SIF Alpha Project Registration

Date of Submission

Oct 2022

Project Reference Number

10037416

Project Registration

Project Title

Intelligent Gas Grid - Alpha

Project Reference Number

10037416

Project Licensee(s)

SGN

Project Start

Aug 2022

Project Duration

6 Months

Nominated Project Contact(s)

stuart.sherlock@sgn.co.uk

Project Budget

£601,426.00

Funding Mechanism

SIF Alpha - Round 1

SIF Funding

£491,075.00

Strategy Theme

Data and digitalisation

Challenge Area

Data and digitisation

Project Summary

Although the project has relevance to the challenges on whole system integration and heat, its scope is most clearly associated with the challenge for data and digitalisation:

- Automated pressure management software, and the use of near real time data and machine-learning techniques, will contribute to better coordination, planning and network optimisation
- Increased injection of biomethane and hydrogen into the network will enable progress towards net zero and enable strategic outcomes from other challenges e.g., decarbonisation of heat

The project directly addresses as its primary focus points 7 and 9 in the challenge scope definition:

- Point 7: this project will use novel sensor technology to improve visibility of the condition of network infrastructure and make data-driven decisions about that infrastructure.
- Point 9: this project will use data, combined with machine-learning and AI techniques, to improve the forecasting abilities of both demand on the network, and required maintenance and interventions.

The principal innovation underscoring the project is use of data-driven techniques based on AI and machine-learning to address each Opportunity Area (OA). These would constitute novel methods which, combined with modular dashboards that integrate the solutions with data analytics, will help SGN continue its positive journey to delivering a digitalised network.

During Discovery, the project evolved by researching network user needs, identifying underlying motivations and enabling deeper understanding of the opportunities. This allowed the refinement of problem statements, outline AI solutions, and impact and complexity assessments. During Alpha, progress will continue by refining benefits cases and undertaking "bench-testing" of solutions ahead of Beta field trials.

The solutions address the challenges in several ways:

- ML/AI models optimise the pressure in the Low Pressure (LP) network to reduce leakage.
- In the Medium Pressure (MP) networks, the models optimise the injection of biomethane enabling progress towards net zero.
- Data from the Utonomy system is used for network anomaly detection leading to improved maintenance. This data is combined with other sources of data to predict the distribution of reported escapes.
- A dashboard is used to display relevant data and KPIs. This enables operators to make faster and more effective interventions.

Utonomy will be the main project partner for Alpha. The Utonomy engineering team has capabilities in electronics design for hazardous areas, data science and machine learning, industrial IoT and digital communications technologies, cyber security, and cloud-hosted software applications. Utonomy has already collaborated successfully with SGN and Wales & West Utilities on developing, trialling and proving 'remote pressure control & management' technology. Utonomy has carried out initial field trials with SGN of its Intelligent Gas Grid Control software concept, developed via an Innovate UK funded project completed in March 2022.

Utonomy will use Faculty Science Limited as lead subcontractor; who are uniquely placed to deliver state-of-the-art AI solutions from teams formed from over 200 professionals comprising both technical and commercial experts. In delivering AI solutions, in-house developed AI Engines allow specialised techniques to be applied to customer problems and to optimise performance

The solutions will be primarily used by two sets of users; the network maintenance team, responsible for managing pressures and undertaking maintenance, and the network planning team, responsible for overall network planning, performance and analysis.

The maintenance team will use the solution to adjust governor pressures remotely, and automatically, to minimise leakage and optimise biomethane feed-in. They will also use the data to diagnose and resolve network or asset faults more quickly. The planning team will use the solution to track KPIs such as leakage reduction or biomethane injection. They will also take decisions based on data and analysis provided by the solutions.

Project Description

Following the successful collaboration on the NIA-funded 'Pressure Control and Management' project over the last three years, SGN and Utonomy now propose to continue to innovate towards a vision of the Intelligent Gas Grid.

Using Utonomy's remote control pressure system as the enabling technology, the project idea is to collect and use network data alongside external data such as weather to develop machine-learning and AI applications that optimise network pressures and provide insights on network performance.

