SIF Alpha Project Registration

Date of Submission

Oct 2022

Project Reference Number

10036957

Project Registration

Project Title

Gas System of the Future Digital Twin

Project Reference Number

10036957

Project Licensee(s)

SGN

Project Start

Aug 2022

Project Duration

6 Months

Nominated Project Contact(s)

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Project Budget

£847,123.00

Funding Mechanism

SIF Alpha - Round 1

SIF Funding

£494,925.00

Strategy Theme

Data and digitalisation

Challenge Area

Data and digitisation

Project Summary

Our proposed project unifies two SIF Discovery Phase projects (hydrogen production and gas network digital twins). The Alpha Phase aims to explore further the commercial, societal and operational benefits that could be derived from the deployment of a unified "gas system of the future" digital twin within a distribution network.

Balancing supply and demand in an ecosystem of connected digital twins is fundamental to the future of the gas industry in the UK as we know it. Managing associated risk -- be it operational, technical or financial -- and security of supply given recent geopolitics is key as different supply chain segments are exposed to risk from partners in this chain. Relationships between the production and transportation of gas along with industrial and domestic demand need to be understood.

Aligned to the specific aims of the "data and digitalisation" challenge theme; our project will support the management of that variation of inputs to the gas network -- specifically hydrogen and biomethane -- as it becomes increasingly distributed and decentralised. It will support connectivity to renewables and other utilities; it will drive the transformation of network planning in the future; and it will be the trigger for the right-skilling of the future energy network workforce.

We believe it is important to capture "hearts and minds" and bring energy network teams along the digital twin journey -- any transfer of decision-making to a data-driven application depends on the criticality of the task and the level of trust users will have in our application. We have built a package of work to focus on this with key users from the gas transmission, gas distribution, gas

production, and electricity as stakeholders on our project.

From a purely digital twin perspective, we believe that the highest value can be achieved through automation over time - but with higher complexity comes higher risk. We will focus on measurable business outcomes, ensuring that business needs rather than technology are driving the activities and that the networks start to focus on good quality data and information assets. That is a significant undertaking not to be underestimated. Our project has specific work package for this.

Whilst we know what many of the Net-Zero system architecture components could be - and we understand many of the deployment and integration challenges - there are still many unknowns. We aim to design this proposed ecosystem of connected digital twins with flexibility and extendibility at its heart. We believe that demonstrating the concept of connected digital twins is hugely exciting; aligned to the strategic vision of Ofgem and the networks; and completely aligned with the Gemini principles shared by the National Digital Twin programme. Ultimately, we expect our project outcomes to save money and reduce cost -- for example, by managing provision of electricity to the grid or to produce hydrogen, depending on price or capacity. Or when to carry out critical maintenance.

We are delighted that our partners are willing to be part of our project and all will play a more significant role in our concept. DNV will play a key role by leveraging further expertise from their pool of hydrogen and gas network experts along with their gas modelling, data transformation and analytics teams; IBM will lead the architectural and digital platform work packages, ensuring systems of record such as maintenance systems are critical components in a future digital twin landscape; and AWS will lead the build environment and deployment of AWS services for the Alpha prototype. In addition, both NGGT and NGESO bring critical insights from other projects; both will play a key role in governance work package.

Project Description

The unification of two SIF Discovery Phase projects (a hydrogen production digital twin; and a gas network digital twin) forms the basis of our project, which for the Alpha Phase aims to explore further the commercial, societal and operational benefits that could be derived from the deployment of a unified "gas system of the future" digital twin. Balancing supply and demand in an ecosystem of connected digital twins is fundamental to the future of the gas industry in the UK as we know it. Managing associated risk -- be it operational, technical or financial -- and security of supply given recent geopolitics is key as supply chain segments are exposed to risk from partners in this chain.

Digital Twins have long been heralded as the solution to future energy industry challenges. Millions of decisions concerning real-world assets' design, construction and operation will be taken based on their digital twins. Some digital twins in the gas industry will represent a simple component; others span entire facilities -- or systems.

