# Gas Network Innovation Competition Screening Submission Pro-forma

## Notes on completion

Before completing this form, please refer to the Gas Network Innovation Competition (NIC) Governance Document, which details all of the information that you are required to provide. Please use the default font (Verdana size 10) in your submission, the text entry areas are predetermined and should not be changed. The full-completed submission should not exceed 11 pages in total.

**Ofgem will publish all the information contained within the Screening submission.**

## Funding Licensee

Northern Gas Networks Ltd

## Network Licence Project Partners

IGEM, WWU, QEM Solutions, Leeds University, GIRSAP, AVK, Radius Systems

## Funding Licensee area

North of England

## Project title

21st Century Technical Standards Project (TS21)

## Project Summary

*The Licensee must provide an approximate Project start and end date.*

Gas Transporters (GT's) have the potential to positively impact upon the achievement of the UK's carbon reduction targets both through its own activities and by facilitating wider market developments whilst also reducing costs for customers. However, a key barrier to delivering these benefits is the lack of research and development in industry Technical Standards, which play a significant role in investment decisions.

These standards, which once placed the UK at the forefront of technologies and working practices, have failed to keep pace with developments in other markets in the UK and internationally. This has resulted in an industry that is less well placed to deliver its necessary role in facilitating the transition to a low carbon economy in the UK. This project will seek to address the root causes of this decline, by funding the a targeted programme of research, trialling and and demonstration of the potential development of existing and new standards.

The project will place value for money and carbon impact at the heart of investment decisions across the industry. The project will act to create a framework that can re-stimulate the significant activity required in this area through specific research and development projects in conjunction with national and international organisations across the gas industry supply chain. The project's long term aim will be a self-sufficient framework for standards development that will act as a catalyst for the change and development required to deliver the low carbon economy.
Jan 2015-Dec 2020.

## Estimated Project funding

*The Licensee must provide an approximate figure of the total cost of the project and the NIC funding it is applying for.*

| | | | |
|---|---|---|---|
| **Total cost of Project** | £6.25m | **NIC funding requested** | £5.63m |
| **Cross Sector Projects only: Requested funding from Electricity NIC, NIA or second tier LCN Fund?** | *If yes, please specify* | | |

## Problem

*The Licensee must provide a narrative which explains the Problem(s) which the Project is seeking to address.*

The Technical Standards presently utilised in the gas industry have evolved over the last 50 years based on compliance and the management of risk. Customer value (commercial considerations) and Business Carbon Footprint (BCF) have never been considered as part of the technical standards development process and as such they are significantly sub optimal in these critical areas. This is to the detriment of the customer and the BCF of UKplc.

Technical standards cover everything from material specifications, product acceptance, work procedures and management procedures. Currently in the UK gas industry the suite of technical standards can be categorised as follows:

1) Independently owned technical standards: circa 620 owned by NGN, NG, WWU, SGN
2) Gas Industry Standards (GIS): 66
3) IGEM Standards: circa 62
4) External Legislation - circa 74 pieces of external legislation

The breakup of the industry in 2005 has compounded an already outdated approach to technical standards revision by effectively quadrupling the number of standards which a licensee is required to manage. Technical expertise in the industry is dwindling and the ability to prioritise technical standards revisions by risk, cost and carbon impact is a concept that, to date, has not been considered. This is to the detriment of the customer

There is no universal vehicle that can effectively and efficiently review and revise standards in line with a prioritised system based on risk, compliance, cost and carbon impact. There is also no specific point of contact for new product acceptance and development which could subsequently be incorporated into technical standards. This is stifling innovation in the industry, again to the detriment of its customers and BCF.

Today, as the UK transitions towards a low carbon economy, the gas industry needs to respond to an increasing requirement for change. Without the development of a proven framework and method of assessment which will allow a risk averse industry to quickly and responsibly respond to change the gas industry will remain in the slow paced position it currently adopts. NIC provides the stimulus to effect this change now.