The applications developed under this project will reduce methane leakage and increase the feed-in capacity of renewable gases including biomethane and hydrogen.

Components will be developed to provide autonomous early warning and diagnosis of network faults and dashboards will allow network operators to monitor KPIs and predictive alarms in near real time.

The project vision is to autonomously and intelligently monitor and control networks, both in terms of pressure management and operational 'planning & maintenance', using data-driven algorithms and decision-making, and to support network digitalisation.

This will lower costs to consumers, and increase the resilience of the network, whilst also supporting the progress to net zero.

Preceding Projects

10027183 - Intelligent Gas Grid

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Project Approaches And Desired Outcomes

Innovation Justification

Some gas distribution networks today are still manually operated with governors adjusted seasonally. This means that they are often set conservatively high, creating more pressure in the network than is required which in turn causing avoidable leakage. Manual adjustment is also a logistical problem, tying up skilled technicians, and it can also be difficult to judge when to make a setting change.

Another problem with networks is they were designed in the 1970's for North Sea gas, which had a small number of entry points and flowed in one direction. Today, there are multiple entry points as further biomethane plants are connected to lower pressure tiers in the network, which will grow even more with the arrival of green hydrogen. Therefore, intelligent and smarter network control is necessary to effectively manage the new operating challenges facing networks.

Networks are continually under pressure to increase efficiencies; improved access to data and analysis will enable faults on the network to be diagnosed and resolved more efficiently.

Better analysis of the causes of reported gas escapes should also enable the frequency to be reduced and labour to be more efficiently deployed.

AI/ML models have not previously been used for pressure management, making this project highly innovative. Gas Technology Institute (GTI) of the US has done a global market search on behalf of US utilities and has not discovered anything else comparable. SGN tendered the pressure management NIA in 2018 which also did not reveal any alternative solutions.

This project is important to the energy sector, which needs to:

- Maximise injection of biomethane to support network goal to reach net zero.
- Reduce methane emissions: There is greater emphasis following COP26 and the methane pledge.
- Reduce costs of distribution which will contribute to lower energy bills.

The problem of optimising the pressure in the network is expected to be solved by developing two ML models. The first forecasts demand profile over the following 24 hours. The second predicts network extremities' pressure over the same period, given a level of demand and the governor settings. Using both models together it's possible to determine the optimum settings of the governors feeding the network. Biomethane application is similar; natural gas feeding into the MP network needs to be continuously adjusted to ensure Security of Supply is guaranteed and biomethane feed-in is prioritised. The escape prediction application is based on two models; an escape count model and a causal escapes model.

Knowledge missing from previous projects is as follows:

- Risk assessment of pressure management. Low point monitoring and alarm facility.
- Testing pressure management on wider variety of networks.
- Testing anomaly detection on live networks.
- Using intelligent control on existing biomethane projects.

Not carrying out the project would have the following impacts on the GB gas network:

- The network would run at higher pressures leading to higher methane emissions.
- Biomethane injection would continue to be restricted leading to increased flaring.
- A number of biomethane plants would not be built because they couldn't get connection.
- The network would have higher operational costs which would be passed on to consumers.

In the long-term, the value of the solutions is to enable the network to transition to net zero. In the short-term it is increased efficiency and a reduction in methane emissions.

If the project were funded under BAU or within the price control, it would take significantly longer, and the solutions would arrive too late to enable effective transition to net zero.

Benefits

The most significant expected benefits are:

- Reduction in methane emissions.
- Increase feed-in capacity of biomethane and hydrogen.
- Predict and reduce gas escapes.
- Predict the occurrence of faults on key network assets.
- Summarise the health and ongoing performance of the network.
- Enabling more effective KPI/dashboard management for networks.
- Improve Repex efficiency (e.g., more insertion and less open cut).
- Meet increased demand through pressure management rather than capex.

Net benefits to consumers, as follows:

- Reduced operating costs will be passed on to consumers in the next price review (GD3).
- Customer surveys indicate a high proportion of gas customers would welcome
- reductions in methane emissions and effective progression towards net zero.
- Improved customer service - if network problems are fixed more quickly.