Hydrogen is one of the key technologies on the road to decarbonisation. The coming decade will see increasing cost competitiveness for low-carbon hydrogen from electrolysis by improving efficiency and decreasing CAPEX. In areas with abundant renewable resources and low-priced electricity, the costs of hydrogen will drop even further. Adapting our gas distribution networks to transport hydrogen could lead to the least disruptive and most cost-effective route to carbon free heating for most homes.

Yet the understanding of how the gas network will manage the future system's foreseen complexity is very uncertain. Networks need to ensure a sustained focus on the safety, resilience and sustainability of the future network whilst ensuring assets and infrastructure are compatible with new gas blends or 100% hydrogen or biomethane.

In addition, ensuring that sufficient energy can be supplied to meet the country's needs and that supply is resilient will be challenged given the increasingly distributed inputs from new producers to the network. Short term modelling of networks will also need to change as energy content changes and further storage locations are needed.

The scope supports energy industry objectives to build knowledge and competence in data, modernise energy data access, and stimulate innovation across the industry through digital twins. While supporting the data and digitalisation theme, it aligns with the whole systems approach that is fundamental to the success of our energy transition and pathway towards net zero.

Preceding Projects

10027059 - Digital Twin - Exploring the societal, operational, and cross industry whole system benefits on the Gas Distribution Network

10025731 - Digital Twins: Exploring the commercial, societal and operational benefits on green hydrogen projects

Nominated Contact Email Address(es)

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Project Approaches And Desired Outcomes

Innovation Justification

With the recently revised ambition from the UK Government to achieve 10GW of hydrogen generation by 2030 and inject it into the gas network along with biomethane, the commissioning and connection processes for new gas plants must accelerate along with increased short term storage. As a result, extensive changes to cross-ecosystem planning and simplification of planning, modelling, and approvals across the entire supply chain are required. In effect, we are attempting to "solve" an enabling element of the energy trilemma -- namely finding a balance between security, affordability, and sustainability whilst managing energy supply and demand.

Decarbonizing the energy ecosystem increases dependence on intermittent energy sources. For example, a renewable energy generator can either sell its electricity or convert it to green hydrogen, depending on the market. Or a system operator can instruct a peaking plant to generate electricity within minutes to balance the electricity demand. Currently, the GDN does not have visibility of these intermittent energy sources. Under current regulations the gas system operator is prohibited from working with the electricity operator. Our solution could help Ofgem when developing the Future System Operator (FSO).

Our solution supports the management of variable inputs to the gas network (hydrogen/biomethane) as it becomes increasingly distributed and decentralised. Furthermore, by connecting renewables and other utilities, we will be able to simulate the market behaviour and its impact on a gas network and recommend the best consumer linked actions to maintain the security of supply. Our solution will achieve this by connecting different sets of systems and data in a unified interface, visualising the existing and operational capabilities of the connected system, and integrating information about the demand profile (current and planned).

Monitoring the remaining capacity in near real-time will allow optimization of asset utilisation and resulting rewards through improved responsiveness to changing demand dynamics. In addition, improved network modelling will enable "what if" scenario simulation to drive future design and faster decision making in a troubled situation with an impact to end customers. Currently, this is not possible due to a lack of interoperability between systems and minimal sharing data.

The impact of not doing this project is a detriment to the progress towards a functioning hydrogen and biomethane enabled economy. In addition, it would increase the risk of different companies developing separate solutions to manage their immediate needs resulting in the energy industry remaining siloed. We'd go so far as to state our project is a critical enabler for the industry to function in a decentralised model and evidenced this in our discovery phase feedback.

In terms of missing knowledge, we have not identified any specific gaps at this stage -- rather, we are positioning our project to bring together many previous activities to ensure previous innovation outcomes themselves do not contribute to said missing knowledge.

