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

Oct 2015

Project Reference Number

NIA_NGN_133

Project Registration

Project Title

CNG Vehicle Trial

Project Reference Number

NIA_NGN_133

Project Licensee(s)

Northern Gas Networks

Project Start

October 2015

Project Duration

2 years and 3 months

Nominated Project Contact(s)

Trevor Lister (mobile: 07773589834)

Project Budget

£93,889.00

Summary

The scope of the project is to prove the operability, business case and emission savings (carbon and air-quality) available from operating CNG vans. The information gained in this trial will be used to justify a larger pilot fleet of CNG vehicles and further inform the roll out of CNG vans across the fleet.

The scope of the demonstration includes:

- Swapping a diesel vehicle that is currently being used by a NGN measurement technicians with a CNG vehicle from Leeds City Council
- Hiring a CNG van to replace one of NGN's operational vans from the emergency and repair team.
- Converting CNG vehicles to NGN livery publicizing the fact that we are using low carbon solutions to our operations.
- Entering into an agreement with Leeds City Council to use their LNG fueling station for the duration of the project.
- Monitoring the performance of the vehicles against a set of parameters, including but not limited to:
  - Driver and fleet manager acceptance
  - CO2 emissions
  - Economics
  - Comparator vehicles
  - Availability and breakdowns
  - Vehicle range
  - Air quality
  - Weight
- Comparing the performance of the CNG vehicles against the performance of similar fleet vehicles (model, age, euro standard) operating over similar drive cycles undertaking similar duties to allow a robust comparison of running costs savings and emissions.

In the UK, CNG vans are currently used in a variety of industries including retail, local authorities and logistics.

The uniqueness of trialing CNG vehicles at NGN is to see how they perform against the operational requirements of a gas distribution network which involve responding to emergency call-outs in sometimes remote areas making the deployment of vehicles unpredictable in both, frequency and range.

Third Party Collaborators

VSL International

Cenex

Leeds City Council

Nominated Contact Email Address(es)

innovation@northerngas.co.uk

Problem Being Solved

De-carbonisation of transportation from diesel to an alternative low carbon fuel has not been resolved. One of the main areas yet to have low carbon alternatives are light commercial vehicles. Diesel emissions add to air pollution and consequently impact adversely on public health. The gas networks operate a significant light vehicle fleet to undertake its operational activities. NGN currently operates approximately 600 diesel vehicles using 1.6m liters of fuel per year and producing 4,543 TCO2e of carbon emissions.

One low-carbon alternative that is commercially available is Compressed Natural Gas (CNG). However, there is no research at the moment around the feasibility of moving towards a CNG fleet for our emergency operational vehicles. This project therefore seeks to demonstrate the commercial and operational feasibility of converting NGN's entire fleet to CNG.

Method(s)

We will undertake a trial using two CNG-fuelled vehicles from different operational disciplines and monitoring their performance over 12 months against a series of relevant parameters which are being specifically developed for the project.

The vehicles for the demonstration are going to be procured as follows:

- 1 vehicle swap with Leeds City Council (LCC) because this is the most cost efficient solution
- 1 van hire

Scope

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TO EXTEND TO DEC 17 - Extension required following delays in producing the final project report. Validation of the data captured by the trial identified that there were discrepancies with the expected results and actual results. These have now been rectified and the project report will be produced by the end of October.

Objective(s)

The objective of the project is to demonstrate:

- The commercial feasibility of using CNG vehicles within NGN

- The operational feasibility of using CNG vehicles within NGN

- The possibility of converting NGN's entire fleet to CNG

- The possibility of significantly reducing the organisation's carbon emissions produced by transport

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

Success of the trial will be identifying that, through using CNG vans, NGN can improve their environmental performance (CO2, air quality, PM, NOX) without increasing costs, vehicle breakdowns or reducing operability.

Project Partners and External Funding

n/a

Potential for New Learning

n/a

Scale of Project

For the trial two vehicles have been selected as this is deemed the most cost effective and efficient solution: One vehicle will be swapped with LCC for free which is beneficial to gas customers. However, since the use of this vehicle is limited, this needs to be balanced of with a realistic operational vehicle which needs to be hired. Selecting more vehicles would be cost prohibitive and would not allow to do the project in the selected time scale.

The duration of the overall project will be 17 months to allow for sufficient time for project planning, carrying out the trial and project de-mobilisation. The project can be broken down into the following three stages:

Stage 1 – Project planning (3 months)

Stage 2 – Trial (12 months)

Stage 3 – Data analysis and formulating next steps (2months)

In order to be able to monitor the performance of the vehicles during the entire range of workloads of a GDN, for the trial a duration of 12 months has been selected since the workload during the winter months is usually higher than in summer months due to frequent emergency call-outs.

Technology Readiness at Start

TRL7 Inactive Commissioning

Technology Readiness at End

TRL8 Active Commissioning

Geographical Area

The trial is going to be performed within the operational range of NGN's Leeds depot. LCC's fuelling station is only a 5 minute drive away from the depot. The geographical area is of sufficient size to obtain a representative demonstration to inform the prospect of a network-wide roll-out.

Revenue Allowed for the RIIO Settlement

n/a

Indicative Total NIA Project Expenditure

CNG van hire for 12 months:	£ 30,000.00
Vehicle branding:	£ 2423.30
Fuel costs:	£ 8000.00
Performance monitoring services:	£ 15,000.00
20% Contingency	£ 15,000.20
Total External Costs	£ 70,423.50
Total Internal Costs	£ 23,465.11
Total NIA Project Expenditure	**£ 93,888.61**

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)

The project has the potential to deliver financial benefits to the customer in form of cheaper fleet fuel costs and associated reductions in operating expenditure. The most significant benefits arise as a result of reductions in Particulate Matter, Nitrous Oxides and Carbon Dioxides. The projected financial benefits associated with these emissions savings equate to £16,634 based on the assumption that NGN converts 53 vans to CNG over a period of ten years. This estimate is based on calculations carried out in conjunction with NGN's NIC bid for 2015.

Please provide a calculation of the expected benefits the Solution

The objective of this project is, among other things, to demonstrate the commercial feasibility of using CNG vehicles within NGN. Until this is proved, a calculation of expected financial benefits cannot be undertaken.

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

The deployment of CNG vehicles for operational purposes has the potential of being rolled-out across all Network Licensees in GB provided that CNG fuelling stations are available at the right location and in the right scale to serve the demand for fuel.

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

As roll-out costs depend on the network's individual circumstances, i.e. size of vehicle fleet, number of vehicles to be converted to CNG, fuel availability etc., it is not possible to provide an estimate for a GB wide roll-out at this stage.

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 main outcome of the NGN CNG vehicle trial is knowing whether CNG fuelled vehicles can perform under the operational parameters of a gas distribution network depot. The learning is going to inform the assessment of the possibility of converting NGN's entire fleet to CNG. Since other network licensees operate a similar vehicle fleet, the learning from this project will be directly applicable to them.

Or, please describe what specific challenge identified in the Network Licensee's innovation strategy that is being addressed by the project (RIIO-1 only)

This project addresses a problem in the area of the Future Role of Gas which is one of five focus areas in NGN's Innovation Strategy. Projects in this focus area seek, among other things, to identify market developments and requirements of the gas network. The proposed project prepares NGN's vehicle fleet for the possible arrival of a city-scale CNG fuelling station so that NGN can use this low-carbon fuel and can reap the financial and environmental benefits associated with it to its full extend, as soon as it is commercially available.

☑ 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