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

Mar 2019

Project Reference Number

NIA_WWU_056

Project Registration

Project Title

Bridgend Future Modelling Phase 4 – Economic Case For Hybrid Heating

Project Reference Number

NIA_WWU_056

Project Licensee(s)

Wales & West Utilities

Project Start

February 2019

Project Duration

0 years and 8 months

Nominated Project Contact(s)

Chris Clarke

Project Budget

£41,947.00

Summary

There project will undertake an independent and objective financial modelling assessment to determine the economic case for smart hybrid heating, considering a retrofit installation into some and/or all type(s) of existing domestic residential dwelling in various different types of urban and rural environments in the UK. This will ensure that customers are making the correct decisions for the energy needs.

Nominated Contact Email Address(es)

innovation@wwutilities.co.uk

Problem Being Solved

Smart hybrid heating technology may present a decarbonisation breakthrough for the future of home heating in the UK. For many decades, domestic energy consumers have used & invested in traditional heating and hot water systems. Latest volumes estimate that 26 million residential homes are heated using traditional gas boilers. The Freedom project demonstrated that smart hybrid heating technology solution(s) can complement this existing system.

Many domestic energy consumers could benefit from a ‘retrofit’ into their existing residential homes, using smart hybrid heating technology solutions.

There is a requirement to undertake an independent and objective financial modelling assessment to determine the economic case for smart hybrid heating, considering a retrofit installation into some and/or all type(s) of existing domestic residential dwelling in various different types of urban and rural environments in the UK. This will ensure that customers are making the correct decisions for the energy needs

Method(s)

If financial modelling makes a robust economic case for Hybrid Heating, as a retrofit; this can be used to highlight the benefits to

individual house owners so they have confidence in investing in this technology. Investment could be a critically important component which helps to support the resolution of the UK Energy Trilemma.

1. Energy Costs Reductions - Across the UK there could be a significant reduction in domestic home energy costs.

2. Environmental Benefits - Critically, important reductions in millions of tonnes of carbon pollution. This will enable the UK to start to achieve UK and world environmental carbon reduction targets by 2030 and beyond.

3. Reliability & Sustainability – This solution will complement and continue to provide an ultra-reliable, and sustainable home energy system, which meets domestic customer needs.

If this independent and objective financial modelling does not make a robust economic case, then this will provide evidence that smart hybrid heating technology may not be the solution for some or all of existing residential dwellings in the UK

Scope

Financial Model - Develop a simple and effective Financial Model; to assess whether or not there is an economic case for smart hybrid heating, including retro fit, into various domestic dwellings in Urban and Rural environments. This model will inform the contents of the deliverable of the project which is a report.

Summary Report - Produce a brief summary report which defines the key messages and provides a limited number of agreed and relevant Case Studies; and to assess whether or not there is an Economic Case for smart hybrid heating in domestic residential dwellings, including retrofit.

Future of Energy (FOE) Stakeholder Engagement – Initial limited Stakeholder Engagement to share and disseminate the key Outcomes from the Project

Objective(s)

Financial Model - To have developed a simple and effective Financial Model to assess whether or not there is an economic case for smart hybrid heating', including retrofit, into various domestic dwellings in urban and rural environments. This will have the capability to model different heat and hot water demands for numerous different types of domestic dwellings and will use established accounting investment techniques. This model is being created to inform the deliverable of the project which is a report.

Summary Report –Produce a brief summary report which defines the key messages and provides a limited number of agreed and relevant case studies and to assess whether or not there is an economic case for smart hybrid heating in domestic residential dwellings, including retrofit.

Future of Energy (FOE) Stakeholder Engagement – Hold at least one Stakeholder Engagement Event, designed to share and disseminate the key Outcomes from the Project.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

The project will be deemed a success if we understand the economic case for hybrid heating and the factors and policy requirements to make an economic case from a consumer perspective.

Project Partners and External Funding

Business Navigators Ltd
All funding will be via NIA

Potential for New Learning

The project will allow us to understand the economic case for hybrid heating. This will help consumers to make informed decisions on their future energy needs.

Scale of Project

This project is done at the relevant scale which is a desk top study.

Technology Readiness at Start

TRL2 Invention and Research

Technology Readiness at End

TRL3 Proof of Concept

Geographical Area

The project will be applied to the Bridgend area, as this is a typical town in the UK. The learning is applicable for all UK gas and electricity network operatives.

Revenue Allowed for the RIIO Settlement

N/A

Indicative Total NIA Project Expenditure

External Cost: £31,460

Internal Cost: £10,487

Total: £41,947

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 will enable the savings identified in the Freedom project (NIA_WPD_023) to be utilised. This project found that smart controlled heating controls, combined with flexibility and balancing services could save £15.2bn per year compared to heat pumps alone.

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

Bridgend is recognised as typical of many towns and cities in the UK, so therefore the findings and conclusions are highly likely to be applicable throughout the UK. A report will be produced & uploaded to the portal.

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

Costs would be minimal. The outputs will be shared with other networks and applicable to all areas of the UK

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 learning generated from the project could be used by all networks in both the gas and electricity industry. If the economic case is robust, investments in the technology across the UK could help with the resolution of the UK Energy Trilemma.

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.

No work of this kind has been completed in the UK to date.

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

Smart hybrid heating is an emerging technology for domestic properties and work to assess its economic viability has never been completed.

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

It is yet to be proven if there is a robust economic case for hybrid heating systems and Wales & West Utilities do not have expertise to complete such a project in house

This project has been approved by a senior member of staff

☑ Yes