

NIA Project Registration and PEA Document

Date of Submission

May 2024

Project Reference Number

NIA2_SGN0063

Project Registration

Project Title

Hydrogen Technical and Safety Case for Domestic Heat – Phase 3

Project Reference Number

NIA2_SGN0063

Project Licensee(s)

SGN

Project Start

April 2024

Project Duration

0 years and 6 months

Nominated Project Contact(s)

Simon Joyce

Project Budget

£1,007,748.00

Summary

The project aims to continue working with Arup for the purpose of reviewing and assessing the safety evidence in order to meet the required September 2024 deadline in submitting evidence to HSE.

During Phase 3, Arup will continue identifying any gaps in the current and planned technical and safety evidence development. Additionally, Arup will analyse and advise GDNOs (Gas Distribution Network Operators) on any progress and feedback of evidence review by HSE. Finally, Arup will facilitate effective demonstration of D-65 points by executing a previously developed roadmap and coordinating the efforts of GDNS in addressing any gaps whilst avoiding duplication of work. The goal is to ensure that all evidence is submitted on time for the September 2024 deadline.

Preceding Projects

NIA_CAD0091 - Hydrogen Technical and Safety Case for Domestic Heat

NIA2_SGN0050 - Hydrogen Technical and Safety Case for Domestic Heat – Phase 2

Third Party Collaborators

Arup

Nominated Contact Email Address(es)

sgn.innovation@sgn.co.uk

Problem Being Solved

In order to support the Government's decision regarding the use of hydrogen for heat, a substantial amount of evidence must be

presented. To facilitate this, the Health and Safety Executive (HSE) has been commissioned by the Government to evaluate the safety and technical evidence submitted by the Gas Networks and the suppliers contracted by DESNZ (Department of Energy Security and Net Zero). The findings from this evaluation will align with the guidelines outlined in the HSE's documentation. However, there is a challenge in ensuring that the required evidence is delivered to the HSE by September 2024.

DESNZ has expressed concerns about the adequacy and timely delivery of the evidence to meet the September 2024 deadline. To address this concern, the Gas Networks have agreed to establish a new governing body empowered to oversee and implement measures to ensure the timely submission of the required evidence. This governing body, known as the Safety and Technical Gas Networks Board will play a crucial role in ensuring the progress and success of the evidence delivery process.

Method(s)

The project will encompass the previous completed Phases 1 & 2, which involved the comprehensive gathering of evidence from all ongoing projects that contribute to the safety and technical evidence required for the HSE assessment. Additionally, an evaluation will be conducted to assess how effectively the gathered evidence addresses existing gaps and identify any further projects needed to fulfil the Policy decision request from HSE/Government. This evaluation will build upon the previously conducted work in the area of Interventions for Hydrogen by Asset Group.

Furthermore, the review will encompass an exploration of national and developed evidence, including a thorough examination of existing information and progress achieved thus far. For this project under Phase 3, a previously developed roadmap will be executed to facilitate the coordination of efforts among the GDNOs in generating evidence to address any gaps, prevent redundant work, and ensure timely submission for the September 2024 deadline.

This project will be engaged with a number of governing bodies to ensure learning and next steps are captured, helping to support the HSE evidencing for September 2024.

Scope

The Department for Energy Security and Net Zero (DESNZ) is scheduled to make a policy decision regarding the use of UK Hydrogen for heat in 2026. To facilitate this decision-making process, it is necessary to create and present technical and safety evidence to the Health and Safety Executive (HSE) for their assessment by the third quarter of 2024.

SGN and the other Gas Distribution Networks (GDNs) including National Gas are actively involved in preparing and submitting safety evidence to the HSE in order to develop a Hydrogen Technical and Safety Case for Domestic Heat.

The objective of this Project is for Arup to provide strategic technical and project management support to SGN and the GDNs in their efforts to submit evidence to the HSE to demonstrate the safe use of hydrogen.

Arup will work with SGN and the GDNs in a systematic manner to develop a holistic safety narrative by using existing project information. Arup will build on evidence developed to date and highlight if there any gaps.

The emergent project evidence will be prioritised, prior to submission to the HSE.

Objective(s)

The project's objective is to systematically compile the safety and technical evidence collected thus far, while also identifying any existing or future gaps in evidence development. It is imperative to ensure that such evidence aligns with the requirements set by the HSE/Government.

During Phase 3, the project will aim to execute a previously created roadmap that effectively coordinates the efforts of the GDNOs in generating evidence, enabling them to address any identified gaps and avoid duplicative work. This will ensure the timely submission of evidence by the September 2024 deadline.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

The project primarily aims to examine the evidence supporting the conversion to hydrogen as an alternative to current operation methods. Although not its central focus, the research conducted to establish hydrogen as a viable decarbonization solution could potentially result in reduced expenses for individuals in vulnerable circumstances.

Success Criteria

The success criteria for the Project encompass the following deliverables:

- A comprehensive overview of the evidence pertaining to the safety and technical assessment of hydrogen leading to a well-defined understanding. Arup will be providing a critical path to the CFA for the S&T Group.
- Identification of any existing gaps within the evidence, highlighting areas that require further research or investigation.
- Analysis on progress of evidence review by HSE and recommendations regarding any HSE feedback.
- For Phase 3 implementation, the execution of previously designed roadmap to guide the coordinated delivery of evidence, ensuring efficient and streamlined progress.

Project Partners and External Funding

SGN & Arup will be the lead partners and will have support from the other GDNs.

Potential for New Learning

The project will serve as a valuable opportunity for gaining clarity regarding the evidence that is currently being delivered and needs to be delivered to the HSE for review. This will include a thorough assessment of how the evidence aligns with the Safety and Technical requirements set forth by the HSE and the Government, which are crucial for informed policy decision-making. The project will also highlight any existing gaps in the evidence, thereby indicating the need for further projects to address and complete the identified evidence requirements.

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

TRL5 Pilot Scale

Technology Readiness at End

TRL6 Large Scale

Geographical Area

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

Revenue Allowed for the RIIO Settlement

N/A

Indicative Total NIA Project Expenditure

The total external project expenditure is £378,000. Total project value is £503,874, 90% (£453,487) of which will be recovered via the NIA funding mechanism in line with the funding conditions.

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 utilise hydrogen as a fuel, 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 be 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 carried out in Phases 1 & 2 as well as the work 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 ongoing efforts within the Interventions for Hydrogen by Asset Group involve consolidating information into a centralized repository to align projects and perform gap checks. The purpose of this project is to compare the existing work with the criteria established by HSE and the Government to ensure the delivery of accurate evidence. By doing so, we can assess any gaps and, if necessary, define new projects to address them. It is possible that the scoping process for such projects may occur within the framework of the Interventions for Hydrogen by Asset Group project, rather than within this project.

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 the use of hydrogen for domestic heating is new.

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 is a new area of innovation and therefore would require a collaborative approach through NIA where information and lessons learned can be shared.

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'.
- SGN 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 managed mailbox: sgn.innovation@sgn.co.uk

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 its 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

Due to the innovative approach, this style of project would normally have a risk profile that is too high for BAU or other funding methods. In addition, if the project were funded under BAU or other methods, it would take significantly longer, and the solutions would arrive too late to support the net zero transition. Also utilising NIA allows for shared learning with the other utilities and GDNs.

This project has been approved by a senior member of staff

☒ Yes