POWERSYSTEMS™
HIGH VOLTAGE SPECIALISTS
An Employee Owned Business

CASE STUDY 16185

Tolldish Hall Solar Farm

25.2 MW renewable energy project exporting clean electricity to the National Grid

£2.7 MILLION | 12 MONTHS | RENEWABLE ENERGY | 25.2 MW OUTPUT

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Tolldish Hall Solar Farm

Powersystems successfully delivered the complete high voltage (HV) electrical infrastructure for the Tolldish Hall Solar Farm, a 25.2 MW renewable energy project exporting clean electricity into the National Grid Electricity Distribution (NGED) network via a 33 kV cable connection.

Developed in partnership with Innova, the project represents a significant contribution to the UK's renewable energy expansion. Located southwest of Tolldish Hall, the solar farm generates enough electricity to power up to 7,091 homes, preventing approximately 5,550 tonnes of CO_2 emissions annually.

The Solar Farm is being built without government subsidy, demonstrating the growing competitiveness of solar power against traditional fossil fuel generation. By increasing the supply of clean, low cost electricity, the project is expected to help reduce NGED prices while supporting regional investment and the creation of green jobs.

Project Facts and Figures

- **Totalled Installed capacity: 25.2 MW**
- **Connection Voltage: 33 kV**
- **Length of 33 kV cabling: 1,750 m**
- **Low-carbon technology producing 60% less CO_2 emissions than coal or oil.**
- **Powersystems are a Lloyds registered (NERS) approved independent connection provider (ICP)**

33 kV

Powering the Transition to a Sustainable Future

Tolldish Hall - Solar Farm capable of delivering 25.2MW to 7,091 Homes

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

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Project Scope

As a Lloyd's registered NERS accredited Independent Connection Provider (ICP) with over 49 years of HV engineering expertise, Powersystems was responsible for the full design, installation, testing, and commissioning of both customer and DNO HV electrical Balance of Plant (BoP).

The scope included:

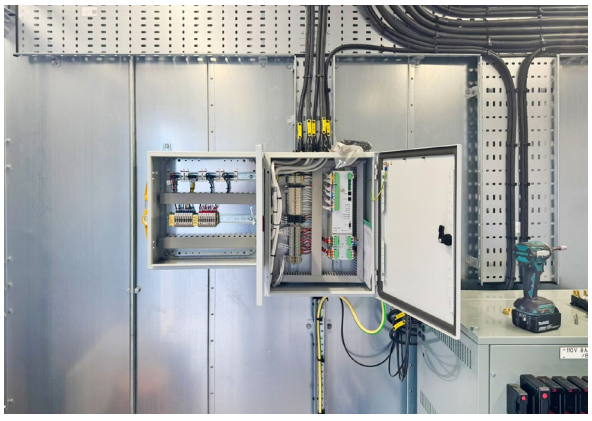
- Civil and electrical design and construction
- Delivery of the NGED 33 kV grid connection
- Installation of the 33 kV cable route
- Protection and control systems
- Grid transformer installation
- Integration with the customer's 33 kV substation

The connection comprises a 1,750m private 33 kV underground cable linking the new NGED substation to the customer's solar substation on Hawkesbury Road, Warwickshire, feeding into NGED's established network at Alderman's Green Road, Coventry.

NGED 33 kV Infrastructure Delivered

Key Deliverables

- Design, procurement, installation, and commissioning of the 1,750m 33 kV cable connection
- Civil design and construction of the NGED 33 kV steel substation enclosure
- Installation of:
  - Siemens NXPLUS 33 kV switchboard
  - IBOX RTU
  - Connection control and interface panels
  - G99 PQM/DSM panel
  - 110 V & 48 V battery chargers
  - NGED 33 kV incomer and feeder circuit breakers
  - 33 kV voltage transformers
  - 2 × 3 × 1c 300 mm^2 AL 33 kV XLPE cables
- Installation of NGED protection and control systems
- Earthing, LV infrastructure, compound lighting, and all LV/control/signal/comms cabling



Customers 33 kV Infrastructure Delivered

Key Deliverables:

- Civil design and construction of one customer 33 kV steel substation compounds
- Design, supply, installation, and commissioning of:
  - Ormazabal CPG.0. V 33 kV switchboards
  - Customer and NGED incomer circuit breakers
  - LVAC distribution board
  - DSM/PQM panel
  - Fire and intruder alarm systems
  - Auxiliary transformer and supply systems
  - 33 kV circuit voltage transformer
  - 50 kVA 33 kV/415 V auxiliary transformer
  - 2 × 3 × 1c 300 mm^2 AL 33 kV XLPE cables
- Earthing installation
- LV, control, signal, and communications cabling

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Outcome

The completed system provides a robust, compliant, and fully integrated HV network connection, enabling the solar farm to reliably export renewable power into the NGED network.

