

Caithness – Moray HVDC Transmission Project

Investment Planning Context & Performance specification



Dr Bless Kuri
SHE Transmission
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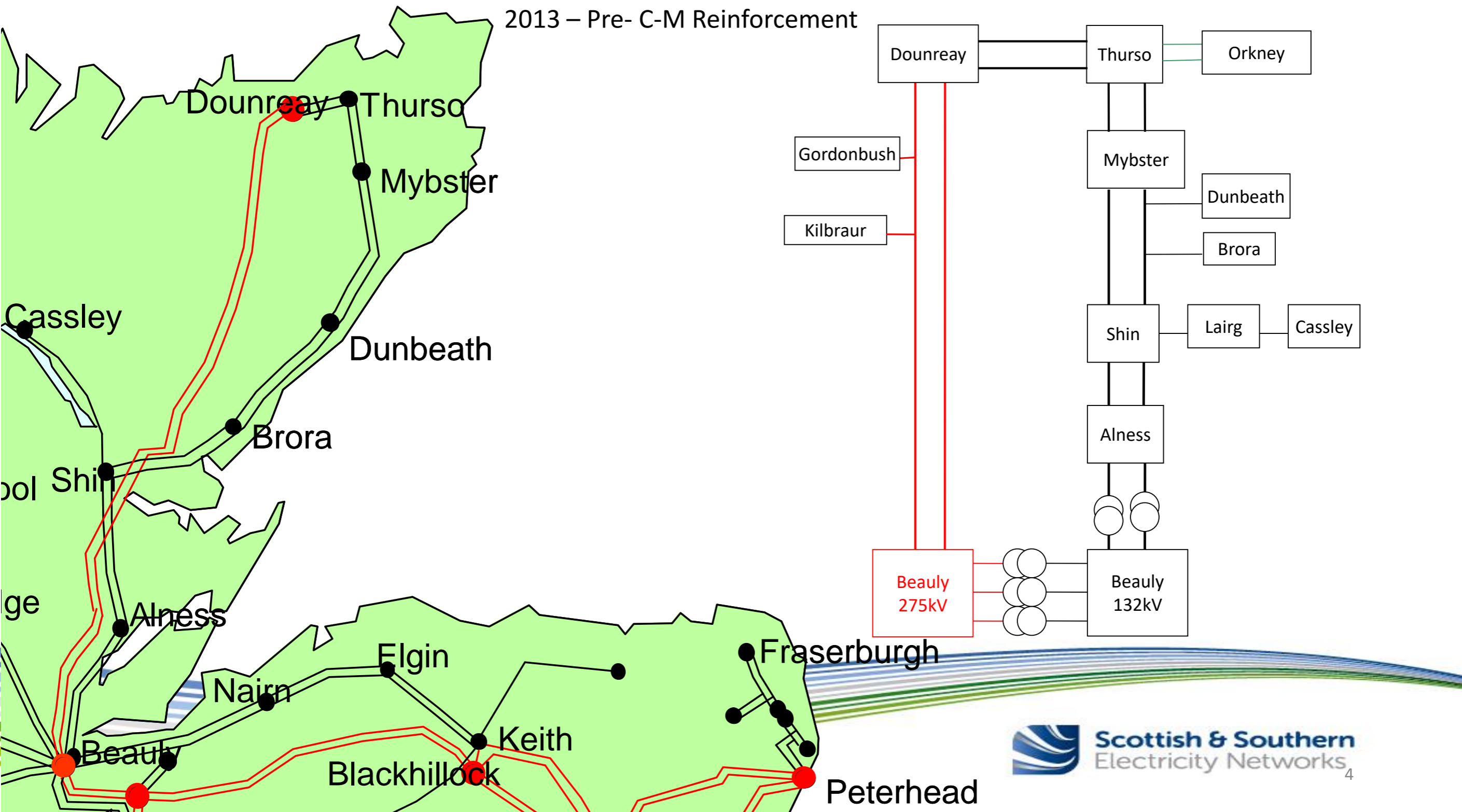