## Method(s)

*The Licensee should describe the Method(s) which are being demonstrated or developed. The Licensee must outline how the Method(s) could solve the Problem. The type of Method should be identified where possible eg technical, commercial etc.*

TS21 will aim to prove the effectiveness of this new approach to the researching, trialling and development of both current and new standards. It will also stimulate and facilitate the necessary innovation required to drive the industry forward. The project will employ a range of methods to identify, evaluate, demonstrate and/or develop new standards. Advancements / modifications to technical standards will be developed through subject matter expert reviews, consideration of international and cross industry best practice and trailing and testing or new innovations in conjuction with maturing relationships with key universities.

The project will incorporate a wide ranging review of the current suite of standards based on an evaluation of cost and carbon impact alongside the traditional focus of safety and risk management. The initial stages of this review is currently being completed as part of a smaller scale NIA project that has provided valuable learning to support the development of this larger TS21 project. On this basis, the project will seek to identify the most appropriate method to be employed for researching and evaluating each standard on its own merits.

## Method(s) continued

TS21 will be developed and established based on the ranking review system currently being undertaken as part of NGN's smaller NIA project. This will rank standards in accordance with risk, carbon and cost impact. This will ensure that the technical standards which provide the most substantial benefits back to the customer and UKplc's carbon footprint are updated first. Use of the project funding will provide a fierce focus on delivering the quickest benefits back to the customer. Recruitment of key staff, engagement with other industries, international best practice benchmarking, use of external consultancies and trailing and testing of products with universities would all be designed to provide the biggest return in the shortest timescales.

By designing and growing TS21 in a managed well-constructed way this project will address all the current issues hindering development in the UK gas industry. It will also ensure tangible short term deliverables and will provide the project team with measurable outputs that justify each ongoing stage of development in the project. This project will also prove that development and evolution of technical standards is critical to placing the UK gas industry at the forefront of the international community, providing value back to customers and contributing to the ongoing reduction in BCF. It will remove traditional cynicism and inertia form the industry allowing innovation and best practice to be adapted quickly and responsibly.

## Funding commentary

*The Licensee must provide a commentary on the accuracy of its funding estimate. If the Project has phases, the Licensee should identify the approximate cost of each phase. IGTs should indicate potential bid costs expenses.*

Funding has been forecast based on a detailed model for the full TS21 project. The finances have been based on staff costs, external support, travel, office facilities and IT requirements. In order to establish a phasing profile which will allow the project to deliver the most significant benefit to the customer and impact on BCF educated assumptions have been made based on the work NGN have undertaken in this area to date. The phasing has been designed as follows:

Year One: Establishment of office facilities, communication systems, key staff (to begin to deliver the customer and BCF benefits quickly against the most appropriate standards) and external consultant support (£1,142K)
Year Two: Ongoing recruitment of staff to other positions and establishment of graduate recruitment (£1,298K)
Year Three: Near full complement of staff for TS21, reduced reliance on external constancies as relationships with universities begin to mature (£1,260K)
Year four: Full complement of staff with increasing university based projects (£1,236K)
Year five: Potential establishment of TS21 as an industry body of excellence, under the auspices IGEM, which would be self sustaining supported by the UK gas industry and funded entirely by the IDN's/GDN's and UKT. (£1,312K)

## Specific Requirements (please tick which of the specific requirements this project fulfils)

| | |
|---|---|
| A specific piece of new (ie unproven in GB) equipment (including control and/or communications systems and/or software) | ✓ |
| A specific novel arrangement or application of existing gas transmission or/and distribution equipment (including control and communications systems software) | |
| A specific novel operational practice directly related to the operation of the gas transportation system | ✓ |
| A specific novel commercial arrangement | ✓ |

## Accelerates the development of a low carbon energy sector & has the potential to deliver net financial benefits to existing and/or future customers

*The Licensee must demonstrate that the Solution has the potential to accelerate the development of the low carbon energy sector in GB and/or deliver wider environmental benefits to GB customers. The Licensee must demonstrate the potential to deliver net financial benefits to existing and/or future customers.*

*As stated in the Gas NIC Governance Document, the Network Licensee must provide the following to demonstrate compliance with this criterion:*

*i. How the proposed Project will make a contribution to the Carbon Plan. In particular the Network Licensee should outline:*
- *What aspects of the carbon plan the Solution facilitates;*
- *The contribution the roll-out of the Method across GB can have in facilitating these aspects of the Carbon Plan;*
- *How the roll-out of the proposed Method across GB will deliver the Solution more quickly than the current most efficient Method in use in GB; and/or*

