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 2018

Project Reference Number

NIA_CAD0015

Project Registration

Project Title

HyNet – Capital Resources Project

Project Reference Number

NIA_CAD0015

Project Licensee(s)

Cadent

Project Start

February 2018

Project Duration

0 years and 5 months

Nominated Project Contact(s)

Cadent Innovation Team

Project Budget

£80,000.00

Summary

The principle objective of this project is to recommend the novel commercial framework and potential sources of capital that can be used to support the North West Hydrogen cluster.

Nominated Contact Email Address(es)

Innovation@cadentgas.com

Problem Being Solved

The UK has to make a step change in reducing its carbon emissions to meet the 5th Carbon Budget. To date, good progress has been made in decarbonizing power but little progress has been made in heat and transport. Hydrogen offers a solution to decarbonise both heat and transport in the near future and as a consequence Cadent has constructed the NW Hydrogen Cluster, as part of its wider HyNet programme, to look at the options for decarbonizing heat and transport in the North West of England.
The NW Hydrogen Cluster is a deliverable, replicable and no-regrets project which would require a large capital input from various mechanisms and regulatory policies would need to be implemented to ensure that the project is economical in the absence of a strong carbon price. The policy support required to allow Carbon Capture and Storage (CCS) to be delivered to the UK to allow hydrogen to be used widely will be unique and untested in the UK before; a novel commercial strategy will need to be developed that the project can exist within.

Method(s)

It is proposed to undertake a two phase project, the phases will occur sequentially:
• Phase 1: Technical Workshop: A technical workshop will occur at the start of the project to ensure the project team understands all of the technical aspects of the NW Cluster project.
• Phase 2: Techno-economic analysis: A detailed techno – economic study will be conducted in order to recommend a novel commercial strategy that supports the project.

Scope

The following high-level tasks are proposed:
• Task 1: **What activities require capital resource and at what level**
(a) Activity – this will look at what activities require funding and what the specific parts of the value chain that are impacted.
(b) Duration – This will consider whether the capex investments are a one-off or is there a need for ongoing policy support.
(c) Counterfactual – this will identify the incremental costs
• Task 2: **Capital Resource requirements**
(a) Shareholders – what is the role of shareholders
(b) What are the primary (and secondary) justifications for resourcing the project? This will look at the different options of how the project is categorised (i.e. – R&D, demonstration, trialling, GVA and export opportunities)
(c) Phasing – How can an incremental approach be demonstrated. Timeline and phasing of the project is also investigated to show what will be needed and by when.
• Task 3: **Overarching economic and policy principles**
(a) Socialisation – What socialisation of costs should occur
(b) Equalisation – What new commercial framework needs to be included and what are the levels of subsidy that needs to be paid. This will also look at State Aid issues, and ongoing cost/benefit associated with intervention.
(c) Option Value – Can the project be configured in a way that could improve the value under different (potentially non-hydrogen) futures.
• Task 4: **What are the potential sources of capital and conditions**
(a) Potential sources can include RIIO, Industrial strategy/Clean Growth Strategy/Oil and Gas Climate Initiative. Other sources could include specific Government hydrogen/heating funds.
• Task 5: **Recommendation**
(a) All the above the elements are brought together to determine the recommendations for the project and suggest how a novel commercial framework can be implemented.

Objective(s)

The principle objective of this project is to recommend the novel commercial framework and potential sources of capital that can be used to support the North West Hydrogen cluster.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

The success criteria for the project are:
• Understand the sources of capital for the project and the differing aspects which will require funding and the period that it is required
• Understand the policy support which may be needed in the absence of a strong carbon price
• Recommend how the project can be phased and how the resources can be justified
• Identify the overarching economic and policy principles (socialization, equalization, option value).
• Produce a recommendation on the novel commercial framework for the North West Hydrogen Cluster.

Project Partners and External Funding

Frontier Economics

Potential for New Learning

The support mechanisms and the policy framework for the North West Hydrogen project will be unique and specific for the project. This project will look at a full CCS chain and conversion of a cluster of heavy industry from natural gas to hydrogen. There will be separate hydrogen and carbon dioxide networks which will need to be operated and capital resourced in a unique policy framework. This will be the first time that this has been considered in the UK and if implemented it will require a completely novel commercial framework compared to what is in existence today. This framework will be vital due to the absence of a carbon price and to make the project economically feasible.
The potential for new learning on how this framework is constructed and maintained is significant and will form the bedrock of the North West Hydrogen Cluster project alongside the technical work which is being considered in parallel

Scale of Project

The project will be a desk based study throughout. The scale of the project which is being looked at includes all the economic considerations around the North West Hydrogen Cluster. To reduce the scale would mean that some of the key considerations could be missed and the project would need to be revisited at a later date.

Technology Readiness at Start

TRL2 Invention and Research

Technology Readiness at End

TRL2 Invention and Research

Geographical Area

The North West Hydrogen Cluster project is located in the geographical area of the North West of England and includes the Local Enterprise Partnership (LEP) jurisdiction regions of Cheshire and Warrington, Greater Manchester and Liverpool. This project will only look at the NW region as described in the NW Hydrogen Cluster project. However, if this project is successfully implemented it could be recreated in other UK compatible sites such as Teesside, Humberside and Grangemouth.

Revenue Allowed for the RIIO Settlement

NO

Indicative Total NIA Project Expenditure

External Cost: £70,000
Internal Cost: £10,000

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 project in itself will not provide a reduction in cost to customers but provide novel commercial information that will allow the UK to decarbonise quickly using a least cost pathway.

Please provide a calculation of the expected benefits the Solution

This project in itself will not provide a financial benefit. However, this piece of work will look at the economic and commercial framework that the NW hydrogen project will exist within. Customers will then have the opportunity to benefit from the decarbonisation within the UK via the least cost pathway.

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

This piece of work is for the North West Hydrogen Cluster and the specific commercial and policy framework that surrounds it.

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 new learning could be used to inform other CCS/hydrogen projects in the UK. The NW Hydrogen Cluster project is replicable in other industrial parts of the UK hence the specific commercial arrangements would need to be replicated by other network licensees also.

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 output from this study is seen as an enabling function, with benefits to all gas network operators.
This project will enable the NW Hydrogen cluster which will result in a material reduction in carbon emissions from the decarbonisation of heavy industry and also a hydrogen blend being injected into the domestic network.
☑ 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.

There is no other project that looks specifically at the commercial and regulatory regime for the North West Hydrogen Cluster.

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

CCS implementation and converting a cluster of heavy industry has not been achieved in the UK before. The NW Hydrogen Cluster presents an opportunity for this to happen in the near future so the commercial framework must be considered.

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

Hydrogen conversion of the domestic grid and heavy industry due to having a full CCS chain in operation cannot be considered business as usual. This will present a step change for the UK gas industry if achieved and could future proof the gas grid for many decades to come.

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

This fits the NIA guidelines with reference to setting up a novel commercial and regulatory regime.

This project has been approved by a senior member of staff

☑ Yes