The innovation in this project revolves around connecting and interoperating multiple digital twins from different energy ecosystem partners using open industry standards -- combining hydrogen, biomethane, electricity and gas like never before. This is novel and risky but should be viewed in an opportunistic way, primarily since energy networks, producers and utilities have historically guarded data and avoided sharing information with one another as competition is promoted. Whilst current license conditions contained a presumed open clause, our project provides a real-world use case to networks to demonstrate their commitment to such requirements -- and do so collectively. Hence, we believe this is far from a typical business-as-usual activity and will force energy networks to work closely together to achieve a common aim -- decarbonization of our energy network as we strive for net zero in 2050.

Benefits

We believe that our project and the concepts within are essential for the UK to achieve both its low carbon hydrogen (10GW by 2030) and its biomethane (30GW by 2030) ambitions. It will demonstrate digital twin interoperability and connectivity to other utilities to take advantage of new insights.

Currently, there is an inability to rapidly share data held by energy networks, including information regarding planned maintenance and future developments. The development of our project will allow energy transporters to have a better strategic understanding of energy production, supply and demand, leading to a reduced carbon footprint as new gas is introduced much faster. Cost savings will also be passed onto the end consumer due to a better understanding of energy usage and supply/demand issues.

When done correctly, digital twins can be a critical enabler for the future gas system - but establishing trust in both data and actors in the energy mix is still lacking as our research has evidenced. We strongly believe our project can be a critical enabler to drive an increase in digital and data maturity in the energy sector -- it is wholly aligned with the ambitions outlined in the 2022 Energy Digitalisation Taskforce Report and would provide that narrative with a much-needed use case, connecting it to the UK Hydrogen Strategy and UK Energy Security Strategy. As such, we believe we should be bold and hence state that our project can be a major

step towards resolving the Energy Trilemma -- that is, finding a balance between security, affordability, and sustainability in how we access and use energy in our daily lives. Balancing supply and demand is key and our project can enable that to happen.

Other tangible benefits that we believe our project will deliver are: giving energy networks a better understanding of their energy data and usage; reducing downtime through constant supply; managing the risk of productions failure; improving gas system asset efficiency; supporting targeted investment in future infrastructure/developments; and supporting the scaling of similar concepts beyond our own project use cases. We believe our projects can significantly benefit Government planning, highlighting areas for future strategic investment. Other benefits we have qualified and quantified in our 2x discovery phases are: identifying where new entrants (either producers or short term storage locations) are needed to be sited in the network; achieving full transparency on the gas source as well as other measurements such as quality and calorific value.

We can support the management of intermittent demand and supply and cross-sectorial energy integration by supporting optimum network planning decisions and increase in fixed asset utilisation. It provides the basis for interactions of cross-sectorial coupling of energy network and can influence decisions to manage network based on behaviour of renewable markets. Overall reducing the cost to the customer and increasing network availability / reducing outages.

Finally -- safety is paramount. By allowing improved, informed, decision-making on emergency incidents we'll also drive an overall reduction in downtime. Public safety is a key driver and will benefit from the combination of the two discovery phases.

In terms of quantified benefits: A UK-wide hydrogen economy could be worth £900M and create over 9,000 high-quality jobs by 2030 (ref UK Net Zero Strategy). The insights from digital twins such as ours will be a critical enabler for this and, we value our contribution at 5% or GBP45M and 20% of the job market. Further investment in hydrogen production with £100M for electrolytic projects -- we estimate that it is reasonable to expect our digital twin's potential economic value to be in the region of 20% of this value per annum

Risks And Issues

As we have outlined, digital twins can offer significant business benefits to the future hydrogen economy -- therefore, our headline risk is that a future hydrogen-based gas system fails to materialise and the government decides to focus on electrification; or safety concerns are insurmountable. We trust that the UK Energy Security Strategy, with its renewed commitment, mitigates some of those concerns, as do ongoing innovation projects to prove that hydrogen is a safe and secure fuel source.