*ii. How the proposed Project could deliver environmental benefits to customers; and*

*iii. The expected financial benefits the Project could deliver to customers.*

Technical Standards are responsible for investment decisions and operational activities across gas transportation networks. As such these standards have the potential to significantly impact both the carbon intensity of and efficiency almost all activities. These standards have evolved over the last 50 years based on safety requirements and the management of risk. Many of the current Standards have not been critically reviewed for many years. Even where these reviews and revisions have taken place, customer value (commercial considerations) and Business Carbon Foot print have not been considered - resulting in technical standards which could be viewed as being sub optimal in these critical areas.

There are two areas where research and development of these standards has a key role to play in accelerating the development of a low carbon energy sector:

1. The day to day operation, maintenance and investment in the gas transportation networks has a direct and significant impact upon the wider business carbon footprint. This is particularly the case when you consider the carbon impact of the standards on the wider supply chain and any additional processes and costs that are imposed as a result of technical specifications that are required uniquely for the UK gas industry. There are a wide range of examples where current standards require additional tests, production processes and materials when compared to other commercially available products that have been developed since the original standard was derived. Using this example - the project would review and test the applicability of other available technologies within the gas industry and if accepted change the standard with an immediate impact upon carbon and cost.

2. The development of the majority of standards relate to a period of time where there has been significant stability in the way gas is produced, transported and consumed in the UK. There has been little or no requirement to consider how standards may need to change and adapt to the evolving environment where the UK is transitioning to a low carbon economy. The requirement to amend current standards or develop new standards in an efficient and timely manner, to address the changing energy and gas market, will be key to ensuring that the gas transporters can play an effective role in that transition.

Identifying a framework that can address this issue and seek to 'future-proof' the industry standards can overcome the situation where current processes are a potential blocker to this effective transition and accelerate this transition.

## Delivers value for money for gas customers

*The Licensee must demonstrate that the Method(s) being trialled can derive benefits and resulting learning that can be attributed to or are applicable to the gas transportation system.*

*As stated in the Gas NIC Governance Document, the Network Licensee must provide the following to demonstrate compliance with this criterion:*

*i. What is the potential Direct Impact of the Project on a Network Licensee's gas network or on the operations of the GB System Operator;*
*ii. Justification that the scale/ cost of the Project is appropriate in relation to the learning that is expected to be captured;*
*iii. The processes that will be employed to ensure that the Project is delivered at a competitive cost;*
*iv. The expected proportion of the benefits which will accrue to the gas transportation system as opposed to other parts of the energy supply chain; and*
*v. How Project Participants have been identified and selected including details of the process that has been followed and the rationale for selecting Project participants and ideas for the Project.*

The technical standards govern the work that is undertaken on the gas transportation system. Therefore every change that this project produces will have an immediate beneficial impact directly on that system. The technical standards will be reviewed, amended, deleted or superseded prioritised by a risk, carbon and cost model which will result in standards with the most significant impact being upgraded first.

Incorporating international and comparable industry best practices into the UK gas industries technical standards will provide the opportunity for significant innovation, customer value and reductions in BCF. TS21 will also manage a streamlined system for new product development and acceptance supplemented and supported by a maturing relationship with universities. This will ensure the UK gas industry has an efficient framework, method of evaluation and engaged supply chain that contributes to a longer term vision of a 'body of excellence' ensuring it becomes the 'smartest' gas industry in the international community.

The project will cover all technical standards which have a direct and clear impact upon the investment programmes of all gas distribution networks within the UK. With planned annual capital investment of more than £300m per annum and £750m in the replacement of metallic mains across all networks during RIIO-GD1, even small percentage savings in investment decisions derived from opportunities and changes identified from new standards have the potential to generate significant savings for gas customers. This potential is further increased when consideration of the wider impact that gas networks activities have upon the BCF of the UK economy.

NGN are currently undertaking a detailed study of all current technical standards to understand the potential of each to contribute towards expenditure and carbon impact of GDN activities. The project will use this assessment to focus on the smallest sample of the wider portfolio of standards required to develop the framework, processes and partnerships required to identify the value to be created from longer term and wholesale review of technical standards. This aims to minimise the cost of the project whist providing the relevant economies of scale and scope to justify the wider initiative.

