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 2024

### Project Reference Number

NIA_CAD0105

## Project Registration

### Project Title

International Evidence Gathering

### Project Reference Number

NIA_CAD0105

### Project Licensee(s)

Cadent

### Project Start

June 2024

### Project Duration

0 years and 10 months

### Nominated Project Contact(s)

George Brookfield

### Project Budget

£263,839.00

### Summary

Evidence is required to demonstrate hydrogen is an alternative to natural gas in the UKs energy mix. Gathering and evaluating evidence from international sources allows us to gain more inputs to better tackle the energy transition, for the benefit of all its users and customers.

The UK hydrogen village trials were anticipated to provide a real-world example of a gas conversion. Both proposed UK projects were cancelled for different reasons which left a gap in UK evidence.

There are practical trials taking place in the Netherlands, Germany, and beyond. These trials are currently demonstrating home heating through a converted gas network. Their knowledge and experience can be assessed for applicability to the UK and used to complement our own research.

### Third Party Collaborators

GL Industrial Services Ltd

### Nominated Contact Email Address(es)

Innovation@cadentgas.com

### Problem Being Solved

Evidence is required to demonstrate the viability of hydrogen as an alternative to natural gas in the UKs energy mix. Gathering and evaluating evidence from international sources grants us the opportunity to gain more inputs and more understanding to better tackle the energy transition, for the benefit of all its users and customers.

The UK hydrogen village trials were anticipated to provide a real-world example of a gas network conversion to hydrogen. However,

both projects from Cadent and NGN were cancelled for different reasons which has left a gap in the evidence which would have fed into the comprehensive formal assessment (CFA) and heating policy decision.

## Method(s)

1. Introduction – making the initial connection and establishing communication channels, agreeing ways of working, and outlining the GDN/DESNZ project.
2. Applicability assessment – initial knowledge capturing, which can be done in two parts; initially with open questions on evidence frameworks and then general evidence queries (ref. questionnaire as a guide).
3. Internal review – evaluating what sources can be sought for further targeted evidence gathering or instigate the potential for visiting projects.
4. Targeted evidence gathering – either submission of specific evidence questions, or arrangements made to visit a project to learn more from physically witnessing the project.
5. Submission to HSE – including reviewing, aligning to evidence gaps, and writing up the acquired knowledge and learning before submitting to the HSE for consideration in the CFA.

This will allow the project to create the following deliverables:

- Overview project/trial reports for each of the six trials.
- Technical Work Package reports for the projects/trials.
- Timeline for evidence and phasing.
- Translation of technical documents, if required

With the technical work package reports being submitted to HSE ERG for consideration along side the other safety and technical evidence been supplied from the rest of the UK projects.

The project recognises that not all evidence will be applicable to our UK gas system, and so robust applicability testing will be done to ensure quality of outputs are maintained. This is done by an applicability survey embedded in the above methodology.

Data sharing and interpretation is also critical for success, which is why the project is proposing to partner with well established and experienced project delivery partner in this space, DNV. Not only do DNV have international arms to their business, supporting many of the intended international contacts, but they have already demonstrated that the UK based team have an excellent track record for data and knowledge exchange, interpretation, and utilisation, both in the UK and overseas.

Data Quality statement .

A project plan has been proposed for this project. However, due to the nature of the activities it will have to retain a degree of fluidity. DNV will be supporting the gas networks in acquiring, assessing and then

reporting data from international trials. This requires willing engagement with key stakeholders, if responses to information request are not forthcoming then the programme will need to adapt as required. This could mean extending certain elements or deciding to end engagement with a chosen trial.

Data collected from the trials will be referenced in the project report. If data is gathered through other means such as face to face meetings this will be shared with the trial owner with a chance to review and comment before being finalised in the project report.

To ensure compliance with GDPR data will be anonymised. If data cannot be anonymised approval will be sought to include this information. Furthermore, if there are any IP sensitivities an NDA may be used to enable discussions to take place.

Measurement Quality Statement.

DNV are accredited to the ISO 9001: Quality Management Systems standard.

To meet the data quality statement above DNV will follow their quality policy DMSG-12-0.

We commit ourselves to:

• Deliver in accordance with stakeholders' expectations

• Continually improve our performance

This is achieved through:

• Serving our customers with a high degree of pro-activeness and responsiveness

• Complying with applicable standards and regulations

• Continually improving our services

• Continually improving our management system

• Continually investing in research and innovation

• Striving to be at the forefront of technology

• Striving to attract, develop and retain leading competence

Furthermore, project reports will undergo a robust QA process before be issued.

## Scope

The project will compliment the 3 areas of research and interest: Network Safety and Impacts (NSI), End-User Safety Evidence (EUSE), and the Trials Evidence Framework, with the potential for it to cover LTS and NTS investigative works also (give the opportunity to do a 'cover-all-areas' initially, with our European counter parts). This is currently broken down into the following work packages:

1 – Transmission (above 7 bar)

2 – Distribution (below 7 bar, to ECV)

3 – End-user (beyond the ECV)

Evidence is required from all these areas to demonstrate the viability of hydrogen as an alternative to natural gas in the UKs energy mix. Gathering and evaluating evidence from international sources grants us the opportunity to gain more inputs and more understanding to better tackle the energy transition, for the benefit of all its users and customers.

The intention is to liaise with, and seek technical evidence from 6 international sources/trials/projects.

There is a lot of ongoing work to identify the most effective route to meet net zero in the UK and this project is one of many projects which will assist in this area. Repurposing the UK gas networks with hydrogen to support the challenge of the climate change act has the potential to save millions of pounds with minimal gas customer disruption verses alternative decarbonisation solutions.

