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

Jul 2015

Project Reference Number

NIA_NPG_003

Project Registration

Project Title

Smart Data

Project Reference Number

NIA_NPG_003

Project Licensee(s)

Northern Powergrid

Project Start

September 2012

Project Duration

3 years and 4 months

Nominated Project Contact(s)

Mary Black

Project Budget

£5,000.00

Summary

The demonstration business applications that will be modelled are for the LV network in the areas of:

- Asset management (condition/health of the network) and replacement policy
- Fault management and restoration
- Network design (new connections, reinforcement, and load management)

Project outputs will be applicable across all parts of the Northern Powergrid network.

Nominated Contact Email Address(es)

yourpowergrid@northernpowergrid.com

Problem Being Solved

The project addresses how best to intelligently use new kinds of data from low carbon network development, in our analytical, design, planning and network management areas. For example data will become available to potentially be able to bring up a real time geospatial picture overlaying a whole number of variables such as current power consumption, customers off supply, wind and solar conditions, typical customer load profile, asset age and condition, and state of customer restorations (obtained from smart meter readings, weather data, asset management systems, and trouble management systems). The question of how best to manage and store / not store the data is of special interest. An important part of ascertaining how to make best use of the new data lies in understanding how data is currently used within DNOs; what is necessary to fulfil statutory and regulatory requirements; and what kinds of core functions can be / might have to be enhanced by the new data.

Method(s)

As well as identifying and assessing the data, representation technologies and the potential benefits, a prototype will be implemented

to demonstrate potential practical applications. A GIS will be used to represent data taken from LV monitoring of substations and statistical load allocation methods will be used to provide estimates where there are gaps in the data.

Scope

The demonstration business applications that will be modelled are for the LV network in the areas of:

- Asset management (condition/health of the network) and replacement policy
- Fault management and restoration
- Network design (new connections, reinforcement, and load management)

Project outputs will be applicable across all parts of the Northern Powergrid network.

Objective(s)

There are three key objectives to the project have been undertaken as a three year PhD project. The project's main phases are:

Months 1 – 3: Understanding the background e.g. electricity distribution networks

Months 4 – 12: Identifying and assessing the data, representation technologies and the potential benefits.

Months 13 – 24: Constructing demonstrator

Months 25 – 33: Demonstrating and improving

Months 31 – 36: Completion of write up

The relevance of this project to the business is that it aims to make a significant contribution to the next generation of network management systems through understanding and showing the capabilities of geospatial diagrams and data representation with regards to low carbon and smart data, in terms of the impact they can have on network management. The project contributes to our preparedness for the future by enhancing our understanding of the data management implications of low carbon technologies.

The project at the point of transfer from IFI to NIA is month 29 of the schedule.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

The project will be deemed successful if we receive all of the deliverables and are able to interpret and apply the results.

Specific success criteria include:

- Clear classification of types of data and representation technologies.
- Useful guidance on potential solutions to data management problems.
- Helpful advice about using the new data in distribution network management.
- Successful implementation of the demonstrator to serve as a prototype / functional design aid for future network management system requirements.

Project Partners and External Funding

n/a

Potential for New Learning

n/a

Scale of Project

This is a small scale project based on an agreement with Sheffield University to part fund a PhD student working on a project being carried out as part of the Sheffield EFutures programme.

Technology Readiness at Start

Technology Readiness at End

TRL3 Proof of Concept	TRL4 Bench Scale Research

Geographical Area

The project includes a demonstrator built from data gathered through the SCADA system and from other sources that represent the Northern Powergrid network in the Rotherham area. The learning outcomes however are applicable anywhere and are not geographically specific.

Revenue Allowed for the RIIO Settlement

None

Indicative Total NIA Project Expenditure

The estimated value of the project is £34,500. Of this £34,500 has been spent before 1 April 2015, with no monies outstanding. The project is registered only to ensure that resources required for knowledge dissemination and supervision of the project contractor are addressed.

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)

The knowledge generated by the project establishes future data needs reducing the costs of potentially unnecessary data collection. The research nature of this project means that the findings are currently too far from business-as-usual to determine quantitatively what those savings are likely to be.

Please provide a calculation of the expected benefits the Solution

Research project N/A

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

The Method could be applied across all Network Licensees.

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

Implementation costs are potentially very low, with large scale investment to implement not required. Dissemination of the findings to all GB DNOs would require less than £20k of expenditure.

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

The statistical methods and visual representation techniques developed can be used by other DNO's

Or, please describe what specific challenge identified in the Network Licensee's innovation strategy that is being addressed by the project (RIIO-1 only)

The project is addressing challenges of using new big data that have not previously been addressed.

☑ Has the Potential to Develop Learning That Can be Applied by all Relevant Network Licensees

Is the default IPR position being applied?

☑ Yes

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