national gas transmission

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

Sep 2015

Project Reference Number

NIA_NGGT0083

Project Registration

Project Title

Geospatial Information System (GIS) Pipeline Costing Tool

Project Reference Number

NIA_NGGT0083

Project Licensee(s)

National Gas Transmission PLC

Project Start

December 2015

Project Duration

0 years and 7 months

Nominated Project Contact(s)

Paul Lee

Project Budget

£44,000.00

Summary

The current process relies too heavily on the construction engineers experience, which includes subjectivity and human factors. The current process is disconnected from formal cost estimating and too often relies on rules of thumb.

This project is innovative because it makes best use of National Grid's GIS technology to provide decision support through analysis, combined with the engineers experience. It will provide a method to generate additional information to support critical decision making where currently only limited information and assumptions are available.

Third Party Collaborators

Hyder Consulting UK Ltd

Nominated Contact Email Address(es)

Box.GT.Innovation@nationalgrid.com

Problem Being Solved

Currently it is a manual and labour intensive process to compare the relative cost of conceptual gas pipeline developments (route corridor studies) to support the consenting process of Nationally Significant Infrastructure Projects, in particular to support Preferred Corridors Statements based on Non Statutory Consultation and early environmental and engineering studies.

Method(s)

Our proposed approach is to use GIS data and software to estimate the relative costs of different gas pipeline route options developed using traditional route corridor study and vantage survey methods. The principle is that route options in GIS can be queried

against readily available desktop GIS data related to real world features which have an associated cost and set back distance from each feature (for example a road crossing width plus 5m either side). From this analysis the indicative relative cost pipeline route options can be calculated.

The output will be a pilot ArcGIS Toolbox and MXD which will allow users to compare the relative costs of gas pipeline routes on a map and as a GIS database table. This can be then used to support investment decisions and discussions with statutory stakeholders. Pilot project needs to be of a suitable scale to capture a representative length of pipeline and typical crossing scenarios. Intended to take approximate 40km cross country pipeline to test the application. Trans-pennine projects completed in the past 10 years will be evaluated to compare estimated costs against tendered costs. This will also allow reuse of previously purchased map data.

The project deliverables are:

- Pipeline tool as an ESRI ArcGIS Toolbox (version to be confirmed)
- Documentation (user guide)
- Closure report

Scope

The current process relies too heavily on the construction engineers experience, which includes subjectivity and human factors. The current process is disconnected from formal cost estimating and too often relies on rules of thumb.

This project is innovative because it makes best use of National Grid's GIS technology to provide decision support through analysis, combined with the engineers experience. It will provide a method to generate additional information to support critical decision making where currently only limited information and assumptions are available.

Objective(s)

To trial by pilot a method for generating quantitative information in relation to relative gas pipeline corridor costs to support down selection of preferred corridors. Subject to a successful pilot, the process can be applied to diversions, in particular of potential use for HS2.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

Delivery of the pilot ArcGIS MXD and toolbox with pilot data which can be used and extended by GIS trained staff at National Grid. Training costs are not included within this paper

Project Partners and External Funding

n/a

Potential for New Learning

n/a

Scale of Project

Project is desk based.

Technology Readiness at Start

TRL4 Bench Scale Research

Technology Readiness at End

TRL7 Inactive Commissioning

Geographical Area

National Grid offices (Warwick)

Supplier offices: Hyder (Bristol), PESL (Shrewsbury)

Revenue Allowed for the RIIO Settlement

None

Indicative Total NIA Project Expenditure

£44k

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)

Comparable time saving on each activity is estimated at 2 weeks of QS time (circa £5000), however greater benefit from avoiding consenting delays and regulatory buy in substantially more. Assuming DCO costs of 250k per month, projects have been delayed historically by up to 3 years due to planning enquiry. This risk would be substantially reduced by supporting the costing justification. The calculation below is based on just one project being delayed within the RIIO period.

Please provide a calculation of the expected benefits the Solution

Commercial risk avoidance assuming 1 in 7 gas projects are delayed due to consenting challenges (since 2010); Costs run at £250k per month for 3 years equals £3M.

£3M x 0.14 (1 in 7 probability) = £420 000

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

Applicable to all network licensees required to route new high pressure pipelines

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

Licence costs (for networks not already using GIS) approx. £2500 for 6.

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

Other networks routeing new high pressure pipelines will likewise benefit from the intelligence provided on the effectiveness of GIS based pipeline costing methods

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