Paris Session 2022

Project Aquila: and example of a planned multi-vendor, multiterminal DC system

Study Committee B4

B4.00 for SC B4-1.13

"What examples can be presented regarding existing or planned facilities related to multi-vendor HVDC systems?"

Ben Marshall, UK

The National HVDC Centre

Scottish & Southern Electricity Networks TRANSMISSION

Project Aquila- context & drivers

•Net Zero targets for GB by 2030

• up to 50GW of Offshore wind, by 2030 at least 40GW
  – Scotwind leasing- 25GW in Scottish waters alone.
  – Drives multiple co-located high capacity HVDC projects, reinforcing network and connecting Net Zero resources.

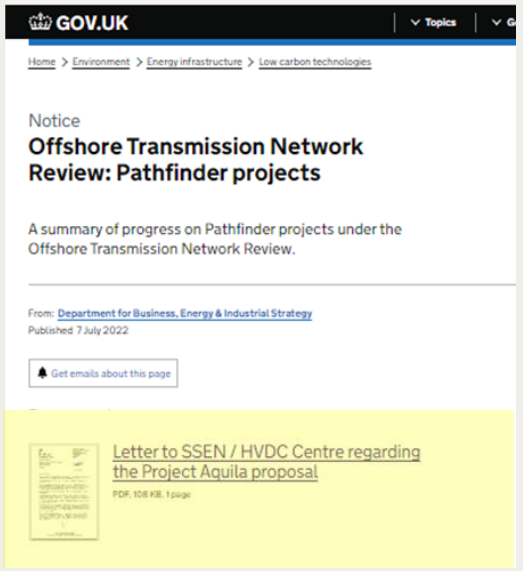
•Drivers for Multi-terminal & Multi-vendor.

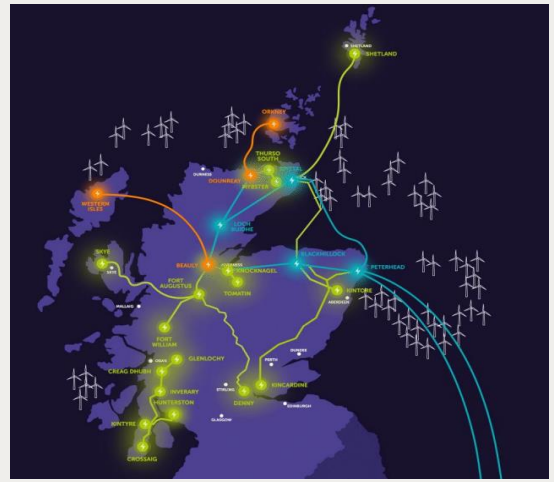
•Environmental, cost and network efficiency benefits in avoiding excessive converters, and managing power flow in multi-terminal.
  – Scale of simultaneous projects.
  – Staged development of multi-terminal

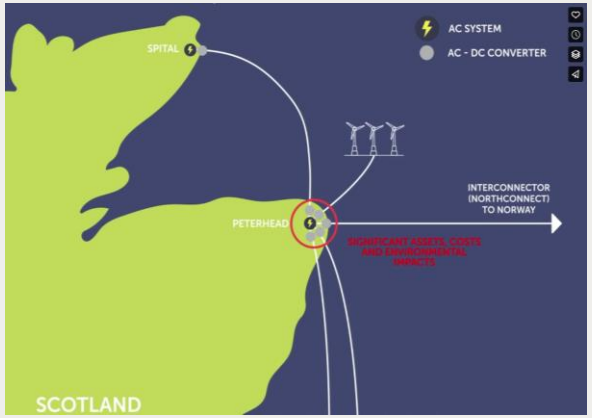
•Delivery under Business as Usual with Government commitments.

•Pathfinder approval- assures Government and regulatory support in removing blockers across policy, frameworks, codes to enable project delivery.

•Funded within the context of known available regulatory instruments, providing certainty.







Group Discussion Meeting

Project Aquila- project description

•Innovative topology

• Foundation of 525kV rigid bipole Eastern Green Links
  – Integrates with other radial full-bipole arrangements via DCSS
  – Supports connection opportunities and transmission reinforcement.

•DC switching station (DCSS).

