

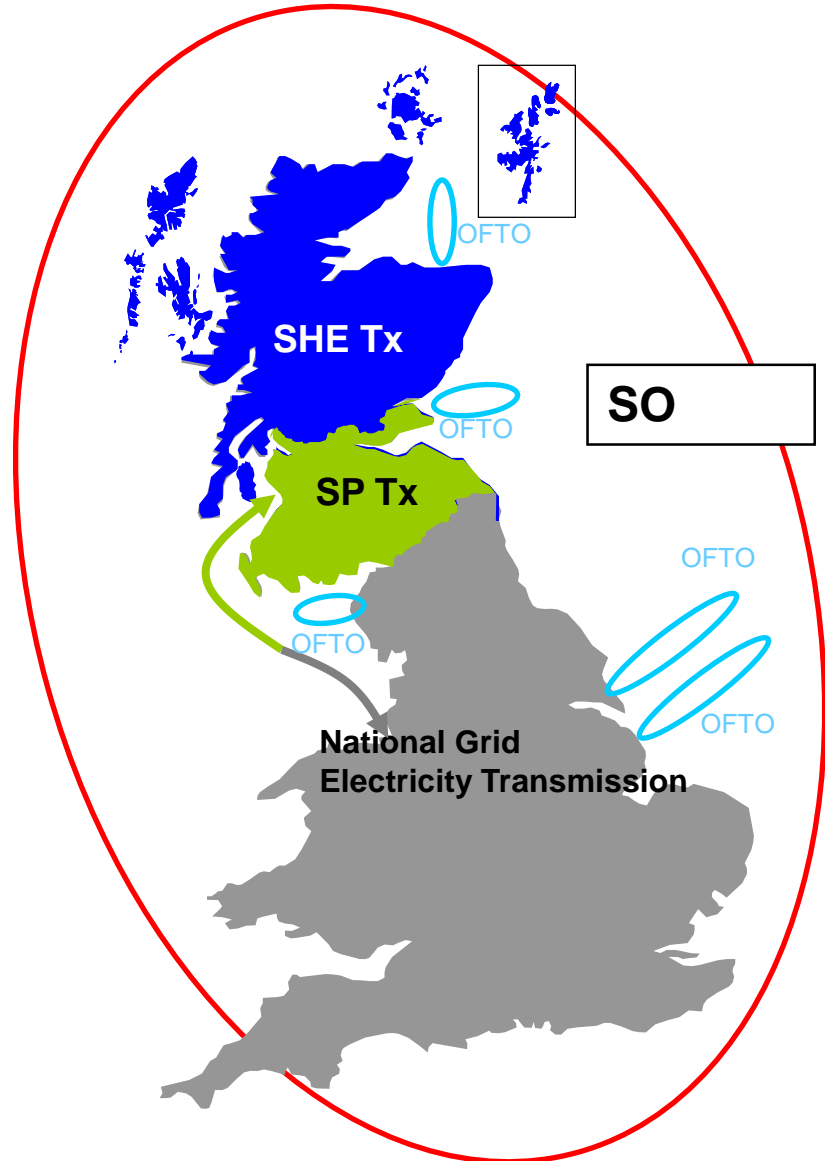
# SWITCHGEAR FOR HVDC MULTI-TERMINAL

CIGRE SC A3 & B4 Technical Panel  
on HVDC circuit breakers

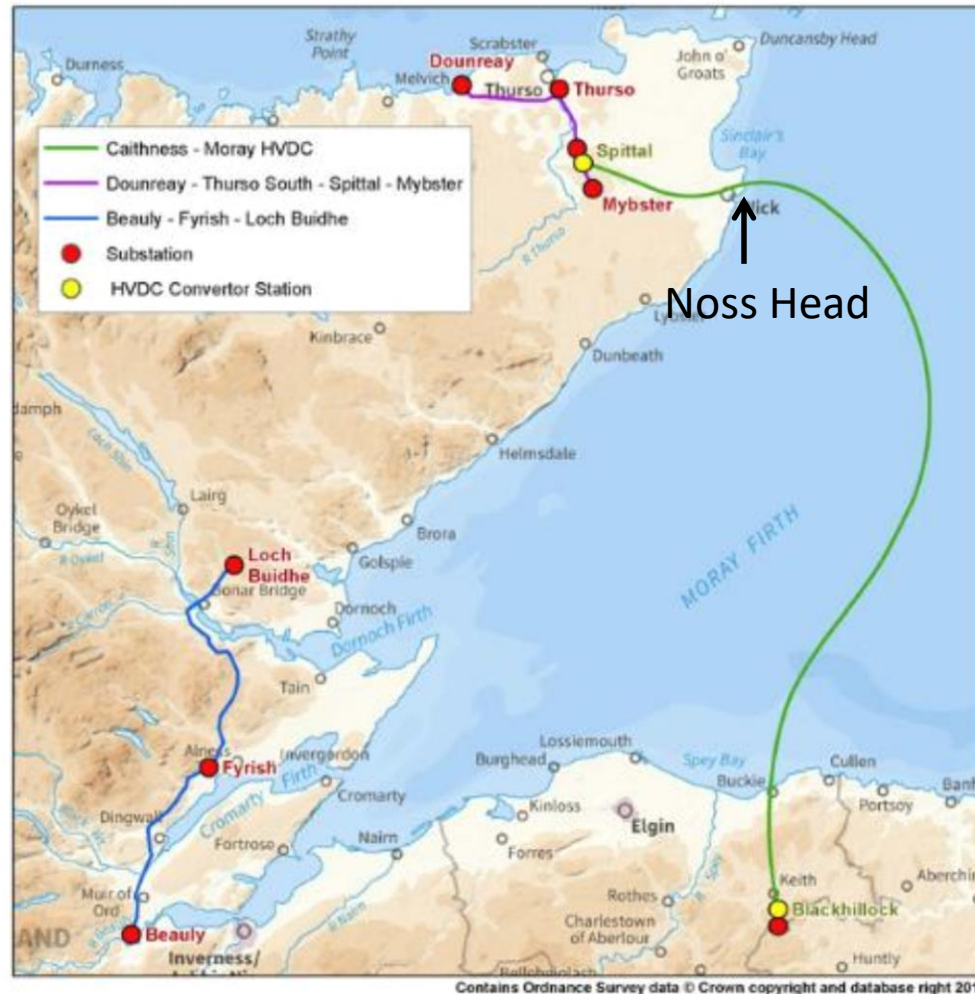
Paul Neilson, SHE Transmission plc, Scotland



