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NIA Project Registration and PEA Document

Date of Submission

Jul 2015

Project Reference Number

NIA_SSEPD_0011

Project Registration

Project Title

ACCESS – Local Constraint Management (Mull)

Project Reference Number

NIA_SSEPD_0011

Project Licensee(s)

Scottish and Southern Electricity Networks Distribution

Project Start

July 2015

Project Duration

2 years and 8 months

Nominated Project Contact(s)

SSEN Future Networks Team

Project Budget

£420,000.00

Summary

The scope of the project will include the following:• Identify network constraint points and network safe operating limits;• Install appropriate monitoring equipment;• Trial and test equipment prior to deployment to ensure network compatibility ;• Trial and demonstrate the use of local demand side management to manage network constraints;• Investigate and contribute to the development of new technical arrangements and inform the development of commercial arrangements to facilitate local demand side management ;• Engage with other stakeholders to develop end to end solutions and trial potential solutions;• Identifying the effectiveness of existing regulatory incentives and regulatory barriers; and• An economic assessment of the business model being implemented

Nominated Contact Email Address(es)

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Problem Being Solved

There has been a steady growth in the number of Community Energy Schemes which are seeking connections for renewable energy projects. This is in response to a number of policy drivers with both DECC and the Scottish Government publishing Community Energy Strategies with the latter targeting 500MW of community owned renewables in Scotland by 2020. To help achieve this the Scottish Government have introduced the Local Energy Challenge Fund and Community and Renewable Energy Scheme(CARES) programme to provide direct support to community groups to develop projects. Working with community groups has also been identified as a key area in the SSEPD Innovation Strategy.

Many of these projects are being developed in areas which are already subject to grid constraints and unlike commercial developers; community groups do not have the option to consider other locations. It is necessary to explore alternative, non-traditional, method of connection and interaction with these types of projects, which would deliver benefits to the community and which, due to grid constraints and prohibitive reinforcement costs, would not be able to proceed under conventional methods of connection.

Method(s)

The method involves creating the technical and commercial framework to allow generators to manage generation and demand within a pre-determined network area. Specifically this is intended to link local controllable demand (i.e. heating systems) with intermittent local generation. In general both UK and Scottish Governments have put in place some policy drivers to facilitate locally owned community generators to be used to supply local customers in an attempt to address fuel poverty in rural areas.

This project seeks to test the effectiveness of these drivers, as well as explore additional regulatory barriers and proposing changes when appropriate.

The large scale ACCESS project includes a range of partners which represent many of the main actors in the value chain including renewable generators, community groups, energy suppliers, aggregators etc. The intention is to trial the new arrangements by linking the output from a community owned hydro scheme with new local flexible demand. The generator will be responsible for matching local demand with generation and SHEPD will only intervene if network integrity is compromised.

The DNO has a crucial role to play in facilitating this project. In addition to the provision of connections for both the new generation and controllable demand, SHEPD intend to install network monitoring equipment which will monitor network parameters at potential constraint points and will send appropriate signals to disconnect either the generator and/or demand to protect and maintain network integrity. These signals will only be used should the network come close to breaching safe operating parameters. At all other times the generator and their chosen demand aggregator will be responsible for balancing supply and demand within the specified network.

Scope

The scope of the project will include the following:

- Identify network constraint points and network safe operating limits;
- Install appropriate monitoring equipment;
- Trial and test equipment prior to deployment to ensure network compatibility ;
- Trial and demonstrate the use of local demand side management to manage network constraints;
- Investigate and contribute to the development of new technical arrangements and inform the development of commercial arrangements to facilitate local demand side management ;
- Engage with other stakeholders to develop end to end solutions and trial potential solutions;
- Identifying the effectiveness of existing regulatory incentives and regulatory barriers; and
- An economic assessment of the business model being implemented

Objective(s)

1. Define the DNO's requirements for local demand side response;
2. Produce a Functional Design Specification for the system based on the DNO requirements ;
3. Demonstrate and trial local demand side management on the Isle of Mull, working along with an established unconstrained community generation scheme and new community led demand customers in the form of new flexible electric heating systems primarily storage heaters;
4. Create recommendations and inform the development of commercial arrangements , technical standards and operating procedures;
5. Identify potential Regulatory and market barriers;
6. Determine the technical and commercial viability of this system; and
7. Produce recommendations on the suitability for wider application of this methodology.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

The deployment of a successful trial that informs new technical and commercial standards.

