SIF Alpha Round 2 Project Registration

Date of Submission

Project Reference Number

10061244

Initial Project Details

Project Title

CommsConnect

Project Contact

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Challenge Area

Improving energy system resilience and robustness

Strategy Theme

Whole energy systems

Lead Sector

Electricity Distribution

Project Start Date

01/10/2023

Project Duration (Months)

6

Lead Funding Licensee

UKPN - South Eastern Power Networks Plc

Funding Mechanism

SIF Alpha - Round 2

Collaborating Networks

UK Power Networks

Scottish and Southern Electricity Networks Distribution

Technology Areas

Comms and IT

Control Systems

Resilience

Substation Monitoring

Project Summary

Electricity networks require resilient communications to operate safely and efficiently. To provide this level of resilience typically comes at a high cost. CommsConnect aims to reduce the critical interdependency of communication and power networks, through increased information exchange and interoperability between Distribution Network Operators (DNO) and Mobile Network Operator (MNO) systems. Understanding and removing the barriers obstructing the use of public mobile networks using this innovative approach empowers networks to operate more affordably, effectively reducing costs and ensuring improved performance.

Add Preceding Project(s)

10061243 - CommsConnect

Add Third Party Collaborator(s)

University of Strathclyde

Nokia

Project Budget

£463,355.00

SIF Funding

£403,382.00

Project Approaches and Desired Outcomes

Problem statement

Traditionally, DNOs have designed and provisioned their own communication networks to meet their specific needs. These networks require high levels of resilience, with failover and black start capabilities for critical infrastructure. The cost of deploying, maintaining, and operating such extensive networks is significant. While utilising existing public communication infrastructure could potentially reduce costs, there is currently a crucial interdependence of communication networks on energy networks to function. Achieving the level of resilience demanded by DNOs nationwide is both economically unfeasible and environmentally burdensome for public mobile networks.

Our Discovery Phase research revealed that deploying a hybrid network for communication resilience using combinations of standard commercial networks along with private provision where required, offered cost savings and enhanced resilience. However, through engagement with subject matter experts and other industry stakeholders we identified an information barrier between DNOs and MNOs. This prevents us from making enhanced decision-making on the required resilience levels in specific areas based on the available electrical network assets.

The key to unlocking cost-effective resilience is the provisioning of adequate information about communication network performance for decision making on areas to focus investment on resilience initiatives. The Alpha Phase will focus on the acquisition of MNO data and its integration with existing DNO systems; and to investigate opportunities and use cases identified in the Discovery Phase.

CommsConnect continues to meet Challenge 3, improving energy system resilience and robustness. Our increasing reliance on data and communication for network automation, supervisory control and DSO services necessitates the need for a communication system that matches the requirements of a smart grid. The provisioning of MNO data would further facilitate this ambition by enabling the integration of MNO data with DNO control systems.

Any network operator with assets that require communications for operations and monitoring would benefit, the cost of using the public infrastructure is less of an issue due to preferable data plans and the low bandwidth requirements of typical SCADA applications. A lack of visibility of the state of the public infrastructure transporting critical data has been identified as a challenge.

Our proposed solution will automatically inform a DNO management/monitoring server of power outages, or service degradation of communication infrastructure they are utilising, including detailing which utility assets will be affected by this loss of communication. This information can be used to proactively re-route power via automation or invest in upgrading battery backup systems in areas that require it.

The planned decommissioning of the public switched telephone network (PSTN) by 2025 means that more customers will be relying on public mobile networks to keep in touch. Ensuring the resilience of public networks is enhanced during storms becomes critical for vulnerable customers residing in areas with no alternative communication methods.

Innovation justification

CommsConnect will understand and remove the barriers obstructing the optimal use of public mobile networks by utilities using an innovative approach that empowers networks to operate affordably, effectively reducing costs and ensuring improved performance.

