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 2019

### Project Reference Number

NIA_UKPN0051

## Project Registration

### Project Title

Firefly

### Project Reference Number

NIA_UKPN0051

### Project Licensee(s)

UK Power Networks

### Project Start

June 2019

### Project Duration

1 year and 1 month

### Nominated Project Contact(s)

Luke Hughes, Richard Gould

### Project Budget

£99,000.00

### Summary

Energy Efficiency is used in other countries to defer the need for capital investment to reinforce the network.

Individual energy efficiency measures or a combination of them have been previously investigated in GB to understand the potential network benefits associated with customers' behavioural change. However, a holistic approach looking at DNO led energy efficiency as alternative to network reinforcement has not been trialled in GB. If successful, this may lead to significant customer savings.

### Nominated Contact Email Address(es)

innovation@ukpowernetworks.co.uk

### Problem Being Solved

Energy Efficiency is used in other countries to defer the need for capital investment to reinforce the network.

Individual energy efficiency measures or a combination of them have been previously investigated in GB to understand the potential network benefits associated with customers' behavioural change. However, a holistic approach looking at DNO led energy efficiency as alternative to network reinforcement has not been trialled in GB. If successful, this may lead to significant customer savings.

### Method(s)

Firefly aims to understand the viability of a DNO-led approach to energy efficiency as alterative to network reinforcement. It will inform DNOs and Ofgem on any changes to the regulatory framework which would be required to implement the solution if successful.

This will be carried out in two phases: phase 1 (the Firefly project) will focus on feasibility and benefits definition, while phase 2 will focus on trialling the new process identified in phase 1. The latter will be carried out with a partner organisation that will be responsible for the delivery of the trials.

Firefly will only carry out phase 1. Subject to success in phase 1, phase 2 will then be applied for under a separate demonstration project.

## Scope

This project aims to understand how the energy efficiency delivery process works in other countries. To inform the DNO role, the model costs and benefits will be based on GB customer and network data. The scope will utilise developments made in other countries, particularly those within North America, to identify the potential for energy efficiency to lead to alternatives to traditional network reinforcement.

The main activities of Firefly (Phase 1) are summarised below:

- Identification of DNOs' potential role(s) in energy efficiency by studying other countries where this is successfully in place;
- Definition of types of energy efficiency available and applicable to GB and likely benefits of each. The results will be input into a model;
- Study of load profiles at primary and grid sites to identify source of loads and likely benefits of energy efficiency measures in model;
- Model to identify areas of greatest benefit and likely cost of implementation;
- Bi-Lateral discussions with regulator to gain feedback on DNOs' potential role in delivering energy efficiency and trial approach;
- Identification of potential partner organisations for phase 2;
- Review of existing GB regulatory framework to inform DNOs and Ofgem on any changes to the regulatory framework which would be required to implement the solution if successful.
- Risk assessment of the proposed solution against possible future regulatory arrangements.
- Phase 2: Trials of the project DNO-led energy efficiency delivery process (future project).
- This phase will be carried out with partner organisation(s) identified for the delivery phase.

## Objective(s)

The objective of the project is to identify a method and assess the benefits of a DNO-led rollout of energy efficiency measures by looking at two primary or secondary grid substations which would be considered in phase 2. This will be documented in a report which would summarise the key findings, outline next steps and discuss potential regulatory changes to existing framework. The latter will serve as a basis for discussion with Ofgem.

## Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

## Success Criteria

The project will be considered successful if it determines:

- Whether Energy Efficiency is a viable method to defer network reinforcement in GB
- The role of a DNO in delivering these solutions and unlocking associated benefits
- The scope of a second phase (that will cover the trial of the proposed measures) is in the customers interest to pursue

## Project Partners and External Funding

The potential partner(s) will be determined through competitive tender.

There is no external funding for this project.

## Potential for New Learning

The proposed methodology has the potential to reduce the cost of reinforcement for network customers. This learning will be disseminated by means of regular reporting and presentations to DNOs, Ofgem, and other interested stakeholders.

