

The National HVDC Centre *@ the LCNl Conference 2019*



The National
HVDC Centre

part of



Scottish & Southern
Electricity Networks

together with

nationalgrid

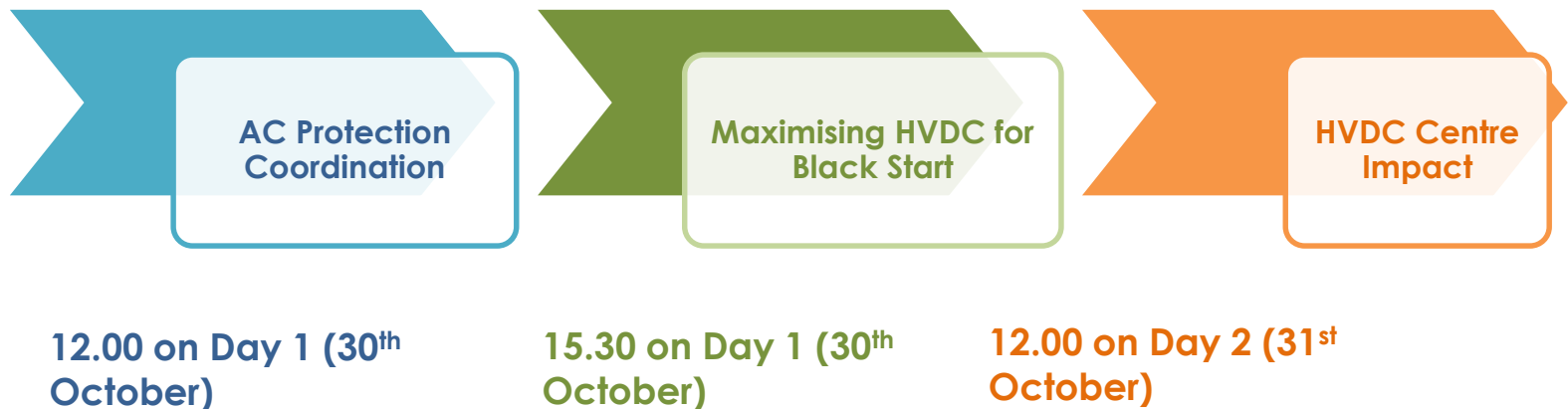


The National
HVDC Centre

- 1. Overview**
- 2. 5 Main Projects**
- 3. Research Programme**
- 4. Training, Engagement & Dissemination**

The National HVDC Centre at LCNI 2019

The National HVDC Centre is an Ofgem funded simulation and training facility available to support the deployment and de-risking of all GB HVDC schemes.



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 **nationalgrid**
 **SP ENERGY
NETWORKS**

HVDC in GB (2019)

7 HVDC Links - Totalling: 8 GW



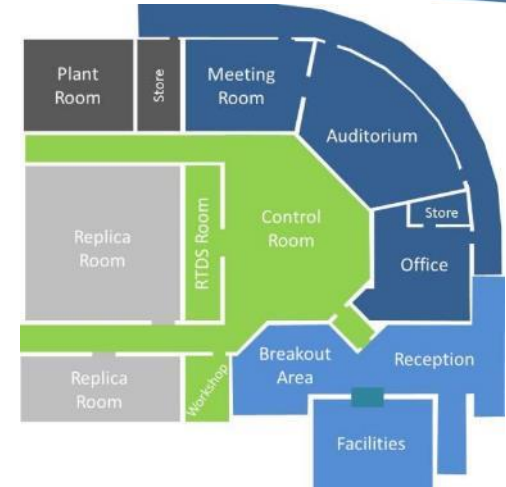
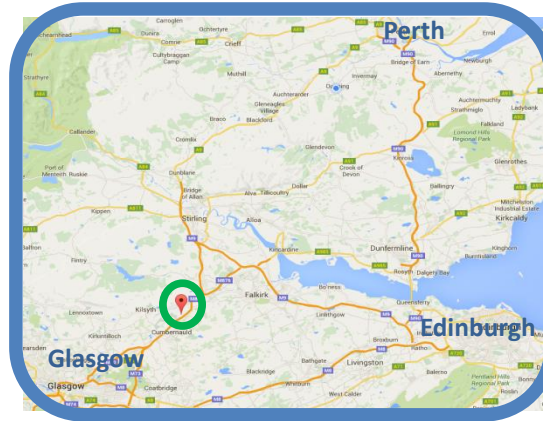
HVDC in GB (2028)

