SIF Alpha Project Registration

Date of Submission

Nov 2022

Project Reference Number

10036952

Project Registration

Project Title

HyNTS Pipeline Dataset

Project Reference Number

10036952

Project Licensee(s)

National Gas Transmission PLC

Project Start

Aug 2022

Project Duration

6 Months

Nominated Project Contact(s)

box.gt.innovation@nationalgrid.com

Project Budget

£632,759.00

Funding Mechanism

SIF Alpha - Round 1

SIF Funding

£454,090.00

Strategy Theme

Data and digitalisation

Challenge Area

Data and digitisation

Project Summary

HyNTS Pipeline Dataset focusses on the development of a data assessment platform for hydrogen gas networks, determining the datasets required to repurpose natural gas assets in a timely manner. National Grid Gas PLC (GT&M) & Cadent own and operate gas transmission and distribution networks in the UK and are developing solutions for hydrogen injection into the gas networks. To uprate network assets today a detailed assessment of the assets is required, this is a time consuming and costly activity as our data is not always easily accessible. The project delivers against several of the challenge requirements with a key focus on how to improve the visibility of infrastructure and assets, for instance new digital infrastructure or novel uses of sensor and communications technologies. Further information on how we are aligning to the challenge can be found in the Additional Appendix in the Project Plan question.

Our approach not only considers the methods for gathering and collating data into easy to analyse datasets but also considers novel methods for collecting data in an accelerated timescale such as using novel In-Line Inspection (ILI) tools. Hydrogen impacts our network in a different way to natural gas, material type and <1cm defects that have no impact on network safety today, will need to be understood in the deployment of hydrogen.

The Discovery Phase determined the asset data requirements for the hydrogen transition and determined the gaps in current knowledge of our networks within four work packages (WP) relating to the status of current data availability, the ability of inspection

technologies to gather additional data, investigation of a hydrogen conversion data management system and development of a hydrogen conversion suitability ranking system.

Discovery concluded that:

Many datasets that would be required for the transition were not readily available and easy to access.
Attainment of new data required such as <1cm defects and detailed material composition is feasible with inspection technologies and further work is required to understand the cost and applicability of these technologies.
Deployment of these technologies in a hydrogen environment would pose a challenge and needs further consideration in the Alpha phase.
The current GT&M system architecture is comprised of isolated components; a geospatially-aligned pipeline database with each physical component of the pipeline network represented as a single database object is our planned approach.
Data transformation will likely involve steps such as digitising existing physical archives and extracting key insights for an AI/ML enabling database.
The solution will provide accessibility to an extended asset dataset whilst enabling an accelerated assessment of network readiness for change. The data gathered with novel sensing solutions will build upon historic datasets and enable improved network planning.

Rosen are experts in the inspection and management of network data to determine asset state whilst Xoserve is the central data service provider for Britain's gas market together alongside stakeholders (HSE) they will ensure our project output is suitable for hydrogen ready assessments. The GT&M team will include our data departments to develop the requirements for the database system and methods for interacting with current systems. Rosen provide asset inspection to Cadent and GT&M today, the improved sensing system and data management will enable Rosen to provide an improved service whilst enabling the networks to better understand and extrapolate data for management of their systems.

The users of our innovation will primarily be the gas networks, however, improved access to asset data and capability will enhance interactions with regulators, suppliers, stakeholders, customers and the wider energy community. Through Discovery we have engaged with our internal stakeholders to understand the ILI and data processes in place today.

Project Description

The aim of this project is to develop the tools and processes to determine the state of National Transmission System (NTS) and Local Transmission System (LTS) pipelines, and their capability to carry Hydrogen. When looking to repurpose methane pipelines for hydrogen there is a requirement for us to have improved understanding of our pipeline assets; material type and smaller defects such as cracks become critical for hydrogen embrittlement effects and need to be understood prior to hydrogen injection, and whilst in use.

