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 2015

### Project Reference Number

NIA_NGN_110

## Project Registration

### Project Title

T Shale – Part One (scenarios)

### Project Reference Number

NIA_NGN_110

### Project Licensee(s)

Northern Gas Networks

### Project Start

January 2015

### Project Duration

2 years and 7 months

### Nominated Project Contact(s)

Greg Dodd NGN - (07966887355), Craig Mauelshagen BMA –(07577628226)

### Project Budget

£126,500.00

### Summary

In 2014 NGN were unsuccessful in their NIC 'T-Shale' project bid. OFGEM requested that the original NIC bid should be broken down into smaller more manageable NIA projects. This project is the first of three smaller NIA projects.This project seeks to identify and quantify the currently unknown, significant challenges faced by both shale gas produces and the distribution networks to effectively introduce unconventional gas to GB. Ofgem recognised this as innovative approach and work that has not been carried out to any appreciative depth.

As part of this project NGN also seeks to develop a viable, efficient connection scenario for the connection of the Bowland shale basin to the existing Northern Gas Network infrastructure

### Third Party Collaborators

Business Modelling Associates

### Nominated Contact Email Address(es)

innovation@northerngas.co.uk

### Problem Being Solved

There has been an increase in potential production of on-shore unconventional gas sources in the UK in recent years. This brings potential benefits in terms of security of supply, facilitation of the transition to a low carbon economy and direct customer benefit from access to the wider energy market. However, there are significant challenges to address if these benefits are to be realised. Key amongst these is how GB's gas transportation system and the associated commercial and regulatory framework can be most efficiently utilised, developed and operated to support these developments.

At present there is a general lack of understanding of the technical, commercial, regulatory and timelines between the shale gas exploration and production companies, and the gas transmission and distribution networks. Furthermore good practice and mistakes can be learned by looking at how the transportation infrastructure has developed in other countries to accommodate shale gas development.

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## Method(s)

Northern Gas Networks will undertake a programme of research, utilising gas industry experts and independent experts in the shale gas industry, to provide an assessment of the challenges to be faced in connecting shale gas production to the gas transportation infrastructure in GB. The research will address the following areas.

1. Technical assessment of the physical challenges faced in connecting shale gas development to the existing GB gas transportation infrastructure
2. Commercial assessment of the costs associated with the viable technical solutions
3. Regulatory assessment of the current gas transportation standards and policies to identify actions required to accommodate the connection of shale gas development to the GB gas transportation infrastructure
4. International investigation and learning to identify best practice and lessons learned for compatible gas transportation infrastructure development to accommodate shale gas development

Northern Gas Networks will also undertake a feasibility study to identify the optimum solution for connecting the Bowland shale basin to the NGN network

## Scope

In 2014 NGN were unsuccessful in their NIC 'T-Shale' project bid. OFGEM requested that the original NIC bid should be broken down into smaller more manageable NIA projects. This project is the first of three smaller NIA projects.
This project seeks to identify and quantify the currently unknown, significant challenges faced by both shale gas produces and the distribution networks to effectively introduce unconventional gas to GB. Ofgem recognised this as innovative approach and work that has not been carried out to any appreciative depth.

As part of this project NGN also seeks to develop a viable, efficient connection scenario for the connection of the Bowland shale basin to the existing Northern Gas Network infrastructure

## Objective(s)

The objectives of the project are:

1. To deliver a final report on the project research findings
2. To produce feasibility report for the connection of the Bowland shale basin to the existing Northern Gas Network infrastructure.

The research final report will summarise the findings, results and outcomes of the research into the connection of shale gas development to the GB gas network infrastructure. The report will cover the following areas:

1. Technical – Research viable connection scenarios, incorporating best practice and lessons learned for shale gas development in the United States
2. Commercial – Develop high level cost estimates against viable scenarios
3. Regulatory – Review the current safety, environmental, planning, gas industry standards and network license conditions and assess them for suitability against the identified, viable connection scenarios
4. Schedule – Review timescales for infrastructure development to accommodate connections for shale gas development

The feasibility report for the connection of the Bowland shale basin to the existing Northern Gas Network infrastructure will contain the following information:

1. Viable connection scenarios
2. Cost estimates against viable scenarios
3. Timescales for viable scenarios
4. Ranking methodology for ranking scenarios

Identification of regulatory actions required

## Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

## Success Criteria

The success of the project will be measured against the following criteria:

Research final report

The research final report will deliver the following information:

1. Technical – Identifying and ranking the viable scenarios for connecting shale gas development to the GB gas infrastructure from a technical perspective
2. Commercial – Providing cost estimates (+/- 30%) against the top 5 viable technical scenarios
3. Regulatory – Identifying gaps in the current safety, environmental, planning, gas industry standards
4. Schedule – Providing indicative programmes for the top 5 viable technical scenarios

Feasibility study for the connection of the Bowland shale basin to the existing Northern Gas Network infrastructure

The feasibility study will deliver the following information

1. Viable connection scenarios, ranked in order of overall suitability
2. Cost estimating (+/- 30%) of all identified scenarios
3. Indicative programmes for all connection scenarios
4. Ranking methodology for developed scenarios
5. Table identifying regulatory actions required to accommodate each viable connection scenario
6. Schedule – Providing indicative programmes for the top 5 viable technical scenarios
7. Optimum Solution – Provide recommendations for the optimum solution for the connection of the Bowland shale basin to the Northern Gas Network infrastructure

## Project Partners and External Funding

n/a

## Potential for New Learning

n/a

## Scale of Project

The project requires a mixture of inputs from both gas industry experts and shale gas industry experts. Northern Gas Networks staff and specialist consultants, from their project management framework agreement will provide the necessary gas industry expertise, whilst the shale industry expert consultants, from RSKW, will provide the specialist shale gas industry knowledge. This mix of NGN expertise and shale gas industry knowledge will minimise costs by using specialists to undertake the initial research. This will also ensure the outcomes are delivered to the required timeline.

## Technology Readiness at Start

TRL2 Invention and Research

## Technology Readiness at End

TRL5 Pilot Scale

## Geographical Area

The project will address the implications of shale gas development across the UK mainland.

The project will look in detail at the Bowland shale basin, located within the Northern Gas Network region, as a typical shale gas development scenario, and produce a feasibility report identifying a technically viable, and efficient option to accommodate the production of shale gas in this area It is anticipated that this will provide invaluable information and a model that is repeatable across all gas networks in the UK

The project will also entail a fact finding visit, by gas industry and shale gas industry specialists, to the United States to understand best practice and lessons learned in the rapid development of the shale gas industry in this region.

## Revenue Allowed for the RIIO Settlement

None

## Indicative Total NIA Project Expenditure

Total Project Budget: £126,500
External Costs: £101,500
Internal Costs: £25,000

# 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)

Due to the research nature of this project It is impossible to calculate the ultimate quantum of cost benefits this research will provide. However, the project will identify the most efficient, cost effective options to accommodate the onset of shale gas production in GB. This will ensure that connection costs to GB gas transportation infrastructure will be minimised, ultimately providing cost savings to end users.

## Please provide a calculation of the expected benefits the Solution

N/A

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

The information gained from this research will be applicable to all GB Gas Distribution Networks and the National grid, in geographical areas identified with potential shale gas reserves.

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

The final report will be made available to all GDN's and national Grid at zero cost

## 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

This research will deliver invaluable information, identifying the most efficient methodology required to accommodate the onset of shale gas development across GB. The project will have considered all available options for connecting shale gas production to the existing GB gas transportation infrastructure, and will be applicable to all the Gas Distribution Networks and the National Grid.

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

NA

☑ 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