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

Apr 2015

Project Reference Number

Project Registration

Project Title

ROGER

Project Reference Number

Project Licensee(s)

National Energy System Operator

Project Start

January 2013

Project Duration

1 year and 1 month

Nominated Project Contact(s)

National Grid TO Innovation Team

Project Budget

£42,000.00

Summary

In order for the electricity transmission grid to function correctly and provide security of supply, the amount of generation input and consumption off-take from the grid must be balanced at all times. As the generation-side of this equation moves to more volatile weather-dependant sources, additional mechanisms for achieving power balance will become more crucial.

Demand-side management is expected to play a major role in the energy balancing mix and it will become increasingly important to be able to control the timing and levels to which households draw power from the grid for applications such as space and water heating. By having access to facilities which can adjust demand, or minimise peaks, it is believed that critical maximum temperatures in expensive assets such as transformers can be controlled, thereby extending their lives.

Whilst large industrial loads have contributed to balancing services for many years and the theory of demand-side management and ‘smart-grid’ technologies have been developed, the complexities of controlling individual appliances within a domestic or SME environment has yet to be deployed into mature services. The emphasis is on controlling individual appliances in a way which does not affect their enjoyment by consumers, whilst successfully aggregating these power control functions into useful and measurable mechanisms for the grid operators.

Nominated Contact Email Address(es)

box.so.innovation@nationalgrid.com

Problem Being Solved

Method(s)

Scope

Objective(s)

Project “Roger” seeks to develop, install and verify that coordinated control of appliances in domestic and commercial premises can be detected and operated to provide the System Operator with a balancing product. More specifically, it is to evaluate whether Grid-Metrix technologies from Reactive Technologies Ltd are able to provide measurements of power consumption of distributed loads in a realistic distribution/transmission network setting. This will enable a more accurate assessment of loading on substation transformers.

The project will install 30 demand devices of 3 kW range rating at normal 240V single phase distribution levels within a single grid supply point area. The on/off state of these devices will be controlled in a coordinated manner by a simulated services aggregator function, which will send programme signals to a controller box. During the trial period, the electricity demand profile will be sampled from meters in substations and state-ofthe-art signal processing algorithms previously deployed in mobile telecommunications devices will be tested for their detection capabilities.

The project aims to prove that small loads in the kW range in a domestic and small and medium enterprise (SME) setting:

1. Can be controlled by remote signal / or by timesynchronised programme.
2. Can be coordinated to act together in a manner useful to the grid.
3. Produce signals which new cutting-edge technologies in signal processing may detect at the meter-points in transmission and distribution substations.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

n/a

Project Partners and External Funding

n/a

Potential for New Learning

n/a

Scale of Project

n/a

Geographical Area

Revenue Allowed for the RIIO Settlement

Indicative Total NIA Project 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)

n/a

Please provide a calculation of the expected benefits the Solution

n/a

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

n/a

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

n/a

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)

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

Please demonstrate how the learning from the project can be successfully disseminated to Network Licensees and other interested parties.

Please describe how many potential constraints or costs caused, or resulting from the imposed IPR arrangements.<

Please justify why the proposed IPR arrangements provide value for money for customers.

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