Hydrogen will play a significant role in the energy transition required to meet net zero emissions targets by 2050. One cost-effective method for hydrogen transportation is to repurpose existing methane pipelines, however, before transitioning the network a fundamental step is to verify that they can be safely repurposed. This requires the networks to attain and asses network asset data against a hydrogen impact assessment.

The first critical step is a deeper understanding of the current condition of their pipeline assets, particularly material properties, defect populations and the handling and management of large datasets.

The Discovery phase of this project examined the current knowledge of engineering data with respect to the NTS and LTS, the ability of inspection solutions to fill data gaps, and how a data management system could facilitate storage, alignment and visualization of those datasets. A number of data gaps and challenges were identified which will need to be overcome.

The proposed Alpha Phase will build upon the work completed in the Discovery Phase by planning how the identified data gaps can be filled, together with preparing for a beta phase to trial proposed solutions. To this end, National Grid will select a pilot NTS feeder pipeline where the following topics will be analysed:

- The currents status of integrity-related data required as inputs to hydrogen repurposing studies;
- A detailed review of the ability of currently-available inspection technologies to obtain additional datasets both within methane and hydrogen environments;
- Methodologies investigated and developed to allow existing hard copy records from the pilot NTS Feeder to be digitised;
- A prototype data management tool to store and manage the data required for hydrogen conversion;
- A risk ranking methodology will be applied to rank sections of the pilot feeder for conversion to hydrogen; and
- Plans will be made for demonstrations in a future beta phase for "live" inspections in the pilot Feeder and the Future Grid test loop.

Preceding Projects

Third Party Collaborators

ROSEN

Xoserve Ltd

Nominated Contact Email Address(es)

Box.GT.Innovation@nationalgrid.com

Project Approaches And Desired Outcomes

Innovation Justification

Hydrogen will play a significant role in the energy transition required to meet net zero emissions targets by 2050. To safely transport hydrogen from producers to end users, the options are to utilise new builds or repurpose existing National & Local Transmission System (NTS and LTS) pipelines. Economically, it's desirable to repurpose existing pipelines -- it's anticipated that up to 80% of the existing system could be repurposed. However, the NTS and LTS systems were designed and built to transport an essentially inert gas - methane.

Gas networks are required to have improved understanding of their pipeline assets with emphasis on the determination of material type, possible anomalies, and the effect of Hydrogen on these prior to repurposing any pipelines. Detailed integrity assessments will also be required to determine pipeline suitability and identify any remedial actions that must be performed before repurposing can be safely undertaken.

Our approach in Alpha is innovative through the development of data systems and automated assessment procedures for hydrogen enabling improved visibility and access to pipeline information. This is vital to ensuring we safely manage the repurposing of the network but also accelerate this assessment from the 2.5yr average for an uprating assessment of ~100km of pipeline to a process that can be managed within a year to help accelerate the transition to net zero.

Current inline inspection (ILI) tools don't measure material types and changes along the pipeline that will be important for hydrogen embrittlement factors, nor do they measure small defects and cracks as these have little impact for the natural gas network but will be impacted by hydrogen and accelerate pipeline deterioration. The use of novel ILI technologies such as RoMat and EMAT have never been run before in either the NTS or the LTS; and although utilised in a methane environment globally, the technologies have never been run in a hydrogen environments. Furthermore, the gas networks have never had the ability to download data from an ILI vendor directly into a "datalake" as envisaged in this project.

This is an important energy sector project as it will provide clear insight into datasets required, how they can be obtained via novel ILI technologies and how those data can be uploaded into a "digital twin" of a physical pipeline. These activities will enable the technical case which will need to be made before converting NTS & LTS pipeline assets to hydrogen service. This knowledge will then inform the feasibility, timescales, and costs of the overall network conversion. Without this knowledge, it isn't clear how the existing UK gas network could be converted without the construction of new pipelines.

