



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

Mar 2014

### Project Reference

NIA\_SGN0028

## Project Registration

### Project Title

Gas Eco (GECO) Gas Pump

### Project Reference

NIA\_SGN0028

### Project Licensee(s)

SGN

### Project Start

March 2014

### Project Duration

2 years and 1 month

### Nominated Project Contact(s)

Ryan Smith, Innovation Delivery Manager

### Project Budget

£73,333.00

## Summary

The scope of this project is as follows:

### Research, Development and Production of Working Drawings

- Develop conceptual design drawings.

### Manufacture Prototypes

- Produce working prototypes.
- Test prototypes against the relevant performance specifications criteria.

### Manufacture Batch Units

- Produce working batch units.
- Test batch units against the relevant performance specifications criteria.
- Produce working procedure document for review by relevant SGN experts.
- Produce final version of work procedure incorporating expert feedback.

## Delivery and Training

- Produce training package.
- Confirm delivery and training locations.

## Produce formal closure report

- Produce draft report.
- Produce final report and submit to Ofgem.

## Nominated Contact Email Address(es)

sgn.innovation@sgn.co.uk

## Problem Being Solved

Scotia Gas Networks (SGN) has identified an issue when decommissioning and abandoning gas pipes and gas holders as the gas contained within them is currently vented to the atmosphere. This has an environmental impact as natural gas is twenty one times more harmful to the environment than carbon dioxide. Every tonne of natural gas that is released into the atmosphere has the same CO<sub>2</sub>e impact as a person taking a flight from Edinburgh to London 109 times.

This project is to develop further an intrinsically safe gas pump, which will enable piped gas that would normally have been vented to atmosphere during decommissioning activities, to be recompressed and then be injected back into the gas network.

The introduction of this development will be an aid to reducing SGN's real environmental impact.

## Method(s)

SGN will work with Pipetech Pipeline Technology Ltd to develop a prototype pump, powered by compressed air. If successful this will be scaled to 10 units to allow a representative field trial to be carried out.

This technical solution to the above problem will contribute towards SGN's ongoing commitment to reduce emissions to atmosphere.

## Scope

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- Confirm delivery and training locations.

#### – Produce formal closure report

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The project has been delayed due to testing issues. There was originally a problem with the temperature capabilities of the cylinders in the pump. This problem was rectified and there were no further problems with the pump. However, this has subsequently had a knock-on effect on the testing period, which was initially anticipated to be acceptable by the project team. Following discussions with Engineering Policy it was advised that the testing regime should be extended in order to build additional confidence in the temperature and pressure results following the re-design of the cylinders. As a result, there will be a further extension for the project. Early indication of test data has been positive and there are not thought to be any further impacts. The project team are confident with the design that is being progressed and it is being evaluated by Engineering Policy prior to commencing field trials.

The project title, problem, objectives, success criteria and cost arrangements will remain unchanged. The change is beneficial as it will allow the project to complete as planned and deliver learning which will benefit all Gas Distribution Networks in their distribution operations across GB.

### Objective(s)

The objective of this project is to develop a single stage air powered gas pump capable of pressurising gas that would normally be released in to the atmosphere after abandoning pipes and holders. This is to enable it to be injected back into the piped gas network and minimise wasted gas whilst carrying out repair and maintenance activities.

- Research, development and production of drawings of working prototypes.
- Manufacture prototypes, carry out off site testing and review against relevant performance specifications.
- Manufacture batch units; carry out off site testing and produce test report and working procedures.
- Deliveries of batch units to selected SGN sites and carry out required training.
- Produce final closure report.

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

n/a

### Success Criteria

The success criteria for this project are:

- Production of the working drawings.
- Production of working models and completion of performance testing.
- SGN attend site to witness the performance of pre-prototype gas pumps.
- Provide a production build/test schedule and submit fortnightly progress reports of project.
- Produce Geco gas pumps to enable the field trial to commence.
- Delivery of pumps to agreed sites and the provision of onsite training and competency base assessments at GB representative locations within SGN's network.
- Detail the environmental benefits achieved from the field trials results.

### Project Partners and External Funding

n/a

### Potential for New Learning

n/a

### Scale of Project

This project has been designed to assess the suitability of the Geco Gas Pump to support SGN's environmental targets.

A prototype was constructed in-house to demonstrate and confirm the proof of design concept.

### Technology Readiness at Start

TRL6 Large Scale

### Technology Readiness at End

TRL8 Active Commissioning

### Geographical Area

The field trials associated with this project will be across SGN's footprint. The purpose of the trials being carried out in a number of regional locations is to ensure that the equipment is used extensively in varying environments to ensure the integrity of the findings to support GB rollout.

### Revenue Allowed for the RIIO Settlement

While there is no direct revenue allowed for vented gas within daily operating activities, SGN has a total shrinkage budget of £138.8m for RIIO – GD1. However, this will be a real reduction in natural gas emissions and is not currently recognised by the leakage model (LRMM).

### Indicative Total NIA Project Expenditure

The total project expenditure is £73,333, 90% of which is allowable NIA expenditure (£65,999)

## 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 both a financial and an environmental benefit to be gained from this project. For example where 2km of 12" medium pressure main is being replaced, the approximate potential environmental saving would be equivalent to approximately 6.8 tonnes of CO<sub>2</sub>, the same carbon footprint as a person flying from Edinburgh to London 35 times.

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

The operational base and method costs are broadly similar in this project. The financial benefit is recognised in a saving of gas which would normally be wasted. How this will be recognised in the LRMM is to be confirmed.

A typical mains replacement of 2km of 12" medium pressure would normally involve releasing approximately £450 worth of natural gas into the atmosphere.

Assuming a target price £450 per unit, this would justify purchase and use of this product after a single use.

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

This product is replicable right across Great Britain (GB). Across all DN's we are abandoning approximately 1000 kilometers of gas mains per annum.

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

Excluding the cost of purchasing the equipment, it is anticipated that the cost of disseminating the development outcomes and findings from the project and training costs incurred before the product can be used would be approximately £2,500 for SGN. Using the 4:2:1:1 split with reference to the size of the networks, it could be assumed that National Grids training costs would be approximately £5,000, and Wales & West Utilities and Northern Gas Networks would be £1,250 each. Therefore, the estimated total cost of training before the equipment can be used operationally would be £10,000.

However, this figure is very speculative as all DN's have different contracting and operational models.

## 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

## 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