There is currently no method of collecting essential resilience data from MNOs and integrating it with DNO control systems. The proposed solution would close the gap between DNO and MNO, increase cooperation between critical infrastructure providers and create opportunities for future innovation beyond the initial use cases. These include improving storm response, automated power restoration systems and ensuring customers on the priority services register (PSR) remain connected during storms. CommsConnect addresses Challenge 3, Theme 2 by proposing to trial solutions to improve communication infrastructure resilience. This would promote the deployment of DSO services such as flexible connections which require communications and an ever-increasing volume of

data.

Engagement with the CreDo+ SIF project has provided insight into potential longterm applications for MNO data. CreDo+ looks at how infrastructure dependencies impact system resilience, and how data sharing can improve overall system resilience. The solutions being developed in CommsConnect have the potential to support CreDo+ in collecting, storing, and sharing data required for modelling.

Engagement with UK Power Networks' internal stakeholders provided insight into the Business-as-Usual (BAU) operations of DNO communications networks. The Joint Radio Company (JRC), the energy industry-owned spectrum management organisation, has provided guidance on 3GPP standards and the work being done as part of the 3GPP TR 28.829 technical report, which provides a technical specification on network and service operations for energy utilities, CommsConnect will be aligned with this standard. Conversations with the Department for Energy Security and Net Zero provided insight into regulatory direction. While engagement with Nokia means CommsConnect will utilise the latest technologies and platforms during the Alpha Phase.

Engagement with a diverse group of industry bodies and individuals revealed that true innovation would be standardising and improving the data provisioning and sharing capabilities between DNOs and MNOs. This allows MNOs to prioritise resilience in areas with higher volumes of critical infrastructure, and DNOs to better understand the complexity of the current mobile network and use the information to improve network automation.

Success requires cooperation with telecommunications equipment providers to ensure the appropriate information is available at a hardware level for export to a centralised DNO monitoring system. Through a whole systems approach, standardisation organisations, vendors and mobile network providers will be engaged to ensure BaU suitability. The solution described can be adopted by all GB DNOs that use some level of public mobile network infrastructure for communication with network assets. Technology readiness level by the end of the Alpha Phase is estimated to be at 6, with integration readiness level at 6 and commercial readiness level at 5.

The SIF mechanism allows for a phased approach to the development of the solution and to shift focus as new learnings are made. Discovery Phase identified the key requirements, Alpha Phase will finalise the design of the solution in a test environment, and Beta Phase will trial the solution with an MNO and DNO. This level of engagement, testing and funding would not be possible as part of BaU activities. Stakeholders from various sectors also require engagement, this is being done throughout the three phases.

The counterfactual solution is to install sufficient battery backup at all MNO base stations in areas with large numbers of DNO assets reliant on wireless communications. This would require a high level of investment from the MNO, who would likely pass the cost onto DNOs and this cost would ultimately filter down to consumers.

Impact and benefits (not scored)

Financial - future reductions in the cost of operating the network

Financial - cost savings per annum on energy bills for consumers

Environmental - carbon reduction – direct CO2 savings per annum

Others that are not SIF specific

Impacts and benefits description

· Financial - future reductions in the cost of operating the network

· Financial - cost savings per annum on energy bills for consumers

· Environmental - carbon reduction -- direct CO2 savings per annum

· Others that are not SIF specific -- Improved network resilience and fewer outages

Financial - cost savings per annum on energy bills for consumers

· Description: Need for MNOs to install bigger batteries means costs of battery installation and maintenance will be reduced, and cost will not be passed down to DNO customers.

· Pre-innovation baseline: Typical UK base stations use 12V, 100Ah batteries, a standard street cabinet site may deploy three of these which would provide 15- 45 mins battery backup. The ENA G91 recommendation calls for 72 hours of battery backup, so each site would require 100-150x more batteries, increasing the cost from ~£600 to ~£75,000 per site. Extrapolating across the 40,000 nationwide masts, this would result in a cost of ~£3bn nationwide, not accounting for continued battery maintenance. This cost would inevitably be passed down to DNOs and general consumers.

