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

Feb 2022

Project Reference Number

NIA2_SGN0017

Project Registration

Project Title

Bio CNG – SIU Feasibility Study

Project Reference Number

NIA2_SGN0017

Project Licensee(s)

SGN

Project Start

February 2022

Project Duration

0 years and 1 month

Nominated Project Contact(s)

Colin Thomson

Project Budget

£70,858.00

Summary

The UK has committed to a target of Net Zero emissions by 2050, with Scotland committing to 2045. To achieve these decarbonisation targets, the energy system must evolve from current fossil fuel dependency to low carbon alternatives. All four SGN SIU mainland networks currently utilise liquefied natural gas (LNG) sourced from the Isle of Grain LNG terminal in Kent, which is ultimately derived from fossil fuel sources at locations around the world and transported to the UK by bulk carriers. This feasibility study will cover three aspects of the potential to utilise a Scottish biomethane CNG alternative; these include the logistics chain between the biomethane production facility and the SIUs focusing on security of supply considerations, operational feasibility of utilising biomethane CNG and engineering and asset requirements to implement the biomethane solution with associated carbon savings.

Third Party Collaborators

WSP UK Limited

Nominated Contact Email Address(es)

sgn.innovation@sgn.co.uk

Problem Being Solved

The UK has committed to a target of Net Zero emissions by 2050, with Scotland committing to 2045. To achieve these decarbonisation targets, the energy system must evolve from current fossil fuel dependency to low carbon alternatives.

All four SGN mainland SIU networks currently utilise liquefied natural gas (LNG) sourced from the Isle of Grain LNG terminal in Kent, which is ultimately derived from fossil fuel sources at locations around the world and transported to the UK by bulk carriers. The LNG is transported a distance of 700 miles between the Isle of Grain and the Wick and Thurso SIU networks, a round trip of 1,400 miles, with LNG being stored locally to each SIU network to ensure security of supply requirements are met throughout the year.

This feasibility study will look at the potential to decarbonise a major part of the gas demand at two of the SIU networks in Wick and Thurso, utilising locally produced biomethane, transported to the sites via compressed natural gas (CNG) road tankers

Method(s)

The project will follow a 3-phase approach aligned with the scope of the work packages detailed in the scope, below:

- Phase 1 – Logistics chain.
- Phase 2 – SIU Operational Plan.
- Phase 3 – Engineering/asset requirements.

Additional Phase:

Phase 4: Road Tanker Loading

Scope

The project will consist of 4 Work Packages as follows:

Work Pack 1: Logistics chain

- Process model to ascertain the “real” capacity of CNG trailers.
- Logistics programme comprising of:
  - Operating model.
  - Costs.
  - Risks.
  - Recommendations on key steps to set up.

Work Pack 2: SIU Operational plan

- High-level concept / design document detailing the assets required to facilitate CNG injection at the two SIU locations.
- Operational plan at a high-level covering: -
  - Daily operations, for SGN specified 80:20 split.
  - Variable plan.
  - Assess COMAH requirements.
  - GSMR compliance requirements for gas quality.

Work Pack 3: Engineering/asset requirements

- High level concept design document for both sites for RTL facility and CNG gas injection.
- Preliminary general arrangement drawing for RTL facility and CNG injection point.
- Preliminary ELD for RTL facility and CNG injection point.

Work Pack 4: Future Viability of Methane-Based Fuels

- Technical note concluding viability of methane-based fuels both nationally and specifically for the SIUs in question.
- Summary on the consumer benefits of a local, Scotland based CNG biomethane renewable energy source including CO2 reduction benefits.

Additional work pack

Work Pack 5: Road Tanker Loading

- Define the road tanker loading process and review the impact of the facility.
- Detail the major engineering and asset requirements to construct the facility.

Objective(s)

The objective of this Project is to deliver a feasibility study covering the transportation and use of biomethane compressed natural gas at the two SIU locations at Wick and Thurso. The study will cover four aspects of the potential to utilise a Scottish biomethane CNG alternative to LNG, these include:

- The logistics chain between the biomethane production facility and the SIUs focusing on security of supply considerations.