If this project isn't undertaken, traditional methods of data gathering, collation and assessment will be the only option and assessment criteria will need to be developed via other funding mechanisms. This will likely slow the transition to hydrogen and prevent us from meeting our ambitious timelines on both project union and the wider Hydrogen roll-out. If data can't be provided to demonstrate the repurposing of the network, costly new pipelines will be required to ensure resilience of our energy system.

The development of a hydrogen ready assessment tool is novel in its own right and not something that would be considered through the RIIO-2 business plan as it is focused on the hydrogen transition. In associating this with novel systems for current data collation, new data collection and automated assessment we are producing a system that will truly demonstrate benefits but consists of many challenges leading this to be a high risk high reward project suitable for innovation funding.

Benefits

It is evident that a hydrogen economy has full Government backing; only last month, the Government doubled its ambition to 10GW of hydrogen production capacity by 2030. It is envisaged that this will mobilise over £9 billion in private investment, as well as supporting 12,000 jobs by 2030. To achieve such ambitions and to feed the well-publicized hydrogen-fired power station on Humberside and industrial cluster activities across the country, it is clear that significant gas pipeline capacity will be required to transmit hydrogen from production sites to end users. Hydrogen is also seen as a critical component of future energy systems by providing the flexibility to cope with intra/inter day swings in energy demand, supporting decarbonisation of transport and in some domestic uses providing heat to consumers.

The HyNTS Pipeline Dataset project provides a critical input to the future conversion of the UK gas network from methane to hydrogen service. Although the Discovery phase of the project has shown that there are technical challenges to overcome before pipelines can be repurposed for hydrogen usage, there is no evidence that such challenges are insurmountable. The Alpha phase therefore represents the next stage on the journey towards providing the technical case to convince Regulators that existing pipelines can indeed be safely repurposed.

Consumers will see benefits from this project through the efficient justification of safe repurposing of existing pipelines as opposed to new construction. There are clearly major cost savings in repurposing existing pipelines as opposed to the design and construction of new pipelines, together with reduced environmental footprint.

The core benefits of this project are in the reduction of time and cost associated to data gathering, collation and assessment of datasets for hydrogen asset repurposing. These will directly impact the consumer in the reduction of the cost of the transition. Refinement of the achievable reductions will be undertaken in the Alpha phase, the attached business case demonstrates our proposed target and assumed savings.

Other associated benefits of such an approach are:

1.Safety & Environmental - maintaining the gas networks enviable safety record by providing the framework to safely manage high pressure hydrogen networks, providing increased confidence in the use of hydrogen over fossil fuels and will therefore help to reduce the gas network's carbon footprint.

2.Governmental - Given the current political situation in in Ukraine, it is clear that hydrogen can potentially become one of the secure, indigenous fuel sources for the United Kingdom, the acceleration of the transition is vital to supporting this and fast robust assessments are a key enabler for repurposing our systems

3.Consumer - Development of asset datasets will enable improved understanding of our assets and enable more efficient maintenance both with natural gas and hydrogen. Continued use of network assets in a net zero future prevents stranded costs and maintains jobs within the gas industry which could be lost given the public's desire for a "green revolution"

4.Economic - The safe repurposing of existing pipelines will reduce/ remove the requirement for new pipeline construction. This will significantly reduce the cost of conversion and reduce its environmental footprint.

5.Resilience - The enablement of gas network connections via transmission and distribution assets ensures consistent energy supply to industry, power and heat applications with natural gas and this project will enable that to continue with net zero gases.

6.Whole system - The provision of a coordinated data management system within the energy networks which can receive and assess information from multiple sources will lead to greater transparency throughout the industry

Risks And Issues

The risk register will be maintained as a live document throughout the Alpha phase of the project and reviewed at the weekly project meeting. This will allow the partners to identify any emergent risks/issues in a timely manner and react accordingly. The scoring of new and existing risks will be reviewed based upon their likelihood and impact. Any significant risks which may impact the viability of the remainder of the project will be escalated to stakeholders at regular steering group meetings as appropriate.

