SIF Discovery Round 2 Project Registration

Date of Submission

Apr 2023

Project Reference Number

10060000

Project Registration

Project Title

Supply Chain Resilience in the Transition

Project Reference Number

10060000

Project Licensee(s)

National Gas Transmission PLC

Project Start

Apr 2023

Project Duration

2 Months

Nominated Project Contact(s)

box.gt.innovation@nationalgrid.com

Project Budget

£86,547.00

Funding Mechanism

SIF Discovery - Round 2

SIF Funding

£77,893.00

Strategy Theme

Net zero and the energy system transition

Challenge Area

Improving energy system resilience and robustness

Lead Sector

Gas Transmission

Other Related Sectors

Gas Transmission

Funding Licensees

Lead Funding Licensee

NGT - National Gas Transmission PLC

Collaborating Networks

National Gas Transmission PLC

Technology Areas

Asset Management, Commercial, Gas Transmission Networks, Hydrogen, Resilience, Stakeholder Engagement

Equality, Diversity And InclusionSurvey

Yes

Project Summary

SIF Innovation Challenge

This project fits under the theme of Improving Energy System Resilience and Robustness and specifically 'Strengthening UK's energy system supply chain resilience to support efficient roll out of new infrastructure.' From either the viewpoint of a large programme of works such as the hydrogen backbone (Project Union) or by the 'run the business' activities required during an energy transition, a functioning and available supply chain is one of the most important factors for resilience and robustness during the period of change.

Network Innovation

Supply chains are established today and National Grid Gas (GT&M) manage their current supply chain via the in-house procurement and contract management teams. These teams are focused on today's supply chain and ensuring the natural gas assets are available to buy ahead of the current campaigns. An innovative approach is therefore needed ahead of the energy transition that will support the networks in building procurement strategies for the future that both understand what assets will be needed and the risks to the suppliers. By doing this, procurement risks during the transition will be minimised helping keep the rate of change required for the country's net zero ambitions.

Experience and Capability

GT&M own and operate the gas National Transmission System (NTS) which is roughly 7,600km of high-pressure pipelines, 24 compressor stations and over 500 above ground installations. The GT&M procurement team currently have a headcount of circa 35 and look after a range of category areas from; Indirect procurement (Consultancy, HR, Legal, Design Services, etc), Direct Procurement (Construction, Security, Customer works, Cyber and Electrical, etc) and Contract Management activities.

InsiderPro are an expert procurement consulting business with a specialism in challenging and uncertain supply chains. They are well suited to this supply chain mapping exercise as they have a strong understanding of the UK supply chain having produced original research which evaluated c1,500 UK manufacturing businesses with the conclusions reported in the Independent and other media outlets.

Potential Users

For any solution to this challenge there will have to be a collaboration between the gas networks (both transmission and distribution) in the UK, potentially reaching into European transmission system operators in order to 'strengthen' the buying power of the consortium and therefore prevent being left behind when procuring assets against larger organisations globally. For this reason, the potential users could be any number of gas networks that buy similar assets from similar suppliers.

Project Description

The gas transmission supply chain for materials and assets is well established providing the required equipment for the development of the network, from quality suppliers and at the best possible price to provide value for money to the consumer. Even with this well-established supply chain the lead times for assets such as valves can be as long as 52weeks.

This supply chain is at-risk during times of significant change such as during the energy transition. Globally, as gas networks decide to upgrade their networks to be hydrogen ready additional strain will be placed on the manufacturing industry. This pressure coupled with the volatile nature of the current global market for all materials and goods means that companies could be at risk of very long lead times for keys assets. In turn this could lead to a delay in the energy transition as assets are not ready to accept hydrogen on time, threatening the overall goal of net zero by 2050. Alternatively higher than forecast costs would have to be paid to secure the assets.

Project Union is National Grid Gas' (GT&M) proposed hydrogen backbone which is a 2000km stretch of the network joining hydrogen ready industrial clusters across the country, connecting supply and demand over large distances. Although the backbone will be mostly repurposed assets there will still be significant procurement activities ahead of the conversation and in some locations new assets purchased.

In light of this a supply chain mapping exercise is required with the energy transition in mind to understand who GT&Ms supplier base will be and the key risks to these suppliers such as insolvency, demand or a lack of skilled workforce. Once the supply chain map and key risks have been defined this can be applied to a user case such as Project Union in order to develop some indicative solutions that will be taken forward within the SIF process. In parallel a stakeholder mapping and networking activity will take place to understand the perspective from gas networks, main works contractors, procurement teams and the supply chain.

