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

Jun 2023

Project Reference Number

NIA_CAD0091`

Project Registration

Project Title

Hydrogen Technical and Safety Case for Domestic Heat

Project Reference Number

NIA_CAD0091`

Project Licensee(s)

Cadent

Project Start

April 2023

Project Duration

0 years and 5 months

Nominated Project Contact(s)

Lorna.Millington@cadentgas.com

Project Budget

£316,670.00

Summary

The project is looking to engage Arup to support the review and assessment of the safety evidence and ensure we meet the required timescales. The work is split into Phase I: Arup will undertake evidence gathering exercise and review the technical and safety evidence developed to date and identify the gaps in the current and planned evidence development.The review will also include developing an understanding of the evidence developed internationally, include conducting a detailed review of existing information and progress made to date. During the gathering and review of existing data, Arup with scope out a second phase of this work, to develop a roadmap that will coordinate the work of the GDNOs in developing evidence to address any gaps and avoid duplication of work and ensure evidence is submitted on time for the September 2024 deadline. The resultant phase 2 scope (and associated costs) will be submitted to Cadent for consideration.

Preceding Projects

NIA2_SGN0025 - Interventions for Hydrogen by Asset Group

Third Party Collaborators

Arup

Nominated Contact Email Address(es)

Innovation@cadentgas.com

Problem Being Solved

To support the Government decision regarding hydrogen for heat, a large amount of evidence is required. The HSE have been engaged by Government to assess the safety and technical evidence provided by the Gas Networks and the suppliers engaged by DESNZ. This evidence will provide the information the HSE have set out in their documentation. The challenge is that the evidence

must reach the HSE by September 2024.

DESNZ have raised concerns about the completeness of the evidence and timeliness of delivery to meet the September 2024 date.

The Gas Network CEO's have agreed to establish a new group with authority to monitor and put actions in place to keep the evidence delivery on track. This group is the new Safety and Technical Board.

Method(s)

The new Safety and Technical Board are looking to engage Arup to support the review and assessment of the safety evidence and ensure we meet the required timescales.

The work is split into Phase I: Arup will undertake evidence gathering exercise and review the technical and safety evidence developed to date and identify the gaps in the current and planned evidence development.

They will assess the evidence to ensure alignment with the HSE guideline and DESNZ requirements.

The review will also include developing an understanding of the evidence developed internationally, include conducting a detailed review of existing information and progress made to date.

During the gathering and review of existing data, Arup with scope out a second phase of this work, to develop a roadmap that will coordinate the work of the GDNOs in developing evidence to address any gaps and avoid duplication of work and ensure evidence is submitted on time for the September 2024 deadline. The resultant phase 2 scope (and associated costs) will be submitted to Cadent for consideration. This Phase 2 work if taken forward will be open for collaboration.

Scope

The project will cover in Phase 1 evidence gathering of all the projects underway contributing to the Safety and Technical evidence for the HSE assessment. From this will be an assessment of how the evidence addresses gaps and whether there are any further projects required to meet the Policy decision ask from HSE/Government. Building from the work already carried out under Interventions for Hydrogen by Asset Group.

The review will also include developing an understanding of the evidence developed internationally, include conducting a detailed review of existing information and progress made to date.

Phase 2 if taken forward will include development of a roadmap that will coordinate the work of the GDNOs in developing evidence to address any gaps and avoid duplication of work and ensure evidence is submitted on time for the September 2024 deadline.

Objective(s)

The objective of the project is to

- Collate the Safety and Technical evidence gathered to date
- identify the gaps in the current and planned evidence development
- ensure alignment with the HSE/Governments requirements
- If Phase 2 is delivered it will development of a roadmap that will coordinate the work of the GDNOs in developing evidence to address any gaps and avoid duplication of work and ensure evidence is submitted on time for the September 2024 deadline.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

The project is focussed on the evidence for conversion to hydrogen rather than current operation. Although not directly focussed on consumer vulnerability, the work to define hydrogen as an option for decarbonisation could offer lower bills for those in vulnerable situations.

Success Criteria

The success criteria for the Project is the delivery of the following:

- That we have a clear view of the evidence for the Safety and Technical assessment of hydrogen
- Any gaps in evidence are identified
- For phase 2 if delivered a roadmap of evidence delivery is produced to support coordination of the evidence delivery

Project Partners and External Funding

For Phase 1 the project partners are:

Cadent Gas Ltd & Arup

Phase 2 will be open to collaboration if delivered.

Potential for New Learning

The learning from the project will be clarity on the evidence being and to be delivered to the HSE for review, and how it meets the Safety and Technical requirements for HSE/Government to make the Policy decision.

Also any gaps that remain and require projects to complete the evidence identified.

The learning from the project will be disseminated via the newly formed Safety and Technical Board.

Scale of Project

The project is UK wide and will cover all the evidence required to support the Government's Policy decision.

Technology Readiness at Start

TRL4 Bench Scale Research

Technology Readiness at End

TRL5 Pilot Scale

Geographical Area

The work is desktop based and although not collaborative it will cover all Gas Networks projects.

Revenue Allowed for the RIIO Settlement

All relevant foreground IP created as part of the project will follow NIA governance.

Indicative Total NIA Project Expenditure

The external cost of the project is £95,000 for phase 1 alone and the internal spend is £31,666 giving an overall total of £126,666.

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:

This project is a vital enabler to the future conversion of domestic properties in GB to run on hydrogen, thus playing a part in the wider net-zero ambitions of the country.

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 project covers all across GB and does not need to scaled.

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

N/A

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 learning is across all network licenses as it pertains to projects being carried out by all Gas Networks

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 will build from the work being undertaken within Interventions for Hydrogen by Asset Group the NIA project being led by SGN. The work within the project outside of this is not duplicating the evidence building work underway.

If applicable, justify why you are undertaking a Project similar to those being carried out by any other Network Licensees.

The work underway within Interventions for Hydrogen by Asset Group building information into a single repository to align projects and begin to check for gaps. This project will take the work to date and cross check against the criteria set out by HSE and Government to ensure we are delivering the correct evidence. This is will then allow gap assessment and new projects to be scoped where necessary. The scoping may take place under Interventions for Hydrogen by Asset Group project rather than this one.

Additional Governance And Document Upload

Please identify why the project is innovative and has not been tried before

As this work concerns the Safety and Technical evidence for the use of hydrogen it is innovative as use of hydrogen for domestic heating is new.

Relevant Foreground IPR

All relevant foreground IP created as part of the project will follow NIA governance.

Data Access Details

The data regarding the scope of the evidence being gathered will be captured.

Data for this project and all other projects funded under the Network Innovation Allowance (NIA), Network Innovation Competition (NIC) or the new Strategic Innovation Fund (SIF) can be found or requested in a number of ways:

· A request for information via the Smarter Networks Portal at https://smarter.energynetworks.org, to contact select a project and click 'Contact Lead Network'. Cadent already publishes much of the data arising from our innovation projects here so you may wish to check this website before making an application.

· Via our Innovation website at https://cadentgas.com/future-of-gas

Via our managed mailbox futureofgas@cadent.com

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

The conversion of GB's homes to run on hydrogen, and any of the associated projects which will enable hydrogen conversion cannot be considered as BAU due to their first of a kind nature and risks which go beyond BAU.

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

This project has inherent risks due to its first of a kind nature so it is right it should be supported using NIA funding.

This project looks to uncover technical, operational and regulatory considerations when determining the suitability of the existing Gas Network to be repurposed for hydrogen service.

This project has been approved by a senior member of staff

☑ Yes