# Transmission ownership and operation in Great Britain

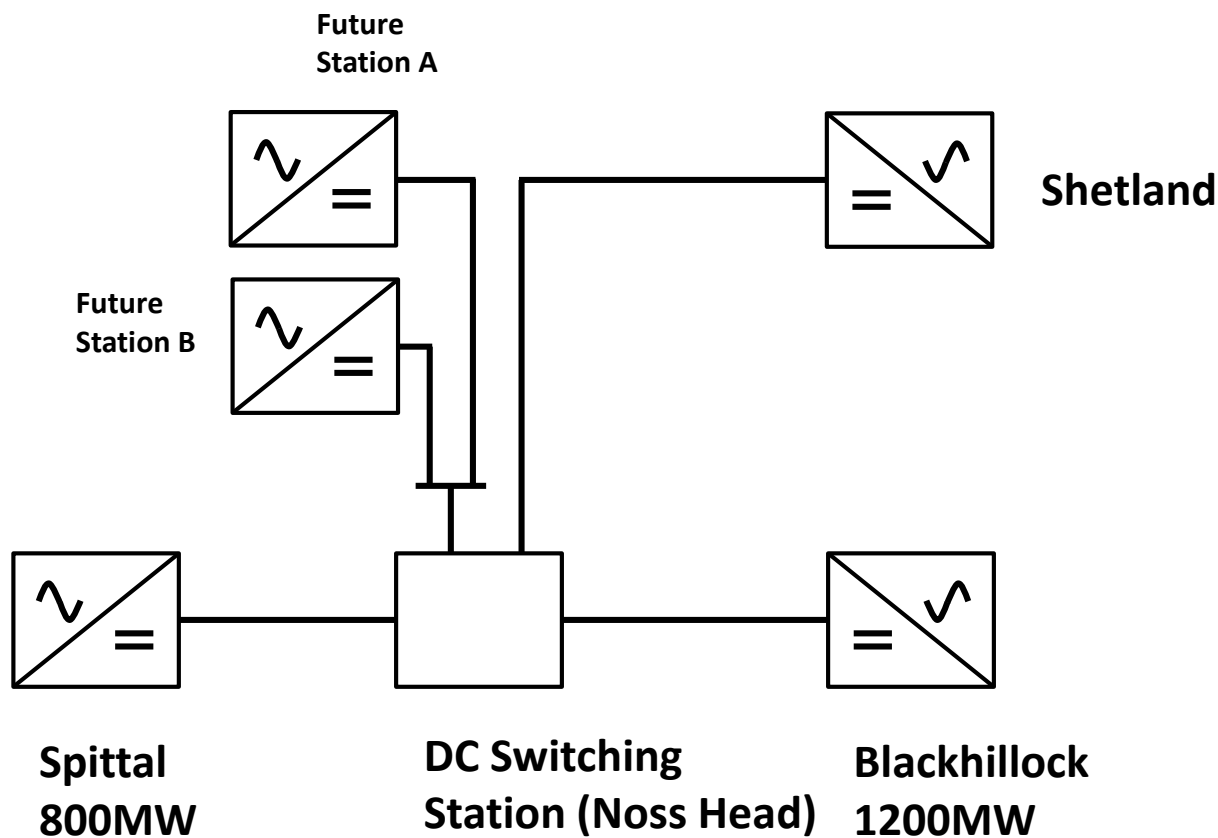


# Caithness-Moray HVDC project



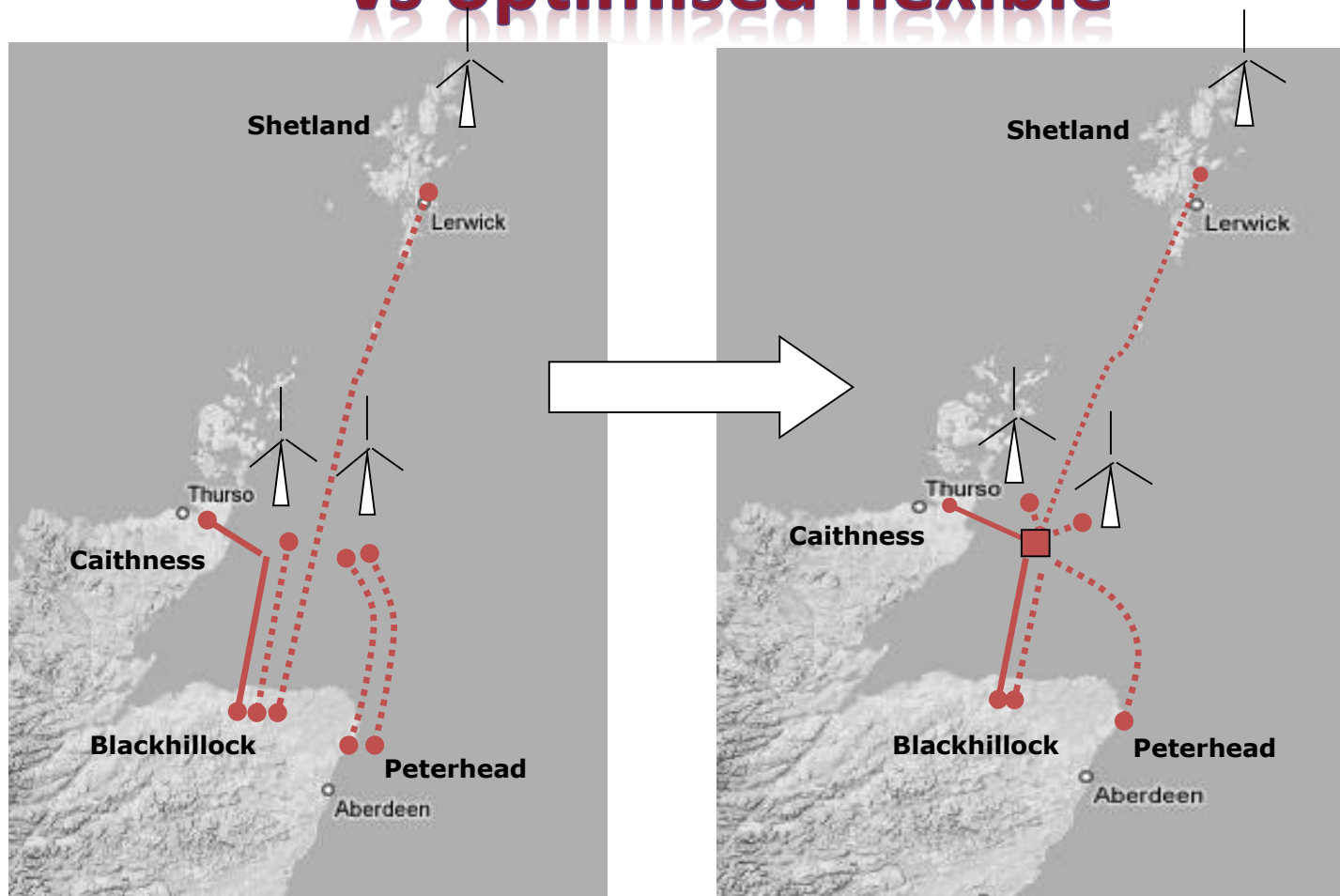
- 800MW/1200MW VSC HVDC
- Under construction now for commissioning by end 2018
- €1.3bn project funded through regulated allowances

# Designed for extension to multi-terminal





# Original concept 2010: dedicated radials vs optimised flexible



# TSO (SHE Transmission) design considerations

- Infrequent Infeed Loss risk 1800MW on the GB transmission system
- Layout & extension arrangements for Noss Head switching station to ensure infeed loss risk < 1800MW
- Five ended scheme Noss Head HVDC bussing point requires either HVDC breakers OR split running arrangements
- SHE Transmission decision 2012 to avoid reliance on availability of HVDC breakers and engineered Noss Head on the basis of AIS switchgear for HVDC duty assuming “normally-open” HVDC substation configuration.
- For HVDC control integration and multi-vendor compatibility – The National HVDC Centre (<http://www.hvdccentre.com/>)

# Thank you

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