Scottish & Southern
Electricity Networks

Overview

- Overview of the SHE Transmission system
- Reinforcement drivers & System requirements
- Options considered
- What next?
- Wider transmission investment context

2013 – Pre- C-M Reinforcement

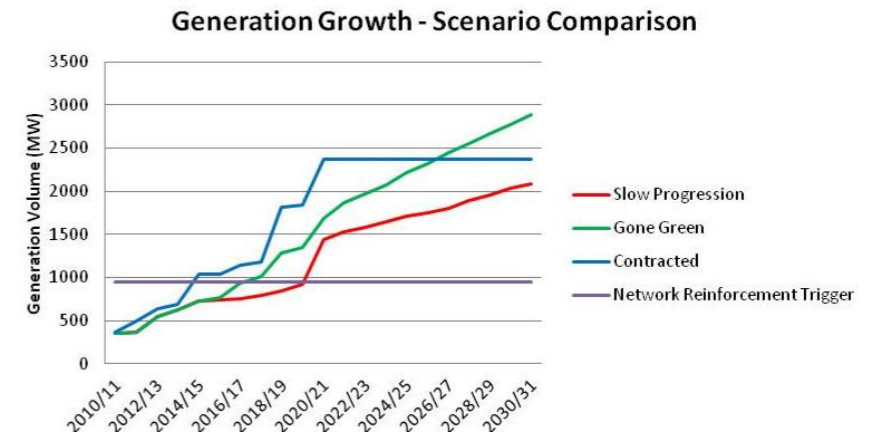


Reinforcement Driver

- Licence obligations to facilitate competition in the generation and supply of electricity and to develop an economic, efficient and coordinated transmission network
- Rapid growth in renewable generation in the area north of Beauly
- Limited transmission network capacity
- Transmission investment proposals checked against a range of generation outcomes from the contracted generation background to scenarios which either meet the Government's GB targets for CO2 reduction (Gone Green) or that are more pessimistic (Slow Progression)

