 Works Completed – August 2021

Phase 2 Works Begin – June 2022

Phase 2 Works Completed – March 2024

- Following the successful completion of Phase 1 works at Rothienorman substation in 2021, SSEN Transmission have commenced the execution of Phase 2. This phase will see the Rothienorman substation being upgraded from its current operating voltage level of 275kV to 400kV.
- This is required as part of the wider North East 400kV upgrade project, spanning from Peterhead to Kintore, in order to meet the energy transfer capacity requirements from the increased generation in the North.
- The key attributes of the upgrade work at Rothienorman substation include replacement of two Super Grid Transformers and their associated bay equipment, as well as changes to protection & control systems on site.



### Peterhead 400kV substation

Works Begin – Start 2021

Works Completed – October 2023

- 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 in the North East 400 and provide a connecting point for the proposed Eastern HVDC link.
- In 2022 we have erected two new 400kV Overhead Line (OHL) 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.



### Moray Offshore West

Works Begin – July 2022

Works Completed – December 2023

- SSEN Transmission has a requirement to connect the 860MW Moray offshore West wind farm to Blackhillock 400kV substation.
- The works include the extension of the existing 400kV Gas Insulated Switchgear (GIS) double busbar and installation of new 2 x 400kV GIS double busbar feeders complete with line circuit breakers, line disconnectors and associated busbar selector disconnectors at Blackhillock 400kV substation.



### North East OHL 400kV Upgrade

Works Began – May 2021

Works Completed – Spring 2023

- Significant progress has been made as part of our plans to upgrade the existing 275kV overhead lines (OHL) connecting the substations at Blackhillock, Keith, Kintore and Peterhead for operating at an increased voltage of 400kV.
- We have completed our work between New Deer and Peterhead and substantially completed the OHL works between New Deer and Rothienorman substations. The project is currently working on the section of OHL linking Rothienorman, Keith and Blackhillock substations, working on this through to the end of 2022.



### Kintore 400kV Substation

Works Began – July 2021

Works Completed – October 2026

- The Kintore 400kV works are split into two phases. Phase 1 is part of the North East 400 upgrade scheme and works are underway to install two new Super Grid Transformers (SGTs) at Kintore and to tie these into the existing substation via the diversion of the existing overhead line from Rothienorman when it is upgraded to 400kV in Q3 2023.
- In phase 2, the project shall then go on to construct what will be the world's first SF6-free 400kV Gas Insulated Switchgear (GIS) substation. This will not only help SSEN Transmission meet our ambitious sustainability objectives by omitting large volumes of SF6 from the network (the equivalent of 116,000 Tn of CO2) but will also help manage the ever increasing amount of renewable generation.



### New Deer Substation

Phase 1 Works Began – March 2019

Phase 1 Works Completed – May 2021

Phase 2 Works Begin – December 2022

Phase 2 Works Completed – March 2024

- In May 2021 New Deer substation was energised at 275kV, this is the first g3 gas-insulated substation on SSEN Transmission's network. Leading the UK's electricity industry with the world's largest installation to date of GE's g3 SF6-free gas.
- As the North East OHL 400kV upgrade progresses, similar to Rothienorman substation, phase 2 of New Deer substation will see the substation being upgraded to 400kV in order to meet the energy transfer capacity requirements from the increased generation in the North.



# Working with the community

Throughout the life of our projects, we aim to work positively with local communities and keep people informed about what we are doing. This is particularly important when we are developing a proposal as we want to understand what local people think about our plans.

When our project progresses into construction, we will continue working closely with the local community to ensure that our work has as little impact on the lives of those living and working in the area and has many long term positive effects as possible.

During some operations, we will position staff in locations to help with information, provide reasonable instruction and ensure safety of the public.

Each of our projects are ultimately given their own dedicated project website. This is where you will find regular, more specific updates regarding the latest news and timelines relating to the individual projects works. To view the complete list of projects with websites please use the following URL: <https://bit.ly/3MShRoN>

**If you have any questions or queries on projects in this booklet, or if you would like more detailed information regarding any of the projects then please get in touch with our Community Liaison Manager, Dav Lynch:**



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