The most significant risk to the Alpha phase of the project is the timescale required to identify and collate the existing pipeline data currently held by National Grid Gas PLC (GT&M). During a recent uprating study for a feeder pipeline (a less complex engineering assessment) this took ~2.5 years. Therefore, it is likely to be challenging to compile the required data in less than 6 months. In order to mitigate this risk GT&M have identified resources within their Data Team to support the project. In addition, the assessment will initially focus upon one section of the selected example Feeder Pipeline and the scope of the Alpha phase may be reduced just to consider this section, if required. This will enable us to demonstrate the concept in a timely manner ensuring we can begin delivery of the system in the Beta phase with little additional development of the concept required. Consideration is also to be taken by Cadent in the data available and how the associated systems could be utilised in their business, demonstration of this will however will not occur in Alpha.

The main technical risk to the Alpha phase of the project is a lack of clarity around the post-repurposing operating regime. Currently pipeline codes and standards place different requirements for hydrogen conversion depending on the proposed operating conditions (e.g. maximum allowable operating pressure, hydrogen partial pressure etc.). Therefore, if the post-repurposing regime is not known then it will be very challenging to conduct a data gap analysis. In order to mitigate this threat it may be required that the project team define a 'worst credible' operating scenario and define the data requirements for this case. Ongoing projects across the gas networks are developing assessment criteria and information sharing across these projects will enable us to provide a optimised solution base don knowledge today. As we progress our understanding of the impact of hydrogen and likely failure modes we would look to input this into the assessment tool, it therefore will be flexible enough to accept changes throughout its lifetime.

With respect to project management risks, key staff at ROSEN, Xoserve, Cadent and GT&M have already been identified and the technical scopes of work have been identified and agreed. Knowing that the project would be conducted over a fixed six month period allows the key staff members to be allocated for that time, however the ramp up of the project is a risk to be mitigated. The project partners will prior to August 2022 ensure that the key project team are fully briefed and have all the resources required to deliver the

project in a timely manner. In order to mitigate the risk of project member's annual leave in August delaying the start of the project all members identified in the organogram will be asked to appoint delegates when unavailable.

Intellectual property (IP) will be manged as per the contractual terms agreed prior to the project kick off, the contractual terms will align to the requirements of the SIF governance document. IP issues that arise will be managed through the contractual agreement terms.

Project Plans And Milestones

Project Plans And Milestones

The project plan and risk matrix are provided as Appendices. The discovery phase work packages (WP) have been expanded based on the findings of the Discovery phase. The project participants propose seven WPs, primarily to develop plans to overcome the challenges raised from the Discovery phase but also as preparation for a future Beta phase. These WPs and success criteria are summarised below:

1.WP1 Project Management - To ensure that the project meets SIF governance requirements through regular meetings and management activities. Success will be determined by the completion of the following work packages to time and cost as proposed in this application.

2.WP2 Data Gathering - Will review the relevant data that National Grid holds for a specific pilot NTS feeder pipeline against the requirements identified in the Discovery Phase WP1 and identify any data gaps that may prevent conversion to hydrogen. Successful completion will provide a clear view of all data available against the asset assessment criteria.

3.WP3 Novel Data Gathering Tools - Will determine the ability of the inspection technologies identified in the Discovery Phase to close the data gaps identified in Alpha Phase WP2. Successful completion will determine the design of the systems required to be run on the chosen feeder in the Beta phase.

4.WP4 Digital System - Will detail a "roadmap" for data systems within the gas business, and will build a prototype data management system to ensure that any data developed from the HyNTS project can be transferred to the NG "datalake" and associated systems. Successful completion will provide a system for the WP2 data to be collated and managed ready for the following WPs.

5.WP5 Risk Ranking - Will develop the plan, approach and methodology to ensure that the hydrogen conversion suitability ranking can be utilised for the pilot NTS feeder pipeline selected according to WP2 and can link to the data management system. A physical solution would be created under the beta phase. Successful completion will see the provision of data analytics in the WP4 system to enable the assessment and ranking of the pipeline datasets.

