Date of Submission

May 2021

Network Innovation Allowance Progress Report

Notes on Completion: Please refer to the appropriate NIA Governance Document to assist in the completion of this form.

Network Licensees must publish the required Project Progress information on the Smarter Networks Portal by 31st July 2014 and each year thereafter. The Network Licensee(s) must publish Project Progress information for each NIA Project that has developed new learning in the preceding relevant year.

Project Progress

Project Title

Whole-System Growth Scenario Modelling

Project Reference

NIA_SSEN_0030

Funding Licensee(s)

Scottish Hydro Electric Power Distribution, Southern Electric Power Distribution

Project Start Date

October 2017

Project Duration

1 year and 0 months

Nominated Project Contact(s)

SSEN Future Networks Team

Scope

The complete project will:
• Devise a methodology for local engagement that informs both the investment decisions of the DSO and of local decision-makers and other energy network owners to maximise the likelihood of investments and decisions that support an optimal whole system outcome
• Devise a methodology for whole-system energy scenario modelling which includes electricity, water and gas; distributed energy resources; EV uptake and other transport issues; housing and infrastructure development plans; and the Future Energy Scenarios
• Using the methodology, create a detailed, ground-up model of Generation and Demand growth scenarios from the present day to the year 2040, covering the distribution network served by specific Grid Supply Points in the three nominated areas of Scotland, from the Transmission/Distribution interface down to the 33kV level
• Look beyond the current project pipeline of development for each technology considered, by using the National Grid Future Energy Scenarios as the basis of longer term modelling
• Model the impact of the intentions and aspirations of wider local stakeholders, including the Scottish Government, local authorities and industries, and the wider communities within the areas concerned, especially the development of housing and infrastructure
• Assess the effects of developments such as Gas Distribution Network extension on power flows, power import/export at the T/D interface, system stability and balancing services; similarly, the effects of planned developments by other infrastructure providers such as water and telecoms utilities
• Overlay the results on our existing models of the network, and ask where flexible resources can be used. Use experience gained in previous projects (such as SAVE and NTVV), together with CMZ and Active Network Management deployments, to identify how these can provide option value and reduce total system costs over the range of future scenarios
• Develop a methodology for identifying the optimal holistic development strategy for the area concerned
• Identify the events and conditions which would trigger reinforcement investment and the optimum time to begin those investments in the four Future Energy Scenarios
• Assess the risks posed by increasing reliance on unconventional assets and virtual resources (such as aggregated demand response), to system stability and quality of service. Examine the failure modes and effects of these resources, when used in combination with other assets in the three areas concerned
• Document the methodology used in the modelling so that it can be repeated in other areas and the models updated over time as changes occur

Objectives(s)

1 Understand the possible patterns of change over a two-decade horizon in the distribution networks served by three GSPs in the nominated areas
2 Create a whole system modelling methodology, and subsequently three specific area models, for anticipating the impact of these changes and the options for responding to them, in various local Future Energy Scenarios
3 Demonstrate a methodology that allows the two-way transfer of knowledge and understanding between network operators and those that make investment decisions in the areas served by the network, to facilitate efficient whole system planning
4 Apply learning from projects in other regions to assess their value for reducing overall system costs and risks in the three areas, and to identify investment triggers for network improvements

Success Criteria

- A whole-system methodology is developed which enables a ground-up model to be constructed of a distribution area, looking forward for 20 years or more, under various scenarios, which can inform investment planning and decision-making
- The scenario analysis allows the company to examine the scope for applying flexible and distributed energy resources to meet the new DSO responsibilities in the areas modelled
- Improved understanding is gained of whole-system factors including the extension of the gas supply network and other utility developments
- Acknowledgment from local decision makers of the value of the methodology in allowing them to make the best decisions from a whole system perspective
- Dissemination of the outputs to all stakeholders, with continuing engagement

Performance Compared to the Original Project Aims, Objectives and Success Criteria

The initial work package was the definition of the project and preparation of the brief for the principal project consultant. This led to a tender evaluation and the selection of Mott MacDonald as the principal consultant.
The consultant has prepared a stakeholder engagement plan and begun to establish relationships with the external and internal stakeholders, including local authorities. The three areas to be studied using the Method have been fully defined.

Required Modifications to the Planned Approach During the Course of the Project

No modifications to the approach have been found necessary at this stage.

Lessons Learnt for Future Projects

N/A

The Outcomes of the Project

N/A

Data Access

N/A

Foreground IPR

N/A