Throughout our many stakeholder interviews, we elicited several concerns -- real-world problems of the future that will potentially keep our contacts awake at night. These included

Failure to deliver gas of suitable quality to and from networks
Unable to manage the complexity of blended or whole hydrogen exiting the production system
Failure to operate production facilities due to loss of utility
Unable to effectively scale up / back production
Unable to understand the consequence of production failure
The safety of hydrogen
Control of a decentralized energy system
Given that our concept is that of a connected digital twin, cyber risks were the dominant threats identified during the first phase. As with any digital service development, unintended access to our service could allow hackers gain access, posing a loss of intellectual property and data, and risks to the supply chain. Therefore, a systematic cybersecurity strategy will be developed to eliminate gaps between the physical and digital security mirroring and ensure the ongoing hardening of the end-to-end solution.

We have also identified several technical risks surrounding technology maturity and lack of interconnected data to build a digital twin of the gas distribution network successfully. We expect incompatibility between different data systems (IT/OT/SCADA) exist at SGN and other utilities, hence we will be assessing the technology maturity of the systems, data accessibility and security in the Alpha phase through our Assurance and Data work packages. Our partner significant experience in this space will be key.

Data maturity is considered low across the energy sector resulting in difficulties sharing data across organisations despite Ofgem's push to enable data transparency. This resistance to sharing will be challenging and is one of the highest risks of delivering an open data-driven gas system of the future digital twin. Trust is key -- our partners at DNV bring a wealth of experience from the offshore and onshore energy sector as an independent third party with recommended practices, which will be used to help manage emerging risks early using their methodology, which will feed into the risk register.

Collectively we cannot emphasise enough how important good quality data and data assets are on a pathway to building digital twins - our discovery process led us into business process; people process; our applications landscape, and the data ecosystem. Suitable risks for all have been defined and will be further qualified at Alpha stage. We will monitor all risks and issues daily.

In pure data terms - our interviewed stakeholders had concerns over the lack of standardisation on secure handover of data and compatibility between different existing systems and protocols; we aim to mitigate such risks by proving that connected digital twins and data ecosystems can indeed exist and will prove that concept on our project. Involvement from NGGT, NGESO, and learnings from the National Twin programme, are key.

Misalignment between project timeline and commitment to deliverables, project governance complexity considering multi-partner engagement, and the availability of key industry SMEs for workshops and interviews are also highlighted as risks. These have been addressed early, and mitigations put in place. Project timelines and deliverables have been agreed upon with all stakeholders, and suitable contingency added.

Project Plans And Milestones

Project Plans And Milestones

SGN proposes to use an agile project management methodology. In this Alpha phase, we will break the work into twelve work packages: (1) Project Start-up, (2) Alpha Phase Technical Architecture, (3) Refine the User Cases, (4) User Testing / Stakeholder Engagement, (5) Data / Data Quality Assessment, (6) Green Hydrogen Production, (7) Gas Network Distribution, (8) Connected Twins, (9) Quality Assurance, (10) Beta Phase Solution Architecture & Design, (11) Project Governance, (12) Project Closeout

The attached project plan appendix presents further details on this methodology and the associated timeline, resources required, deliverables and success criteria.

The proposed project team will consist solely of SGN, DNV, IBM, AWS, NGGT and NGESO employees, and no subcontractors will be used in this project. AWS will provide digital platform services as part of an existing supplier relationship with SGN. National Grid ESO will join this project for the Alpha phase having not previously been part of either of the Discovery phase projects.

All parties will support the project management activities by running administration processes across the entire project lifecycle, covering all work packages. This will involve:

attending project progress meetings/ daily stand-ups,
assisting with technical reporting,
providing regular progress reporting,
cost control,
management of any go/no-go decisions,
updating the risk register; and
writing the project closeout report.
The key metrics that we intend to use in this project to measure the impact of success are:

mental (or knowledge),
social (or societal), and
economic (or commercial).
In the project initiation phase we will set up tools to capture these metrics, using percentage terms, and report them at the end of each work stage-gate. Passing each stage gate will depend on critical success criteria, which are outlined in the appendix.

As shown in the appendix we have proposed monthly billing milestones and identified SMART payment milestones linked to critical objectives/deliverables.