There is a significant risk that relatively smaller Transmission owners such as GT&M will not be able to compete on the global scale for procurement of new assets in the future and options such as collaborative buying within the UK or Europe and promoting UK manufacture could help to prevent long lead times or excessive costs for the transition.

Third Party Collaborators

Insider Pro

Nominated Contact Email Address(es)

Box.GT.Innovation@nationalgrid.com

Project Description And Benefits

Applicants Location (not scored)

National Grid Gas PLC (GT&M)

1 - 3 Strand, London, WC2N 5EH

Insider Pro Ltd (IP)

122 Warwick Street, Leamington Spa, Warwickshire, CV32 4QY

Project Short Description (not scored)

Without a structured plan or strategy for procurement, gas networks could be at risk of very long lead times for key assets during a significant change to the industry such as the energy transition.

Video description

https://youtu.be/gSW2lDdv_Jo

Innovation justification

Problem

As National Grid Gas (GT&M) look to operate, maintain and transition its network to net zero we will be competing against all of the other gas networks in the same position therefore putting a large strain on the supply chain we operate within. Whilst established within the supply chain GT&M do not have the buying power of some of the larger, multinational gas networks globally and so there is a risk of long lead times or paying over the market rate for assets.

Innovation

To combat the potential of delaying our own energy transition, a fresh look at the gas supply chain and procurement strategies is required with the specific challenge in mind of net zero and the risks and impacts it presents to the global marketplace. The key output of the Discovery phase will be to derive a list of potential innovative solutions to carry forward into the next stage.

Knowledge gaps

The current supply chain is well understood and managed by GT&M teams however a review of the market conditions with the energy transition in mind has not been carried out to date. Gaps in knowledge include the types of suppliers that will be needed in the future and what risks they face including such as, over demand, lack of skills, insolvency, raw material availability and inflation. Stakeholder engagement in the Discovery phase will look to understand the appetite from the wider gas networks in the UK and Europe for collaborative procurement strategies.

Economic & sustainability

Ultimately the economic value will be a cheaper cost to the consumer for the energy transition. This will come from two parts, either from being able to negotiate better prices by buying in bulk with others or by preventing the need to over pay for the same assets to secure delivery.

In terms of sustainability there will be indirect benefits of bulk buying assets and transporting them to a central hub for further distribution than individually buying them for each network. Also, one of the solutions could be to promote UK manufacturing of the required assets, therefore reducing the transportation miles completed from manufacture to site

Funding

This project cannot be funded by 'business as usual' as GT&M do not currently have funding for hydrogen deployment, Project Union looks to resolve this triggering a reopener in Nov22 however this will not look at innovative supply options outside of current practice.

Benefits Part 1

Environmental - carbon reduction – direct CO2 savings per annum against a business-as-usual counterfactual
Environmental - carbon reduction – indirect CO2 savings per annum against a business-as-usual counterfactual
Financial - future reductions in the cost of operating the network
New to market – products, processes, and services

Benefits Part 2

Financial - future reductions in the cost of operating the network

To track this benefit analytics can be used on the costs of assets brought today versus the costs of them in the future if brought in bigger bulks. Whilst this is a relatively simple calculation, provisions will have to be put in place for the natural cost increase of raw materials and services when comparing future costs to todays. Another way to track benefits in the future will be to look at the lead times on key assets and compare this to today or what a supplier would quote if buying in smaller quantities. Hydrogen ready assets may have additional costs associated and this will be considered in this calculation.

Environmental - carbon reduction -- direct CO2 savings per annum against a business-as-usual counterfactual

By ensuring our assets are purchased ready for when they are needed it will help gas networks reach their targets for carbon neutrality, any delay to this will result in CO2 emissions that could have been avoided and this can be tracked.

Environmental - carbon reduction -- indirect CO2 savings per annum against a business-as-usual counterfactual

Indirect emissions from the removal of heavy haulage off the road due to bulk buying or UK manufacturing will be hard to track although an estimation of number of journeys saved could be attempted.

Revenues - creation of new revenue streams

New revenue streams and markets set up in the UK to support the supply chain can be directly tracked by their annual accounts showing the impact they are having to the wider UK economy and job market.