Discovery Phase considered eight Opportunity Areas (OAs). The benefits and impacts of each of the OAs was analysed. An impact framework was developed which identified four key benefits sources for consumers, society, government, and the environment.

- Cost savings: direct savings (for example, reduced gas purchases) and improved performance against outcomes framework targets.
- Carbon reduction: minimisation of emissions, gas escapes and enabling increased injection of renewable gas sources.
- Customer experience: via reductions to unplanned interruptions, and proactive maintenance scheduling.
- Operational efficiencies: via augmentation of periodic network activities with AI solutions.

A prioritisation approach was developed which considered both potential impact and complexity, which assessed factors including feasibility, development effort, data availability, production suitability and the ease of translating decision-making insights into operational outcomes. These complexity metrics will ultimately define costs, in addition to those directly related to this project, of deploying any resulting solutions.

In Discovery, potential benefits have been assessed through a combination of stakeholder input and high-level statistics. Given the wide potential set of use cases, the Discovery Phase has therefore focused on assessing all initial OAs that maximise the value of AI with remote pressure control technology.

The project will create associated benefits as follows:

End consumer

- Lower gas bills through reduced distribution costs.
- Faster resolution of network problems.
- Less disruption through fewer gas escapes.

Economic benefits for supply chain, broader industry, and the UK economy

- Create high skilled jobs in Utonomy (SME).
- Develop UK AI capability with application to energy networks.
- There is significant interest in this technology in US and Europe which will lead to increased exports.
- Will increase demand for Utonomy hardware (pressure management) benefitting supply chain.
- Increased number of biomethane plants will create jobs in rural communities.
- Will increase revenue of biomethane plants stimulating further investment.
- Impact on government priorities

Digitalisation of the grid is necessary if it is to be repurposed in the future to carry Hydrogen.
Environmental impacts

- Reduction in methane emissions.
- Enables use of renewable gas.

Expected regional or wider energy supply resilience benefits

- Reduces imports of gas by using more biomethane.

Impacts on consumers of the whole energy system

- Reduces costs of distribution through increased efficiency and reduced unaccounted for gas.
- Using locally produce gas-biomethane reduces reliance on gas imports.

Risks And Issues

There are two current risks that may affect the project:

1. The ability to quickly identify and extract data likely to underpin potential solutions.
2. The ability to move to live field trials of pressure optimisation solutions early in Beta depends on having safe and approved processes in place that protect security of supply under all conditions.

The above risks will be mitigated as follows:

1. One of the earliest activities within the Alpha approach is a data feasibility assessment against each OA: this will assess whether data currently exists or requires additional work to collect/extract/process; what format is the data in; its completeness; and whether it can be provided (and potentially updated) in a timely manner as required by solutions.
2. The recommended Alpha project approach includes formal risk assessment deliverables, to be completed at the earliest opportunity within Alpha, for both: a) end-to-end intelligent control systems; and b) low-point monitoring. These risk assessments will involve specialist third party gas network service providers to act as independent chair-persons when categorising and assessing risks to security of supply and safe operation.

As a result of the above mitigations to the identified risks, the project may be adapted as follows:

1. Outcomes from the data feasibility assessment will feed into decisions taken during Alpha phase about which OAs are most likely to realise benefits first and therefore which OAs should be accelerated during the latter stages of the phase.
2. The outcome of the formal risk assessments will dictate whether the proposed solutions are suitable as proposed to proceed to field trials, or whether additional development and/or components are required; this direction will be reflected in the project plan for Beta and may also be considered in which OAs should be accelerated during the latter stages of the phase.

New risks will be identified as early as possible by the technical and commercial working groups that will be formed specifically for each OA and raised via the day-to-day project management structure.