6.WP6 Hydrogen Impact - In-line inspection technologies are commonly deployed to run in natural gas, but running in hydrogen will require different obstacles to be overcome, e.g. running at higher velocities, issues with sealing the tools to provide the drive force, the effects of possible new "barrier" coatings on pipeline internal surface etc. This WP will investigate these challenges in the hydrogen environment. Successful completion will provide a detailed plan for testing these systems in a hydrogen application environment such as FutureGrid and methods to overcome key challenges identified in Discovery.

7.WP7 Dissemination & Implementation - Will plan for the Beta phase activities and determine the costs and timelines associated with them alongside further development of the business case for roll out of the system for all hydrogen networks.

Project timelines and costs will be managed through robust management of the project plan and monthly project reviews covering timelines, costs, and risks. Whilst the project will predominately be undertaken at a desktop level - small lab-based demonstrations of key technologies will be undertaken at ROSEN. Project costs will be invoiced monthly with associated deliverables/milestones providing the evidence of progress, this can be seen in the project plan.

Xoserve joins the project as an expert in data systems along with additional internal partner teams required to deliver the project, such as data analytics and inline inspection subject matter experts, increasing the expertise and knowledge in the project. The project partners are vital to delivering the technical challenges identified in the discovery phase.

Regulatory Barriers (Not scored)

There are no regulatory barriers that prevent the delivery of the project through Alpha or Beta. These phases will enable the delivery of knowledge and systems for future application on our hydrogen investment activities such as Project Union. 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.

Our network supplies natural gas to industrial, power and heat applications today and has a fantastic opportunity to support transport applications with net zero gases. The National Transmissions Systems (NTS) first application of hydrogen in the UK will be through Project Union, repurposing 2400km of pipeline to enable interconnectivity between the industrial clusters and strategic UK locations

such as St Fergus and Bacton. Through this work we have commissioned a project with Frontier Economics to consider the options for regulation of 100% hydrogen networks.

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.

Engagement with our stakeholders and customers in the deployment of hydrogen and the timelines associated is vital to the success of future hydrogen deployment to ensure Network exit and entry agreements (NEXA/NEA) are aligned to the network approach in the vicinity of these customers. We have already begun these discussions with the majority of our key stakeholders through Project Union, these interactions have been very positive with an agreement that a hydrogen backbone in the UK is a requirement.

The policy landscape is already beginning to enable the deployment of hydrogen and through the continuation of the policies on hydrogen in industry, transport and power we will be enabled to deploy the findings of the SIF projects. The announcement of the industrial cluster decarbonization plans has been key to our hydrogen backbone proposal and with further progress of the later track clusters and introduction of further clusters we can support further decarbonization in the UK. Business model and regulatory regimes alongside these policies will ensure the robust and accelerated transition of the hydrogen infrastructure in the UK.

Consideration of interconnectors with Europe and their route to hydrogen deployment in their systems has already begun with the European hydrogen backbone proposal incorporating the NTS. Europe have accelerated their transition to having a blend of hydrogen in the network to 5% by 2024, in order to maintain interconnection with our counterparts we must be enabled to blend gas into our gas networks, protecting customers that cannot accept this with deblending technologies.

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.

Business As Usual

This project is vital in accelerating the assessment of our pipelines capability for hydrogen in an timely and cost efficient manner. In order to enable future projects to utilise the outcomes of this project the system developed must be integrated into network digital systems, easy to access, utilise and manage, provide clear auditable assessments and manage multiple data inputs. In order to ensure this is the case the end users must be engaged in the development process.

The initial end users of the system will be both our data, assurance and engineering teams, these stakeholders have contributed to discovery and are to be integrated into each alpha work package providing insights into our current systems and how they could be interfaced with. Several technical workshops and project reviews will be undertaken to ensure involvement and clear guidance will be sought from these teams. The other key end user will be that of our operational team whom manage our current inline inspection activities, this team have provided insight into the potential timelines for running novel tools and the approach required to deliver the demonstration in Beta. Continued engagement with this team will ensure that not only the demonstration can be completed but the use of these tools can be progressed past the end of the project.