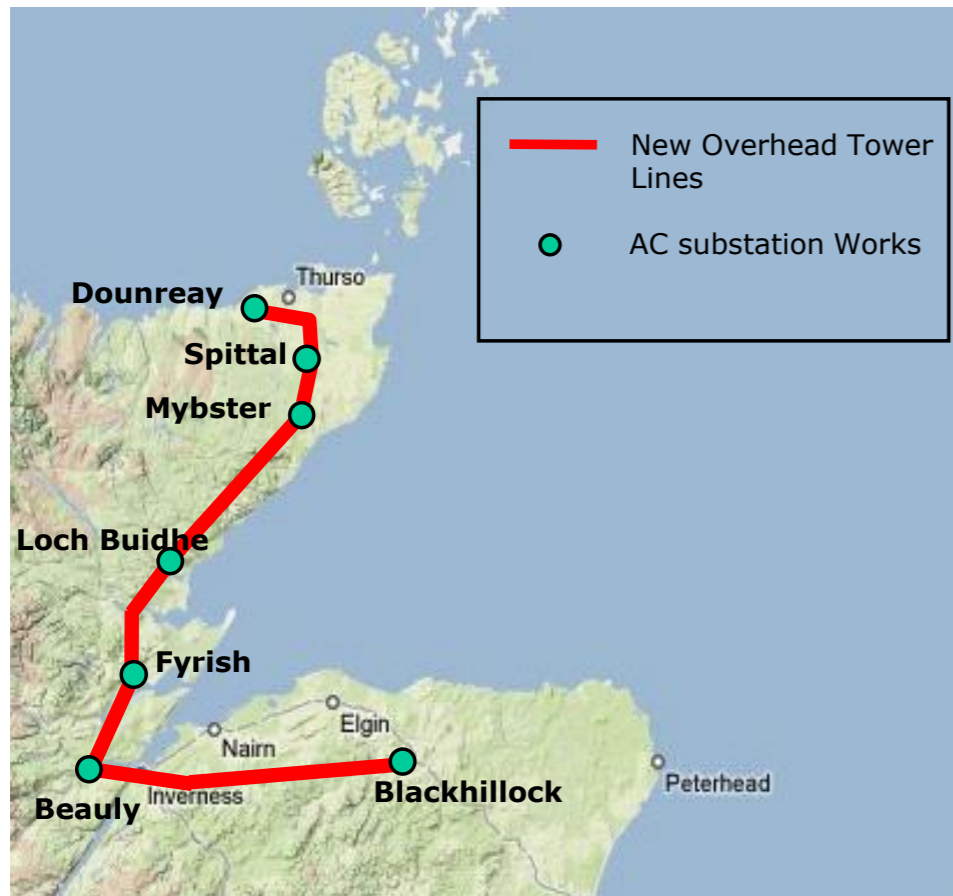
System Requirements

- Network capacity to evacuate renewable generation from the area north of Beauly
- Voltage support north of Beauly and in Morayshire
- Future connection of the Shetland island
- Blackstart capability

