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 2013

Project Reference Number

UKPNT1003

Project Registration

Project Title

Smart Urban Low Voltage Network

Project Reference Number

UKPNT1003

Project Licensee(s)

UK Power Networks

Project Start

July 2012

Project Duration

2 years and 9 months

Nominated Project Contact(s)

UKPN Innovation Team

Project Budget

£2,141,000.00

Summary

UK Power Networks and TE Connectivity have been working in collaboration, as part of an Innovation Funding Incentive (IFI) funded project, to develop a new solid-state switching technology for use on Low Voltage (LV) distribution networks.

The devices developed in the IFI project retrofit to existing LV plant, and the system provides previously unavailable remote switching and re-configuration of the LV network. Single phase fault break/fault make circuit breakers replace existing LV distribution board fuses, and load break/fault make switches replace solid links in link boxes. In addition the system has the ability to provide visibility of power flows on the LV network down to link-box level, as near real time communications and built in sensors allow extensive load monitoring data to be collected.

Initially the project will focus on the industrialisation of hardware developed during the IFI project; this will enable a larger roll out of the technology in two areas within the LPN LV network (up to 60 secondary substations will be equipped with circuit breakers and 140 link boxes with switches or load monitoring devices). Its potential for helping DNOs address the challenges faced with the transition to a low carbon economy will be investigated. Case studies will be developed to:

- Investigate how a greater understanding, visibility and control of the network can lead to LV active network management, and facilitate the connection of low carbon technologies
- Quantify the expected improvement to quality of supply when using remote control and automation to create a self healing LV network
- Use the unprecedented visibility of the LV network available (single phase load monitoring at link box level) to validate current LV modelling and increase our understanding of the LV network.

Nominated Contact Email Address(es)

innovation@ukpowernetworks.co.uk

Problem Being Solved

Method(s)

Scope

Objective(s)

This project will demonstrate the business benefits of a large scale roll out of a technology that facilitates remote smart management of the LV network. The following objectives have been established:

- Industrialisation of hardware (based on learning from the prototype deployment undertaken in the LV remote control & automation IFI project), and development of a link box load monitoring device (non-switching) to retrofit into older cast iron link boxes
- Integration of LV hardware with a SCADA based control system utilising LV connectivity models
- Roll out of the technology and evaluation of the potential benefits which are expected to include reduced losses, increased capacity headroom, early visibility of emerging loading or power quality issues. A potential improvement in quality of supply of up to 75% has been identified in the trial area.

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