· Benefits forecast: The resilience map produced by the solution enables MNOs to install battery backup only at critical sites, which will reduce the cost of deployment while increasing communications resilience. Estimated at £276.91m whole life NPV of costs avoided for one DNO.

Environmental - indirect CO2 savings per annum

· Description: Need for MNOs to install bigger batteries, this avoids the CO2 emissions and avoided generation through effective use of DERs enabled through reliable connectivity.

· Pre-innovation baseline: Each kWh of batteries produced will generate between 150 to 200 kilograms of CO2, a figure based on the world's predominantly fossil fuel energy mix. Assuming the average consumption of the base station is about 5-6 kilowatts of power (for three sectors of 12 radios), this may produce between 750-1,200 kilograms of CO2 each hour for each base station. If the batteries will be used for three hours than the CO2 emission will be between 2 to 3.6 tonnes of CO2 for each mobile station. This can reach 36,000 tonnes for one MNO (assuming that the total number of base stations are 10,000 for each MNO).

· Benefits forecast: The resilience map produced by the solution enables MNOs to install battery backup only at critical key sites which would reduce the CO2 emissions from the additional batteries installed at MNO sites. An estimated 1,962.96 tCO2e of avoided greenhouse gas emissions up to 2040 for one DNO.

Improved network resilience and fewer outages

· Description: Storm Arwen and Eunice resulted in the disruption of thousands of mobile cell sites by power outages and prolonged outages. Mobile mast sites are backed up with an on-site battery designed to last between 15 minutes and six hours. One provider reported that over 1,500 of its mobile sites went down during Storm Arwen, and around 130 of these were down for more than 72 hours.

· Pre-innovation baseline: The loss of communications during storms slows down restoration times. Lack of mobile service increases the time taken for field staff to get in contact with the control room to confirm and report a fault; and a lack of SCADA prevents remote control and inhibits functionality of the Automated Power Restoration System (APRS). APRS automatically detects faults on the electrical network and restores power automatically where there is an alternative route power can take to end-consumers. This is achieved using fault passenger indicators (FPIs) and APRS relies on reliable communication. Due to the number and location of FPIs, they are commonly wirelessly connected over public mobile networks. This reliable communication is not available within all DNO areas.

· Benefits forecast: The proposed solution enables DNOs and MNOs to increase resilience in remote areas with a high proportion of assets connected to mobile networks. Providing reliable communication would ensure APRS functions optimally, which can successfully restore power to consumers in under three minutes, thereby, reducing customer impact.

Teams and resources

Each of the partners - UK Power Networks (UKPN) and PNDC - from the Discovery Phase have played a valuable role in shaping the development of the insight and recommendations and continue to be involved in the Alpha Phase. Alongside the existing team we are adding Nokia and Scottish and Southern Energy Networks Transmission (SSEN-T) for Alpha Phase.

The new partners were identified during Discovery Phase and will support this phase and Beta Phase. Nokia is a Tier 1 supplier of carrier grade mobile infrastructure, and a core implementer of mobile standards and technology. They will provide support, integration expertise and hardware for creating resilient communication networks cost-effectively. This partnership is critical to ensure this functionality can be integrated into commercial networks.

One uniting factor between all DNOs is the need for secure and reliable communication networks. SSEN-T has considerable expertise and requirements for installing connectivity in sparsely populated areas, and accordingly will provide invaluable expertise for potential hybrid approaches to integrating public and private mobile connectivity and reporting.

UKPN:

The project team includes the Innovation team taking the lead from a project management perspective, and an experienced SCADA Standards Engineer providing technical direction for BAU. Throughout the project, stakeholders from our Network Operations Teams will lend their expertise in the creation and approval of requirements, refining solution designs, business processes and integration and testing procedures. An additional key stakeholder from our Control System and Automation team will join the project. This will ensure that ADMS integration requirements for the proposed solution are captured and designed as part of Alpha Phase.