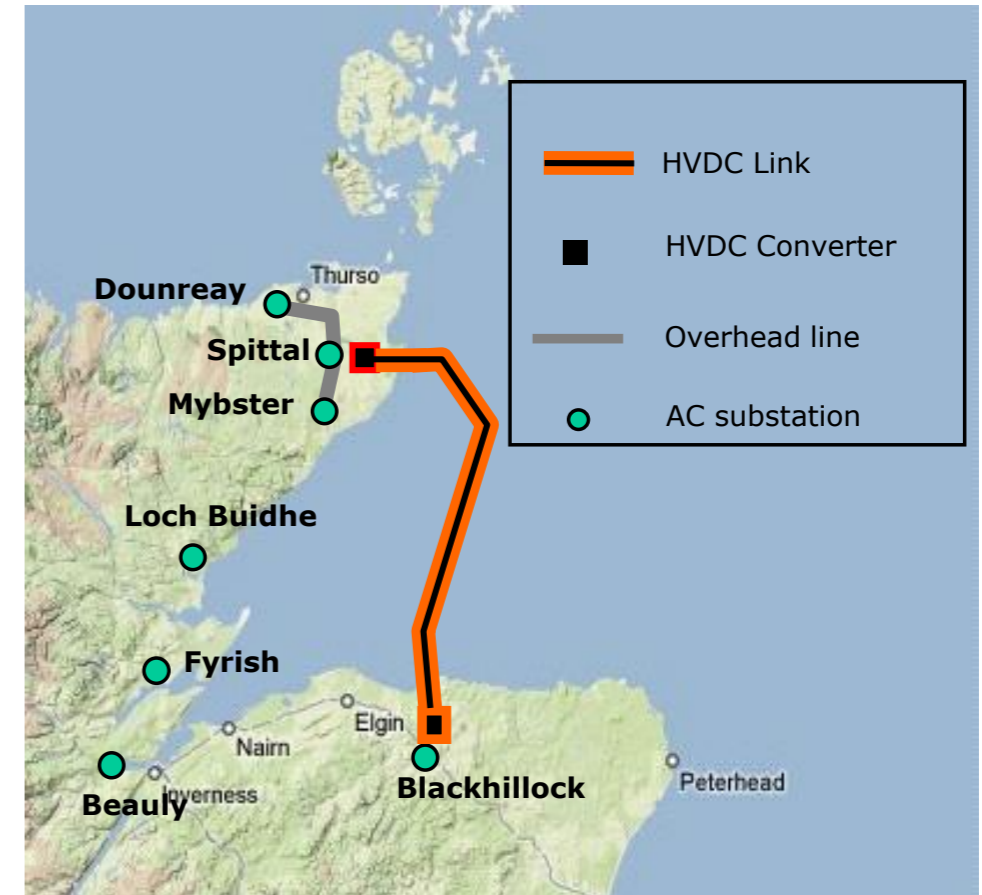


Main reinforcement options considered

(i) AC Onshore replacement of existing 132kV routes



(ii) HVDC Offshore plus associated AC works



AC Reinforcement option

- High environmental impact
- Of the scale of Beaulieu-Denny with around 300km of new overhead tower lines
- Delivery times much longer than HVDC option ~ 2024
- More expensive than proposal but still economic overall

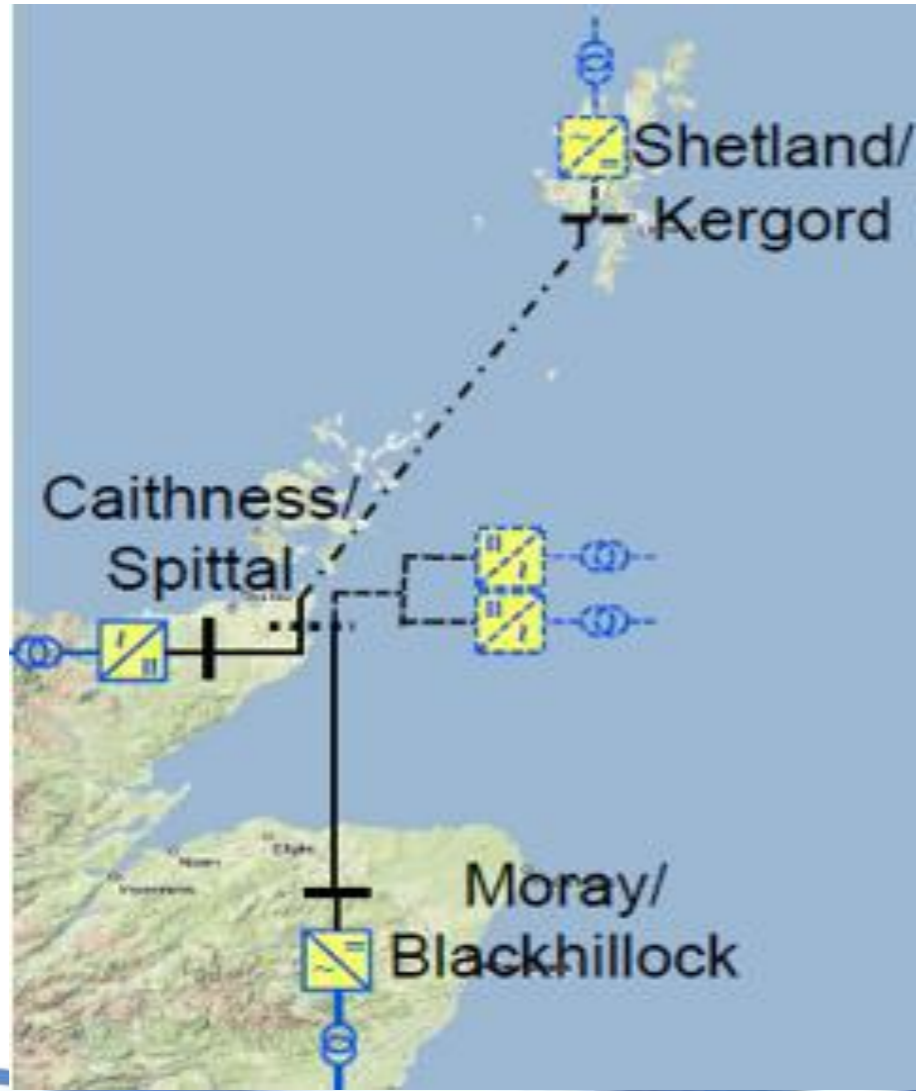
HVDC Reinforcement option

- Low environmental impact
- Minimises new overhead line construction ~ 35km
- Delivery times much shorter ~ 2018/19
- Strong overall cost benefit
- Less expensive than alternative and strong economic need case
- Additional benefits of early delivery including early connection of renewables and offsetting of carbon emissions

