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

Mar 2013

Project Reference Number

Project Registration

Project Title

Supergen FlexNet

Project Reference Number

Project Licensee(s)

National Grid Electricity Transmission

Project Start

May 2008

Project Duration

2 years and 4 months

Nominated Project Contact(s)

National Grid TO Innovation Team

Project Budget

£7,103,000.00

Summary

FlexNet is a four year (2007-11) programme focused on seven themes. Of these Intermittency, System Operation and Multi-terminal High Voltage Direct Current (HVDC) Systems are particular challenges for the UK Government's 2020 Low Carbon Transition Plan (LCTP). The other themes: A More Electric Future, Visions and Scenario, Customer Participation and Active Distribution are topics that prepare for the 2030 onwards agenda. The uncertainty of the future means that flexibility continues to be an important objective. The programme aims, where possible, to showcase its insights and achievements so that these can be taken up by the commercial sector, government and regulators for practical implementation.

Nominated Contact Email Address(es)

box.NG.ETInnovation@nationalgrid.com

Problem Being Solved

Method(s)

Scope

Objective(s)

The issues being addressed by the work-streams and reported under each of the themes are as follows:

- Intermittency: The 40% renewable electricity target will be met mainly by wind energy (intermittent generation). This creates challenges for system balancing and security of supply. This research aims to ensure that cost-effective integration of wind generation is achieved

- System Operation: FlexNet's planned research in system operation is proving well-aligned with the Electricity Networks Strategy Group (ENSG) and Energy Technologies Institute (ETI) reports. The work is focused on building a modelling and analysis base for testing increased boundary transfer limits and of corrective post-fault control. The planning of strategic network investment beyond

2020 is key topics currently being pursued

- Multi-Terminal HVDC Systems: This theme re-focuses on power systems electronics in response to the growing development of offshore renewable generation exploitation of which will require a departure from conventional AC based transmission. To date, HVDC deployment has been limited to point to point connections; realisation of DC networks will require significant research into both control methodologies and underlying hardware

- More Electric Futures: The dramatic cuts in CO2 in the electricity sector require radical changes. This work investigates these changes and examines the implications for the energy networks through five projects. The first project addresses the demand placed on the electricity system in GB from the increased use of electricity as the vector for energy transmission and distribution. The second project looks at how significantly increased electricity use should be accommodated within the GB power system

- Visions and Scenarios - The work carried out for FlexNet supported the 'Longterm Electricity Network Scenarios (LENS) project

- Customer Participation: The emphasis here is on the end use of electricity in economic, technical and human sense. Work is being undertaken on engaging consumers about the necessary transition towards the 2020 objectives. This is focused on understanding how people view the electricity supply system and their flexibility in interfacing with it

- Active Distribution: The work examines the distribution planning problem as a stochastic maths programme. Work is underway on control room interfaces for active networks, and on an active power distribution network and data acquisition simulator/emulator.

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