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

May 2012

Project Reference Number

UKPNT202

Project Registration

Project Title

Flexible Plug and Play Low Carbon Networks

Project Reference Number

UKPNT202

Project Licensee(s)

UK Power Networks

Project Start

January 2012

Project Duration

3 years and 0 months

Nominated Project Contact(s)

UKPN Innovation Team

Project Budget

£9,700,000.00

Summary

The aim of Flexible Plug and Play is to provide a cheaper and faster distributed generation connections to the electricity distribution network.

The Flexible Plug and Play trial area is a rural area of around 700sqkm between Peterborough, March and Wisbech in Cambridgeshire in the East of England. This area has been chosen not only because there are several generation projects connected to the distribution network which has led to power flow constraints in the network, but in recent years, UK Power Networks has seen an increase in the renewable generation connection requests. If UK Power Networks were to connect the planned generation of 200MW of renewable generation in the trial area, using the 'business as usual' approach then extensive reinforcement work would be needed. Flexible Plug and Play will provide renewable generation developers an alternative connection to the costly and time consuming 'business as usual' offer.

In order to speed up the renewable generation connection, Flexible Plug and Play will trial new control and monitoring smart technologies to improve the utilisation of the existing network.

In order to provide cheaper connections, Flexible Plug and Play will look at connecting customers without incurring in expensive reinforcement while proposing to connect them to Active Network Management (ANM). This will be done in line with exploring the extent to which developers of renewable generation have an appetite for 'interruptible' connection offers.

In Spring 2013, the project deployed an internet-like, high-speed telecommunications platform to enable the data protocol IEC 61850, and novel control and monitoring smart technologies such as an Active Network Management system.

The project will also develop an investment modelling tool, called the Strategic Investment Model; this model will determine when it makes best economic and carbon sense to reinforce the networks or use smart alternatives.

Throughout the lifecycle of the project, Flexible Plug and Play will share the knowledge gained with all Distribution Network Operators in Great Britain who face the challenge of connecting high concentrations of renewable generation. Flexible Plug and Play will demonstrate how the deployment of a low carbon network solution can result in the more economic connection of distributed

generation.

The project is working with a rich consortium of partners, all of whom have been chosen for their expertise and innovative culture.

Nominated Contact Email Address(es)

innovation@ukpowernetworks.co.uk

Problem Being Solved

Method(s)

Scope

Objective(s)

Flexible Plug and Play aims to enable faster and cheaper integration of distributed generation, such as wind power or solar, into the electricity distribution network.

The project will achieve this by trialling innovative technical and commercial solutions with real customers (renewable generation developers). Specifically, the project will:

- Deploy smart devices and systems on to the network that will make best use of the existing electricity network and allow real-time management of any network constraints. Examples of such technology that will be deployed are: Quadrature-booster transformer, dynamic rating of overhead lines and an Active Network Management system
- Deploy the first ‘Quadrature-booster’ onto the distribution network; this is a mature technology that currently used on the transmission network, but will be trialled for the first time on the 33kV distribution network. The Quadrature-booster will be used to control active power flow on parallel lines
- Develop a new commercial framework for providing 'interruptible' connections to generator developers
- Develop an investment modelling tool that will determine the optimum network investment from both an economic and carbon emission perspective.

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