The proposed Alpha approach, created during Discovery, includes a dedicated project steering group comprised of stakeholders from each project partner (SGN, Utonomy and Faculty) joined by a representative from a third-party technical expert to advise on network risk assessment activities. Risks and issues will be monitored by the OA-specific working groups, and also by this steering group that will provide the overall project governance. This steering group will ensure that key project stakeholders maintain awareness of all project risks and issues, and that impact and likelihood assessments are updated at a regular interval. As such, new mitigations can be put in place if required, or the project plan adapted accordingly.

If any IP issues arise during the project it is intended that they will be discussed in the first instance between project leads from SGN, Utonomy and Faculty, with possible additional inputs taken from IP-specialists within each company, whilst remaining at all times within the IP treatment allowed under the SIF Governance. Where subcontractors are engaged, agreements will be in place with the relevant project partner such that all generated IP will be owned by the project partner and that confidential information is protected, thereby ensuring freedom to operate.

Project Plans And Milestones

Project Plans And Milestones

The project team will consist of resources from three key stakeholder companies: SGN, Utonomy and Faculty. Across most work packages, a two-level strategy of engagement has been defined that most effectively manages the likely interactions, based on the learnings taken from the Discovery phase: 1) project oversight stream -- a steering group formed of the core project team; and 2) day-to-day joint working groups, to be formed for each Opportunity Area (OA) depending on the users and stakeholders specific for that topic.

SGN representation at both levels will be provided by personnel from Innovation, Network Planning/Strategy/Support/Development, Maintenance Support/Engineering/Management, IT Applications Architecture, Asset Management/Engineering, Business Performance Managers, Design Management, Pricing Management, and Energy Futures teams.

The roles, capabilities and governance structures for Utonomy and Faculty have been detailed in the required skills and expertise Appendices attached for this question. As part of Faculty's engagement in the project, Faculty Platform, a secure data science development environment resource, hosted within Faculty's AWS infrastructure will be used for all data science activities during Alpha.

Since the Discovery phase, the project team will be expanded to include three additional sub-contractors:

- Technical Support (appointment pending): this specialist technical services provider to the gas industry will be used to provide objective feedback into overall project steering group and oversight, especially regarding approach to risk management where outcomes from potential AI / machine-learning software solutions are likely to be implemented on live networks (Work Package 5); additionally it will act as chair for formal RAMS / HAZOP processes to assess safety of proposed field trial activities (Work Package 3).
- MDC Consultants: this consultancy will provide a specialist advisor on GDN pressure control, management process, and risk assessments, and will be used to support formal RAMS / HAZOP processes to assess safety of proposed field trial activities (Work Package 3).
- Stuart Forrest: this resource will act as a specialist advisor on GDN Network Planning & Operations; Stuart is the former Head of Network Planning at SGN until late 2021.

The Alpha phase of the project will be broken down into 4 key work packages, supported by a 5th work package that provides governance and oversight from a steering group in addition to project management from the various key companies involved. The 5 work packages are:

1. Business Integration: Benefit Analysis
2. Data Science
3. Network Risk Assessments
4. Business Integration: Beta planning
5. Project management & steering group

The key objectives, activities, and deliverables for each of the work packages have been included in the Appendix response to this question, with associated Gantt plan showing the inter-dependencies. Detailed success criteria per deliverable are also referenced, but broadly, the success criteria for each of the 5 work packages are:

1. Users identified for each solution, required data availability has been validated, and benefits have been quantified.
2. Solution designs refined on basis of user research and data availability, bench testing scope defined, data discovery completed, bench testing completed.
3. Formal risk assessments completed with approved reports.
4. Finalised and approved CBAs for each OA to be progressed; completed Alpha report; completed draft Beta project plan.
5. Internal & UKRI monitoring completed

Payment schedule by month:

- Aug: 17.8%
- Sep: 18.2%
- Oct: 18.2%
- Nov: 15.3%
- Dec: 15.2%
- Jan: 15.3%

The project team will use an agile methodology for project management comprising monthly steering group meetings for overall project

delivery updates and governance from key stakeholders, regular (e.g. weekly) planning meetings for each OA dependent on project phase, ad-hoc meetings by exception to mitigate impediments, and work package completion reviews that validate the outputs against success criteria.