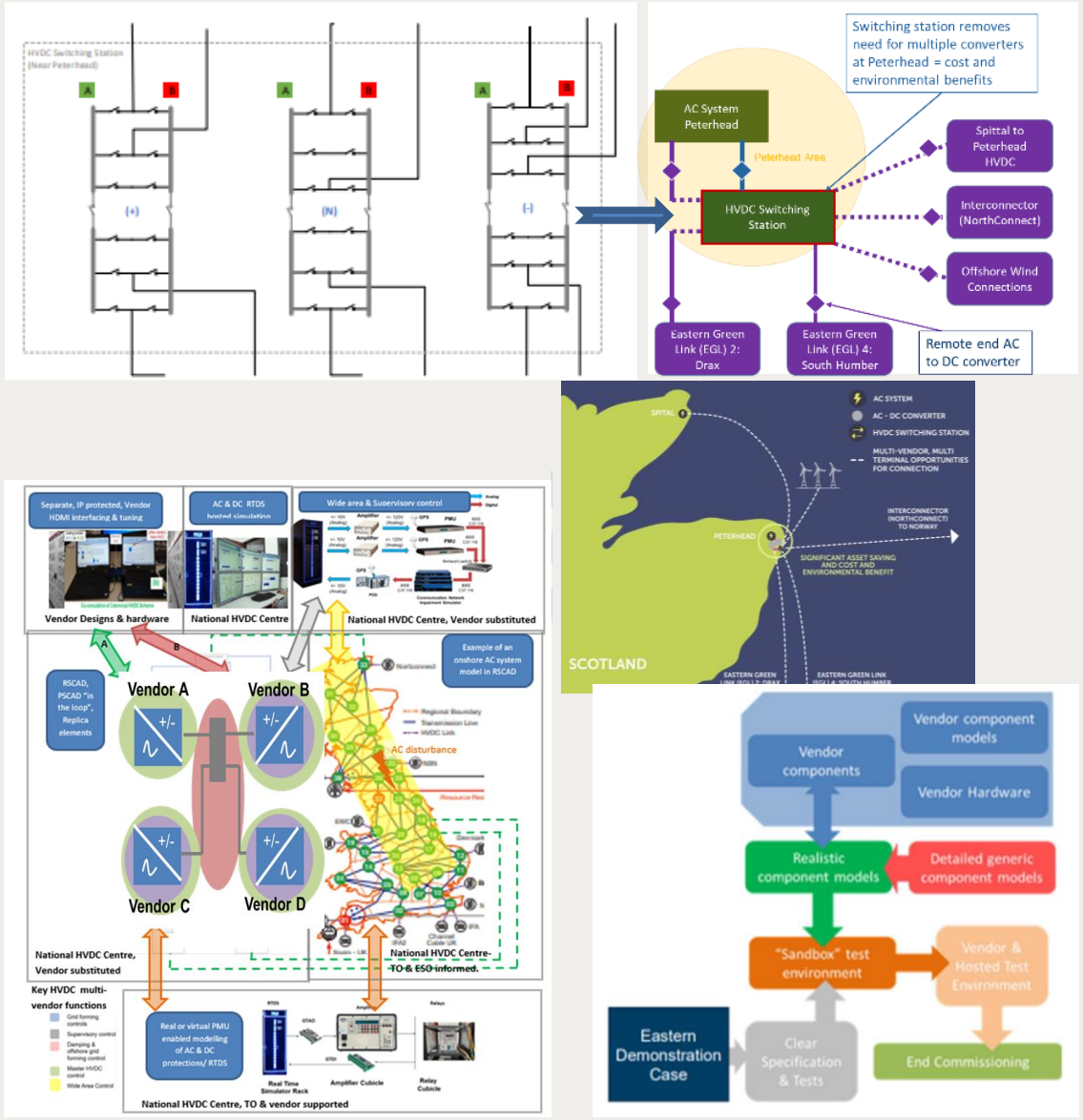
•Positive, Negative and Neutral arrangements.
  – Allows selective multi-terminal arrangements.
  – Optimises resilience of overall arrangement

•Considered design, to support multivendor demonstration.

•DCSS has main and reserve busbars, enabling “fall-back” single vendor and point-point operation.

•Parallel development of functional designs, supporting vendor solution substitution within a defined overall functional specification.

•Vendor IP protected and respected throughout, whilst retaining clear specification, testing and demonstration.



Project Aquila- methodology

•Builds on experience.

• Foundation of projects
  – Caithness- Moray-Shetland
  – EU funded PROMOTioN project
  – Centre work and other supported projects.

•GB Interoperability Expert Group

•Industry and Vendor engagement and commitments.
  – Forum for discussion, review, recommendation.
  – National HVDC centre hosted simulation environment

•Considered plan of activity.

•Clear roles and responsibility.

•Clear timeframes including interoperability demonstration activity

•Careful stepwise approach to delivery with fall-backs.

•Potentially first multi-vendor multi-terminal project outside of China, delivered in a pragmatic industry-ready approach.