



Accelerating your journey to Net Zero

Blake Clough Consulting is a specialist energy consultancy with a focus on the electricity networks. We cover a range of areas relating to power systems analysis, feasibility studies, project engineering, innovation, regulation and technical strategy, with a strong emphasis on our customer relationships.

We are passionate about the decarbonisation of the energy system and the transition to “Net Zero” and aim to support our clients to accelerate this change as effectively as possible, whether that be local authorities, large network companies, or private developers.

Our work is underpinned by solid analysis and modelling, including techno-economic assessment, cost benefit analysis, power systems analysis and network modelling.

We provide a full range of services relating to HVDC, including complex modelling, project development and techno-economic assessment.

Typical HVDC consulting work includes:

- Modelling of HVDC technology including IGBT-based, voltage source (VSC) converters.
- Assessment of feasibility of HVDC versus HVAC options, including losses, availability, capital and operation costs.
- Project development aspects of HVDC such as substation / converter station land take requirements, cable corridor requirements, substation layouts and elevations.
- Development and screening of all potential options, including HVDC and HVAC options.
- Support for regulatory aspects that may impact HVDC project development such as the Holistic Network Design (HND) programme.

Customer Focussed

Our team is extremely customer focused, flexible and efficient. We are able to respond quickly and ultimately to deliver work in compressed timescales, to a high quality.

Our clients range from electricity network operators, regulators and public sector organisations through to private developers, both onshore and offshore, looking to develop projects connecting into the electricity networks.

We understand that HVDC solutions are relatively new, and we are up to date with all developments relating to new technologies through our ongoing discussions and relationships with the supply chain. As well as the basic comparisons relating to costs, we also have in-depth understanding of project development, procurement challenges and supply chain risks which all contribute to decisions relating to the selection of HVDC technologies.

Our modelling team has specific experience in HVDC modelling through both academic and industrial projects.



Blake Clough Consulting recently completed a Power Systems Study for a 40 GW RES-based project based in Kazakhstan.

The project aims to create a Power-to-X hub, which will involve the development of wind and solar photovoltaic (PV) farms with a combined capacity of approximately 40GW. These farms will generate clean electricity to power a water electrolysis facility with a capacity of 20 GW.

The scope included the following:

- Load Flow, Reactive Power Capability and System Losses Study.
- Short Circuit Studies.
- Dynamic Stability Studies.
- HVDC Option Assessment.

A study was performed to analyse the option of using HVDC technology using IGBT-based, voltage source (VSC) converters for the longest transmission networks within the plant. The objective of this exercise was to investigate the feasibility of the HVDC option and compare it against the AC solution in terms of system losses and cost. The synchronous condenser requirement in the AC solution was re-assessed based on HVDC converter stability capability (reactive power support).

Blake Clough Consulting were appointed to identify potential transmission options for a 1000MW floating offshore wind farm in Japan, using both bottom mounted and floating substructure technologies.

This work provided an overall screening of the potential scenarios, including HVDC and HVAC options, and those deploying fixed and floating offshore substations.

A full cost-benefit analysis was carried out on five different connection options, as well as an outline design for each option.

The cost-benefit analysis considered capital costs, operational costs, losses and reliability (i.e. lost energy due to failures).

Blake Clough Consulting were appointed to support the development of a 2000MW Wind Farm.

We provided support to the initial stages of development for a large floating offshore wind farm off the coast of the UK.

This included analysis to:

- Understand the likely requirement for land to connect the proposed 2000MW offshore wind project.
- Inform potential substation site for customer substation.

Land take requirements were devised for HVAC and HVDC scenarios, as well as consideration of the cable corridor requirement for each option.