If the outcome of the project up to and including the proposed beta phase is successful, then a framework will exist to allow the developed methodologies to be applied to other National Grid Gas PLC pipelines and those of the Gas Distribution Networks. The methodology / technologies will look to become part of a pipeline operator's standard toolbox for maintaining pipeline integrity whilst operating with a "new" product, namely high-pressure hydrogen and will therefore become "business as usual". Implementation of the project in the business will be led by the project team from data, operations and innovation, to ensure the successful roll out of the project. It is important the project team take responsibility for this as key knowledge holders for the technology and system.

The proposed first demonstration will support the first Project Union connection between industrial clusters and on successful completion could easily be rolled out to the next up connections. Through the discovery phase engagement with the Union project team was undertaken to ensure the output would be feasible for use in this first application. The use of the system for other UK networks will be developed alongside Cadent and we will look to engage other networks to review the proposed approach as appropriate. The engagement of the HSE on the evidence provided by this tool will be an important step in ensuring the system is usable across the UK and provides all key data required. The working group Hydrogen Grid Research and Development (HGR&D) led by BEIS will be briefed on the activity to ensure alignment to the evidence required for the transition of heat to hydrogen.

Further understanding of the associated cost to demonstrate and deploy the digital solution developed in this project will be created in

the Alpha detailed design phase, providing a clear business case for our Beta application.

The proposed demonstration on the national transmission systems (NTS) will be transferable to the gas distribution local transmission system (LTS) networks. The methodology / technologies could also be offered commercially to other gas pipeline networks worldwide who are looking to repurpose parts of their systems from methane to hydrogen.

Commercials

Commercialisation

This project looks to make available data that is already owned by the networks but is in an array of systems and formats, together with additional datasets which will need to be obtained to assure the integrity of pipelines which transport hydrogen. The deployment of a digital system aligned to our network digital strategy and systems already in place will align to our business plan and accelerate the transitional opportunities for net zero. In developing the methodologies through this project, the tool set which will be developed for a "pilot Feeder" can be rolled out throughout the NTS and LTS systems and will be utilised throughout the lifetime of any one feeder as we progress through various gas blends and operational parameters (pressure/speed/etc...).

The use of inline inspection tools today is managed through a competitive procurement process, which will continue post the end of the project. By developing and trialling in-line inspection technologies for the "pilot Feeder", the knowledge and capability attained by ROSEN through the project will benefit the operators of the NTS and LTS pipeline systems since they will (long-term) be able to call on such technologies as "business as usual". Furthermore, the proposed work will increase ROSEN's competitiveness of their offering to UK and worldwide networks in turn improving UK capability and our opportunity to export services to other countries.

The customer of the data system will be the gas networks and regulatory bodies -- the data management system that is envisaged as part of the alpha phase will provide the vehicle by which all the information necessary to make hydrogen-repurposing decisions is stored in a purpose-built geodatabase. A key part of the geodatabase will be the ability to transpose and then transfer existing paper records and in-line inspection data to the geodatabase, so that the documentation necessary to justify future hydrogen conversion strategies can be presented to Regulatory bodies such as Ofgem and the HSE. This is a key requirement for providing clear, auditable datasets that will enable robust decisions on repurposing of current assets to be made. Efficiently delivering this information in one, purpose-built database will enable Regulatory bodies to make more timely decisions on the progression of our net zero targets.

The customer of the inline inspection tools will be the gas networks, the development of more robust tools for measurement of our network and the additional measurement of hydrogen-impacted features will enable us to gather information unattainable today which will generate information critical to building robust business plans for the future. The consumer value of this project is in the reduction of cost of transitional assessments and the acceleration of the process and therefore the transition to net zero, together with greater transparency of data.

