



66kV 275kV 33kV 11kV 132kV 400kV

CASE STUDY
15957

Kennoxhead Wind Farm

13 Turbines contributing to a connection capacity of 174 MW capable of powering 38,000 Homes



JONES BROS
CIVIL ENGINEERING UK

Brookfield
Renewable Partners

Project Facts and Figures:

- ▶ **Number of Turbines:**
13 × 4.8 MW Nordex turbines
- ▶ **Maximum Installed Capacity:** 62.4 MW
- ▶ **Maximum Export Capacity:** 60 MW
- ▶ **Length of Underground Cable:** 150 m
- ▶ **Connection Voltage:** 132 kV
- ▶ **Grid Transformer:** 70 MVA 132/33 kV
- ▶ **Switchboard:** 33 kV

Powersystems Partnerships

The project, located near the village of Glespin in South Lanarkshire, was delivered in partnership with Jones Bros Civil Engineering on behalf of Brookfield Renewable UK Ltd.

Powersystems also collaborated with Kenda Electronic Systems, who supported the design, build, and testing of the substation protection panels. In addition, SP Energy Networks (SPEN) played a key role in managing the grid connection, including the design and construction of a new 132 kV overhead line linking the wind farm to the national network.

Powersystems planned to mobilise in early March, with Jones Bros commencing civil works in spring.

SPEN continued advancing grid connection designs with on-site works anticipated to begin in summer.



Kennoxhead Wind Farm

Powersystems was responsible for the full installation of a 132 kV substation, including multicore protection systems and small-power infrastructure. The team delivered all testing and commissioning activities, with protection panels professionally built, installed, glanded, terminated, and brought into operational service.

Kennoxhead Wind Farm is subsidy-free and was developed to support Scotland's renewable energy targets by converting wind power into clean electricity. When fully operational, the site will have an installed capacity of 174 MW, generating enough renewable power for over 38,000 Scottish homes.

The development also brings significant economic value through local contracting partnerships, job creation, and investment in regional infrastructure.

Built on land formerly used for coal mining, the project marks a symbolic shift from fossil fuels to clean energy, directly contributing to the UK's net-zero ambitions.



33 kV 132 kV

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Scope of Works and Major Design Considerations

- ▶ 7 × 3.5 MVA 33 kV/0.4 kV transformers with associated bunding
- ▶ Gas supply connections to 14 × 1.5 MW Clarke Energy generators using HDPE and stainless-steel pipework
- ▶ Boilers and hot water pump and distribution systems, including insulated flow and return pipework
- ▶ Cabling for all control and protection panels
- ▶ Installation and testing of compound and substation earthing systems
- ▶ Full building fit-out, including lighting, small power, intruder alarms, CCTV, and fire detection
- ▶ Installation of 33 kV power, low-voltage, control, signal, and communications cables within the Brecon power site

Project Timings

Site preparation and internal access track construction were scheduled between October 2020 and March 2021. Public road upgrades along Glentaggart Road were targeted for completion by April 2021.

Turbine and infrastructure foundations were programmed for completion by late July, followed by turbine delivery and turbine erection by year-end.

Powersystems aimed to complete final Phase 1 works, including commissioning, in the first half of 2022.

Powersystems engineers brought extensive experience in wind farm electrical design, switchgear, transformers, cable systems, earthing, and SCADA, ensuring a seamless installation.

What the Client Wanted

The client's primary goal was to generate renewable energy to support Scotland's transition to low-carbon power. Kennoxhead Wind Farm forms part of Ørsted's commitment to contributing to Scotland's ambition of sourcing 50% of its electricity from renewable sources.

Beyond clean energy generation, the project emphasised community benefits, local employment, and economic development for South Lanarkshire. The client prioritised efficiency, value for money, and high-quality delivery, ensuring the project remained on schedule and within budget.



How Powersystems Helped

Powersystems supported the full design and construction of the site, installing nearly 80,000 metres of high-voltage cabling. Under the Electrical Balance of Plant (EBoP) contract, they provided the complete electrical infrastructure required to operate the wind farm and export power to the national grid.

Their proven expertise in delivering grid connections in remote and challenging environments was instrumental.

- ▶ Electrical Design and Delivery
- ▶ Switchgear installation and commissioning
- ▶ Transformer installation and commissioning
- ▶ Cable and containment design, supply, and installation
- ▶ High-voltage testing
- ▶ SCADA cabling and earthing systems



Powering the Transition to a Sustainable Future

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Design Works

The Powersystems design team ensured a high-quality, technically accurate, and fully compliant design. Key responsibilities included:

- ▶ Electrical Balance of Plant (EBoP): design and installation of HV systems
- ▶ HV Cabling: nearly 80,000 m installed to link turbines to the substation
- ▶ Full Electrical Scope: switchgear, transformers, cable infrastructure, SCADA cabling
- ▶ Grid Connection: support for integration with the national network

Installation Works

Key installation activities included:

- ▶ High-Voltage Cable Installation: 13 km cabling route connecting turbines to the substation
- ▶ Electrical Infrastructure: switchgear, transformers, earthing systems, SCADA cabling
- ▶ Substation Platform: installation and coordination with civil contractors
- ▶ Grid Connection: support to SPEN to enable connection via a 132 kV overhead line to Coalburn Substation

Commissioning Works

Powersystems played a central role in commissioning the site as part of the EBoP package, ensuring the safe and reliable integration of the 62.4 MW generation capacity into the national grid.

Energisation Works

Powersystems delivered energisation activities, including HV cabling installation, full commissioning of electrical infrastructure, and preparation of the substation platform in coordination with SPEN.

Environmental Impact

Environmental assessments were led by SPEN and the client, with Powersystems working under strict environmental compliance requirements. This included:

- ▶ Avoiding sensitive habitats during cable works
- ▶ Meeting noise and visual impact criteria
- ▶ Coordinating with ecological consultants to protect local wildlife
- ▶ Managing land carefully during access track installation
- ▶ Restoring disturbed land to original or improved condition

Kennoxhead contributes significantly to Scotland's net-zero targets, generating clean energy with zero greenhouse gas emissions. The repurposing of former coal mining land further underscores the site's environmental value.

Community Engagement

Community liaison groups were established to ensure local residents could provide input, raise concerns, and receive ongoing project updates.

A community benefit scheme was implemented, providing annual funding to local councils based on installed capacity.

Noise from operations

Property Values potentially affected by the development Environmental Disruption, including loss of forestry and habitat disturbance.

The client addressed these concerns through transparent engagement, environmental safeguards, and responsible construction practices, such as habitat protection, silt netting, and effective drainage.

Environmental Benefits

- ▶ Zero carbon emissions
- ▶ Clean, renewable energy supply
- ▶ Reduced air and water pollution
- ▶ Positive land-use transformation
- ▶ Conservation of natural resources

Economic Benefits

- ▶ Community Benefit Funding: £3,500 per installed MW annually
- ▶ Job Creation and Local Investment: supporting employment and local businesses
- ▶ Cost Stability: contributing up to 174 MW of clean energy to help stabilise long-term electricity pricing

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