Regulatory Barriers (Not scored)

At present the project team, including SGN, are confident the proposed concept would not provoke any regulatory barriers that could affect or hinder delivery of either the Alpha or Beta phases.

Looking to the future, also considering any possible long-term impact from regulation, it is sensible to speculate that the intended 'evolution' of the energy networks, in pursuit of an effective overarching digitalised approach, may give cause to amendments or additions to regulation, therefore, the project team will endeavour to remain updated in terms of regulatory understanding going forward.

Policy considerations will play an important part in the development of this concept; particularly as this project will touch on areas such as Network Hydrogenisation, Digitalisation and AI Network Management/Control; all of which ae new concepts for the energy industry, let alone the gas industry, and existing policies and procedures are likely to need revisiting by review to check their relevance and suitability for any new developments/concepts delivered by the project.

To that end, the project team will not only be working closely with SGNs own Policy team and other relevant business stakeholders within SGN throughout the project, to help consider policy and procedural impact, but will also be making use of a suitable accredited Technical Consultant to help add further 'wider' industry understanding.

Business As Usual

Regular communication with, and 'buy-in' from, business stakeholders is key to BAU adoption; the project team will achieve both through holding regular update/showcase meetings throughout the project as each milestone is accomplished. Additionally, this proactive approach will also be coupled with an ongoing review of the benefits (including regular reviews of the project CBA) perceived as being attainable through utilising the concept.

Again, initiating and maintaining effective levels of communication with business stakeholders will naturally help to promote the perceived value of the expected deliverables by the project. The Discovery phase of this project has already started some of this work which show-cased the overall intention/aims of the project as well as the findings and conclusions from the Discovery phase to SGN.

Initially, SGNs Innovation PMO, with support from the dedicated SGN Innovation Project Manager, will be responsible for the implementation of the innovation. SGNs innovation team are now an established team within SGNs business, who, through working continuously with NIA and NIC projects over the last several years, have developed a capable and broad knowledge of SGNs business activities, as well as the wider energy network industry in the UK. They are well placed to support the transposition from idea to reality and facilitate an effective hand-over to the relevant business teams within SGN, who will need to act as custodians for the proven deliverables going forward and other DNs who may have interest in the concept(s) and/or the learning achieved from the project. However, the innovation team will need to liaise closely with, and ultimately handover to, stakeholders from SGNs Maintenance, Network Planning/Strategy and IT teams to properly support business implementation.

Learnings will be applied to other licensees through providing regular project updates, generally expected to occur upon the completion of each project milestone, along with the production of a final report(s) for sharing with the wider licensee.

The adoption of any project learnings will be supported by maintaining effective levels of communication with relevant stakeholders through regular update and showcase meetings/forums. These forums will gauge what each stakeholder group/team might specifically want to take opportunity from, in terms of the learnings delivered by the project.

It's important to 'seize the moment' proactively and effectively if an early opportunity to exploit the concept(s) arises. In other words, the project team do not believe the project has to fully complete before any deliverable that is proven during the project can be seriously considered for 'roll-out'. Far from it, this project has currently targeted eight potential OAs to explore within Alpha and understand those which may have tangible benefits for taking forward for further R&D in Beta. The project team have already considered it may be possible to deliver one or other of the OAs ahead of the pack, and are determined to enable SGN, et al, to make use of any early opportunities as soon as can be achieved.

Again, maintaining a strong and positive dialogue with all relevant business stakeholders throughout the project, should help to expedite any potential 'roll-out' dialogues. Business stakeholders will need to understand not only how to use and process the output data from the deliverables, but also determine its value to the business.

SGNs funding strategy for adopting the deliverables/concepts proven by this project will be incorporated into the Business Plan for RIIO-GD3, forming one element of a potential overarching strategy for network digitalisation, and planning for future Hydrogen transition.

Commercials

Commercialisation

The project will stimulate the development of competitive markets rather than undermine them. There are a large number of suppliers already servicing the gas distribution market e.g., Technolog, Honeywell, Emerson, and Fiorentini. It's to be expected they will develop their own solutions, and, where possible, software products created by the project will aim to be compatible with hardware supplied by a variety of manufacturers.