UKPN provides industry experience developed from years of managing telecoms systems specifically designed for electricity networks infrastructure and using public mobile communications infrastructure for critical infrastructure. This factor ensures that a suitable proving ground exists for future phases that require a level of trialling in the network environment. We are the leading energy network in the development of the use of public 5G networks for critical infrastructure with the Constellation NIC project.

PNDC (University of Strathclyde)

PNDC is a smart grid innovation acceleration centre, which brings together academics, engineers, and technologists to define and execute research, development, and demonstration projects with the aim of shaping and optimising smart electricity networks of the future. One of the core PNDC themes is to advance the efficiency, security and resilience of communications.

Dr James Irvine, University of Strathclyde will be responsible for the implementation of the Alpha Phase. James is an expert in resource management and security for wireless communication systems, has worked on several 5G design and delivery projects.

James is supported by Dr Kinan Ghanem, lead R&D Engineer at PNDC. Kinan is responsible for PNDC's Communication and Systems Integration theme working on different communication technologies for the smart grid; including connectivity for power assets, bandwidth, and security requirements.

Dr Ross McPherson is an R&D engineer and has designed, developed, and deployed numerous mobile networks, integrating with the requirements of unique stakeholders. Throughout Alpha, Ross will apply his whole systems approach, starting from a strong background in the standardisation process, developing proof of concept systems, deploying into business as usual.

Dr Greig Paul is deputy chair of the UK Telecoms Data Taskforce, a voluntary group sponsored by the Department for Business and Trade, giving independent technical advice to government on telecoms, security and critical infrastructure security.

Project Plans and Milestones

Project management and delivery

CommsConnect will be divided in three distinct work packages to encourage a more focused and collaborative approach:

· Work Package 1 (PNDC): This work package primarily consists of engagement with industry stakeholders, and we will propose a test-bed and integration platform for GB utilities, to explore and understand their own requirements. A key deliverable for this work package is also the compilation of all learnings from WP1, WP2 and WP3 into a plan for the Beta phase.

· Work Package 2 (PNDC, Nokia, UKPN, SSEN-T): A proof-of-concept demonstration facility on an existing MNO platform will be adapted to automatically inform a DNO management/monitoring server of power outages, or service degradation of communication infrastructure they are utilising.

· Work Package 3 (PNDC, UKPN): This work package will develop an interoperable wireless sensing module that can be used by DNOs to monitor the health of surrounding mobile networks around utility assets. The information gathered will be presented on a user understandable interface for DNO operators.

The project is designed to have minimal dependencies, as such, the activities in Work Packages 2 and 3 can operate independently until the findings are compiled as part of the final deliverable of Work Package 1. All work packages have clear ownership and accountability, with assigned lead partners, and clear activities and deliverables.

Approach to Project Management

As the lead partner, UKPN will be accountable for the success of CommsConnect. To effectively manage the project, UKPN will implement four key control measures as used in previous projects. A summary of these processes is provided below:

· Risk and Issue Management: this process ensures the capture, communication, escalation and mitigation of key risks and issues within the project and defines where decisions will be made.

· Change Management: the purpose of this process is to control and agree any changes to the agreed baseline of the project, whether the change relates to time, cost or quality.

· Review Process: all formal outputs from the project will go through a formal review process. An output will not be deemed complete until it has passed this review process. It is the responsibility of the project manager to ensure all outputs are placed under review.

· Approval Process: this will be implemented to ensure all deliverables are adequately approved before they are agreed as complete. The lead network will ensure each deliverable is completed to the quality, cost and timescales as agreed in detailed plans.

Main Project Risks

· Scope - Throughout the Discovery Phase it was highlighted that various organisations were interested in the project outcomes. During Alpha planning sessions it was established that there were various technical solutions which could be beneficial within this area. As a result of both, there is a notable risk of scope creep and encompassing additional requirements/technical solutions.

· Staff and resourcing during the December holiday period could be a challenge, but this can be mitigated with prioritisation of tasks and planning of required resource levels for critical tasks.