Powersystems' end to end delivery from design through commissioning ensured seamless project execution and reinforced our position as a trusted partner in the UK renewable energy sector.

Partnerships & Stakeholder Engagement

Delivered on behalf of Innova, the solar farm sits seven hundred metres northeast of Tolldish Hall Farm. Powersystems coordinated with both Coventry City Council and Warwickshire County Council to deliver the offsite connection infrastructure. Our extensive experience in 33 kV export connections continues to support the rapid deployment of UK solar generation.

Project Development

Solar energy contributes approximately 4.9% of the UK's electricity generation. The Tolldish Hall Solar Farm adds 25.2 MW of clean capacity, supporting national progress toward the 2050 Net Zero target.

Design Works

The design phase covered all civil engineering requirements, protection settings and coordination studies, cable sizing, and the production of all necessary drawings to support construction and commissioning. This comprehensive design package ensured that every element of the project met the required technical, regulatory, and operational standards.

Powersystems engineers were involved with the following below:

- Electrical design
- NGED Design Management
- Interface with NGED for status & constraint signals
- Transformer integration and commissioning
- Cables & containment design, supply & installation
- HV testing
- SAP provision

Construction Project Timeline

Civil works commenced in January 2025 with initial site mobilisation and the construction of the external compound. The 33 kV underground cable, installed within the local highways network, was fully completed by May 2025. During the same month, foundation works for both the DNO and Customer substations began. By June 2025, the earthing installation was completed, meeting all relevant safety and performance standards.

Following completion of the substation foundations, the delivery of both the DNO and Customer substation enclosures was coordinated and successfully carried out in July 2025. The DNO 33 kV equipment was delivered and installed during July, while the Customer 33 kV switchgear had already been pre-installed off-site at Omazabal. In parallel, the electrical infrastructure works continued through to energisation, including all final commissioning activities.

The DNO network was energised in November 2025, in line with the programme, and the Customer Substation was fully energised in December 2025 to align with the client's operational requirements.

Commissioning Works

Commissioning activities commenced in August 2025 and followed a comprehensive programme of primary and secondary testing. Functional testing was carried out on all circuit breakers, disconnectors, and earth switches, accompanied by full verification of multicore wiring to ensure correct system integration. CT and VT analyser testing was undertaken to assess ratio accuracy, polarity, and magnetisation characteristics, while primary current injection on the 33 kV CTs confirmed the integrity and performance of all secondary circuits. Secondary injection testing was also completed to verify the correct operation of COP meters and all associated protection relays.

Further works focused on the protection and control systems. This included full testing of the NGED protection panels, verification of all protection functions, and detailed testing of the constraint panel interfaces to ensure correct communication and coordination. Battery chargers underwent functional performance checks and discharge testing, while the earthing transformer was tested to confirm full compliance with safety, operational, and performance requirements.

The commissioning phase concluded with the completion of all required documentation and the preparation of comprehensive site reports, providing a fully auditable record of all commissioning activities and works delivered.

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Energisation Works

Powersystems supported and facilitated the successful energisation of the Tolldish Hall Solar Farm connection in November 2025 for the DNO network and December 2025 for the customer installation. The energisation process was closely coordinated with NGED, with a Powersystems Senior Authorised Person (SAP) working directly alongside NGED's operational teams to ensure that all safety, switching, and commissioning procedures were completed efficiently and in full compliance with network requirements. This collaborative approach enabled a seamless transition from construction into live operation and marked a significant milestone in the project's overall delivery.

What the Client Wanted

The client's primary objective was to deliver a fully operational solar farm in a manner that was both time-efficient and cost-effective, while also generating meaningful environmental and community benefits. Achieving completion within a seventeen-month programme demonstrates strong project controls and effective budget management throughout delivery.

Powersystems played a significant role in meeting these objectives by delivering the full construction scope for both the grid connection and the customer's 33 kV compound. Acting as the key interface between the client, local authorities, and the DNO, Powersystems coordinated the entire design approval process for the substation and connection works, ensuring full compliance with all technical and regulatory requirements. This included securing NGED approval for the build, enabling a smooth progression from construction through to energisation and final handover.

How Powersystems have helped.

Powersystems drew on its extensive high voltage expertise to procure, install, and commission the specialist equipment required for the Tolldish Hall Solar Farm. The team developed a technically robust and cost efficient cable route design, ensuring that the installation could be delivered without unnecessary civil works or excessive cabling expenditure.

By maintaining high quality standards and delivering works in line with the programme, Powersystems enabled NGED to progress and complete their own substation infrastructure, helping to keep the overall project on schedule. The engineering team contributed across multiple disciplines, including electrical design, NGED design management, interface coordination for status and constraint signals, transformer integration and commissioning, cable and containment design and installation, high voltage testing, and the provision of SAP services.

