

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

Feb 2020

### Project Reference Number

NIA\_CAD0050

## Project Registration

### Project Title

Hydrogen blending - Optimisation of the commercial regime

### Project Reference Number

NIA\_CAD0050

### Project Licensee(s)

Cadent

### Project Start

February 2020

### Project Duration

0 years and 9 months

### Nominated Project Contact(s)

Cadent Innovation Team

### Project Budget

£419,730.00

## Summary

The project will seek to explore the current commercial regime and how it will need to be adapted to allow hydrogen blending.

### Nominated Contact Email Address(es)

Innovation@cadentgas.com

## Problem Being Solved

With the challenge of decarbonising heat, opportunities such as hydrogen blending are key to enabling reduction in our carbon emissions in the short term whilst minimising the customer impact. These low impact reductions are key to moving the UK towards its net zero target.

The technical challenges of blending hydrogen into natural gas have been explored in the Network Innovation Competition project HyDeploy 1 and 2. With the current projects providing the evidence to demonstrate the safety of blends within the network, to support a UK roll out the impacts on the current gas markets need to be understood.

The current commercial frameworks are constructed around Natural gas and will have potential areas that require adaption to facilitate hydrogen blending at a national scale. The current projects will explore the changes at a small scale utilising workarounds. This project will look across the full range of the commercial environment to highlight all areas that would need to be adapted for roll out.

## Method(s)

The project will seek to explore the current commercial regime and how it will need to be adapted to allow hydrogen blending. The process to explore this will be via the following stages

### Stage 1 - Identification of issues and challenges – this will be split into four tasks

Task 1.1 Identify high level hydrogen blend and production scenarios. – understand the scenario to be considered during the project.

Task 1.2 Initial identification of issues and challenges - first pass identification of the issues and challenges

Task 1.3 Principles and criteria for successful solutions – these will be used to assess the different options

Task 1.4. Stakeholder engagement – test of the information gathered to date

## Stage 2: Development of solutions – this will be split into four tasks

Task 2.1 Solution longlist - develop a solution longlist for each of the six elements of the value chain.

Task 2.2 Consideration of interactions and development of solution packages

Task 2.3 Assessment against criteria – to rank options

Task 2.4 Engagement with stakeholders – test outcomes with Stakeholders

## Stage 3: Development of road map

Task 3.1 Development of road map - develop a clear roadmap that sets out key actions that would need to be undertaken to implement the proposed solution.

Task 3.2 Test with stakeholders – final run through with stakeholders

Finishing with the overall project report

## Scope

As part of its funding bid for HyDeploy 2, Cadent estimated that the adoption of blended hydrogen and natural gas could save an estimated 120Mt CO<sub>2</sub> by 2050 across GB. It could also lead to a saving for consumers of £8 billion cumulatively to 2050, when compared to the installation and network reinforcement required to move forward with heat pump solutions.

The commercial and regulatory actions identified in this project will be necessary to unlock these savings.

## Objective(s)

The objective of this project is to understand the changes required to the current commercial market to deploy hydrogen blending across Transmission and Distribution networks. With consideration of

- Injection from 100% Hydrogen networks like HyNet.
- Blended injections from other networks e.g. NTS.
- Interaction between distribution grid and the NTS, in terms of controlling offtake flows and the potential for hydrogen blends coming off/on to the NTS, including the need to potentially instruct hydrogen producers on another network.

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

n/a

## Success Criteria

The outputs for the project can be summarised as follows:

Clear identification of the commercial and regulatory issues associated with blending concluding with a document outlining issues and challenge which has been tested with stakeholders.

Identification of a preferred solution resulting in documentation which sets out a preferred solution, and a clear rationale for its choice which has been tested with stakeholders.

Production of a road map for the implementation of the preferred solution informed by stakeholder feedback

## Project Partners and External Funding

This project will be delivered by Frontier Economics.

## Potential for New Learning

The potential to deploy hydrogen blending will require changes to our current commercial regime. This project will identify the changes needed and offer solutions. This will be required to carry out large scale deployment of hydrogen blending

## Scale of Project

The project will be a desktop study, with consideration of a UK deployment of hydrogen blending

## Technology Readiness at Start

TRL2 Invention and Research

## Technology Readiness at End

TRL2 Invention and Research

## Geographical Area

This project will be across all the UK.

## Revenue Allowed for the RIIO Settlement

Not applicable

## Indicative Total NIA Project Expenditure

£419,730

## 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:

n/a

#### 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)

This research project will provide long term savings to GB customers by providing the option to begin decarbonising without changing their appliances or heating systems in the medium term.

#### Please provide a calculation of the expected benefits the Solution

This is a research project.

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

This is a research project.

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

This is a research project.

### 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 project considers UK roll out of hydrogen blend covering all network licensee's.

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

The project is an enabler to heat decarbonisation facilitating the deployment of hydrogen blend at UK scale. For the UK government to meet its carbon budgets deployment of decarbonisation options opportunities like hydrogen blend are necessary.

- Has the Potential to Develop Learning That Can be Applied by all Relevant Network Licensees

### 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.

Smarter network portal cross checked and the HyDeploy2 remit to ensure no unnecessary duplication.

### 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

As hydrogen blending is an innovation project, the commercial arrangements to support its deployment is also innovative in nature.

### Relevant Foreground IPR

n/a

### Data Access Details

n/a

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

Currently hydrogen blending is not a business as usual activity, therefore the commercial arrangements associated with it is also not business as usual.

### 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 current in progress innovation projects regarding hydrogen blend are addressing the technical and operational risks. This project

aims to understand the commercial risk with the support of NIA funding.

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

Yes