- Operational feasibility of utilising biomethane CNG.
- Engineering and asset requirements to implement the biomethane solution.
- Road tanker loading.

The study will focus on the need to de-carbonise all SGN gas networks including the SIU networks in line with government targets. The expected outcome is the provision of a feasibility study detailing the operational and logistical requirements to provide eighty percent of the two SIU networks' annual energy requirements by Scottish produced biomethane CNG. The study will include all associated legislative safety, engineering governance and associated standards, along with consumer benefits and carbon savings.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

N/A

Success Criteria

Success criteria for the project will be a final report containing the outputs and recommendations from Work Packs 1 to 4 as follows:

- Work Pack 1: Logistics chain.
- Work Pack 2: SIU Operational.
- Work Pack 3: Engineering/asset requirements.
- Work Pack 4: Future Viability of Methane-Based Fuels.

Additional work pack

Work Pack 5: Road Tanker Loading

Project Partners and External Funding

Project partners for the study will be WSP Consulting.

Potential for New Learning

The study will focus on the need to de-carbonise all SGN gas networks including the SIU networks in line with government targets. The expected outcome is the provision of a feasibility study report detailing the operational and logistical requirements to provide eighty percent of the two SIU networks' annual energy requirements by Scottish produced biomethane CNG. The study will include all associated legislative safety, engineering governance and associated standards, along with consumer benefits and carbon savings.

Scale of Project

The project will be a combination of desktop study and stakeholder engagement.

Technology Readiness at Start

TRL2 Invention and Research

Technology Readiness at End

TRL3 Proof of Concept

Geographical Area

The geographical area for the project will be Scotland.

Revenue Allowed for the RIIO Settlement

Not applicable

Indicative Total NIA Project Expenditure

£70,858

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:

The study will focus on the need to de-carbonise all SGN gas networks including the SIU networks in line with government targets. The expected outcome is the provision of a feasibility study report detailing the operational and logistical requirements to provide eighty percent of the two SIU networks' annual energy requirements by Scottish produced biomethane CNG. The study will include all associated legislative safety, engineering governance and associated standards, along with consumer benefits and carbon savings.

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

The initial focus of the study is on Scotland; however, the methodology developed in the project can be used throughout the UK.

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

This is a research study and it is not possible to provide indicative implementation costs before this work has concluded.

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 feasibility study will look at the potential to decarbonise a major part of the gas demand at two of the SIU networks in Wick and Thurso, utilising locally produced biomethane, transported to the sites via compressed natural gas (CNG) road tankers. The learning from this study can be utilised in other parts of the GB network, giving a long term route for the decarbonisation of the gas network utilising biomethane as a source of low carbon gas.

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

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.

The project scope has been reviewed against all existing projects and no areas of duplication have been identified.

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

Locally produced biomethane, transported via CNG trailers has not been utilised before in the quantities estimated to be used in this study, with the potential to decarbonise 80% of the annual gas demand within the two SIU towns of Wick and Thurso. This has an impact on the operation of the network, the facilities to accommodate the biomethane and the logistics involved in the transportation of the compressed gas to site.

Relevant Foreground IPR

N/A

Data Access Details

The project will aim to utilise existing data in the Work Packages detailed. Some sensitive data may be required to be de-sensitised with distribution of the outputs when completed. Sensitive data will most likely be in the form of existing gas network demand information and site configuration.

Please identify why the Network Licensees will not fund the project as apart of it's business and usual activities

The project will look to deliver a technical assessment and feasibility study into the utilisation of locally produced biomethane from CNG transportation to decarbonise up to 80% of the annual demand within the two SIU locations. The aims of the study are to evaluate the logistical, operational, technical and carbon implications of transitioning the majority of the network to biomethane. The initial focus of the study is in Scotland; however, the outcomes developed in the project can be used throughout GB. As such, the project is not part of the usual activities of the business

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

The NIA framework offers a robust, open framework to support this work and ensures the results are disseminated to all licenses. There are risks associated with development of the outputs from this project should the operational aspects of decarbonising the networks with low carbon gas not be feasible. This early feasibility study provides mitigation to these potential risks.

This project has been approved by a senior member of staff

☑ Yes