

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

SSET207-01

Project Registration

Project Title

Low Energy Automated Networks (LEAN)

Project Reference Number

SSET207-01

Project Licensee(s)

Scottish and Southern Electricity Networks Distribution

Project Start

January 2015

Project Duration

5 years and 0 months

Nominated Project Contact(s)

SSEN Future Networks Team

Project Budget

£3,068,000.00

Summary

The Low Energy Automated Networks (LEAN) project aims to deploy technology to reduce electrical losses on the 33kV/11kV networks. Approximately 6% of electricity generated is lost each year in the GB distribution network, incurring costs in the region of £1bn to customers. Most of these losses occur within transformer and lower voltage circuit operation.

Southern Electric Power Distribution (SEPD) will appraise two methods to reduce losses. The Transformer Auto Stop Start (TASS) method relates to switching off one in a pair of transformers in selected primary substations to reduce fixed losses. The Alternative Network Topology (ANT) method may be deployed alongside TASS where appropriate, to further reduce losses and maintain network supply integrity. These methods could save over 31,000MWh of electricity over 45 years, worth over £40m to GB customers. This equates to savings of 6,421 tonnes of CO₂.

The type of trial proposed has never been deployed within GB or overseas and poses an element of risk, which may deter DNOs from integrating such technology directly into business as usual activities. However, the methods offer worthy benefits from the reduction of losses if the solution is proven. For this reason, the LEAN project is ideally suited to the aims of the Low Carbon Network Fund.

Knowledge capture and dissemination will be key to the successful integration of the LEAN solution into GB DNOs' business as usual activities. The project therefore incorporates extensive knowledge capture and includes the production of a Network Losses Evaluation Tool to assess the costs and benefits of the methods considered.

Nominated Contact Email Address(es)

fnp.pmo@sse.com

Problem Being Solved

Method(s)

Scope

Objective(s)

Southern Electric Power Distribution's Low Energy Automated Networks (LEAN) project seeks to develop, deploy and demonstrate innovative methods of reducing electrical losses within the 33kV/11kV distribution network. GB losses currently cost around £1 billion per year and account for 1.5% of all greenhouse gas emissions in the UK. Forecasts show that the transition to a low carbon economy will lead to significant increases in electricity demand and a corresponding rise in losses. Traditionally, DNOs have tried to reduce losses through long-term asset management, replacing end of life transformers with lower loss models.

LEAN aims to demonstrate new methods that can be applied to existing assets to reduce losses. The principal method for the LEAN project involves the use of a Transformer Auto Stop Start (TASS) system. SEPD will deploy a second method, Alternative Network Topology (ANT), where found to be appropriate. LEAN builds on learning captured from previous SEPD LCNF Tier 1 and IFI projects.

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