Up to 34 HVDC Links - Totalling: 45.45 GW

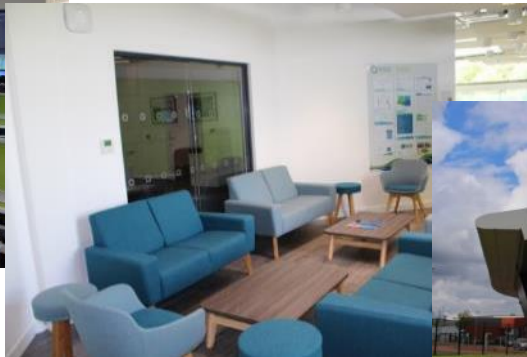


HVDC Centre: Building

Located in the centre of Scotland...



...our modern facility provides a bespoke simulation environment.





RTDS
Technologies

ABB



Caithness

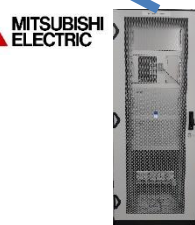


Moray



Shetland

HVDC Replicas



PROMOTION IEDs

Control Hardware



Protection Relays





Ben Marshall

HVDC Technology Manager



Simon Marshall

Centre Manager



Ruth Apps

Business Development Manager



Colin Cameron

ICT Engineer



Ian Cowan

Lead Simulation Engineer



**Dr Oluwole
Daniel Adeuyi**

Simulation Engineer



Habibur Raham

Simulation Engineer



Bharath Ponnalagan

Simulation Engineer

1. Overview

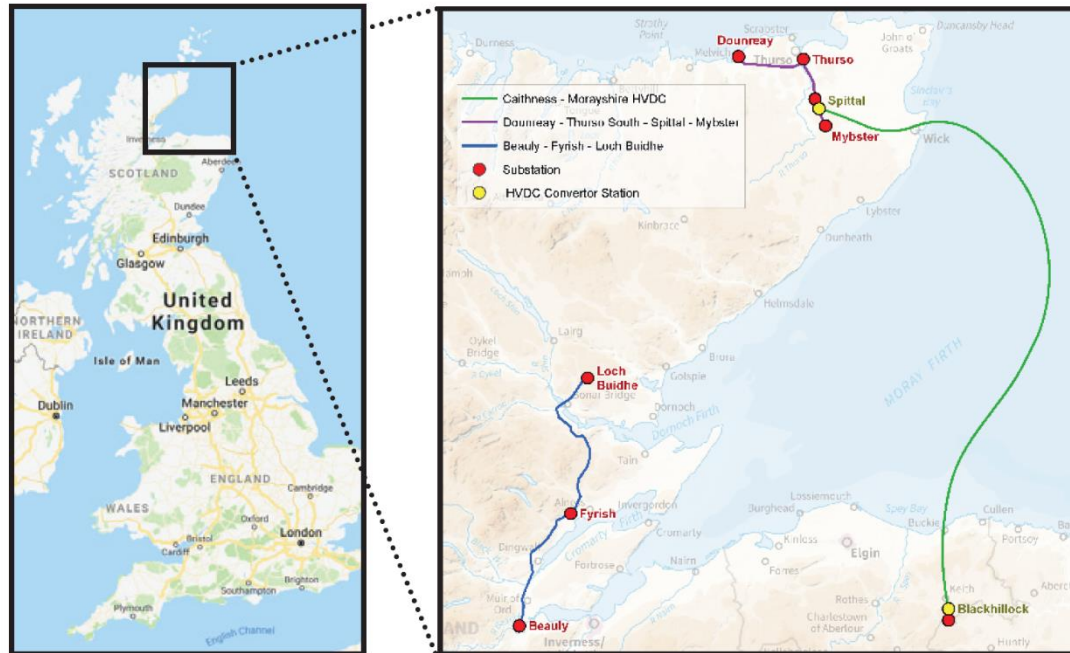
2. 5 Main Projects

- Caithness-Moray Support
- HVDC for Black Start
- NSL Protection Coordination Testing
- Stability Pathfinder
- PROMOTioN