A risk register has been constructed, which outlines the types of risk (time, technical, financial, etc.), the likelihood, impact, mitigations and a score. All technology-specific risks will be identified using the technology qualification process DNV-RP-A204 (Qualification and assurance of digital services). Technology threat assessments will determine the technology risk early in the project, allowing risk mitigations to be developed as part of the agile approach. The main risks identified are within the supplied risk register.

To mitigate the risks around opaque data, SGN have implemented a Data Governance team which is working across the business to improve data maturity. We have also included data maturity and potential impact assessment for the Beta Phase, in the Alpha phase "data" work package, which would help us design the steps to ensure building trust around open data framework.

Our initial sets of defined risks centred around misalignment between the project timeline and commitment to deliverables; complexity of project governance considering multi party engagement (SGN, National Grid, IBM, DNV, AWS) and availability of key industry SME's for the workshops and interviews. We were quick to count these risk items in the register and have created work-around to resolve these risks. Project timelines and deliverables have been agreed upon among all stakeholders - with a 5% contingency - whilst a large number of internal and external stakeholders and SMEs have been interviewed, albeit separately to get valuable insights from them.

To mitigate any high-impact risks going forward this solution will require coordination, public hearings, data exchange and decision/buy-ins among various stakeholders. This is further detailed within our risk register.

Regulatory Barriers (Not scored)

Competition in the energy market which Ofgem seeks to promote in its role as commercial regulator does in many cases prohibit the

sharing of data. Our solution could help Ofgem with both the development and the emergence of the future system operator (FSO). Equally, a change of government policy could change legislation.

Interoperability is key for our project -- in our discovery phases we evidenced that creating safe, trusted and structured data transactions between actors in the UK energy system to manage and track attributes of the (hydrogen and biomethane) gas energy product is extremely important and will be done through an ecosystem of connected twins - gas, electricity, water, renewables. Creating reusable content that can be adopted by future hydrogen production systems or other gas distribution networks is crucial for us.

No other regulatory barriers are foreseen, however it is important that co-development of digital twin approaches is coordinated with other networks to ensure interoperability of outputs. Furthermore, there may be future regulatory considerations over the roles and responsibilities of networks in relation to the operation and management of digital twin functions. Our project will produce a series of findings, recommendations and outcomes, which we will openly share. We intend to speak to stakeholders at the regulator as we progress our project.

Business As Usual

To ensure the proposed technologies are relevant, effective, and safe, we have built a specific work package to elicit robust requirement specifications with the teams who will lead the deployment into BAU.

To provide stakeholders with proof that they can trust the information provided to them through digital means, we will apply established industry processes such as:

DNV-RP-A204 Qualification and assurance of digital twins,
DNV-RP-0497 Data quality assessment framework,
DNV-RP-0317 Assurance of sensor systems, and
The Gemini Papers from the National Digital Twin programme.
By considering such engineering and regulatory standards, industry codes and policies that may transpire during the Alpha phase, we will demonstrate to the industry that improving usage and adoption of digital technology can be used to broaden customer choices and improve the efficiency, security, and resilience of the networks.

To secure buy-in from all levels across organisations - from end-users, through IT/Data teams, to C-level executives - we will continue discussions from the Alpha phase (in and outside of SGN) to ensure all stakeholders understand how to support the business proposition of a platform-led solution to existing problems and that information provided at a suitable level of detail - with known origin and assured quality - to best support their decision-making needs.

Digital twins cannot be developed by data scientists or domain experts alone. It is essential to mobilise a wide range of capabilities to build a digital twin as new thinking is required when approaching data sharing, integrating models and developing visualisations. Collaboration across disciplines is critical to achieving a twin that will fulfil its purpose. Therefore, we will create a multidisciplinary team to prepare for and facilitate future change to ensure successful implementation.

In the Discovery phase, we interviewed multiple organisations ranging from government to catapults to industry. These stakeholders included BEIS; ENA; Fife Local Authority, Greater London Authority; SGN; National Grid Gas Transmission; National Grid ESO; National Digital Twin Programme/DT Hub; Energy Systems-, Connected Places-, Digital- and Offshore Renewable Energy Catapults; BP; BUUK Infrastructure and GTC Utility Infrastructure; Grissan Renewables; Scottish Power Transmission's EN-twin-e; Cadent; Wales & West Utilities and NGN.