Quantitative Measurement

The cost benefit analysis will be carried out as part of Discovery and benefits associated to the identified solutions will be defined. It is therefore difficult to place a quantitative number on the amount of savings we can generate, although buying in bulk and carrying out an effective procurement strategy could save GT&M £ms during the energy transition. In terms of timelines these savings could be seen over a long period of time, through to the goal of net zero by 2050.

A 'UK Manufacturing Barometer' report was completed by project partners Insider Pro and claimed that:

"we estimate that British manufacturers could release as much as £3.5bn of cash tied up in working capital if they fixed sourcing, purchasing and supply-chain difficulties."

Project Plans And Milestones

Project Plan and Milestones

Workpackage 1 - Project Management - National Grid Gas (GT&M)

To ensure that the Discovery phase project is delivered in line with the project plan by tracking and monitoring progress against the project plan and budget, proactively monitoring and addressing risks and potential issues through the project. Successful delivery of the Discovery stage with tracked project plan and risk register will constitute the deliverable. £3946.50

Workpackage 2 - Business Case & Requirements Development - GT&M

To ensure that the business case and requirements are developed through the Discovery phase with the project team GT&M need to share the current supply chain information and risk profiles and help to define the business case for any potential solutions offered. £3946.50

Workpackage 3 - Project Strategy, research and customer perspectives - Insider Pro

Meet with internal and non-supply stakeholders, conducted initial research and mapping and develop a thesis of constraints to test, a fully mapped supply chain with key risks highlighted will be the success criteria. £23,334

Workpackage 4 - Engage key supply partners - Insider Pro

Refine the accuracy of the thesis and understand the potential macro-economic backdrop. Work up possible procurement strategies to mitigate issues. The success criteria will be key supply partners are engaged and interested in the project. £23,333

Workpackage 5 - Final reporting and recommendations - Insider Pro

Test procurement options with partners in principle and provide final report and recommendations which will constitute the final deliverable. £23,333

Risks, constraints and Management

Alongside project delivery risks such as key personnel availability and capacity to work on the project a key risk to this project is the potential for there to be an extreme macroeconomic shock to the entire supply chain by the current volatile global market place and the upcoming energy transition that the supply chain cannot be effectively mapped. The management of risks will be carried out at our monthly team meetings where the risk register will be reviewed in full to assess whether the mitigations are working, if risk ratings need to be adjusted or if a risk is developing into an issue. If a risk develops into an issue, solutions will be sort and the project team will present options to GT&M for a decision on how to respond.

There are no other envisaged commercial or regulatory constraints on this project.

Regulatory Barriers (not scored)

Project regulatory barriers

There are no regulatory barriers that prevent the delivery of the project through Discovery or Alpha. In Beta we are looking to deploy to deploy one of the options that are developed throughout Discovery and Alpha. Uncertainty in the RIIO-2 funding mechanisms requirements and timelines could lead to projects not progressing in the assumed funding route or timescales proposed, however, discussions are ongoing to ensure we are approaching the activities in the correct manner with Ofgem and BEIS to reduce this risk.

Longer-term regulatory barriers and policy requirements

The deployment of hydrogen on gas networks in the UK has not yet been finalised however many exploratory demonstrations have been sanctioned across the UK.

There are several policy and regulatory systems in review around the introduction of hydrogen considering both 100% hydrogen and blended hydrogen. Primary and secondary legislation will need to be updated to enable blends of hydrogen within the network and allow for the development of a 100% hydrogen NTS. Alongside this, rules will need to be agreed, such as the uniform network code (UNC) and Gas Safety Management Regulation (GSMR) to incorporate hydrogen blending and if required adapted for hydrogen

transportation.

Evidence creation to influence future policy and regulations

All current NIA and SIF project are engaged in providing evidence for the transition of the gas networks to hydrogen.

We continue to support Government and Ofgem in gathering the evidence required to deliver policy and regulation that will enable the energy transition through working groups such as Hydrogen Grid Research and Development (HGR&D) and Gas Goes Green (GGG). Evidence of our networks capability to support the transition is beginning the be reviewed by the HSE and development of approaches to blending both commercial and technical are underway through these collaborative working groups.