During the development of the project a number or parties have expressed an interest in supporting the project. However, a tendering process will be used for the major spend items in the project to ensure value for money and that the most appropriate companies, technologies and processes are selected.

This project will be subject to the IMS employed within the NGN. This management system will ensure that processes involving commercial, design, planning, risk and management personnel will follow set and approved guidance. Problems arising will be regularly monitored and managed throughout this project to be sure that the project is delivered on time and within budget.

## Demonstrates the Project generates knowledge that can be shared amongst all Licensees

*The Licensee must explain the learning which it expects the Method(s) it is trialling to deliver. The Licensee must demonstrate that it has a robust methodology in place to capture the learning from the Trial(s).*

*As stated in the Gas NIC Governance Document, the Network Licensee must provide the following to demonstrate compliance with this criterion:*

*i. What new knowledge is intended to be generated from completing the Project;*
*ii. What methodology will be used to capture results from the Project and how the Project's results will be disseminated to other Network Licensees; and*
*iii. Whether the Network Licensee wishes to conform to the default IPR arrangements as set out in Chapter 9. If the Network Licensee wishes to deviate from the default IPR arrangements it must outline the proposed arrangements, justify why the arrangements are more suitable than the default arrangements and justify how the new arrangements will deliver value for money for customers.*

All technical standards could incorporate some new learning into the UK gas industry. This learning could be provided via international/other industry best practice and/or the ongoing university and product research projects that TS21 will oversee.

The project will identify and specify potential developments of new technical standards that can deliver improvements in cost and or value and show a positive impact upon reductions in carbon emissions resulting from GDN activity. All GDNs will have the opportunity to access this information and consider adopting the proposed changes, in whole or in part, to deliver value across the wider UK gas market.

TS21 will use all modern methods of communication to ensure efficient and effective knowledge dissemination to all licensees. This will include but not be limit to, a website, social media, conferences, training sessions and, YouTube videos.

It is anticipated that new learning and developments to existing and new standards will be generated throughout the project. Consequently, frequent and effective communication at all stages of this NIC project is imperative to ensure an immediate benefit to the customer and each licensees BCF. As such the funding for the website development and communications strategy has been identified within the first six months of year one of this project.

NGN will be able to draw on its experience and expertise gained through its successful 2013 NIC bid for the Low Carbon Gas Pre-heating project. This will ensure establishment of the communications systems to disseminate the learning across the industry is efficient and effective.

NGN will comply with the Default IPR Arrangements.

| Please tick if the project conforms to the default IPR arrangements set out in the NIC Governance Document? | |
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*If the Licensee wishes to deviate from the default requirement for IPR then it must demonstrate how the learning will be disseminated to other Licensees and how value for money will be ensured. The Licensee must also outline the proposed alternative arrangements and justify why the arrangements are more suitable than the default arrangements.*

All NGN's technical standards will still be owned by NGN but the ones incorporated in TS21 will be openly shared with the rest of the UK gas industries licensees. Ultimately as TS21 begins to prove the benifits of customer value and reductions in BCF NGN believe TS21 could become a center of excellence managing the technical standards on behalf of the industry. This will ensure effective management of risk whilst providing maximum benefit to its customers and ensuring the most significant reductions in BCF.

It is imperative that the wider UK gas industry is able to retain the intellectual property rights on its technical standards. This will provide a commercial business model for TS21 through the international export of the UK's technical standards. This should ensure, after the initial stimulus provided by NIC, that TS21 becomes self sustaining ensuring its longevity for the continued benefit of the UK gas industry.

Ensuring TS21 becomes self sustaining could result in a 'centre of excellence' becoming a sustainable engine for innovation in the UK gas industry.

Any product development approved through the TS21 project would default to the NIC IPR arrangements .

## How is the project innovative and with an unproven business case where the innovation risk warrants a limited Development or Demonstration Project to demonstrate its effectiveness.