Those relationships with be further nurtured and developed during the proposed Alpha phase to gather feedback but also to disseminate the lessons learned, excite, and inspire stakeholders to join us in current and future phases of the project.

We have already communicated extensively to industry, thought leaders, and academia in the Discovery phase through webinars, LinkedIn, and conversations with different gas networks, IOCs, and organisations involved with Track 1 Industrial Clusters. We plan to expand on these activities by continuing our participation in the ENA's Gas Goes Green and other relevant programmes.

The prototype will help break down the complexities of understanding the system as a whole, offering the ability to simulate scenarios and visualise the possible knock-on effects and trade-offs that a decision could cause. By connecting physical assets, processes, and systems, we will gain insights that will enable improvements and optimisation of assets and predict network conditions to help optimise a response ahead of an event. We will use those simulated scenarios for showcasing and training purposes.

The reusable content we will create can serve as a blueprint for deploying connected DTs and be adopted by future upstream production systems or other gas distribution networks and stakeholders in this space.

Funding strategy for adoption will be considered and worked up during the Alpha Phase, published as part of the end of phase report and will feed into the Beta Phase proposal.

Commercials

Commercialisation

Using digital twins and their data to manage the relationship between energy storage and energy demand will be essential for systems deployment. We believe our project has never been more relevant; to ensure maximum value of a "systems approach", we specifically focused on the value creation across the entire production value chain.

Our proposed solution to prototype (alpha phase) and then build (beta phase) an open data digital twin for the energy eco-system is initially centred around the gas distribution companies. We have identified four user groups, two scenarios; and two use cases; that will provide both the target value proposition and the target customer segments(s) for our innovation.

Gas Network (i.e. SGN) - wants to undertake strategic network planning and operational decision-making, help plan new renewable energy connections, manage pressure, new capacity, maintenance and better deal with safety-related incidents.

Energy Producer (i.e. IOC such as BP) and Energy Storage (i.e. Centrica)- wants to invest in peaking plants, hydrogen production and wind farms. Wants to optimise the energy portfolio to maximise return on investment, is frustrated by the lengthy planning and commission processes, the lack of data to make informed decisions and the poor interaction with the distribution companies. Will provide short term daily or seasonal storage.

Local Authority (i.e. Fife and Medway) - wants better visibility of the current and forecasted capacity of the gas distribution network and new network planning across the local authority to improve city planning activities and assist the planning of new producers (e.g. biomethane plants, CHP plants) across the local authority area. Decarbonisation of transport is important.

Other Utility (i.e. Electricity) - wants to improve visibility and understanding of how these energy sources impact the gas network, wants to integrate renewable generation and wholesale market behaviour to simulate the impact on a gas network to maintain the security of supply.

The two scenarios we will continue to explore with all user groups are:

Scenario 1 -- Managing supply, demand and capacity

Hydrogen/biomethane production needs to be maintained to a reliable standard to meet output, maintain the security of supply to customers and ensure that the supply/demand of hydrogen is met. We discovered that the value of using digital twin-generated data for performance and safety decision-making in projects and operations is significant to distribution networks such as SGN, a UK-wide hydrogen economy could be worth £900M and create over 9,000 high-quality jobs by 2030.

Scenario 2 - Economic stimulation and ensuring the security of supply

When we drafted our discovery proposal in 2021, it was stated that by 2030 the UK would develop its capabilities for producing blue and green hydrogen to hit its target of 5GW of production. In April 2022, this ambition was increased to 10GW by 2030, largely influenced by the Russian invasion of Ukraine. The Hydrogen Business Model, which will support further investment in hydrogen production with £100M for electrolytic projects -- we estimate that it is reasonable to expect the potential economic value of our digital twin to be in the region of 20% of this value.

For both scenarios, our project will Our Alpha phase project will work with two specific use cases.