Expansion of gas distribution network digitalisation and automation will create savings in network operation and maintenance, improving customer service, reducing methane emissions, and facilitating the use of renewable gases. The cost savings and efficiency gains will ultimately be passed on to consumers during GD3.

If the solutions are proven to be viable during the Beta phase, Utonomy intend to develop and release commercial products, which implement the solutions.

The primary customer segment for commercial products that results from these innovations will be operators of gas distribution networks around the world. The other three GDNs Cadent, Wales & West Utilities and NGN have expressed strong interest in the solutions being developed. They are expected to be the first networks to implement the solutions after SGN. Gas networks in the US and Europe have also expressed strong interest. There are similar drivers in these markets to reduce methane emissions, connect more biomethane and to improve customer service and operating efficiency. In the US, GTI (Gas Technology Industry) has already agreed to coordinate trials in the US at the appropriate time.

Solutions are expected to comprise software that implements AI and machine-learning algorithms and processes. The commercial software products are likely to complement and extend Utonomy's remote pressure control technology which has been granted product approval and will begin roll-out later this year. Software products are likely to be hosted in private/public cloud infrastructure and will be licenced to SGN and other GDNs by Utonomy. Where required, additional hardware components, for example additional types of network sensors may be required to provide the necessary data inputs to the software.

The value proposition and associated business case for each opportunity area (OA) is as follows:

1. Reduced methane leakage

Reduce the cost of unaccounted for gas and meet leakage targets at lowest cost. Reduce cost of manual governor adjustments.

2. Increased feed in capacity of biomethane

Achieve business plan and environmental targets for biomethane injection at lowest cost. Reduce cost of manual governor adjustments.

3. Reduce reported escapes and predict escape distribution

Reduction in operating costs, better utilisation of skilled labour, meet business plan outputs at lowest cost. Reduce risk of penalties.

4. Better understand network performance and condition

This would allow SGN to quantify the benefits of asset management activities to customers.

5. Faster diagnosis of network excursions.

Faster resolution of network issues lowering overall maintenance costs and improving customer service. Reduction of unplanned interruptions to supply.

6. KPIs and dashboards

The proposed solution would help SGN meet, and potentially exceed, a number of RIIO-GD2 output targets. Over-delivery against outputs financially rewards both GDNs and their customers. Therefore, a solution that enables improved management of the network could save costs both to SGN and their customers.

7. Repex efficiency

There could be substantial cost savings if some open cut mains replacement could be replaced by much lower cost and less disruptive insertion.

8. Reinforcement capex efficiency

There could be substantial cost savings if some reinforcement could be avoided through more advanced pressure management.

Utonomy is planning to raise £4-5m of equity funding in August 2022 to support commercialisation of its pressure management and control product, as well as supporting ongoing R&D, and to support international expansion.

Intellectual Property Rights (Not scored)

The IPR arrangements follow those set out in Chapter 9 of the SIF Governance Document.

Background IPR includes knowledge and know-how appropriate to the project prior to the commencement date, registered IPR already on file, and data that pre-dates the project. Licences to background IP will be made available, where necessary, for other Project Participants for the duration of this phase of the project (compliant with 9.10).

If background IPR is needed for other project participants' use of their own foreground IP, then licences can be provided under appropriate commercial terms to be agreed (compliant with 9.11).

Foreground IP will comprise Relevant Foreground IPR needed for the implementation of the learnings from this project by other UK network operators (compliant with 9.4 and 9.13). This will include the sharing of relevant data and knowledge gained by the funding party with respect to their learning in how to operate a network with Utonomy technology installed.

Relevant Foreground IPR does not include developments and improvements that are made to Utonomy's commercial products (compliant with 9.14). Such developments are commercially sensitive for Utonomy and must remain owned and controlled by Utonomy to ensure their future business success.

