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

Mar 2024

Project Reference Number

NIA_SPEN_0095

Project Registration

Project Title

Connected Island

Project Reference Number

NIA_SPEN_0095

Project Licensee(s)

SP Energy Networks Distribution

Project Start

April 2024

Project Duration

0 years and 9 months

Nominated Project Contact(s)

Caleb Walker - c.walker@spenergynetworks.co.uk

Project Budget

£196,000.00

Summary

This project will support the strategic improvement and evolvement of the planning and connections process to meet net zero in a timely and cost-effective manner. The current connection process has been identified as being over-subscribed, representing a bottleneck. To achieve the Net Zero targets of the country, it is considered necessary to support the development, implementation and connection of low carbon technologies onto the electricity network. This project will be a feasibility study, and would look to investigate, develop and trial new technical and procedural issues associated with connection applications for new developments. It will help maximise potential additional distributed generation on the grid by implementing a "smart island" microgrid for a specified network community. Export and import capacity requirements would be reduced, compared to a standard firm connection.

Third Party Collaborators

Ricardo

Nominated Contact Email Address(es)

innovate@spenergynetworks.co.uk

Problem Being Solved

The existing connections process is overly complex and slow to progress meaning that there is a large backlog of unresolved connections building up. Several challenges currently being experienced will be addressed through this proposal including-

- Improve coordination, modelling, and planning capability across networks to support holistic and timely system development.
- Accelerate connection times for renewables and/or demand sites to meet 2030 target.
- Support prioritisation of flexible assets in connection queues to increase network headroom and reduce time for viable assets to

secure connection.

- Improve availability of information to consumers to support more cost effective and diverse decarbonisation choices

The connection process is known to be a complex process. This project will provide value by looking into microgrids to establish whether microgrids are the solution. Specially through WP1 (Generation connection policy review [11kV, LV]) and WP2 (Technical considerations for a Connected Island Grid), this project will enable a better understanding of microgrids in SPEN and identify how we can harness the value of microgrids in our network.

Method(s)

The project would look to investigate, develop and trial new technical and procedural issues associated with connection applications for new developments. It will help maximise potential additional distributed generation on the grid by implementing a "smart island" microgrid for a specified network community. Export and import capacity requirements would be reduced, compared to a standard firm connection.

The customer and DNO (SPEN) would benefit by simplifying community connections and reducing the costs and lengthy application windows associated with network reinforcement. This will aim at unblocking the bottle-necks of connection and queue management, supporting the roll-out of low carbon solutions. Learning to promote BaU design and connection application process.

This initial phase of the project will be a feasibility study, the second phase would focus on building the necessary agreements, initial design and CBAs; and third phase will focus on trial/implementation and dissemination. The benefit is expected to be that the island community can conclude preferential DNO connection agreements, based on the degree of energy self-sufficiency. Current microgrid standards, the procedural (connection processes, commercial and legal, responsibilities) and technical (PoC design, protection and control) issues associated with a DNO Point of Connection and the expectations for prosumer behaviour within the microgrid community would be assessed.

Scope

The project scope here-presented consists on the following work packages:

1. WP1: Generation connection policy review [11kV, LV].

Output WP1: generation connection process and microgrid connection policy review reports – bottleneck identifications.

2. WP2: Technical considerations for a Connected Island Grid.

Output WP2: The drafting of a consolidated approach for PoC integration and a framework for a Connected Island Grid.

3. WP3: Cost benefit analysis of the Connected Island Grid.

Output WP3: CBA, assessment of the net impact of the connected island microgrid on DNOs and customers.

4. WP4: Scoping of next steps project.

Output WP4: Proposed scope of a trial and demonstration project to develop the connected island grid concept to BAU.

5. WP5: Internal Stakeholder engagement.

Output WP5: Confirmation of the DNOs' commitment to the implementation of the connected island microgrid.

6. WP6: Reporting and project management.

Output WP6: A technical report describing the methodology and results of the analysis, and dissemination materials and activity for different audiences.