Project Partners and External Funding

n/a

Potential for New Learning

n/a

Scale of Project

The Scottish and UK Governments have ambitious targets for community generation with 500MW planned for Scotland by 2020. Many of these are likely to be located in the more isolated and rural elements of the SHEPD network.

The ACCESS project will look to manage the output from a 400kW hydro generator with approximately 600kW of new controllable demand being installed in up to 100 homes. Given the future investment levels anticipated in this area, this scale of project is considered appropriate.

Technology Readiness at Start

TRL5 Pilot Scale

Technology Readiness at End

TRL7 Inactive Commissioning

Geographical Area

As a development project the trial will be situated on the island of Mull on the west coast of Scotland

Revenue Allowed for the RIIO Settlement

In the RIIO settlement, SSEPD identified savings of up to £7m which could be achieved by the application of innovative approaches to Demand Side Response and a further £10m for Generator Constraint Management. This project is an early stage investigation to develop a set of requirements which, if proven, could inform new solutions which will enable delivery of these savings.

Indicative Total NIA Project Expenditure

The indicative Total NIA Project Expenditure is £420,000, 90% of which (£378,400) 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)

The new local demand side management solution will provide the potential to avoid or defer network reinforcement to allow connection of new renewable generation equipment. By optimising local production and consumption of energy this has the potential to reduce losses on the distribution system. Financial benefits to customers will potentially come from a number of areas including:

- Avoiding or deferring network reinforcement;
- Increased utilization of existing assets; and
- Reduction in network losses.

The project should also facilitate the earlier connection of renewables which would otherwise be delayed

Please provide a calculation of the expected benefits the Solution

As stated above the financial benefits from this project are likely to arise from a number of potential areas, however, the primary financial benefit from a distribution network's point of view arises from the potential to defer or ultimately avoid network reinforcement. From the information contained in the Ofgem Document – "A guide to electricity distribution connections policy" customers pay for over 40% of the cost of network reinforcement, amounting to in excess of £30m per year.

Previous work on the Transform model produced for the Ofgem/DECC Smart Grid Forum Work Stream 3 suggested that typical averaged network reinforcement costs around £460k/MW. (Based on the credit purchase scenario). For the purposes of this analysis, this figure has been assumed to be the Base Cost i.e. £460k/MW.

In total the project will manage up to 1MW of combined generation and demand. In addition to the cost of delivering the ACCESS project it contains costs for studies and testing activities plus learning and dissemination. These activities will not be required if the solution when the solution is deployed at scale. Therefore, we believe that the Method cost will be in the order of £340k/MW. Therefore, we believe that the solution has the potential to provide a lower cost solution than that of the conventional approach.

If successful SHEPD will then look to offer this approach on further constrained Community Energy projects involving generation and flexible demand. This will provide further options for connection customers in situations where ANM based solutions may be lower cost than conventional reinforcement solutions. Once proven the solution could be applied across a range of connection types and locations.

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

This method is potentially applicable to the entire GB power system network and decisions on use at individual sites would be made on case by case basis. From the initial studies and engagement, this solution may be particularly suited to the connection for new renewables, where works are often required in remote locations with access challenges.

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

This project intends to produce developed designs and functional requirements which will be freely available to all GB Network Licensees. The decisions on use at individual sites would be made on case by case basis.

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 learning will inform technical and operating standards and inform development of new commercial arrangements.

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

- 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