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

Aug 2020

Project Reference Number

NIA_NGN_269

Project Registration

Project Title

H21 - Understanding Industrial & Commercial Customers

Project Reference Number

NIA_NGN_269

Project Licensee(s)

Northern Gas Networks

Project Start

August 2020

Project Duration

0 years and 10 months

Nominated Project Contact(s)

Mark Danter

Project Budget

£64,250.00

Summary

Future hydrogen projects will require the conversion of existing Industrial and Commercial customers to hydrogen. There is a high potential that there are going to be issues with converting I&C customers that needs to be reviewed and assessed so that future conversion projects can be planned to take into account these issues and the mitigation applied where possible. For example, I&C customers may have concerns around the duration and timing of the conversion activity, and it may be mitigated if planned in line with their requirements.

Preceding Projects

NIA_NGN_270 - H21 Initial Hydrogen Supply Strategy

NIA_NGN_275 - H21 – Hydrogen Ready Services

NIA_NGN_276 - H21 - Hydrogen Ready Components

NIA_NGN_302 - H21 - Wider Impacts of Hydrogen

NGN_NIA_344 - H21 Ignition Consequence Research

NIA_NGN_348 - H21 Occupied Trials Phase 1 - Safety Case

Nominated Contact Email Address(es)

innovation@northerngas.co.uk

Problem Being Solved

Future hydrogen projects will require the conversion of existing Industrial and Commercial customers to hydrogen. There is a high potential that there are going to be issues with converting I&C customers that needs to be reviewed and assessed so that future conversion projects can be planned to take into account these issues and the mitigation applied where possible. For example, I&C

customers may have concerns around the duration and timing of the conversion activity, and it may be mitigated if planned in line with their requirements.

OFGEM sets guaranteed standards of performance for all gas transporters, ensuring that the required level of service is provided. These standards of service apply to domestic and non-domestic (I&C) customers. The current standards of supply currently align to emergency and planned replacement works where interruptions are anticipated to be less than 24 hours. This will need reviewing with the Regulator and potentially amending in-line with the research from this project. There are also other standards of service agreements on a case by case basis, including interruptible and uninterruptible service guarantees. The varying service agreements may have a significant impact on the way in which the planned conversion will be undertaken, and potentially increases in cost of the conversion and so further research is required.

In order to plan the future hydrogen conversion of I&C customers, a project is required to collate all the Industrial & Commercial customer data, service requirements and further connection/supply details to review the impact of conversion on these customers. An in-depth review of this information will highlight any potential challenges that will need mitigating prior to conversion in the future including, for example, managing and mitigating uninterruptable supplies.

Our current knowledge of our I&C customers indicates that there will be issues to convert some customers with specific gas supply requirements, including some that have an uninterruptable supply agreement which, for example, will require specific mitigation measures to minimise disruption and maintain safety. There will also be I&C customers that will have specific preference over the timing and duration of their conversion to minimise disruption. This project needs to research the various types of I&C customers, review the various service agreements, including contracted pressure, interruptible and uninterruptable, and highlight issues that require resolving to convert and supply these types of customers.

Our current information on the type of connection and the peak pressures and peak demands is limited to modelling data and so there may need to be communication undertaken with a range of I&C customers to research and collate this information.

Method(s)

The project will be delivered in three stages:

Stage 1 - Obtain the information from the various systems and collate into one data set. This will involve filtering and triaging the information to highlight potential customer types that need further investigation.
Stage 2 - Review and assess the triaged information collated to ascertain the issues and potential mitigation needed.
Stage 3 - Report on the findings from the review of the I&C data and make recommendations that should be incorporated into future conversion plans.

Scope

The project will collate the information NGN stores on its Industrial and Commercial customers, including any standard service agreements, uninterruptible and interruptible agreements and any technical details they have on the connections. This data will then be cross checked with the funding parties to ensure that a wide range of I&C sites are covered by the project. The project will liaise with the Hy4Heat project to obtain their current research on hydrogen commercial and industrial appliances, (work packages 5 & 6) within I&C customers.