7. WP7 (OPTIONAL) External Stakeholder Engagement – subject to project results, not included in budget nor timeframe

Objective(s)

1. Microgrid connection policy review report
2. Assessment of the net impact of the connected island microgrid and a CBA with proposed scope of a trial. Drafting of commercial agreements.
3. The Technical report and stakeholder engagement.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

Upon successful delivery of the project, SPEN will be able to deliver strategic improvement and evolvement of the planning and connections process to meet net zero in a timely and cost-effective manner, additionally consumers will experience a much more refined process of gaining connections to the network.

Connected Island will help maximise potential additional distributed generation on the grid by implementing a "smart island" microgrid for a specified network community.

Success Criteria

1. A report detailing the existing bottleneck issues within SPEN's connection process and microgrid connection policy. This should also contain PoC integration and a framework for a Connected Island Grid.

2. A report that contains an assessment of the net impact of the connected island microgrid on DNOs and customers and a CBA with proposed scope of a trial and demonstration project to develop the connected island grid concept to BAU.

3. A technical report describing the methodology and results of the analysis, and dissemination materials and activity for different audiences.

Project Partners and External Funding

Project partners delivering this project are Ricardo, the project will be wholly funded via NIA.

Potential for New Learning

- Improve coordination, modelling, and planning capability across networks to support holistic and timely system development.
- Accelerate connection times for renewables and/or demand sites to meet 2030 target.
- Support prioritisation of flexible assets in connection queues to increase network headroom and reduce time for viable assets to secure connection.
- Improve availability of information to consumers to support more cost effective and diverse decarbonisation choices.
- The connection process is known to be a complex process. This project will provide value by looking into microgrids to establish whether microgrids are the solution. Specially through WP1 (Generation connection policy review [11kV, LV]) and WP2 (Technical considerations for a Connected Island Grid), this project will enable a better understanding of microgrids in SPEN and identify how we can harness the value of microgrids in our network.

Scale of Project

This project will cover the SPM Licence areas, but the solution could be expanded to cover SPD also.

Technology Readiness at Start

TRL4 Bench Scale Research

Technology Readiness at End

TRL5 Pilot Scale

Geographical Area

This project will cover the SPM Licence areas, but the solution could be expanded to cover SPD also.

Revenue Allowed for the RIIO Settlement

N/A

Indicative Total NIA Project Expenditure

£196,000

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:

The project would look to investigate, develop and trial new technical and procedural issues associated with connection applications for new developments. It will help maximise potential additional distributed generation on the grid by implementing a "smart island" microgrid for a specified network community.

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

The customer and DNO (SPEN) would benefit by simplifying community connections and reducing the costs and lengthy application windows associated with network reinforcement.

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)

N/A

Please provide a calculation of the expected benefits the Solution

N/A - project is a feasibility study and policy review

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

N/A - project is a feasibility study and policy review

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

N/A - project is a feasibility study and policy review

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

- The unblocking of bottle-necks of connection and queue management, supporting the roll-out of low carbon solutions.
- Learning to promote BaU design and connection application process.
- The DNO (SPEN) will benefit from the review of our generation connection policies.
- How to deliver the prompt introduction of numerous low-carbon technologies at scale within a self-managed network, without the requirement for major grid reinforcement.

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

N/A

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.

This project was shared with other DNOS's via the Hudl process, and no objections or indication of duplication.

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

The connection process is known to be a complex process. This project will provide value by looking into microgrids to establish whether microgrids are the solution and identify how we can harness the value of microgrids in our network.

Relevant Foreground IPR

N/A

Data Access Details

The SP Energy Networks Data Sharing Policy can be found here.

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

activities

The integration of LCT and Microgrid technology is a new technology, which requires significant assessment to minimise risk of operation on the Network and to streamline effective delivery to our customers.

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

There are significant technical and operational risks to the solution.

This project has been approved by a senior member of staff

☑ Yes