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NIA Project Registration and PEA Document

Date of Submission

Feb 2023

Project Reference Number

NIA2_SGN0033

Project Registration

Project Title

Hydrogen MOBS Asset Information Review Phase 2

Project Reference Number

NIA2_SGN0033

Project Licensee(s)

SGN

Project Start

January 2023

Project Duration

0 years and 5 months

Nominated Project Contact(s)

David Raymond

Project Budget

£202,213.00

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 (MOB). This phase of the project is made up of an asset information review and an assessment of the key factors to be assessed tested.

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 understand conversion opportunities, a detailed understanding of MOBs across the UK is required by GDNs. This will require a MOBs definition and scope of work to carry forward into further hydrogen research and develop quantified risk assessments of MOBs.

Method(s)

1. Industry engagement and briefing

Early engagement with primary stakeholders such as central government (BEIS), gas distribution networks, independent gas transporters, IGEM, HSE (Regulator), Building Safety Regulator (BSR) and wider stakeholder groups will be key to a successful project.

Workshops with these stakeholders will agree a MOBs definition and scope of work to carry forward into further hydrogen research. For example:

- Whether to include domestic dwellings and commercial units within such buildings;
- How to accommodate the overlap of network pipelines and installation pipework;
- To understand and agree the priority building types (high rise versus medium rise);
- To consider whether only those buildings currently served by natural gas be included or should the potential scope be increased.

2. Asset portfolio characterisation

Within this phase of the project an assessment of asset data sources will be performed to include all UK gas distribution networks.

Data will be analysed to provide a detailed understanding of buildings above and below six stories in height. It will consider building types, construction types and date of construction (building and network pipeline). The materials and construction of network pipelines within these buildings will also be analysed. These may require additional data sources such as riser inspection records, risk assessment records and leak / failure records.

A summary of relevant findings for natural gas and hydrogen and to what extent the asset data can be useful in making judgements on the suitability and safety of converting to hydrogen will be provided. This assessment will also identify limitations/gaps within the various data sources. It will make recommendations and provide a scope for any follow on work that may be required.

3. Document landscape review

A review of legislation, regulation, guidance, standards, policies and procedures applicable to gas supplies in MOBs will be carried out based on documentation from all GDNs and other gas transporters.

Scope

The primary objective of the industry engagement and briefing events is to agree a MOBs definition and scope of work to carry forward into further hydrogen research. For example:

- Whether to include domestic dwellings and commercial units within such buildings;
- How to accommodate the overlap of network pipelines and installation pipework;
- To understand and agree the priority building types (high rise versus medium rise);
- To consider whether only those buildings currently served by natural gas be included or should the potential scope be increased.

Objective(s)

The objectives are to produce:

- A recommendation for suitability of MOB stock for use with hydrogen.
- Evidence to make recommendations for suitability of hydrogen in MOBs
- An identification of building types or archetypes which will be difficult to convert or are not recommended for conversion.
- A detailed list of evidential work needed beyond this Work Pack.
- A consensus on the suitability of hydrogen for MOBs (or a subset of MOBs).

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 understand conversion opportunities, GDNs must have a detailed assessment of key factors in MOBs to be assessed tested.

Success Criteria

This phase of the project will be successful if the following deliverables are met:

1. Asset portfolio characterisation report

This will be a report that documents all research and findings. Where gaps are identified, the study will inform the development of further evidence gathering that may be required ahead of hydrogen conversion and to support Phase 3 and Phase 4 of this project.

2. Document landscape review report and Presentation

This will be a report will provide a review of legislation, regulation, guidance, standards, policies and procedures applicable to gas supplies in MOBs and their conversion to hydrogen. Where there are gaps identified, the study will inform the development of further evidence gathering that may be required ahead of hydrogen conversion and to support Work Pack 3 and Work Pack 4.

Project Partners and External Funding

ROSEN, Cadent, Wales & West Utilities, Northern Gas Network

Potential for New Learning

The project will produce a detailed assessment of all MOBs across GDNs presented in through an asset portfolio characterisation report and a document landscape review report. This data will be essential to help GDNs understand conversion opportunities in MOBs. New learning will be posted on the ENA Smarter Networks portal.

Scale of Project

This will be a desktop study, with regular engagement between SGN and the project partners. This is the detailed assessment of MOBs data at UK level prior to the follow on engineering and technical assessment of potential physical conversion changes required (at scale) for MOBs, against a defined population delivered from this work.

Technology Readiness at Start

TRL1 Basic Principles

Technology Readiness at End

TRL2 Invention and Research

Geographical Area

The output of this project will be a detailed assessment of all MOBs across GDN areas in GB.

Revenue Allowed for the RIIO Settlement

Not applicable

Indicative Total NIA Project Expenditure

SGN External - £151,660.00

SGN Internal - £50,553.33

Total - £202,213.33

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 understand conversion opportunities, GDNs must have a robust methodology to identify and characterise complex distribution systems. This will require a detailed assessment of MOB stock to identify conversion opportunities. The project will produce a detailed assessment of all MOBs across GDNs.

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 a detailed assessment of all MOBs across GDN areas in GB.

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 trialed 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 a detailed assessment of all MOBs across GDN areas in GB.

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

The output of this project will be a detailed assessment of all MOBs across GDN areas in GB in preparation for conversion of gas network to hydrogen.

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 project is carrying out research and development on potential hydrogen solutions for heating multiple occupancy buildings connected to the gas network. This project can only be undertaken with the support of NIA funding.

This project has been approved by a senior member of staff

Yes