Fife -- we will work within the boundaries of the H100-Fife use case, connecting with the local authority and consumers within Leven and Methil as hydrogen is produced via the onsite facility and transported through a newly built gas network to 300 opted-in homes.

Medway -- building upon previous work on the NIC funded Real-Time Networks project, we'll connect with the local authority and consumers within the Medway region.

No additional project partner investment is required.

Intellectual Property Rights (Not scored)

Our solution will follow the open data standard governed by the rules of data transparency, data integrity and trust. The models and code delivered under the open digital twin platform will be governed under open-source code IP. In the Alpha phase we will

demonstrate in detail - how Intellectual Property and licensing arrangements offer participation opportunities for all interested parties and mitigate the risk of creating a technical monopoly over the virtual energy system.

Currently we do not believe there any Intellectual Property Rights arrangements required for the Alpha Phase. We will explore Intellectual Property Rights during the Alpha Phase and share findings as part of the end of phase reporting and feed into the Beta Phase submission.

Costs and Value for Money

All funds will be allocated to the six partners (SGN, DNV, IBM, AWS, NGESO & NGGT) in terms of labour as detailed in the project finance section and below.

The total project costs are: £847,123

The amount of funding being sought is: £494,925

The amount of contribution from all project partners is: £352,198, which is 42% of the total project costs as a contribution from private partner funds. This is a significant contribution showing real commitment to the project and value for money for our customers.

Hence the funding sought is under the maximum permissible project budget of £500,000

Balance of Costs & SIF Funding

SGN are requesting £87,374 funding and will fund contributions in kind of £106,791 (55%) through free labour for the project
NGGT are requesting £2,960 of funding, no contribution
NGESO are requesting £5,268 of funding, no contribution
DNV are requesting £133,000 of funding and will fund contributions in kind of £60,377 (31%) through free labour for the project
IBM are requesting £133,323 of funding and will fund contributions in kind of 140,810 (51%) through free labour for the project
AWS are requesting £133,000 of funding and will fund contributions in kind of £44,220 (25%) through free labour for the project
On top of the 42% contribution there will a significant amount of travel, accommodation, meeting / workshop space expenses, and business colleagues times absorbed by the partners. Partners will provide meeting room facilities and sustenance as a further in-kind contribution.

All of the resources for the project are high skilled with vast experience in their field of work, with the majority being UK based. This can make the rates seem high, but they are in line with the market and that of rate cards provided and used by SGN for project work. Therefore the project costs are in line with market rates, and the significant contributions make this project extremely good value for money.

There is small element of subcontracting with Esri UK (£24,000) for consultancy services as we intend to use their GIS platform as a visualisation layer.

In terms of value creation, our sustained belief that digital twins can generate a veritable hotbed of activity for igniting innovation has been evidenced on this project. Our many high-value discussions provided opportunities for thought-provoking conversation around improved productivity and increased enterprise value; many concurred that when done correctly, digital twins can offer significant business benefits;

they can support the management of that variation of inputs to the network as it becomes increasingly distributed.
they will support connectivity to renewables and other utilities.
they should drive the transformation of network planning in the future.
they should be the trigger for the right-skilling of the future workforce.
We have seen clear synergies and innovative concepts between project 10025731 -- Green Hydrogen Digital Twin, and project 10027059 -- Gas Network Digital Twin. This has brought us to the conclusion there will be clear significant benefits and additional value for money combining the two projects together for the Alpha Phase. The merging of the two projects has brought the two teams together (SGN, IBM, DNV, AWS & NGGT) and we have added a new partner (NGESO) to add further value in terms of whole energy system thinking.

SGN will manage this project within the overarching programs of work, ensuring the project is delivering value for money, managing costs, risk and time with the same robust governance and assurance that is used in any other project.

Supporting Documents

Documents Uploaded Where Applicable

Yes

Documents:

Application Submission - Digital Gas Network of the Future.pdf

SIF Alpha Project Registration 2022-10-03 6_03

10036957 SIF Alpha Close Down Report 2023-04-19 10_44

SIF Alpha Project Registration 2024-02-20 10_30

This project has been approved by a senior member of staff

☑ Yes