Case Study

Skeeby BESS, UK
(35.7 MW / 71.4 MWh)

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Project Overview

Innova delivered the detailed civil, electrical, and protection & control design for the Skeeby Battery Energy Storage System (BESS) project in Yorkshire, supporting Tesla's delivery of a 35.7 MW / 71.4 MWh grid-scale energy storage facility. The scope covered all design activities within the BESS compound and the 33 kV cable route up to the Point of Connection at the Northern Powergrid Skeeby substation.

Client Requirement

The client required a design partner capable of producing a fully coordinated, construction-ready design package that:

- Integrated OEM-supplied equipment including Tesla Megapacks, MV transformers, and 33 kV switchgear
- Met UK grid code, DNO (SPEN), and client-specific requirements
- Supported a structured submission and approval process to achieve Approved for Construction (AFC) status
- Reduced programme and interface risk across civil, electrical, and protection disciplines

Scope & Key Deliverables

Innova was responsible for the end-to-end detailed design of the BESS facility, including:

Electrical Design

- 33 kV and LV system design and coordination
- Proposed equipment layouts
- Single line diagrams
- Cable sizing, routing, duct banks, and trenching design up to the POC
- Equipment earthing and bonding design
- Overall site lighting layout

Protection & Control Design

- Protection philosophy and scheme coordination
- Main connections and protection drawings
- Interface design for Tesla-supplied protection equipment
- Control, interlocking, and trip circuit design
- SCADA and field network interface drawings

Civil & Structural

- Civil Layout with multidisciplinary layout coordination to support constructability and efficient installation
- Cut and Fill and proposed levels with backfill quantity
- Foundation design for BESS equipment including Megapack, Switchroom building, transformers, lighting columns and fire tank
- Drainage, access roads, cable routing and earthworks

Sustainable Energy

Design Documentation

- Design deliverables aligned with the client's Design Deliverables Register
- Foundation design calculations,Drainage / SUDS design reports,Earthworks and pavement design
- Submission packages progressed through review to AFC status
- Assurance documents including Design Risk Register,Design Decision logs and Assumption Register

Our Approach

Innova adopted a design-for-delivery approach, prioritising constructability, standardisation, and early risk mitigation. Close coordination with Tesla's equipment specifications and review processes ensured efficient document progression and minimised late-stage design changes.

Key strengths of the approach included:

- Proactive management of interfaces between OEM equipment and balance-of-plant systems
- Early identification and mitigation of constructability and programme risks
- Clear, consistent documentation aligned with client and DNO expectations
- Contractor queries and clarification responses

Value Delivered

- Programme certainty: Design milestones were achieved in line with the agreed schedule, supporting procurement and construction activities
- Reduced interface risk: Clear definition of electrical and protection boundaries between OEM and balance-of-plant systems
- Construction efficiency: AFC documentation minimised site queries and reduced rework during installation
- Regulatory compliance: Designs aligned with UK standards and DNO requirements, supporting smooth grid connection approval

Outcome

The project design was successfully delivered to Approved for Construction status, enabling timely construction and commissioning of the BESS facility. The client benefited from a robust, compliant, and well-coordinated design solution that supports reliable grid integration and long-term operational performance.

Why Innova

Innova combines deep technical expertise in grid-scale BESS design with a strong commercial focus, delivering solutions that are practical, buildable and aligned with programme and cost objectives. Our experience on complex energy storage projects enables clients to progress confidently from detailed design through to construction and operation.