To ensure a successful route to market for the various products and services proposed, it is not envisaged that any new partnerships will be required. However, opportunities may develop for the gas networks to take commercial advantage of the technologies, know-how and software products developed to provide technical consultancy to other pipeline operators both national and international who are looking to proceed with hydrogen conversions. As a worldwide private supplier of pipeline inspection and integrity-related products and services, ROSEN would naturally look to develop further market opportunities on the back of learnings from the project. As far as the authors are aware, ROSEN would provide its own private capital to develop such opportunities.

The business case for the project can be found in question 7 and will continue to be developed through the alpha phase to ensure that our proposal for Beta is relevant and viable.

Intellectual Property Rights (Not scored)

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

The Total project cost is £631,689 and we request funding of £453,020. Our partner contribution to the project is 28% of the total project costs. The project contribution demonstrates the partners ambition to drive hydrogen for the gas networks of the future and the utilisation of novel systems to improve efficiency.

The project cost breakdown is as follows:

National Grid Gas PLC (GT&M)

GT&M are providing a £50,000 contribution to the project that covers our legal and communications activities along with the sub contract activities and contributes to the overall 10% required project contribution. The costs are critical to the project as the lead partner we must ensure delivery of the project and ensure the outputs are relevant to our key stakeholders. GT&M play a key part in enabling the project to progress through the delivery of the datasets for the example feeder.

The GT&M costs have been considered against actual spend in the Discovery phase, the actual reported cost through our financial system utilises actual labour costs whereas the values utilised for the applications are the business averages. The actual costs in this instance have been lower due to the position of the participants against the average day rate. The actual costs must be utilised to enable RRP reporting to be completed accurately alongside the project reporting we therefore have considered this in the number of days associated to each project participant.

ROSENs

ROSEN have applied discounted day-rates to the design and consultancy services provided as part of the project which results in a cost reduction of around £82,000 (16%) when compared to our standard commercial pricing framework. In addition, ROSEN will "self fund" an additional approximately £46,500 (or 9%) as a "contribution in kind" to the project. This project provides added value over business as usual because it ensures that ROSEN's global market-leading expertise in pipeline integrity management, data management and associated inspection requirements are embedded into the UK transition to hydrogen at an early stage.

Cadent

The total of Cadent's costs £ which covers labour costs for involvement in the key project meetings and delivery of the system review for the GDNs applications. The costs are critical to the project to ensure the alignment of the outputs to the other gas networks in the UK.

XOSERVE

The total of XOSERVE's costs are £ of which 100% is labour provided to support relevant technical and steering meetings throughout the project. The costs are critical to the project because exoserve hold key knowledge around energy system digital technologies and industry standards.

All costs for resource day rates are at typical competitive industry rates and discounted where appropriate through project contribution. The subcontract or materials spend will be purchased from approved suppliers offering quality but value for money.

Compared to Discovery, the Alpha phase adds XOSERVE to the consortium, providing expertise in data systems.

This project will provide value to all the businesses involved through the attainment of knowledge around hydrogen and the datasets required to repurpose the gas networks. Business as usual activities could not take the time to review such a novel approach to pipeline assessments providing clear value to future network activities and the consumer.

Supporting Documents

Documents Uploaded Where Applicable

Yes

Documents:

HyNTS Pipeline DataSet Alpha Phase Project Plan Final.pdf

Project Plan Additional Appendix.pdf

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10036952 - HyNTS Pipeline Dataset-Round 1 Alpha End of Phase Report-FINAL-redacted.pdf

10036952-HyNTS Dataset - Final Technical Report - Redacted.pdf

10036952-HyNTS Pipeline Dataset Show and Tell webinar-Alpha-FINAL.pdf

10036952 SIF Alpha Close Down Report 2023-04-05 10_44

SIF Alpha Project Registration 2024-02-20 10_50

This project has been approved by a senior member of staff

☑ Yes