As a result, all IP generated during the project that is solely related to Utonomy's products and services, including hardware and software, will remain owned and controlled by Utonomy (compliant with 9.7) and will be available for other network operators to purchase for use in the UK on an arm's length basis (compliant with 9.14). Without prejudice and subject to contractual terms, Utonomy will make their products and services available for purchase by any network operator within the UK, including products and services that incorporate foreground IP.

Costs and Value for Money

The total project cost is £601,426

The total funding requested is £491,075

SGN will fund the 10% of the total project costs which is £60,143.Utonomy and Faculty will fund just over 10% (£50,208) of their project costs from private funds for the project.

Across the two project partners, the balance of costs and funding is as follows:

SGN:

- Costs: £64,368 (Subcontractor Technical Support not included)
- SIF funding: £64,225

Utonomy:

- Costs: £475,208
- SIF funding: £425,000

Subcontractor costs are as follows:

- Faculty Science Ltd.: £390,000
- Technical Support: £60,000

- MDC Consultants: £9,000
- Stuart Forrest: £7,500

Faculty has the unique capability to deliver state-of-the-art AI solutions from teams formed from over 200 professionals comprising both technical and commercial experts. On each project, multifaceted teams are provided that combine industry and commercial expertise with data scientists and engineers, to provide a fully end-to-end offering for clients. In delivering AI solutions, in-house developed AI Engines allow specialised techniques to be applied to customer problems and to optimise performance. Combined with expertise in AI safety, this allows actionable and explainable insights to be provided, enabling improved business decision-making. These skills, and Faculty's experience of this project developed through the Discovery phase, make the company best-placed to continue the project progress during Alpha.

Subcontracting and other costs

Technical Support (appointment pending): will provide objective feedback into overall project steering group and oversight, especially regarding approach to risk management where outcomes from potential AI / machine-learning software solutions are likely to be implemented on live networks (Work Package 5); additionally it will act as chair for formal RAMS / HAZOP processes to assess safety of proposed field trial activities (Work Package 3).

MDC Consultants: this consultancy will provide a specialist advisor on GDN pressure control, management process, and risk assessments, and will be used to support formal RAMS / HAZOP processes to assess safety of proposed field trial activities (Work Package 3).

Stuart Forrest: this resource will act as a specialist advisor on GDN Network Planning & Operations; Stuart is the former Head of Network Planning at SGN until late 2021, and will work as an advisor to Utonomy across all work packages except WP3.

Comparison to what funds would otherwise be spent on

In the absence of funds being provided by SIF, Utonomy would continue with the commercial roll-out the underlying remote pressure control technology to business-as-usual within SGN and undertake further UK and international commercialisation.

Additional value over business-as-usual activity

Additional funds provided under SIF will allow SGN and Utonomy to accelerate the opportunity areas defined in this project. SGN and Utonomy are engaged in bringing value to consumers by reducing costs and harmful emissions, in line with the UK GDN's strategies for net zero. Funding from SIF would allow research into expansion of the technologies surrounding the roll-out of the underlying new digital pressure control system. It is likely that the GDNs' desired ability to visualise, analyse and undertake predictive actions on their networks would take multiple additional years under normal operation without the provision of SIF funding.

Value for money

The project team believe that delivering the proposed Alpha project plan using the wide cross-section of personnel from a variety of SGN teams, plus the targeted Utonomy team, alongside the selected subcontractors, would represent significant value for money for gas consumers given the potential beneficial impacts the opportunity areas will unlock during the project. The project team further believe that all subcontract fees are priced competitively against normal industry rates given the capabilities, experience and skills of the teams and individuals.

Supporting Documents

Documents Uploaded Where Applicable

Yes

Documents:

Application Submission - Intelligent Gas Grid - Alpha.pdf

SIF Alpha Project Registration 2022-10-03 6_04

SIF Alpha Project Registration 2022-10-06 4_18

03.02.23_IGG Alpha_ Technical White Paper.pdf

10037416 SIF Alpha Close Down Report 2023-04-03 11_57

SIF Alpha Project Registration 2024-02-20 10_43

This project has been approved by a senior member of staff

☑ Yes