Notes on Completion: Please refer to the appropriate NIA Governance Document to assist in the completion of this form. The full completed submission should not exceed 6 pages in total.

NIA Project Registration and PEA Document

Date of Submission

Jul 2015

Project Reference Number

NIA_SSEPD_0012

Project Registration

Project Title

Network Resilient Zone Utilising Embedded Generation – Feasibility Study

Project Reference Number

NIA_SSEPD_0012

Project Licensee(s)

Scottish and Southern Electricity Networks Distribution

Project Start

July 2015

Project Duration

0 years and 3 months

Nominated Project Contact(s)

SSEN Future Networks Team

Project Budget

£35,000.00

Summary

The concept of operating isolated networks in island mode has been considered previously but full implementation of an islanded network zone is not common practise.

This project is innovative as it will consider options to make use of the four wind turbines and the DECC funded 1.68MWh, 105kW battery already located on Gigha. The requirement for Innovative commercial arrangements will be considered and identified as necessary as the operation of these non-SSEPD owned assets would be required to enable and support operation in “island” mode.

Innovative technical arrangements will be considered and identified as necessary.The potential application of this study to other areas of the network is becoming more widespread as distributed renewable generation and energy storage assets become more widely used.

Third Party Collaborators

Smarter Grid Solutions

Nominated Contact Email Address(es)

fnp.pmo@sse.com

Problem Being Solved

Within the SHEPD license area there are a large number of rural communities. These are normally fed by radial 11 kV overhead lines with no alternative source of supply.

Increasingly, these communities have renewable generation connected to the local distribution network.

Conventionally when the network fails either due to weather related events or equipment failure this renewable generation disconnects itself from the network until the fault is rectified and the electrical network is returned to normal.

Many of these rural communities have difficult access arrangements such as the ones located on islands where the only access is by boat which can often exacerbate the delay in reconnection due to their remoteness.

Method(s)

The method is to determine the potential to improve the resilience of supply to remote communities by undertaking a feasibility study on the viability for the electricity supply to the community on the island of Gigha to be supported by the local embedded renewable generation.
The network would operate in true ''island'' mode in the event of a failure of the usual supply to the island as the existing wind generation and energy storage installations would assist in off-grid island operation. Innovative technical and commercial arrangements will be required and there may be a requirement for additional assets to allow the island to operate in an ''island'' mode. The local distribution network would operate effectively under fault conditions and reconnect the island back to the mainland once grid power has been restored.

Scope

The concept of operating isolated networks in island mode has been considered previously but full implementation of an islanded network zone is not common practise.

This project is innovative as it will consider options to make use of the four wind turbines and the DECC funded 1.68MWh, 105kW battery already located on Gigha. The requirement for Innovative commercial arrangements will be considered and identified as necessary as the operation of these non-SSEPD owned assets would be required to enable and support operation in “island” mode.

Innovative technical arrangements will be considered and identified as necessary.
The potential application of this study to other areas of the network is becoming more widespread as distributed renewable generation and energy storage assets become more widely used.

Objective(s)

The aim of this project is to determine the viability of options to permit the operation of a remote rural network containing renewable generation and energy storage in island mode.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

The delivery of a study which determines the viability of options to permit the operation of a remote network in island mode.

Project Partners and External Funding

n/a

Potential for New Learning

n/a

Scale of Project

The scale of this project is limited to a single island containing renewable generation.

Technology Readiness at Start

TRL3 Proof of Concept

Technology Readiness at End

TRL4 Bench Scale Research

Geographical Area

The study will concentrate on the island of Gigha.

Revenue Allowed for the RIIO Settlement

At this stage no saving on expenditure can be assumed.

Indicative Total NIA Project Expenditure

The indicative Total NIA Project Expenditure is £35,000, 90% of which (£31,500) is Allowable NIA Expenditure.

Project Eligibility Assessment Part 1

There are slightly differing requirements for RIIO-1 and RIIO-2 NIA projects. This is noted in each case, with the requirement numbers listed for both where they differ (shown as RIIO-2 / RIIO-1).

