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 2019

Project Reference Number

NIA_WWU_062

Project Registration

Project Title

The future of heat - a decade to make a difference

Project Reference Number

NIA_WWU_062

Project Licensee(s)

Wales & West Utilities

Project Start

October 2019

Project Duration

0 years and 4 months

Nominated Project Contact(s)

Chris Clarke

Project Budget

£33,333.00

Summary

A project that will explore the various options for low carbon heat, both for domestic customers and for businesses.

Nominated Contact Email Address(es)

innovation@wwutilities.co.uk

Problem Being Solved

Heat, whether for commercial or domestic consumers, is now regarded as the most difficult and intractable energy use to decarbonise. Part of the problem with heat is that there is no single technology solution that can deliver a whole system solution that is a) low cost, b) low carbon and c) ease of deployment at the scale needed.

Decarbonising heat technology is much more than a switch of fuel but could require a potential redesign of an entire heating system and potentially a significant change in behaviour.

Several recent studies have outlined a future heat decarbonisation strategy. Almost all involve a combination approach of energy efficiency, electrification wherever possible and some degree of gas decarbonisation with biomethane and hydrogen. Shifts to heat networks may also be possible but the source fuel of these networks also needs to be low carbon.

What these reports do not answer however is how we can get from this interim half-way position to the full decarbonisation of heat and, faced with an imperfect solution today, what is the best strategy to enable long term success.

Method(s)

The paper will address a specific area of the energy system.

The intention is that it should be short format and easily digestible by a wide range of readers.

Rather than trying to explain or cover an entire area the paper will quickly focus on areas of key impact that will “make a difference” with

a specific focus on steps that will mobilise and garner public and community support to transform the way we generate, use and think about low carbon energy.

The paper will consider what radical measure could be taken to really make a difference, including for example considering how the RHI scheme could be expanded and improved, tax and other incentives could be used to encourage investment, regulatory measures and the role of planning to encourage, or enforce, low carbon heating solutions.

Scope

The project will fund a report which will consider the merits and barriers affecting each of the main options of decarbonising heat:

Energy efficiency measures
Electrification of heat
Decarbonisation of gas
Heat networks
Alternative fuels including hydrogen and biomethane

Objective(s)

A strident and radical viewpoint that explores the various options for low carbon heat, both for domestic customers and for businesses

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

• Detailed report published with steps that could leverage long term and radical transformation
• Wide stakeholder engagement activity carried out.

Project Partners and External Funding

Regen are the project partner.

Only part of the project is being funded by NIA. External funding is supporting the remaining budget.

Potential for New Learning

Considering the long-term solutions, the paper will discuss a potential roadmap towards full electrification of heat versus an alternative roadmap towards new hydrogen based heat and fuel networks.

Scale of Project

This is a desktop study, which is the appropriate level for this project.

Technology Readiness at Start

TRL2 Invention and Research

Technology Readiness at End

TRL3 Proof of Concept

Geographical Area

The paper will focus on the whole GB energy sector

Revenue Allowed for the RIIO Settlement

N/A

Indicative Total NIA Project Expenditure

External: £25k
Internal: £8,333

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 better long term planning decisions. This project will help us to identify the optimal investment to facilitate the decarbonisation of heat across different energy networks.

Please provide a calculation of the expected benefits the Solution

Research Project

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

The report will look at the whole of the GB energy sector, so will be relevant to all networks.

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

Due to the nature of the project it Is not possible to provide costs for roll out,

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

This report together with other gas futures research will provide the networks with a holistic view and impact assessment to better predict future gas network requirements. This will allow networks to plan future investment wisely. This work will support the UK's strategic aim to help decarbonise energy and meet Net Zero targets.

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

☑ 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.

Industry research projects have made great strides in this topic and this project will complement the outputs from these projects and build upon them e.g. Decarbonisation Pathways and Regional FES.. What these reports do not answer however is how we can get from this interim half-way position to the full decarbonisation of heat and, faced with an imperfect solution today, what is the best strategy to enable long term success. It is therefore felt that is project is unique and does not duplicate on previous work.

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

A report of this kind, which critically and unconventionally investigates the best strategy to enable long term success, has not been looked at before. Whilst progress is being made to identify a solution pathway for decarbonisation, this paper will take a balanced evidence-based approach to pin point ideas and measures that could enable the radical step change needed to meet the climate change.

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

This project did not form part of the RIIO GD1. It requires funding outside of this.

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

Whole systems approach to the energy market is emerging which carries a risk. By using NIA funding this risk is mitigated, while also ensuring that any learning is shared with the wider energy industry.

This project has been approved by a senior member of staff

☑ Yes