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NIA Project Registration and PEA Document

Date of Submission

Apr 2015

Project Reference Number

NIA_WPD_003

Project Registration

Project Title

ECHO – Energy Control for Household Optimisation (Continuation of Project LCNF_WPDT1010)

Project Reference Number

NIA_WPD_003

Project Licensee(s)

National Grid Electricity Distribution

Project Start

August 2013

Project Duration

3 years and 6 months

Nominated Project Contact(s)

James Bennett – WPD Innovation & Low Carbon Engineer

Project Budget

£385,000.00

Summary

The project will recruit 200 domestic premises to trial a number of DDSR scenarios. The benefits of the scheme will be a report updating the assumptions in the WS3 Transform Model associated with domestic demand response.

Third Party Collaborators

Energy Saving Trust

Problem Being Solved

With the advent of low carbon technologies, such as heat pumps and electric vehicles, there is the potential for a marked increase in load on the electricity network, in particular at peak times. Traditional network investment techniques could be employed to reinforce the network for this peak such as adding larger cables and bigger substation. However more innovative solutions are becoming available including Domestic Demand Side Response (DDSR).

The WS3 Transform Model deploys DDSR solutions in assessing future energy scenarios. Many of the underlying assumptions for the solution have not been validated. There have to date been very few practical trials associated with the DDSR technique and little data is available as to the effectiveness of the technique, particularly within the UK market model.

Method(s)

The Energy Saving Trust (EST) were approached as a project partner to deliver the consumer recruitment and engagement aspects. They have used their database of customers who have registered an interest in taking part in trials, as well as links to housing associations. Two hundred customers have been recruited by EST to participate in the trial allowing several statistically representative groups to be created, and a number of incentive scenarios trialed.

Greenlet were originally selected as the technology supplier, however manufacturing issues with the UK version of their plugin device

have resulted in selecting an alternative supplier, Wifiplug. Each property will receive a number of plug-in devices which sit between the plug socket and the appliance to be controlled. Each unit can be installed by the customer, and will collect data on the appliances whilst allowing load control signals to be actioned. The Wifi plugs create a communications link with a gateway device connected to a domestic broadband service. A head-end software system will be used to schedule the load control events and send signals to the Wifi plugs to control the loads. A web portal is available to customers to monitor energy usage and help manage appliances remotely.

To incentivise customers to participate, a range of financial rewards will be developed and trialed. Data will be collected through the Wifiplug devices and analysed allowing changes to be made to the trial conditions and incentives. Tests will be repeated to see how results are altered.

Scope

The project will recruit 200 domestic premises to trial a number of DDSR scenarios. The benefits of the scheme will be a report updating the assumptions in the WS3 Transform Model associated with domestic demand response.

Objective(s)

- To understand the scale and structure of payments required to ensure behavioral change.
- To quantify the potential changes in peak load through domestic demand response
- To identify the scope for long term enduring demand response services
- To evaluate which domestic devices offer the greatest potential load reduction / deferment.
- To ascertain customer appetite in relation to deferment of load

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

- Recruitment and installation of devices at 200 properties
- Quantification of the amount of peak load reduction possible through such techniques.
- Update WS3 Transform Model parameters
- Deliver the project to time, cost and quality
- Deliver a technology solutions that works out of the box
- To achieve high levels of customer satisfaction

Project Partners and External Funding

n/a

Potential for New Learning

n/a

Scale of Project

The project is planning to recruit 200 domestic customers across a range of social-economic groups. These will be selected from a database of interested customers at EST, and through housing associations. A number of statistically representative sub groups will be created to allow a range of trial scenarios to be completed.

Technology Readiness at Start

TRL7 Inactive Commissioning

Technology Readiness at End

TRL8 Active Commissioning

Geographical Area

This project does not depend on a specific geography to achieve its core objectives. Conclusion will be drawn across a range of properties, independent of location.

Revenue Allowed for the RIIO Settlement

Nil

Indicative Total NIA Project Expenditure

£132,097

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)

Until the demonstration is complete the costs associated with customer incentives are not known. But it is anticipated that a saving of £1.5Million is achievable through reduced/delayed network reinforcement across the WPD network due to reduction in peak demand.

Please provide a calculation of the expected benefits the Solution

£15,000 Base Cost - £4,000 Method Cost = £11,000 Benefit (All Per Site)

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

The methodology is extremely replicable across the GB in all license areas. The method is best suited to urban areas.

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

It is anticipated that the costs of supplying equipment and administering demand response events at suitable sites throughout the GB = £1.5 million

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

- Possible reduction in longer-term capital spend on network capacity increases
- Greater management of network with increasing flexibility and security

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

The project will provide insight into the financial, technological and behavioral aspects of domestic DSR

- 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