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

Jan 2018

Project Reference Number

NIA_WPD_027

Project Registration

Project Title

Smart Energy Isles

Project Reference Number

NIA_WPD_027

Project Licensee(s)

National Grid Electricity Distribution

Project Start

January 2018

Project Duration

2 years and 0 months

Nominated Project Contact(s)

Sam Rossi Ashton

Project Budget

£321,795.00

Summary

The project will perform analysis on real-time network data to create a generator curtailment schedule. The system will use this schedule to issue two LV G59 generators with disaggregated curtailment setpoints. This setpoint will be sent to Hitachi DSR system that has been developed as art of the ERDF project, in order to notify of the generator curtailment.A recommendations report for wider rollout of ANM connections for LV generators will be developed using the technical and commercial issues identified during the development of the system and trials.

Third Party Collaborators

Nortech

PowerON

Hitachi

Problem Being Solved

Active Network Management (ANM) connections are being offered in areas of the network where available capacity is limited. Currently, ANM connections can only be offered to generators connected to the 11kV network and above. Being able to manage a group of Low Voltage (LV) generators connected to the same 11kV point of connection in the same way 11kV generators are managed by the ANM system, could allow ANM connections to be offered to distributed generation connected to the LV network. This would require the capability of curtailing those generators when required based on the outputs of the ANM system.

Method(s)

The project system use network data to perform analysis and create a generator curtailment schedule. The system will then use this schedule to issue two LV G59 generators with disaggregated curtailment setpoints. This setpoint will be sent to Hitachi DSR system that has been developed as art of the ERDF project, in order to notify of the generator curtailment.A recommendations report for wider rollout of ANM connections for LV generators will be developed using the technical and commercial issues identified during the development of the system and trials.

NB.
Hitachi has installed several commercial PV sites as well as controllable demand appliances on the Isles of Scilly and is creating a DSR system as part of its ERDF Smart Energy Islands project. In the Smart Energy Isles project, our system will issue Hitachi's DSR system with a signal when curtailing generators.

Scope

The scope of the project is to trial the capability of curtailing LV generators based on real-time network constraints and to explore the policies required to enable those generators to take part in ANM in a Business As Usual (BAU) situation.

Objective(s)

· Deliver a system that can issue disaggregated curtailment setpoints to LV generators.

· Deliver a recommendations document detailing how ANM connections could be offered to LV generators.

· Document the requirements that would allow multiple disparate LV generators to be modelled as a virtual power plant (VPP).

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

· The project will be deemed a success if real-time constraint signals can be monitored and used to issue curtailment setpoints to multiple LV generators generation on the Isles of Scilly, proving successful curtailment.

· Documentation of policy requirements

Project Partners and External Funding

Nortech - We require a system that will analyse cable constraint data from PowerOn to create an artificial curtailment schedule and then issue this schedule as disaggregated setpoints to Low Voltage Connection Controllers (LVCCs) at two LV generation sites. A setpoint will also be issued to Hitachi's DSR system

No external funding is being utilized.

Potential for New Learning

Issuing curtailment setpoints to multiple LV generators will highlight technical and commercial considerations for wider/business as usual rollout of such a system, this learning can be used to develop requirements for a system that aggregates LV generators to participate as a single entity in a LIFO stack.

Scale of Project

The project is specifically focusing on the control of two LV generators.

Technology Readiness at Start

TRL6 Large Scale

Technology Readiness at End

TRL8 Active Commissioning

Geographical Area

The LV generators that will be controlled are on the Isles of Scilly.

Revenue Allowed for the RIIO Settlement

None

Indicative Total NIA Project Expenditure

The project Budget is £321,795, of which £289,616 is NIA funded.

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)

An ANM system that can curtail LV generators at times of network constraint would allow a higher number of such generation connections to connect to that network. On the Isles of Scilly, this could make an estimated 300MW small generation projects viable, saving the customers up to £800k of costs in the South West.

Please provide a calculation of the expected benefits the Solution

In the case of the Isles of Scilly, sufficient additional generation would trigger reinforcement of the subsea cable at a cost of approximately £7.5mn. The cost of participating in an ANM system that is able to curtail additional generation under constraint conditions is approximately £10k per megawatt. This ANM participation would equate to approximately £1.5k for the sites participating in the trial.

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

This will depend on the need for such a solution in the network and that need changes over time as the network evolves. The method is not site dependent and can be applied anywhere.

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

Subsequent adaptations of a system that enables control of LV generators would be at lower cost, but there will need to be equipment deployed. Based on the learning from this project, recommendations will be made regarding integrating this method with an ANM system in a future innovation project which will provide learning on the costs.

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 interface, equipment design and policies created /learning derived will all be transferable to a new Network Licensee.

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

This project is directly referenced in WPD's Innovation Strategy under the area of New Technologies and Commercial Evolution.
☑ 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.

This is the first time a system has been developed that can issue curtailment setpoints to multiple LV generators based on real-time constraints. Also because we will explore policies required for LIFO treatment.

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

This is the first time a system has been developed that can issue curtailment setpoints to multiple LV generators based on real-time constraints.

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

The architecture deployed for this project is for purposes of trialing the concept and is not an enduring solution.

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

Through this project we will get knowledge to determine how this would be implemented as BAU.

This project has been approved by a senior member of staff

- [x] Yes