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

Jan 2014

Project Reference Number

NIA_NGN_046

Project Registration

Project Title

Biomethane Connection Guidelines

Project Reference Number

NIA_NGN_046

Project Licensee(s)

Northern Gas Networks

Project Start

October 2013

Project Duration

2 years and 1 month

Nominated Project Contact(s)

Dan Sadler (Head of Head of Energy Futures), Dennis Habergham (Gas Specialist Consultant), & Iain Foster (Data & Asset Health Manager)

Project Budget

£50,000.00

Summary

Networks want to facilitate and encourage new sources of gas to enter our networks that meet quality standards, and where necessary adapt quality standards to facilitate the new sources of supply and minimise investment on major infrastructure. At present, produces have no experience or best practice guide to help them through the installation and management of biogas connections. Networks have a variety of policies and procedures to undertake entry connections but these are limited to the transmission system.

As a result of this project with NWL documented guides will be produced as each side goes through installation process. A specialist gas consultant will be employed over the duration of the project to capture all the learning and experiences from a producers and network perspective and document these stages including:

- Initial Enquiry from Gas Producer/Developer
- Gas Producer/Developer to place order for the design or design and build
- Undertake construction phase for all work elements, including any NRO's for u/p connection and commissioning up to ECV upstream of ROV
- Handover process to Gas Network
- Other Considerations.

Third Party Collaborators

Dennis Habergham

Northumbrian Water

Nominated Contact Email Address(es)

innovation@northerngas.co.uk

Problem Being Solved

Currently renewable bimethane gas produces face a range of difficulties and require guidance to allow morw renewable capacity to more easily, more cheaply and more quickly. No guidance documents exist within the UK gas industry on the connection of bio methane waste treatment plants to the gas grid. This will promote efficient and safe connection of renewable gas supplies to the existing gas distribution networks.

Without a simple single set of industry guidelines both produces and networks undertake each project without specific understanding of the steps involved, the criteria for each stage and industry requirements or specifications. Currently the industry is adopting new procedures regarding renewable gas connections, have and are undertaking projects regarding gas treatment and quality issues. These projects require collation and consideration in a single document available to all involved in this sector.

A single simple guidance document developed via a real life practical project on a waste treatment works would provide those involved in this area a real life example showing how all the interconnecting aspects were used in a successful project.

Method(s)

Northern Gas Network are leading an innovative project along with Northumbrian Water Ltd (NWL) to connect a waste water treatment works which produces bio-gas as a by-product of its operations. Howdon (north of the river Tyne) sewage treatment works is the largest sewage treatment works on the eastern coast of England between Edinburgh and the River Thames. The wastewater from Tyneside is transported to Howdon through a network of 73km of sewer pipes and 130 pumping stations. The works can treat up to 12,000 litres of wastewater per second and serves more than one million people on Tyneside.

Progress on developing this project is hampered by a template or series of best practices developed on other plants. NGN intend to engage with a specialist gas engineering consultant to guide this project through the varied specifications, technical requirements, designs criteria and gas quality requirements. At each stage in the process detailed records, reports and outcomes will form the basis of the new guidelines.

The aspects of the work requiring coverage in the guidelines are:

- Produce a Basic Guide for Biogas to Grid Connection, based on Minimum Connection from existing parent main, above & below 7bar operation, where ROV, Odorisation and RTU will be owned and operated by the Gas Transporter/Network.
- Produce a Basic Guide for Biogas to Grid Connection based on Maximum Connection from existing parent main, above & below 7bar operation, where all aspects of design, construction and operation will be owned and operated by the Gas Transporter/Network

Scope

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Objective(s)

Objectives:

1. To accelerate progression of the Howden project supporting with gas specific expertise
2. To liaise between NWL and NGN to ensure hurdles are overcome quickly and NGN's interests are maintained
3. To develop a user guide to bio-methane injection – This guide needs to be broken down into what is to be covered i.e:

- Gas Compression – learning from the Skipton project putting in the first live compression system and its operation over a 12 month period??
- Siloxanes – Aspects of removal and compliance with HSE requirements
- Oxygen level –
- Design criteria – meeting or modifications to IGEM/TD/16

To provide the Networks and suppliers/operators of waste treatment biomethane plants with the first user guide and best practice recommendations for connection to the gas distribution network with the requirements of that plant in relation to minimum/maximum connection, gas odourisation, dewpoint, gas quality measurement etc. To allow consistency across the gas industry for the benefit of suppliers/operators of biomethane installations and gas distribution network operators.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

Consistent assessment of requirements of waste treatment gas plants for connection to the gas distribution network. This will ensure a secure and reliable gas supply.

Enable cost savings for the both the network operator and the waste treatment gas producer by having common agreed connection guide. Reducing the time in planning, designing and installing renewable gas production from this source.

To produce a single simple document for use within Biomethane gas sector that guides and informs both the networks and the produces on all aspects of introducing a successful project.

To produce a report detailing all technical aspects of the Howdon treatment works project and how this informed the production of the guide demonstrating the use of a guide help reduce the time to delivery.

Project Partners and External Funding

n/a

Potential for New Learning

n/a

Scale of Project

This project requires the input of significant knowledge currently not held within the Gas Network Licensee's it will require multi disciplined specialists to research this area and collective provide a guide to future developments. This will minimise the costs to the networks by using specialists to undertake the initial research will speed up delivery.

Dennis Habergham has over 40 years experience in the energy industry, mostly with British Gas/Transco. His key skills include project management and supervision, design and construction of high and low gas handling installations, estimating and costing, preparation of contract documentation and more recently the demolition of gas holders as part of a National Programme, including work associated with land remediation/decontamination. He also has extensive working knowledge of safety regulations and legislation.

Dennis will work alongside the project team covering:

- Initial Enquiry from Gas Producer/Developer
- Gas Producer/Developer to place order for the design or design and build
- Other Considerations

The role is to capture all aspects of the details design research and recommend simplifications and additions to the guide.

Technology Readiness at Start

Technology Readiness at End

TRL7 Inactive Commissioning	TRL8 Active Commissioning

Geographical Area

Project Howdon Sewage Treatment Works - Secondary Treatment Client Northumbrian Water Location Howdon, Tyne & Wear, UK

Revenue Allowed for the RIIO Settlement

None

Indicative Total NIA Project Expenditure

External Costs £77,000

Internal Costs £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 is a development project that will produce a simplified process that will reduce the time from producer enquiry to delivery of a project.

Please provide a calculation of the expected benefits the Solution

Base Cost is currently undetermined as this is completely new to the industry, however, current design criteria is significant costs. This guide will make the process consistent and therefore reduce future costs of this process.

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

We are aware of one other plant going through this process with Thames Water and SGN but are still some way off. This could assist up 13 connections in the current formula period (1 per water company) and also increase future connections in next formula period, RIIO-GD2.

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

Figure shown in base cost vs method cost to be replicated for 13 projects in RIIO-GD1 and beyond.

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

☐ 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

Stakeholder engagement will run throughout the whole of this project working with the producer, their specialist consultants and industry experts. We also aim to share this with other stakeholders including DECC, Ofgem, IGEM, EMIB and gas futures group.

The technical report on aspects of the production

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

Within NGN's innovation strategy it recognises the significant challenges that the wider energy sector faces in the short, medium and long term as it moves towards a low carbon economy. We aim to maintain our focus on improving our overall service to meet stakeholders expectations to deliver efficient renewable connections.

This will facilitate a speedy connection to a low carbon gas source and assist in reduce the cost and time for future waste treatment connections.

☑ 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