## Scale of Project

The project is proposed to be carried out on a small scale initially. The feasibility study in phase 1 will assess load at primary and secondary sites across UK Power Networks' licence areas followed by a detailed analysis of two sites. Generalisation to wider GB will also be carried out. If successful, phase 2 will be taken forward on specific trial sites that will be identified based on findings from phase 1.

## Technology Readiness at Start

TRL5 Pilot Scale

## Technology Readiness at End

TRL7 Inactive Commissioning

## Geographical Area

The project will be carried out reviewing two sites within UK Power Networks' footprint. These sites will be selected to ensure the results could be replicated in any DNO within GB.

## Revenue Allowed for the RIIO Settlement

None

## Indicative Total NIA Project Expenditure

£99,000

# 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)

If successful this solution would enable significant savings, estimated to be in the region of £27.8m in ED1. Please note this is depending on:

- the successful completion of phase 1 (this project), and
- the successful delivery of phase 2 (future project) if approved based on the insights gained in phase 1.

These benefits can be unlocked in the future if the project demonstrates that energy efficiency can be used as a viable alternative solution to network reinforcement.

## Please provide a calculation of the expected benefits the Solution

Phase 1 is a Research Project. The calculation of the expected financial benefits will be provided for phase 2.

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

It is anticipated that the method, if successful, could be rolled out to all GB DNOs. The project will look at a range of customer load profiles and energy efficiency measures. Using a combination of these the method will be able to implemented across the majority of GB DNO substations.

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

N/A – As a Research Project, this will be assessed following the completion of the feasibility study ahead of phase 2 trials

## 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 learning generated would provide a non-traditional alternative to network reinforcement. The method will be used when assessing future reinforcement projects and as a potential solution where assessed as appropriate in the remaineder of ED1. The solution will also be used when planning for RIIO-ED2.

### 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

## 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.

While SAVE and energywise projects have tested the impact of energy efficiency interventions on domestic customers ' demand profile and studied the associated change in consumer behaviour, there has not been any specific project looking at how a DNO-led intervenion can deliver a holistic approach at energy efficiency as altenrative to network reinforcement. This project is looking to trial this approach within GB for the first time.

### 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

The project is trialing a methodology not currently used within GB. The method is carried out in other countries due to differing regulatory requirements.

### 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

The use of energy efficiency as a way of deferring or removing the need for traditional reinforcement methods has not been trialled within GB before. The method has been used in other countries where there is direct interface between customers and network operators, which is not the case in GB. Although energy efficiency through flexibility arrangements could be used currently, this project looks at the DNO working with both domestic and commercial customers directly to implement energy efficiency measures, and the associated regulatory barriers in delivering this. In section 3.2 of the NIA Governance document, the DNOs are encouraged to pursue different types of Methods and Solutions. Looking at the application of energy efficiency solution in GB will identify the issues associated with its implementation and solutions to these issues allowing it to be used in business as usual following the project. Due to the risk involved in the project and not fully knowing whether the benefits can be delivered across our licence areas, these activities would not form part of our business as usual activities. In order to progress an innovative project which carries significant risk in implementation, additional innovation funding is required as a stimulus.

## 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

The project can only be undertaken as an innovation pilot given the operational risks associated with the deployment of an unproven solution in network operations. The proposed approach to outage planning also has an unproven business case, and the range of potential benefits should be tested before the tool can be deployed. As noted in the NIA Guidance, certain projects are speculative in nature and yield uncertain commercial returns. This is the case for with this project. There is a commercial risk that the solution developed as part of the project is not adopted by the stakeholders involved following the trial period. This could be due to the fact that the solution has not reached the level of maturity required for business-as-usual application. This risk is being mitigated against through early engagement with stakeholders and ensuring requirements are clearly defined and documented. If the project is successful, it will have proven a number of technical and commercial solutions and business processes which will reduce costs for network customers by unlocking energy efficiency programs. The specific details regarding the benefits are captured under section 2b of this document.

## This project has been approved by a senior member of staff

☑ Yes