3. Research Programme

4. Training, Engagement & Dissemination

Supporting the development, commissioning and ongoing operation of Europe's first multi-terminal project.



Commissioned by:

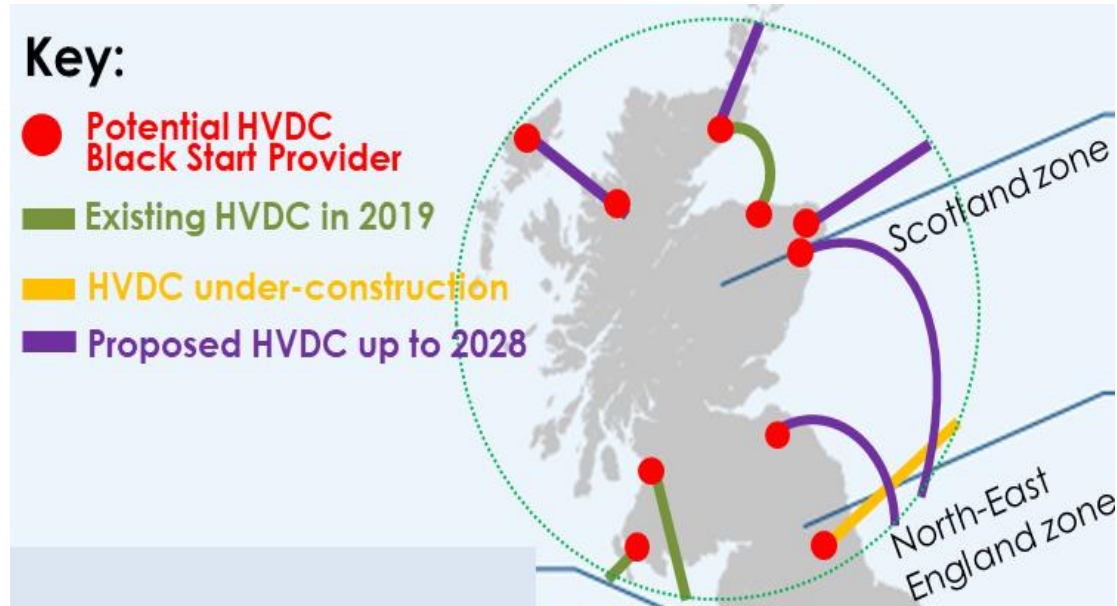


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Maximising the use of HVDC schemes to improve Black Start and system energisation.



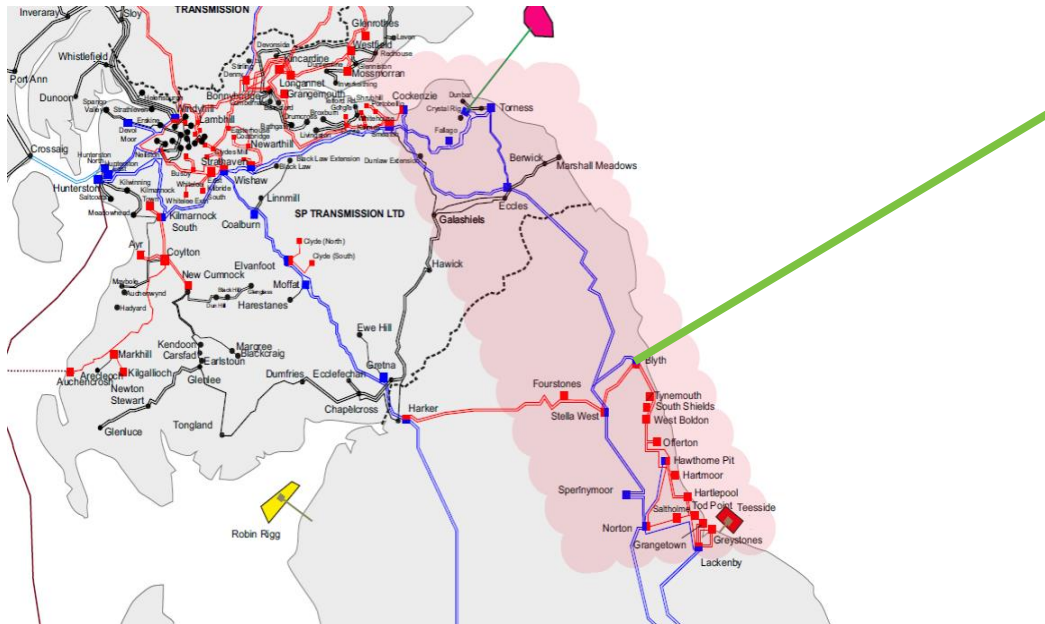
Commissioned by:



Scottish
Government
gov.scot

NSL Protection Coordination Testing

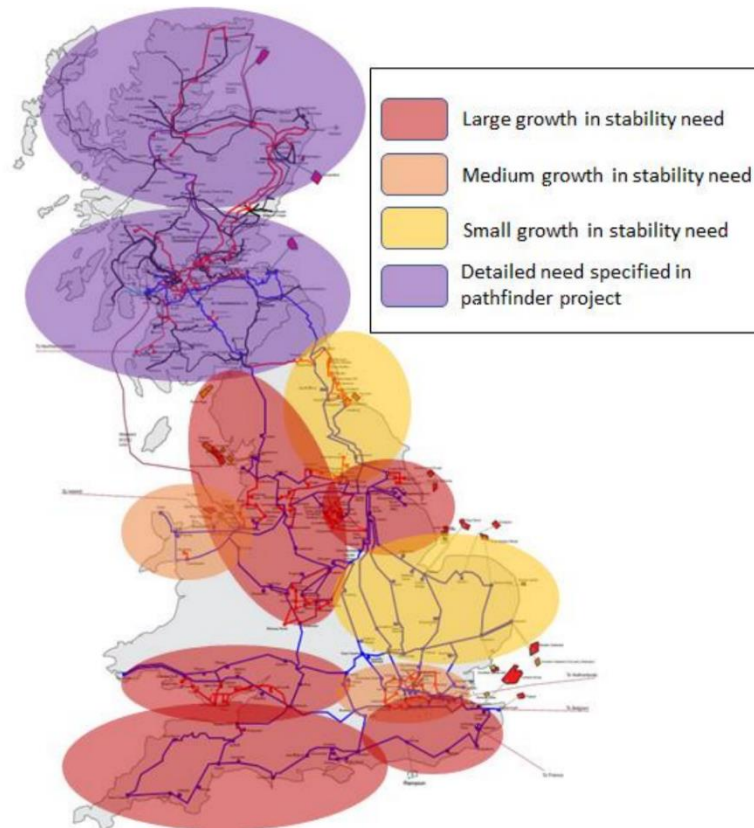
The HVDC Centre is supporting the protection co-ordination testing for the new HVDC North Sea Link interconnector to ensure the security and resilience of the GB electricity network.