The project will include:

- Collation of Address and industry type of I&C Customers from the models and the Demand Derivative System (DDS)
- A review of the industry types to look at the impact of the hydrogen conversion process on that specific industry and conclude any findings and make recommendations around minimising the impact of conversion, e.g. converting schools during a holiday period etc.
- A review of the Hy4Heat research on hydrogen for commercial and industrial appliances
- Sample review of specific service agreements, such as Guaranteed Standard of Service, uninterruptible and interruptible service agreements, etc. to highlight where additional mitigation maybe required, including, for example amendments to notification periods etc.
- An output report highlighting the key issues raised during the review of I&C customers and provide details of any issues found that will require further investigation

Objective(s)

1. Collation and review of I&C data to highlight key customer types, or key service agreements that need further, more detailed, research and suggested mitigation recommendations.
2. A report on the various key issues found, potential mitigation measures and further research requirements. This can be used to inform future engagement with I&C customers.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

1. Data collection of the current info held by NGN and the funding parties on the I&C Customers, including connection details, customer

type, standard service agreement details etc.
2. Output report of the review of the I&C Customer data, including make recommendations to mitigate potential issues for future conversion and any further research requirements

Project Partners and External Funding

NGN will lead the project as part of the H21 NIC bid consortium with support from the wider H21 NIC project partners.
Cadent will be a key contributor to the project in terms of information from their own I&C customers.
No external funding will be needed for this project.

Potential for New Learning

The objective of the future hydrogen projects, including the NGN H21 programme, is to reach the point whereby it is feasible to convert the existing natural gas distribution network to hydrogen and provide a contribution to decarbonising GBs heat and power sectors with the focus on finding a green alternative to natural gas.

In order to undertake live trials and further community scale trialing, there is a need to understand the networks Industrial and Commercial customers, on the below 7 bar network, including how to implement hydrogen conversion, the potential impacts this causes customers and any potential mitigation measures that may need to be considered.

The learning gained from this project will contribute significantly to the future planning and implementation of the hydrogen conversion process across all the GDN networks.

Scale of Project

This project inputs into the success of the future hydrogen conversion projects, which will provide critical information applicable to the entire UK gas system when considering conversion to hydrogen incrementally over time.

Technology Readiness at Start

TRL5 Pilot Scale

Technology Readiness at End

TRL8 Active Commissioning

Geographical Area

The project will be based in the NGN network area but will be applicable and deliver learning appropriate to the entire UK gas distribution system.

Revenue Allowed for the RIIO Settlement

N/A

Indicative Total NIA Project Expenditure

External funding = £0.00
Internal cost = £64,250
Total Cost = £64,250

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)

This project is one of a suite of projects to enable a conversion of the UK gas grid to hydrogen. Repurposing the UK gas networks with hydrogen to support the challenge of the climate change act has the potential to save £46 billion with minimal gas customer disruption verses alternative decarbonisation solutions

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 research and learning undertaken as part of the Understanding Industrial and Commercial Customers is applicable to all GDNs within the UK as the networks will have the same types of customers and therefore the same issues with conversion and so will assist with future Hydrogen conversion projects.

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

This is not applicable

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 issues that will be discovered by this project will be the same for all Network Licensees undertaken hydrogen conversion projects and so the learning is applicable to all.

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

Future of the gas

☑ 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.

In addition to the previous research that has been undertaken looking at domestic customer perceptions as part of other hydrogen projects, the research and learning into the Industrial and Commercial Customers requirements during the conversion process has never been undertaken before.

This work is also on the raft of projects being undertaken by all networks to secure the future of gas and enable a hydrogen tomorrow.

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

This project will build on the original work of the H21 Leeds City Gate project and the H21 Phase 1 & 2 NIC projects and provide valuable knowledge and learning to inform some of the next steps identified in the H21 road map. The research and learning, specifically into the Industrial and Commercial Customers requirements during the conversion process has never been undertaken before.

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

This project is in the interests of UK and is not specific to business as usual operations of the network with no allowance within regulatory business plans. This particular project can be delivered in the most cost effective manner by re-prioritisation of activities and subsequent re-deployment of network resources, who have the skills and knowledge required to deliver this project. Whilst the benefits are undeniable there is no guaranteed benefit back to gas customers without regulator and government support– projects associated with 100% hydrogen are at the cutting edge of gas network innovation.

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 project would only be undertaken with support from NIA funding, it is in the interests of gas customers, the regulator and the UK government and realization of any benefits are outside the control of the gas networks. There is no allowance in BAU business plans for this type of work and the commercial benefits and technical/operational risks associated with these type of 100% hydrogen projects are outside the traditional environment of any gas distribution network or its shareholders.

This project has been approved by a senior member of staff

☑ Yes