

### Northern Isles New Energy Systems (NINES)

Dedicated website – Yes

Organisation webpage – No

Centralised portal – ENA Smarter Networks

Objectives/Success Criteria – Yes

Closedown/final report – Yes

Open-source data – No

Peer-reviewed academic output (Primary Subject / Referenced) - 10 / 20

Brochures/Case Studies/Videos – Yes

On-line major conference/event presentations - 4

Dissemination Event / Output available – 1 / 1

Follow-on project – No

### Consumer Engagement

Consumer Participation – Yes

Consumer Feedback – No

### Output Summary

Progress reports – No

Detailed and objective final report – Yes

Project method detailed – Yes

Performance to objectives detailed – Yes

Lessons learned identified – Yes

Policy/Regulation implications reviewed – No

Overall summary report plus sub-reports for individual work packages.

### Outcomes vs. Objectives/Targets

Performance to objectives – All achieved

### Key Findings

- The overall ANM system operation has allowed a trebling of renewable capacity of Shetland.
- The integration of a 3MWh battery, ANM and DSM controls in individual households can increase network capacity for renewables by 1MW.
- It is feasible to integrate multiple domestic systems within an ANM system to provide a meaningful benefit.
- Frequency responsive DSM has been shown to enable stable network operation in conjunction with an ANM system. We have shown that frequency responsive demand can be used to maintain the frequency stability of the system under the calculated limits.