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

Jul 2014

Project Reference Number

NIA_NGN_079

Project Registration

Project Title

Low Carbon Energy Solutions

Project Reference Number

NIA_NGN_079

Project Licensee(s)

Northern Gas Networks

Project Start

June 2014

Project Duration

2 years and 7 months

Nominated Project Contact(s)

Tom Bell (Head of Social Strategy)

Project Budget

£150,000.00

Summary

To review which existing and potential technologies which could provide more efficient methods of heating and hot water to residents in high density, low income situations.

Develop an innovative scheme that provide a long term, low cost, low carbon energy solution to a large community of social housing residents.

Develop a strategy for available grant funding, identifying any gaps in funding arrangements and options for replication of the scheme across other housing associations and GDN's.

To develop a study that will capture current energy usage behaviours, understand current comfort levels currently experiencing, attitudes to existing heat experience and acceptance of future opportunities,

Third Party Collaborators

Thirteen Group

Michael Dyson Associates Ltd

GB Group

ISTA

Moatboat Ltd

Nominated Contact Email Address(es)

innovation@northerngas.co.uk

Problem Being Solved

The need to deliver a low carbon economy target of 80% reduction in greenhouse gas emissions (based on 1990 levels) by 2050, and to decarbonised electricity generation by 2030, while maintaining secure and robust energy supplies and addressing issues of fuel poverty and aging infrastructure poses significant challenge to the UK energy sector. The future role of the gas network to support large scale transition to the low carbon economy has a large number of uncertainties, especially sounding fuel poverty in a community / social housing context.

Fuel poverty in the Teesside is a significant issue. Latest figures show there are 7,278 households in fuel poverty in Middlesbrough South and East Cleveland, which is 17.7% of all households. Figures from other areas of Teesside are just as damaging. In Redcar, 7,469 households are in fuel poverty (19.1% of all households) and in Stockton South 6,743 households in fuel poverty (15.5% of all households). (source Tom Blenkinsop, MP Middlesbrough South and East Cleveland).

Gas Networks strategy for alleviating fuel poverty has a minimum impact on these numbers and has difficulty reaching mixed housing stock in a particularly deprived area. Very little work has been undertaken to understand how residents within this significant fuel poverty area currently manage energy costs, impact on lifestyle and adoption of new systems to determine which technologies or systems would make a real impact on living conditions.

The complexity of building fabric, current energy source and resident behaviour provides a real challenge to reduce energy costs to the neediest while at the same time increasing their comfort levels at the lowest possible carbon environment.

Method(s)

Working jointly with Thirteen, one of the North East Largest social housing organisations, NGN will develop a partnership to investigate and research real acceptable options that deliver residents needs while delivering a lower carbon impact. The work will also study the role gas has to play in the current lifestyle, the transition from existing to future sources and its role longer term to determine its long term impact on the UK's heat solutions.

An initial feasibility study to be undertaken on what technical solutions could be adopted on a range of single storey, low story, multi-storey mixed occupancy buildings. This stage will determine the feasibility of technologies and suitability of the systems to reduce running costs, alleviate fuel poverty and reduce carbon emissions.

To undertake a research study on the same geographical footprint with a large enough sample to be statistically robust, not just at local but have national implications.

Research funding streams, heating design issues and future trends on social heating solutions.

Scope

To review which existing and potential technologies which could provide more efficient methods of heating and hot water to residents in high density, low income situations.

Develop an innovative scheme that provide a long term, low cost, low carbon energy solution to a large community of social housing residents.

Develop a strategy for available grant funding, identifying any gaps in funding arrangements and options for replication of the scheme across other housing associations and GDN's.

To develop a study that will capture current energy usage behaviours, understand current comfort levels currently experiencing, attitudes to existing heat experience and acceptance of future opportunities,

Objective(s)

To identify true cost and challenges of fuel poor communities transition to the low carbon economy.

To identify actual behaviours residents undertake to maintain heat comfort levels and technologies available that could increase these levels at a lower cost.

To identify the role of gas in assisting the transition to these low carbon solutions and inform NGN on the impact of the transition.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

Complete a statistically robust research project on the energy use, behaviour and attitudes to change. Develop a strategic view on technologies and systems that could prove suitable to buildings, people and owners on how these communities could make a transition to a low carbon economy with costs and challenges.

Develop a view on most suitable options on site that could make that early transition to provide a real example on approaching these communities. Provide guide on existing funding sources and support available that would assist in developing a physical project.

Project Partners and External Funding

n/a

Potential for New Learning

n/a

Scale of Project

The research project will cover four major communities in the Teesside area managed by Thirteen Group. These communities will range from single storey housing, low storey high density group, single multi storey buildings and a mixture of all.

The behaviour study will cover a statistically robust population covering around 2000 residents.

Technology Readiness at Start

TRL2 Invention and Research

Technology Readiness at End

TRL4 Bench Scale Research

Geographical Area

The research will be undertaken within the Teesside area covering four major communities.

Revenue Allowed for the RIIO Settlement

N/A

Indicative Total NIA Project Expenditure

£150,000

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)

> Provide an understanding of real savings and carbon reduction of different technological solutions. Understanding how these would be used by fuel poor residents, how this would improve their reliance on alternative heat sources and identify real cost of raising customers comfort levels.

Please provide a calculation of the expected benefits the Solution

Research

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

> Fuel poverty is a significant issue across the whole of GB and this research will inform energy providers and government on the challenges it faces with a significant section of the community.

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

Research

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

In the UK in order to deliver on the low carbon economy target of 80% reduction in greenhouse gas emissions (based on 1990 levels) by 2050, and to decarbonised electricity generation by 2030, we will need to address the following challenges; maintaining secure and robust energy supplies, addressing issues of fuel poverty and working with an aging infrastructure in urgent need of upgrading. It is anticipated that the breadth of this challenge will alter the nature, scale, location, and demand for domestic and commercial gas and electricity network services in the UK.

Both Gas & Electricity Networks have the challenge of reducing fuel poverty, reducing dependency on high emission energy solutions and reducing the need for expensive reinforcements. These difficult buildings and communities will provide a future scenario on the future role of gas in supporting the UK to move to the low carbon economy.

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 major challenges facing this project is around the behaviours of the consumers:

Willingness to adopt change

Adaptation to new energy sources

Changes to energy management to reduce energy, while maintaining or increasing comfort levels

Technical challenges will be focused around the buildings fabric, location and suitability to take new renewables

Impact on the electricity network

Role of gas as a support/back up to new systems

There may also be some regulatory challenges around cross utility projects

☑ 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.

n/a

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

n/a

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

n/a

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

n/a

This project has been approved by a senior member of staff

☑ Yes