

Flexible Networks for a Low Carbon Future (FlexNet)

Dedicated website – No

Organisation webpage – Yes

Centralised portal – ENA Smarter Networks

Objectives/Success Criteria – Yes

Closedown/final report – Yes

Open-source data – Yes

Peer-reviewed academic output (Primary Subject / Referenced) - 5 / 0

Brochures/Case Studies/Videos – Yes

On-line major conference/event presentations - 2

Dissemination Event / Output available – 1 / 0

Follow-on project – No

Consumer Engagement

Consumer Participation – Yes

Consumer Feedback – No

Output Summary

Progress reports – Yes

Detailed and objective final report – Yes

Project method detailed – Yes

Performance to objectives detailed – Yes

Lessons learned identified – Yes

Policy/Regulation implications reviewed – Yes

Significant number of work package specific reports available.

Outcomes vs. Objectives/Targets

Performance to objectives – All achieved

Key Findings

- Use of enhanced seasonal ratings for primary transformers in network groups approaching firm capacity consistent with an appropriate level of risk.
- Use of real-time thermal ratings (RTTR) for 33kV overhead lines enables increased wind generation connection with minimal additional risk.
- Use flexible network control (FNC) to switch load automatically to other HV network groups when high loading approaches the firm capacity of the network group to enable additional demand growth or connections beyond the existing firm capacity.
- Customised voltage management at primary and secondary substation transformers through seasonal tap settings to meet high load conditions in winter and increased embedded generation activity in summer, or through line drop compensation techniques.

- The deployment of an automatic voltage regulator (AVR) to facilitate flexible network control schemes, where load transfer to long interconnectors is constrained due to voltage issues. Whilst SPEN already have a number of AVRs installed on the network, these are to enable generation connections.
- Changes in operational strategy are best implemented through policy.
- The introduction of innovations should avoid extensive actions or decisions from the operator although the operator should always have the option of taking manual control.
- Network control engineers should be equipped with the knowledge, suitable information in the NMS and appropriate level of control of innovations under both normal running conditions and contingency conditions.
- Energy efficiency measures were the least effective for increasing network capacity.
- Improved network monitoring is required to develop a holistic approach to network information gathering that is optimised for network planning and operations needs, including facilitation of feasibility and operation of innovative techniques.