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

Nov 2023

Project Reference Number

NIA2_SGN0047

Project Registration

Project Title

Hydrogen MOBs Standards and Procedures Phase 4

Project Reference Number

NIA2_SGN0047

Project Licensee(s)

SGN

Project Start

October 2023

Project Duration

0 years and 9 months

Nominated Project Contact(s)

David Raymond - dave.raymond@sgn.co.uk

Project Budget

£97,332.00

Summary

There is a requirement for gas distribution network (GDN) operators to understand the cost, safety, and practicality of converting network pipelines from natural gas to hydrogen in Multi-Occupancy Buildings (MOBs). This phase of the project will produce recommendations to IGEM for an interim standard and procedures for MOB conversion to hydrogen. This will act as Phase 4 of the project in the ongoing MOBs project to investigate the conversion of MOBs from natural gas to hydrogen use, building on findings from Phases 1, 2 and 3 of the project.

Preceding Projects

NIA2_SGN0023 - Hydrogen MOBS Data Analysis Phase 1

Third Party Collaborators

ROSEN

Nominated Contact Email Address(es)

sgn.innovation@sgn.co.uk

Problem Being Solved

Most of the research focus on hydrogen to date has targeted on smaller, simpler end user systems (e.g., simple one and two storey dwellings) but there is a need to understand hydrogen as applied to Multi Occupancy Buildings (MOBs). MOBs connected to natural gas represent a significant portion of domestic dwellings (a proportion of which are classed as vulnerable customers) and non-domestic buildings. It has been estimated that flatted properties make up 21% of the UK's domestic heat load. GDNs need to fully consider these properties and make an assessment for likely conversion opportunities.

To realise MOBs hydrogen conversion, recommendations for an interim standard and onsite procedures is necessary. This will require applying an understanding of the differences in the design, installation, operation, inspection and maintenance of gas installations for hydrogen in comparison to natural gas. This Phase of the project will build on the findings from Phase 1, 2 and 3 of the MOBs programme of work.

Method(s)

This phase of the project will solve the problem by:

1. Producing a set of recommendations for an interim standard for hydrogen in MOBs:

This will be drafted in the form of an IGEM/G/5 hydrogen supplement, to be read in parallel with IGEM/G/5 edition 3. The supplement will outline the differences in the design, installation, operation, inspection and maintenance of gas installations for multi-occupancy buildings between hydrogen and natural gas. This will be based on findings from WP1, WP2 and WP3 of this programme of work. The supplement will be drafted as a working document at an early stage in the project, to be updated as information from WP3 becomes available.

2. Producing a draft procedure for MOBs conversion:

A conversion procedure for MOBs will be produced, including a process flow chart. This procedure will draw on the learnings from previous phases of the project and will be drafted as a working document at an early stage in the project, to be updated as information from Phase 3 becomes available. The procedure will be drafted using a template to be provided by SGN. At this stage the requirement for detailed work procedures is unknown, and these will need to be scoped and developed at a later stage.

The conversion procedure will include:

- A conversion process flow chart
- Pre conversion desk top review requirements
- Pre-conversion survey requirements to assess the suitability of existing gas installations including network capacity, network riser design and condition, materials, jointing method, ventilation, meter location, allowance for expansion and contraction, electrical safety and fire protection measures.
- Overall suitability for conversion, including any required modifications
- The above information can be used when considering a cost benefit analysis.

Scope

The recommendations for an interim standard and onsite procedures will apply to all MOBs in the Great Britain. For this project a MOB is defined as a building that contains three or more domestic dwellings and/or commercial units with one or more meter points within the building.

Objective(s)

- Produce a set of recommendations for an interim standard for hydrogen in MOBs:
- Produce a draft procedure for MOBs conversion.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

MOBs connected to natural gas represent a significant percentage of domestic dwellings (a proportion of which are classed as vulnerable customers) and non-domestic buildings. To realise conversion opportunities, GDNs must support the production of industry standards and procedures to safely convert MOBs to hydrogen.

Success Criteria

1. Production of a set of recommendations for an interim standard for hydrogen in MOBs:

- Interim draft covering progress to date.
- Production of a draft standard for MOBs conversion

2. Production of a draft procedure for MOBs conversion:

- Interim draft conversion procedure covering progress to date.

- Production of a draft conversion procedure for MOBs including a process flow chart.

Project Partners and External Funding

ROSEN (UK)

Potential for New Learning

The project will provide recommendations to IGEM for interim standard for hydrogen in MOBs which is essential to supporting GDNs in realising conversion opportunities in MOBs. New learning will be posted on the ENA Smarter Networks portal.

Scale of Project

This will be a desktop project, with regular engagement between SGN and the project partner. The scale of the project is critical in the Heat Policy Decision to evidence how MOBs in Great Britain can be converted to hydrogen.

Technology Readiness at Start

TRL2 Invention and Research

Technology Readiness at End

TRL3 Proof of Concept

Geographical Area

The output of this project will be recommendations for an interim standard and procedures for conversion of MOBs to hydrogen, covering GDN areas in Great Britain.

Revenue Allowed for the RIIO Settlement

Not applicable

Indicative Total NIA Project Expenditure

SGN External - £97,332

SGN Internal - £32,444

Total - £129,776

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:

To realise conversion opportunities, GDNs must have standards and procedures in place to convert MOBs to hydrogen. This will require a set of recommendations for interim standards and procedures for hydrogen in MOBs to identify conversion opportunities.

How the Project has potential to benefit consumer in vulnerable situations:

Not applicable at this stage.

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)

Not applicable.

Please provide a calculation of the expected benefits the Solution

Not applicable.

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

The output of this project will be recommendations for interim standards and procedures for MOB conversion to hydrogen to be used on all MOBs in Great Britain.

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

Not applicable 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 output of this project will be recommendations for interim standards and procedures for MOB conversion to hydrogen that can be used by all GDNs.

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

Not applicable.

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.

This project has been reviewed against other projects with collaboration and regular engagement between all GB Gas Networks.

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

Not applicable.

Additional Governance And Document Upload

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

This project will build on findings from Phases 1, 2 and 3 to deliver recommendations for new standards and procedures for MOB conversion to hydrogen. This has not been tried before as the relevant testing and modelling on MOB conversion to hydrogen had not been completed.

Relevant Foreground IPR

Not applicable.

Data Access Details

Any consumer data gathered throughout this project will be anonymised and will be compliant with General Data Protection Regulations (GDPR) and the UK Data Protection Act. Any compliant data can be made available for review upon request.

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

The project is carrying out research and development on an emerging technology. This technology is at a low technology readiness level and as such it 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 licensees.

This project has been approved by a senior member of staff

☑ Yes