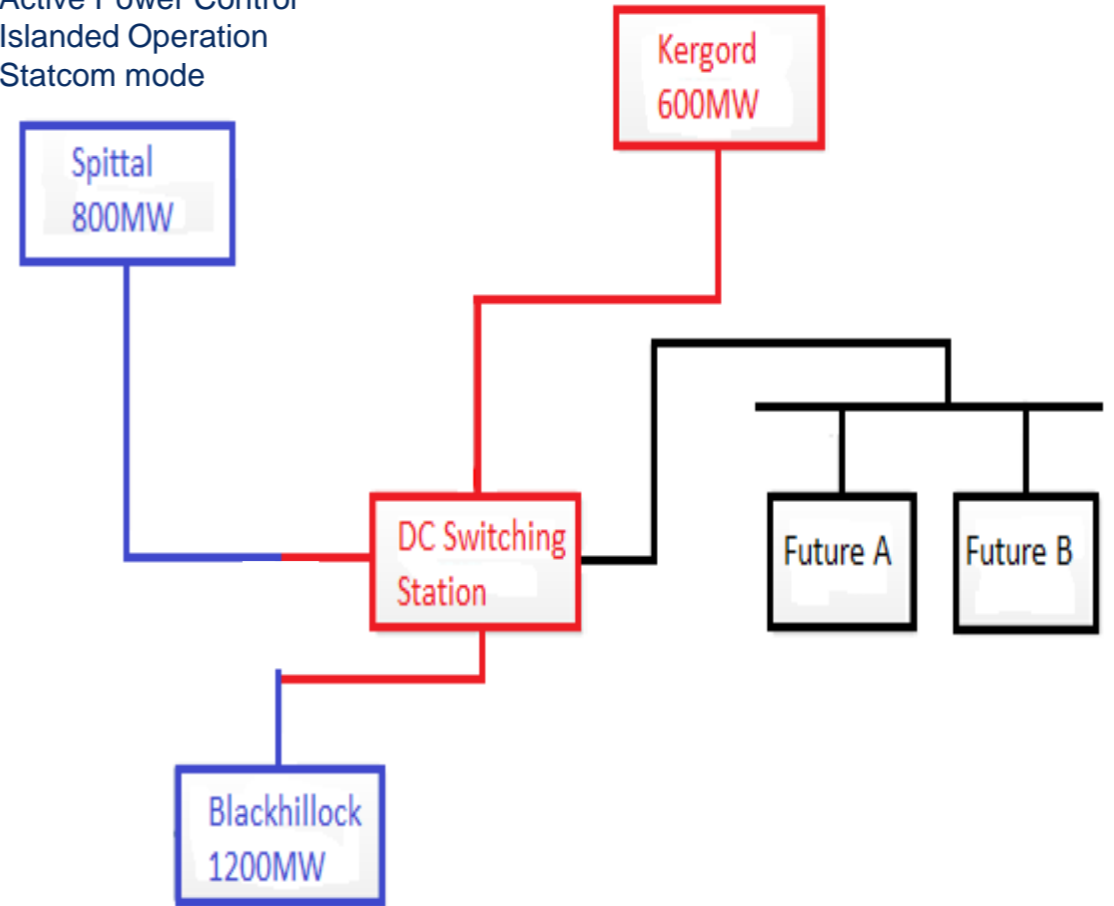
VSC HVDC technology benefits

- Reactive power capability
- Black-start capability
- Island mode operation
- Potential multi-terminal link to Shetland

What next?



- 1.Active Power Control
- 2.Islanded Operation
- 3.Statcom mode



- 1.DC Voltage Control
- 2.Statcom mode

