



PROJECT SUMMARY:



CLIENT

AMP Clean Energy

PROJECT

Electrode Boiler & Biomass
Decarbonisation Project

PROJECT OVERVIEW

Simpsons Malt, one of the UK's leading producers of malt, is revolutionising its electrical and heating infrastructure at its Tweed Valley Maltings site. This innovative project, in partnership with AMP Clean Energy, aims to reduce annual emissions by 25,000 tonnes per year and will include an 11kV, 12MW Electrode Boiler that can utilise electricity from a North Sea wind farm. The new setup will alternate between the biomass boilers and the electric boiler, with the latter taking over heating operations

when excess wind farm electricity is available.

The project's capacity necessitated an additional 33kV 12.5MVA supply to facilitate their new Electrode Boiler. These works will include integration with Scottish Power Energy Network's existing systems.

The partnership was led by AMP Clean Energy who were instrumental in developing and funding the project and will operate the energy centre.

VITAL SOLUTION

In addition to being the main contractor on the energy centre build and heat network, we also acted as the Independent Connection Provider, which involved the design and construction of a complex Extra High Voltage (HV) electricity system at 33kV, for adoption by Scottish Power Energy Networks (SPEN). This involves SPEN adopting the newly constructed infrastructure and integrating it into their existing network and then providing ongoing operation and maintenance.

This involved the design and build of the substation, extra HV cable and associated infrastructure needed to adhere fully with the strict engineering design rules (G81) and requirements set out by Scottish Power Energy Networks to ensure that its ICPs'

installations would integrate seamlessly with their existing electrical network.

Design Pack Submission:

The process of designing and implementing electrical infrastructure for adoption by Distribution Network Operators (DNOs) involves navigating a system of unique requirements and specifications (G81) set by SPEN. In the case of (SPEN, their approval process consists of a rigorous 5-stage design approval system.

- D1 – High Level
- D2 – Cables / OHLs
- D3 – Plant Equipment
- D4 – Substation / Civils

THE BENEFITS:

- > 25,000 tonnes of carbon reduction per year.
- > 12MW electric boiler utilising free curtailed electricity from north sea wind farms.
- > Complete Independent Connection Provider service for all extra high voltage contestible works.
- > All works adopted by the distribution network operator.
- > 100% compliant design which underwent rigorous 5-stage design approval.

▶ (Right) The electric boiler arriving at Simpsons Malt Berwick-upon-Tweed site.
(Below) The construction phase of the project where we acted as Independent Connection Provider, delivering the 11kV electrical infrastructure.



“With the Energy Centre delivering up to an 80% reduction in our Scope 1 & 2 emissions at our Tweed Valley Maltings site and around a 55% reduction company-wide, the project will not only have a significant impact on our own carbon footprint, but the Scope 3 emissions of some of the world’s leading whisky brands who we are proud to supply from our Berwick-upon-Tweed headquarters.”

STEVEN ROWLEY, OPERATIONS DIRECTOR AT SIMPSONS MALT

D5 – Protection / Communications

This multi-stage approach ensures that every aspect of the design meets SPEN’s specific technical standards, regulatory requirements, and operational needs.

Cabling Works:

To integrate the Tweed Valley Maltings site with the electrical grid, we undertook a comprehensive installation of 650 meters of 33kV cables, capable of meeting the site’s substantial energy demands. The installation process involved excavation work, precise cable laying, careful backfilling and thorough reinstatement of the affected areas, minimising environmental impact.

One aspect of this connection was the jointing of the cables and termination of the 33kV cables onto the switchboard.

Substation Installation:

The switchboard serves as the central hub for power distribution, efficiently channelling electricity to various smaller load circuits throughout the facility. Its proper installation and configuration are paramount to the long-term safety and reliability of the entire electrical system.

The supply, installation, testing, and commissioning of a 33kV substation were carried out to facilitate seamless integration into the existing SPEN

infrastructure. A substation is a crucial part of the electrical power system, serving as a node where voltage levels are transformed, and power is distributed. In this case, the 33kV substation functions as an intermediary point on the extra high-voltage network

Additionally, the substation houses various critical equipment such as 33kV circuit breakers that included a Bus Zone protection system, switches, and control systems that allow for the monitoring, protection, and control of power flow. All other ancillary equipment including Battery Tripping Units and building services were included as part of the building installation.

Collaborative Delivery

This project is a strong example of a collaborative partnership working to deliver a project which includes Independent Connection Project works. We have designed and built these works in close cooperation with our partners and the Distribution Network Operator, SPEN - SP Distribution, which is adopting the new 33,000-volt infrastructure.

Additionally, Lloyds Register Quality Assurance assessed the site as part of our audit of our NERS accreditation to enable full accreditations for the contestable works, ensuring that all necessary standards and regulations are met. This collaborative effort has allowed

for the efficient design, construction, and integration of the new infrastructure, to deliver a high-quality project that meets both the client’s needs and regulatory requirements.

Derisking the project

As an Independent Connection Provider (ICP), we manage the design and construction in-house, eliminating reliance on external parties like the Distribution Network Operator (DNO). This allows for efficient decision-making and problem-solving whilst maintaining direct oversight of project costs and timelines, including delivery of the Biomass plant and all other private wire installation.

By taking full responsibility, we can actively manage expenses, optimise schedules, and address potential risks early in the process. This proactive approach not only enhances our ability to deliver the project efficiently but also provides Simpsons Malt with a single point of accountability, ensuring a successful upgrade of their facility’s electrical infrastructure.