Commissioned by: nationalgrid &



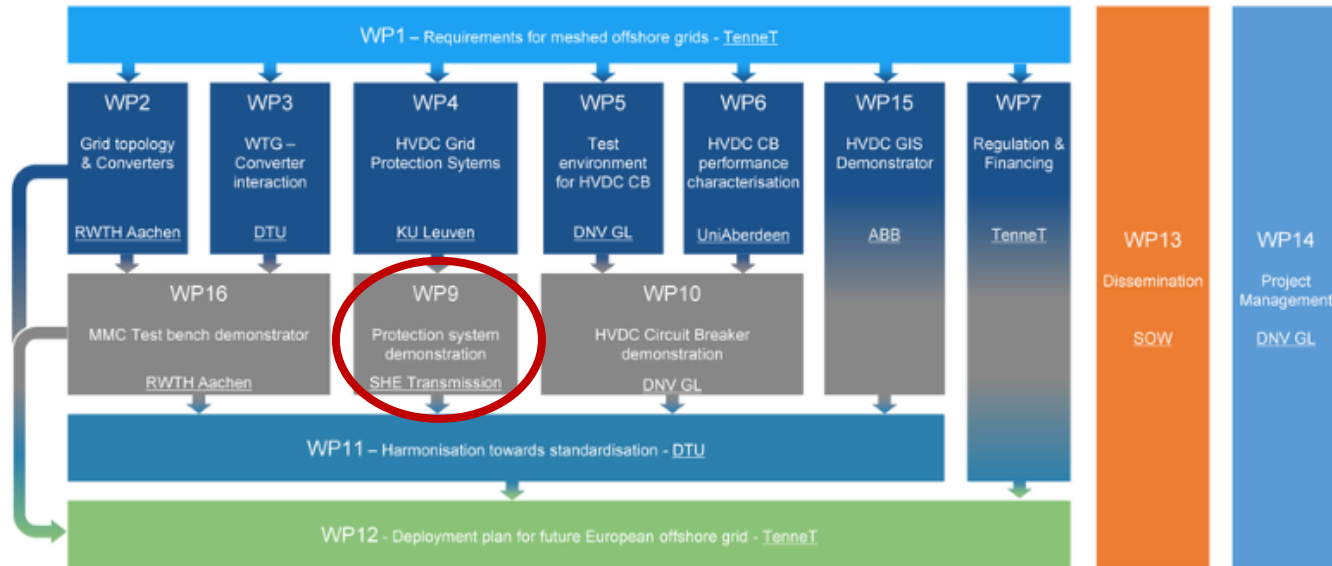
Utilising HVDC to improve the stability of the electricity network.