*Demonstrate why the Licensee has not previously used this Solution (including where the Solution involves commercial arrangements) and why NIC funding is required to undertake it. This must include why the Licensee would not run the trial as part of its normal course of business and why the Solution is not Research.*

*As stated in the Gas NIC Governance Document, the Network Licensee must provide the following to demonstrate compliance with this criterion:*

*i. Why the Project is innovative and has not been tried before;*
*ii. Why the Network Licensee will not fund such a Project as part of their business as usual activities;*
*iii. Why the Project can only be undertaken with the support of the NIC, including reference to the specific risks (e.g. commercial, technical, operational or regulatory) associated with the Project.*

Over a prolonged period of time there has been little or no requirement for technical standards to be reviewed, challenged and amended as we have benefitted from a very stable gas market environment in the UK. The large scale development of North Sea gas in the UK was the last significant driver for change which was met with a significant level of investment into the development of new standards which played a leading role in developing the gas transportation networks we enjoy today. That period of investment benefitted from the nationalised industry structure in addressing the risks associated with this intense period of innovation and development.

This project will seek to prove the benefits of structured and targeted development in this area and in the longer term to restimulate and sustain similar levels of investment that delivered the current suite of standards. The project will put in place a new and innovative project team, working in a more collaborative and inclusive environment than the industry has previously employed. And use the development of new technologies, products and processes that have not been considered for use in the gas industry and/or the UK previously to develop standards that better meet the requirement of the gas industry

As such, the results of the research, trials and demonstrations that will form part of this project are highly uncertain and as such attract an elevated level of risk which could not be borne within

## How is the project innovative and with an unproven business case where the innovation risk warrants a limited Development or Demonstration Project to demonstrate its effectiveness - continued.

the low risk profile of the gas transportation networks. Industry experience has clearly illustrated that without a change to the approach outlined by this innovation stimulus funding the risks associated with this work will not progress.

## Project Partners and external resourcing/funding

*The Licensee must provide evidence of how Project Partners have been identified and selected, including details of the process that has been followed and the rationale for selecting participants and ideas for the Project.*

*The Licensee should provide details of any Project Partners who will be actively involved in the Project and are prepared to devote time, resources and/or funding to the Project. If the Licensee has not identified any specific Project Partners, it should provide details of the type of Project Partners it wishes to attract to the Project.*

NGN has carried out a wide programme of engagement in identifying the scope of the TS21 project. To date the following parties have expressed their support with the principles of the project and/or becoming a project partner:

**IGEM:** Institutre of Gas Engineers & Managers
**Wales & West Utilities**: Gas Distribution Network
**QEM Solutions: P**rofessional services consultancy
**Leeds University:** Engineering research and development
**Gas Industry Registration Scheme Advisory Panel (GIRSAP):** GIRS accreditation, and subsequent registration, allows UPs to tender for and carry out installation, commissioning and connection of gas mains and services, relevant to their level of accreditation, for adoption by Gas Transporters (GTs).
**AVK:** Valve and Fittings Manufacturer
**Radius Systems:** Development and manufacture of plastic pipes and fittings

Work will continue to identify and confirm project partners and their role within the wider project subject to successful completion of the ISP stage of the NIC process.

## Derogations or exemptions

*The Licensee should outline if it considers that the Project will require any derogations, exemptions or changes to the regulatory arrangements.*

None

## Customer impact

*The Licensee should outline any planned interaction with customers or customers' premises as part of the Project, and any other direct customer impact (such as amended contractual or charging arrangements, or supply interruptions).*

None

## Details of cross sector aspects

*The Licensee should complete this box only if this Project forms part of a larger cross sector Project that is seeking funding from multiple competitions (Gas NIC, Electricity NIC or LCN Fund). The Licensee should explain about the Project it will be collaborating with, how it all fits together, and must add a justification for the funding split.*

None

| Any further details the Licensee feels would add to the submission |
| --- |
| |
| **Contact name** |
| Dan Sadler |
| **Contact Address** |
| Northern Gas Networks<br>1100 Century Way<br>Thorpe Park Business Park<br>Leeds<br>LS15 8TU |
| **E-mail** |
| dsadler@northerngas.co.uk |
| **Direct telephone line** |
| 0113 397 5381 |
| **Job title** |
| Head of Investment Planning & Major Projects |