What were the top five environmental risks and mitigation measures associated with this construction development?

1. Construction Waste Management

Construction activities naturally generate a variety of waste materials, and without proper controls these can lead to pollution, site contamination, and inefficient resource use. To prevent this, Powersystems maintained a clean and well organised site throughout the works at Tolldish Hall Solar Farm. Designated waste disposal points were used across the project area, and all waste was segregated, stored safely, and removed at regular intervals to ensure full compliance with environmental standards.

2. Fuel Consumption and Emissions

Plant, machinery, and transport operations can significantly increase fuel use, carbon emissions, and local air quality impacts if not carefully managed. To minimise these effects, materials were ordered in bulk and sourced from local suppliers wherever possible, reducing transport distances and associated fuel consumption. Machinery use was also efficiently scheduled, helping to further limit emissions during construction.

3. Resource Use and Material Sourcing

Large construction projects can place high demand on materials, particularly when items are transported over long distances or sourced unsustainably. Powersystems mitigated this risk by procuring materials locally whenever feasible. This approach reduced transport related emissions and supported responsible sourcing practices across the project.

4. Long Term Land Use and Energy Output

Large scale solar developments can raise questions about long term land use and environmental value, particularly if the benefits are not clearly demonstrated. In this case, the Tolldish Hall Solar Farm provides enough clean energy to power approximately 7,091 homes, significantly reducing reliance on fossil fuels. The long term renewable energy output offsets the land use change and contributes directly to the UK's national Net Zero objectives.

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Environmental Impact

The Solar Farm delivers a wide range of environmental sustainability benefits, demonstrating how renewable energy infrastructure can enhance both local and national environmental outcomes.

The 25.2 MW installation generates enough clean electricity to power approximately 7,091 homes, significantly reducing reliance on fossil fuels and directly supporting the UK's commitment to achieving Net Zero by 2050. By transforming arable land into a combined solar and habitat site, the development creates dual value: long term renewable energy generation alongside improved ecological richness and biodiversity.

During construction, the project's carbon footprint was minimised through local procurement, efficient coordination planning, and reduced fuel use, all of which helped lower the overall carbon intensity of the build phase. These measures ensured that environmental considerations were embedded throughout the project lifecycle.

The wider policy context further reinforces the importance of developments like Tolldish Hall. There is growing national and local recognition of the need to reduce dependence on fossil fuels and accelerate the transition to renewable energy. Nuneaton & Bedworth Borough Council has declared a climate emergency and is working towards the ambition of making the area carbon neutral by 2030. At a national level, the UK has committed to becoming Net Zero by 2050 and decarbonising the electricity grid by 2035, a goal that requires an additional 3 GW of solar capacity to be built every year. Projects such as Tolldish Hall are therefore essential in addressing the climate emergency and meeting these ambitious targets.

Together, these outcomes demonstrate that the Solar Farm not only generates clean, reliable energy but also enhances the environmental quality of the surrounding landscape and contributes meaningfully to long term climate objectives.

Environmental Benefits

The Tolldish Hall Solar Farm provides a broad range of environmental advantages that align with both local and national sustainability objectives. By generating low carbon electricity, the development directly reduces greenhouse gas emissions and supports the decarbonisation of the UK's energy system. Its flexible peak generation capability also enhances grid stability during periods of high demand.

Producing more than 25.2 MW of renewable energy, the solar farm supplies clean electricity to thousands of homes and plays a vital role in the transition away from fossil fuels.

Economic benefits

In addition to its environmental contributions, the project delivers significant economic value. By strengthening the wider NGED network, the solar farm indirectly supports commercial and industrial activity across the region. It also creates local employment opportunities in areas such as operations management, maintenance, and site security, with recruitment prioritised from the surrounding community wherever possible.

Challenges and Lessons Learned

The project faced several challenges throughout its lifecycle. Adverse weather during the rainy season created difficulties for civil engineering works, particularly ground preparation, and construction sequencing. Long lead procurement items also required careful planning to ensure equipment arrived in line with the project schedule.

Key lessons from Tolldish Hall Solar Farm project highlight the importance of consistent, proactive communication between all stakeholders. Maintaining clear coordination across design, procurement, construction, commissioning, and grid connection activities proved essential in mitigating delays, managing expectations, and ensuring smooth project delivery.

The Results

The Tolldish Hall Solar Farm now successfully exports 25.2 MW of renewable electricity to the grid, contributing meaningfully to the UK's progress toward Net Zero. The site generates enough clean power for 7,091 homes and delivers wider environmental gains, including enhanced habitat value and increased ecological diversity. Economically, the project supports local employment and strengthens regional industry by reinforcing grid capacity and improving network resilience.

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