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

Nov 2014

Project Reference Number

NGETEN03

Project Registration

Project Title

Enhanced Frequency Control Capability (EFCC)

Project Reference Number

NGETEN03

Project Licensee(s)

National Energy System Operator

Project Start

January 2015

Project Duration

3 years and 3 months

Nominated Project Contact(s)

Vandad Hamidi (SMARTer System Performance Manager)

Project Budget

£9,344,000.00

Summary

Meeting UK carbon reduction targets will result in a significant increase in the volume of renewables. This will reduce system inertia, giving rise to an increase in the volume and speed of frequency response requirements. Under existing arrangements this increased response requirement is anticipated to see the cost of controlling frequency increase by £200m-£250m per annum by 2020. To mitigate this increase in cost to the end consumer it will be necessary to develop new, significantly faster response solutions utilising renewables, demand side resources, and other new technologies in a coordinated manner. The successful implementation of this project can result in savings of £150m-£200m per annum by 2020.

The objective of this project is to develop and demonstrate an innovative new monitoring and control system which will obtain accurate frequency data at a regional level, calculate the required rate and volume of very fast response and then enable the initiation of this required response. This system will then be used to demonstrate the viability of obtaining rapid response from new technologies such as solar PV, storage and wind farms. The new system will also be used to demonstrate the coordination of fast response from demand side resources (DSR), and fast start up from thermal power plants. Utilising the output of this trial, a fully optimised and coordinated model will be developed which ensures the appropriate mix of response is utilised. This will support the development of an appropriate commercial framework prior to full roll out.

New generation technologies are required to facilitate the carbon agenda. EFCC will enable these to contribute to resolving the

challenges associated with the change in the generation mix, without imposing increased risk on the security of the system. This will provide commercial incentives and ensure these new technologies can effectively compete with existing technologies in the ancillary service market. There is no provision for trialling the EFCC concept as business as usual.

Third Party Collaborators

The University of Manchester

University of Strathclyde

Siemens

BELECTRIC GmbH

Centrica

General Electric

Flexitricity

Orsted

Nominated Contact Email Address(es)

box.so.innovation@nationalgrid.com

Problem Being Solved

Method(s)

Scope

Objective(s)

The Great Britain (GB) electricity system is undergoing huge change, with decarbonisation resulting in increasing volumes of renewable and small-scale generation. One of the key areas challenges resulting from this is the impact on the ability to control system frequency.

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