Commissioned by: **nationalgrid**ESO

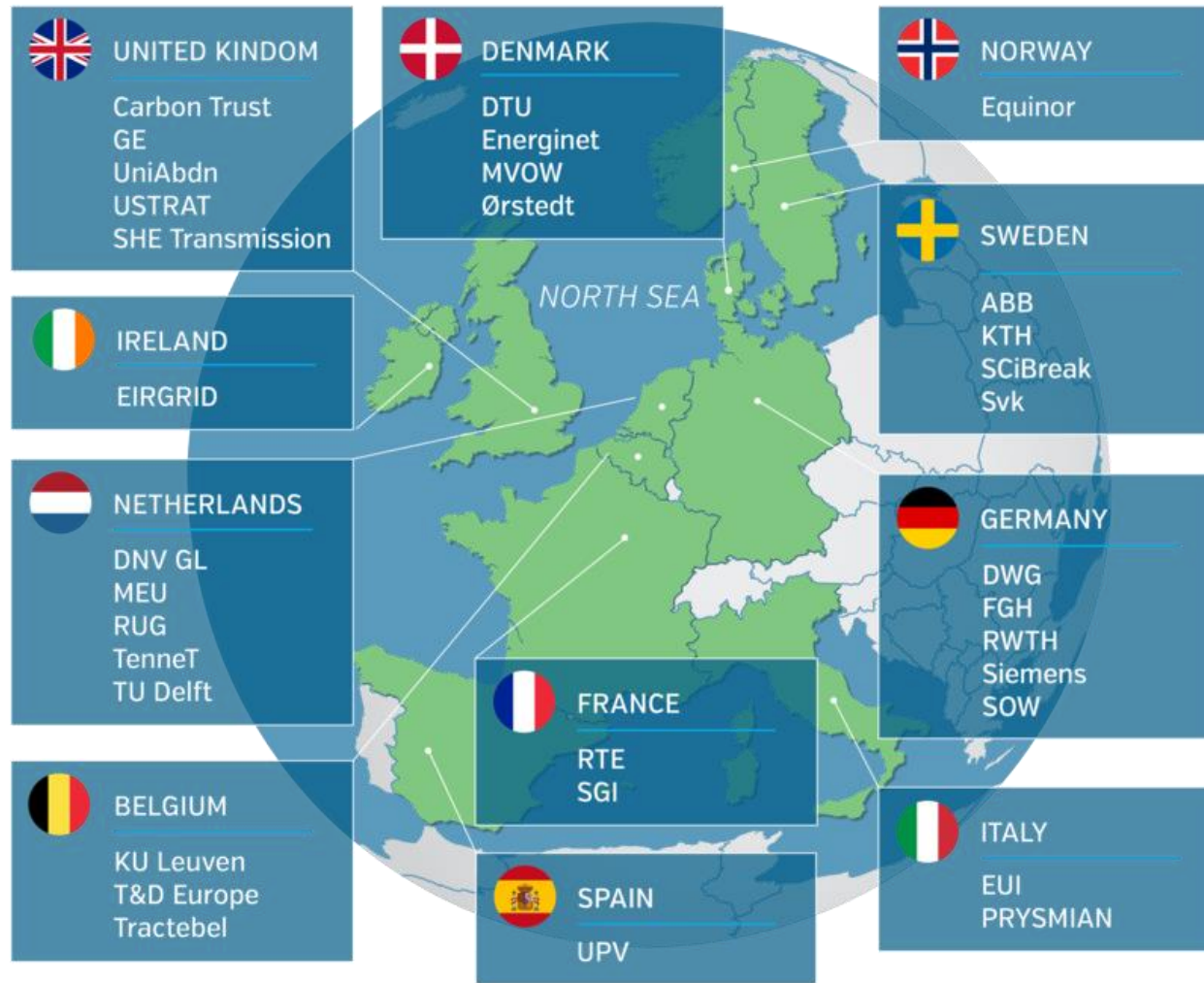
PROMOTiON – Project organisation

Work packages



The Road Ahead





1. Overview
2. 5 Main Projects
- 3. Research Programme**
 - Completed
 - Current
 - Future
4. Training, Engagement & Dissemination

Completed Innovation Projects

Developing Open-Source Converter Models



Stability assessment for co-located converters



Design of DC/DC Converter



Current Innovation Projects

Coordination of AC network protection during energization



Stability assessment and mitigation converter interactions



Improving Grid Code For HVDC



Future Innovation Projects

Investigation of Power Oscillation Damping Controls

Complementing HVDC with synchronous condensers/ ancillary equipment

Assessment of AC protection performance with HVDC

Future Potential NIC Project

Whole System Functional Acceptance Testing

Training Programme

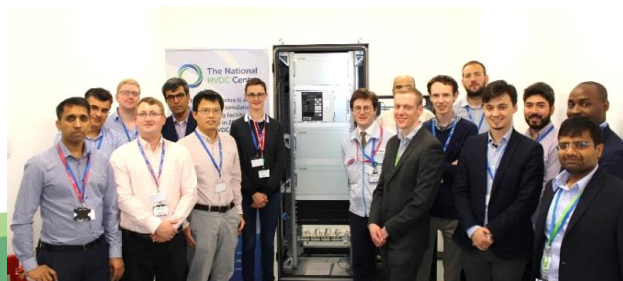
- 1) Control Room Training
- 2) Approved RTDS Training Centre
- 3) Introduction to HVDC Training
- 4) HVDC Engineer Training
- 5) PSCAD/PSSE Training



The team presenting at the IET ACDC Conference (5-7 February)



Ian delivering RTDS training (30 April–2 May)



PROMOTiON DC Grid Demonstration Event (22 August)

Working Group Participation

- 1) IET ACDC Organisation Committee
- 2) OFTOs Working Group (ENA)
- 3) CIGRE (B4.82) Working Group
- 4) Grid Code Expert Working Group
- 5) Annual HVDC Operators' Forum



Dave closing the CM Dissemination Event (28 March)



Daniel presenting at the 2019 HVDC Operators' Forum (26-27 June)

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www.hvdccentre.com



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