Commercials

Route To Market

Project transition to Business as Usual (BAU)

This SIF application will be managed by the National Grid Gas (GT&M) Procurement team and as such any concepts and ideas will be adopted by that same team as they move to business as usual. A procurement strategy can be adopted into BAU as soon as it is agreed as the supply chain is active today, it just focuses on the natural gas assets and not hydrogen ready future assets.

Competitive Markets

The potential solutions discussed in this application such as procurement strategies with similar gas networks and encouraging UK manufacturing all help to promote a competitive market and not undermine the development of them. Developing the supply chain will help encourage the whole marketplace and ensure that the supplier base is kept varied and not dominated by one or two key suppliers.

Implementation and Adoption

The GT&M procurement team currently have a headcount of circa 35 and look after a range of category areas from; Indirect procurement (Consultancy, HR, Legal, Design Services, etc), Direct Procurement (Construction, Security, Customer works, Cyber and Electrical, etc) and Contract Management activities. They are the team of procurement specialists, buyers and contract managers that look after GT&M and will be leading this project and implementing any completed innovation.

Deployment of any new solution for GT&M will be carried out through investment programmes and the spend justified through our price control business plan proposals as is done today for purchase of any new assets.

Customer Segment and Value

The customer segment for this innovation would be the global gas pipeline industry, both transmission and distribution, for transmission in the UK this would be GT&M only but there are many transmission owners in Europe and globally. Successful delivery into BAU will lead to achieving the value proposition of a reduction in costs for key assets as a result of bulk buying and an effective procurement strategy with other gas networks. Additionally, the value of promoting UK manufacturing will be new revenue streams and jobs created, giving value to the wider UK economy.

Intellectual property rights (not scored)

What are the Intellectual Property Rights (IPR) arrangements for your project?

For SIF projects, each Project Partner shall own all Foreground IPR that it independently creates as part of the Project, or where it is created jointly then it shall be owned in shares that are in proportion to the work done in its creation. The exact allocation of Foreground IPR ownership will be determined during the contractual negotiations with the Project Partners on the agreement for the project.

Also if the party appoints a sub-contractor, the agreement with that sub-contractor should have similar IP provisions to those in this agreement and which at least achieve the same aims as the agreement regarding IP.

Once the Project is completed, Relevant Background IPR will be licensed for use by the Project Partners in connection with another Project Partners' Foreground IPR solely to the extent necessary to use that Foreground IPR, upon terms to be agreed.

Describe how each Project Partners complies with Chapter 9 SIF Governance Document.

We intend to ensure each Project Partner will comply with Chapter 9 SIF Governance Document through the contractual terms governing the project. However, precisely how this is done will be subject to contractual negotiations with the Project Partners on the agreement for the project.

Costs and value for money

Total project costs = £86,547 Funding requested £77,893

National Grid Gas (GT&M) will be providing the compulsory 10% contribution in full.

Value for Money

The project team delivers value for money by offering favourable labour rates recognising the unique experience and knowledge they bring. Each partner brings the following critical expertise to the project:

National Grid Gas (GT&M) provide expertise on gas transmission and a suite of projects that are exploring the role of hydrogen within the National Transmission System (NTS), including projects considering the effect of hydrogen on a variety of materials. Our base rates have been used for this project.
The InsiderPro team is led by Jeremy Bowley (Managing Director) who has 25 years' experience evaluating and improving the supply chains of more than 200 companies and has served as the Procurement Director of a major UK construction business. The typical Insider consulting team member has more than 20 years' experience and the Financial Analysis function is led by an ICAEW fellow. It is for this reason we have selected InsiderPro to be the supplier for this work as the skills and expertise this small team will bring will far outweigh junior consultants who would be brought into a team if a large procurement framework company was used. Additionally, InsiderPro are based local to the GT&M head office, supporting the local community and reducing any mileage needed to attend meetings. It was also decided to not bring on any of the supply chain, main works contractors or other gas networks in Discovery but instead reach out to them for interviews as part of the work packages, this will gather the information we need to progress but not require funding for those parties until Alpha or Beta.

Document Upload

Documents Uploaded Where Applicable

Yes

Documents:

InsiderPro_Barometer_Edition_1_Extract.pdf

Supply Chain Application Nov22 (1).pdf

SIF Discovery Round 2 Project Registration 2023-04-12 9_23

SIF Discovery Round 2 Project Registration 2023-04-12 9_23 (1)

This project has been approved by a senior member of staff

☑ Yes