## Objective(s)

Overseas

1. Engage with and establish working relationships with approximately 6 international sources, projects, or trials.

2. Collect and curate evidence in an appropriate and complimentary manner to supplement the work being carried out in NSI, EUSE,

and the trial evidence framework.

3. Creating enduring relationships which prosper future knowledge sharing opportunities.

At home

4. Identify the areas where international evidence would benefit the current UK based evidence data sources, including colligatively working with NSI and EUSE working groups, as well as colleagues in DESNZ and the trials evidence framework.

5 .Engage with and confirm expectations with HSE ERG reviewers for the submission of non-UK based evidence.

## Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

An assessment of distributional impacts (technical, financial and wellbeing related) for this project has been carried out using a bespoke assessment tool, which assesses the project as having a positive, negative or neutral effect on consumers in vulnerable situations. To help inform the assessment, this tool considers the categories of consumers identified in the Priority Services Register.

This project has been assessed as having a neutral impact on customers in vulnerable situations

## Success Criteria

A successful project will have satisfied the 5 objectives stated above to a level that allows us to submit some additional evidence and establish some enduring relationships. This project is exploratory in nature, so the degree to which this is achieved is currently unknown (and part of the reason for the project). From previous engagements over the continent, there is confidence in the receptiveness of European counterparts and the evidence and knowledge they have available to share. A very successful project will be one which provides abundance of additional evidence.

## Project Partners and External Funding

This project will see the collaborative working of X out of 8 GB gas distribution networks, joined with project deliver partner, DNV.

## Potential for New Learning

A great deal of learning is anticipated to come out of this project as it investigates project involving hydrogen throughout the world.

This knowledge will be disseminated to NSI, EUSE, and trials evidence framework contributors and stakeholders to ensure it appropriately meshes with the UK outputs.

The current project learning dissemination methods will continue throughout this project, including but not limited to:

- Written publications to project partners and wider industrial subject matter experts
- Seminars and webinars, when appropriate.

## Scale of Project

The project will target 6 international sources, trials or projects, to ensure the breath of information can be identified.

These projects are not specific to any geographical location but current proposals is to focus the Netherlands and Germany, building off from our current relationships with Dutch DSO, Alliander, and German project, H2Direkt.

Reducing the scale of this project is very possible, but so is increasing it. How much we put in will be proportionate to what we can get out. On evaluation of some of the areas we are considering, the scale we are proposing is an appropriate middle ground approach. This will allow us to do enough to see tangible benefits to the current evidence portfolio, but not too much whilst we establish the necessary relationships.

## Technology Readiness at Start

## Technology Readiness at End

| | |
|---|---|
| TRL5 Pilot Scale | TRL6 Large Scale |

## Geographical Area

All funding and beneficiary parties are UK based.

Naturally the work will take us overseas, where necessary, to European countries.

## Revenue Allowed for the RIIO Settlement

N/A

## Indicative Total NIA Project Expenditure

External Cost

Cadent: £98,939.50

SGN: £ 49,469.75

WWU: £24,734.88

NGN: £24,734.88

Internal Cost

Cadent: £ 32,979.83

SGN: £ 16,489.92

WWU: £ 8,244.96

NGN: £ 8,244.96

Total: £263,838.67

# 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 will contribute holistically to the overall delivery of hydrogen distribution and end-user evidence. Ensuring the most relevant and up-to-date knowledge and evidence is with the decision makers who need it.

## 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

There is a lot of ongoing work to identify the most effective route to meet net zero in the UK and this project is one of many projects which will assist in this area. Repurposing the UK gas networks with hydrogen to support the challenge of the climate change act has the potential to save millions of pounds with minimal gas customer disruption verses alternative decarbonisation solutions.

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

The applicability of the outputs from this project run Great Britain wide.

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

Due to the nature of the project, roll out costs are not applicable. The outputs are evidence that will feed into the HSE's CFA.

## 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

☐ 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

Any learning from International source, projects and trials, will be first evaluated for applicability to the UK gas industry, after which, any and all information should be utilised by the relevant evidence work package to feed into the overall submission to HSE and their CFA.

A second primary benefit will be to understand the operational of other networks and not just what the conclusions have been, but how they have derived them. This will stand to benefit gas distribution networks post CFA as we continue to develop not just safety and technical evidence, but operational understanding and knowledge.

### 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.

This project will work in close collaboration with, and is a direct result of, all other evidence work streams feeding into the HSE CFA. It is also being delivered by project partners responsible for other research and evidence projects, so risk of unnecessary duplication is not perceived to be a very large risk.

### 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

For the first time in our evidence submission to HSEs comprehensive formal assessment we looking to international sources of information.

The UK hydrogen village trials were

anticipated to provide a real-world example of a gas network conversion to hydrogen. However, both projects from Cadent and NGN were cancelled for different reasons which has left a gap in the evidence which would have fed into the CFA and heating policy decision. The proposal to look internationally was announced in December 2023 by DESNZ.

## Relevant Foreground IPR

Foreground IPR will include all emerging knowledge and learning from international projects.

Although all parties will come with some know-how and potentially background IPR from previous international engagements, the project outputs will only be covering new foreground IPR.

## Data Access Details

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

This piece of works primary focus is to deliver results to feed into the HSE's CFA to help determine the viability and opportunity of repurposing the GB gas distribution networks to hydrogen. The primary benefactors are the GB government and the GB citizens.

## 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

NIA represents the requirement to do this piece of work collaboratively. We are required to show that hydrogen gas can be safely distributed and used throughout Great Britain.

As such, funding this type of work needs to be done to the maximise it's dissemination and minimise the burden on any singular population of energy consumers.

## This project has been approved by a senior member of staff

☑ Yes