

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\_SHET\_0016

## Project Registration

### Project Title

Alternative to Wood Poles – Feasibility Study

### Project Reference Number

NIA\_SHET\_0016

### Project Licensee(s)

Scottish and Southern Electricity Networks Transmission

### Project Start

July 2015

### Project Duration

1 year and 0 months

### Nominated Project Contact(s)

SSEN Future Networks Team

### Project Budget

£40,000.00

## Summary

During this project SHETL will undertake a literature review of the available composite, laminated and modular pole alternatives to wooden poles. These alternative poles have not been used in the UK but have been successfully used in North America. A desk top review will be undertaken to ascertain all the potential benefits and costs of these alternative methods through the full product life cycle from procurement, installation, maintenance through to disposal. In addition, the safety case and product specifications will be reviewed to ensure that they will meet the required UK standards. The scope of the project will include the following:

- Identify the requirements and standards that govern transmission voltage of 132kV;
- Assess new structure design options, including the use of new materials, from a review of what is being built internationally;
- Consider designs that should be taken forward for field trials and tests;
- Assessment of the safety, health and environmental impact of the new design (with the aim of improving safety, and reducing the environmental impact); and
- Review the economics of the new structures from procurement to disposal (taking into account, foundations, access requirements, construction time, maintenance and lifetime of the new structure).

### Nominated Contact Email Address(es)

transmissioninnovation@sse.com

## Problem Being Solved

Within the UK Distribution and Transmission networks there are large numbers of wood poles coming to the end of their operational life. With an ageing network we will see an increase in the demand for wood poles ranging in size for which the supply may be limited in some cases for the larger poles.

These ageing structures can suffer from both pole top and ground level rot, and during severe weather periods run the risk of collapse due to wind damage and ice loading.

A shortage of poles may require the user having to procure wood poles made from fast growing trees which do not have the strength of the traditional woods. These faster growing types of wood are also more likely to suffer rot in a shorter period of time.

Wood pole failure leads to a number of customer interruptions across the UK each year and replacing the older equipment, reduces short term maintenance and refurbishment costs and improves customer service.

Although wooden pole alternatives have been used elsewhere in the world their application in the UK has not been measured and there is a degree of uncertainty as to the potential benefits they may provide whilst ensuring that they meet the required technical and safety standards. The project will attempt to improve on that degree of uncertainty and look to better understand the business case and application.

## Method(s)

This project seeks to investigate structures which could be used, in some instances, as suitable alternatives to wood poles. From these investigations the project will lead to us having chosen those suitable and having a conclusive cost benefit analysis tool.

## Scope

During this project SHETL will undertake a literature review of the available composite, laminated and modular pole alternatives to wooden poles. These alternative poles have not been used in the UK but have been successfully used in North America. A desk top review will be undertaken to ascertain all the potential benefits and costs of these alternative methods through the full product life cycle from procurement, installation, maintenance through to disposal.

In addition, the safety case and product specifications will be reviewed to ensure that they will meet the required UK standards. The scope of the project will include the following:

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## Objective(s)

- Produce a literature review of available products
- Create technical specifications for assessing 132kV alternative poles
- Identify all the costs and benefits of available composite, laminated and modular pole alternatives
- Develop a more accurate cost benefit analysis tool
- Define an appropriate testing methodology for products
- Estimate and schedule requirements for future testing and development

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

n/a

## Success Criteria

The project will seek to improve the variability of currently understood costs and benefits of available composite, laminated and modular pole alternatives.

To identify the appropriate applications for available composite, laminated and modular pole alternatives in the UK.

To identify the costs and benefits of available composite, laminated and modular pole alternatives and develop a detailed cost benefit analysis case which will give a clear recommendation for their deployment across the SHETL area.

## Project Partners and External Funding

n/a

## Potential for New Learning

n/a

## Scale of Project

The scale of this project is sufficient to fully investigate the benefits associated with a number of different pole structures for use at 132kV. This phase of the project should give more accurate outputs on whether there is a benefit in developing and testing the available products further.

## Technology Readiness at Start

TRL3 Proof of Concept

## Technology Readiness at End

TRL4 Bench Scale Research

## Geographical Area

The project will be managed by SHE Transmission staff from their offices in Perth, with Innovation to Industry Ltd (based in Nottingham) providing technical support.

## Revenue Allowed for the RIIO Settlement

At this stage no saving on expenditure can be assumed.

## Indicative Total NIA Project Expenditure

The indicative Total NIA Project Expenditure is £40,000. 90% of which (£36,000) is Allowable NIA 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)

There is the potential to provide improved certainty on the benefits case for available composite, laminated and modular pole alternatives and improve the business case.

If there is a positive conclusion to the findings of this project this will progress DNO's towards the use of alternative wood poles on the assumption that over the life of the asset there is a saving to be made.

There is also the potential to find a solution to the shortage of super/extra stout wood poles. If we get to the point of having a very limited supply of these larger wood poles then the only other conventional method may be to use lattice steel tower structures. The cost of these compared to traditional wood poles is almost 20 times.

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

n/a – research project

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

This project focuses on developing an accurate cost benefit analysis tool and testing schedules for alternative 132kV transmission poles, which could be used for all new 132kV wood pole construction in the UK.

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

This project intends to produce an accurate cost benefit analysis tool to help network licensees choose the correct alternative pole structure required. An appropriate testing schedule to show products comply with current standards will also be available.

The project will cover commercially available composite, laminated and modular pole alternatives from reputable manufacturers. As this is a feasibility project we hope to gather accurate costs from this.

### 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

This project intends to produce an accurate cost benefit analysis tool and testing schedule for a range of alternative pole structures which will be freely available to all network licensees.

#### 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.

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