Requirement 1

Facilitate the energy system transition and/or benefit consumers in vulnerable situations (Please complete sections 3.1.1 and 3.1.2 for RIIO-2 projects only)

Please answer **at least one** of the following:

How the Project has the potential to facilitate the energy system transition:

n/a

How the Project has potential to benefit consumer in vulnerable situations:

n/a

Requirement 2 / 2b

Has the potential to deliver net benefits to consumers

Project must have the potential to deliver a Solution that delivers a net benefit to consumers of the Gas Transporter and/or Electricity Transmission or Electricity Distribution licensee, as the context requires. This could include delivering a Solution at a lower cost than the most efficient Method currently in use on the GB Gas Transportation System, the Gas Transporter's and/or Electricity Transmission or Electricity Distribution licensee's network, or wider benefits, such as social or environmental.

Please provide an estimate of the saving if the Problem is solved (RIIO-1 projects only)

Over the past 4 years the incurred cost due to CI/CHL on the island of Gigha has averaged around £65,000 per year.
The feasibility study will inform the estimate of saving but it is assessed this stage that a 50% reduction in CI/CHLs may be achieved over the 8 year RIIO-ED1 period leading to a benefit in the order of £260,000.

Please provide a calculation of the expected benefits the Solution

N/A-Research Project.

Please provide an estimate of how replicable the Method is across GB

This methodology could be applied by all UK DNOs to remote communities with embedded renewable generation.

Please provide an outline of the costs of rolling out the Method across GB.

The use of the methodology to determine the viability of options will be able to be applied with minimal extra cost.

Requirement 3 / 1

Involve Research, Development or Demonstration

A RIIO-1 NIA Project must have the potential to have a Direct Impact on a Network Licensee's network or the operations of the System Operator and involve the Research, Development, or Demonstration of at least one of the following (please tick which applies):

☐ A specific piece of new (i.e. unproven in GB, or where a method has been trialled outside GB the Network Licensee must justify repeating it as part of a project) equipment (including control and communications system software).

☐ A specific novel arrangement or application of existing licensee equipment (including control and/or communications systems and/or software)

☑ A specific novel operational practice directly related to the operation of the Network Licensees system

☐ A specific novel commercial arrangement

RIIO-2 Projects

☐ A specific piece of new equipment (including monitoring, control and communications systems and software)

☐ A specific piece of new technology (including analysis and modelling systems or software), in relation to which the Method is unproven

☐ A new methodology (including the identification of specific new procedures or techniques used to identify, select, process, and analyse information)

☐ A specific novel arrangement or application of existing gas transportation, electricity transmission or electricity distribution equipment, technology or methodology

☐ A specific novel operational practice directly related to the operation of the GB Gas Transportation System, electricity transmission or electricity distribution

☐ A specific novel commercial arrangement

Specific Requirements 4 / 2a

Please explain how the learning that will be generated could be used by the relevant Network Licensees

n/a

Or, please describe what specific challenge identified in the Network Licensee's innovation strategy that is being addressed by the project (RIIO-1 only)

Our RIIO- ED1 submission outputs relating to reliability, availability, social obligations and customer service will be directly addressed by this project.

In addition, our 2015 Annual Distribution Survey of Domestic Customers noted:

- 92% of domestic customers surveyed are supportive of a project to establish 'zones' where the electricity network is more resilient to provide a local haven when exceptional weather impacts on local communities;
- 95% of domestic customers surveyed are supportive of a project to develop a new solution to keeping the power on in homes when the network is damaged;
- 99% of domestic customers surveyed say it is important for SSEPD to invest in the network to maintain security and reliability of their electricity supply.

☑ Has the Potential to Develop Learning That Can be Applied by all Relevant Network Licensees

Is the default IPR position being applied?

☑ Yes

Project Eligibility Assessment Part 2

Not lead to unnecessary duplication

A Project must not lead to unnecessary duplication of any other Project, including but not limited to IFI, LCNF, NIA, NIC or SIF projects already registered, being carried out or completed.

Please demonstrate below that no unnecessary duplication will occur as a result of the Project.

n/a

If applicable, justify why you are undertaking a Project similar to those being carried out by any other Network Licensees.

n/a

Additional Governance And Document Upload

Please identify why the project is innovative and has not been tried before

n/a

Relevant Foreground IPR

n/a

Data Access Details

n/a

Please identify why the Network Licensees will not fund the project as apart of it's business and usual activities

n/a

Please identify why the project can only be undertaken with the support of the NIA, including reference to the specific risks(e.g. commercial, technical, operational or regulatory) associated with the project

n/a

This project has been approved by a senior member of staff

☑ Yes