- Telecoms broadcasting license. To demonstrate information gathering it is required to have an Ofcom broadcasting license.

Stage-gating and Risk Mitigation

During Alpha, an integrated Proof of Concept can be developed reducing the costly and resource intensive process of integrating with production systems. The Alpha-Beta split provides an optimal stage gate. The proof of concept can be tested at PNDC in an isolated environment without having supply interruptions; this is useful as the nature of the trial would require both electrical/MNO consumers to be off supply, would require high levels of coordination and prove an inconvenience to consumers, making the test unfeasible.

Key outputs and dissemination

The project's overall objective is to increase the resilience of mobile communications infrastructure in areas with high volumes of utility assets connection to them. The Alpha Phase objective is to engage with key industry stakeholders, achieve alignment with industry standards and build and test prototypes for MNO/DNO integration that can be expanded into a full network test in the Beta Phase.

The three primary objectives and outputs for Alpha phase are:

1. Objective: Using learnings from the Discovery Phase, we will engage with industry partners to provide a testbed and integration platform for GB utilities, The engagement sessions will be used to better understand requirements and inform the design of solutions. These learnings will be used to develop global standards. We will ensure a future interoperable and cost-effective eco-system, designed for utility requirements. This is both in line with existing HMG policy to increase engagement with future communication standards, and JRC's existing goals and objectives working on behalf of all DNOs.

Outputs:

- Internal project stakeholder engagement plan
- Report with recommendations for longer term collaboration and data exchange between DNOs and MNOs.
- Report detailing Alpha Phase findings, updated cost-benefit analysis, and plans for further expanded trials.

Responsible Party: PNDC

2. Objective: To test and validate an existing product that will be adapted to automatically inform a DNO management/monitoring server of power outages, or service degradation of communication infrastructure they are utilising. This will include detailing which utility assets will be affected by this loss of communication. This will increase the information exchange between MNOs and DNOs to enable automated/intelligent restoration plans to reduce CMLs and reduce the interdependency between communication and power.

Outputs:

- Proof of concept demonstration of MNO/DNO integration using and existing product.
- Document with detailed requirements and design for MNO/DNO information exchange system.
- Document describing test procedures, use cases, and test results for implemented solution.

Responsible Party: PNDC

3. Objective: Finally, we will develop a wireless sensing module to monitor the health of surrounding mobile networks of utility assets. The information gathered will be presented on a user interface for DNO operators. This will allow DNOs to develop an independent understanding of the resilience capabilities of the public network in that location, which in turn would allow DNOs to make case-by-case decisions on which sites should employ which communication methods for optimal cost-effective resilience.

Outputs:

- Proof of concept demonstration of MNO independent data acquisition system
- Document with detailed requirements and design for DNO independent sensor for the development of resilience maps.
- Document describing test procedures, use cases, and test results for implemented solution.

Responsible Party: PNDC

Dissemination activities:

The University of Strathclyde/PNDC hosts quarterly Knowledge Exchange Forums focused on communications and the needs for the industry. This includes membership and engagement from various DNOs and communication providers/suppliers for a whole industry solutions approach. The learnings and project progress of CommConnect will be presented at this quarterly event.

The University additionally has strong links with European Utilities Telecom Council (EUTC), innovation accelerators, and government departments where this information can be shared. Project outputs will be shared and used as an exemplar for future standardisation and industrial collaboration.

All our Alpha Phase projects will be uploaded to the Smarter Networks Portal and feature on the UKPN innovation website with specific project learnings being disseminated at the IUK Show & Tell events. In addition, UKPN will host an in-person event in London to disseminate the learnings and key outputs of all our successfully awarded Alpha Phase projects to a wider audience. UKPN will share project successes and discoveries via its social media channels with the external press media where appropriate.

Commercials

Intellectual property rights, procurement and contracting (not scored)

The parties agree to adopt the default IPR arrangements for this project as set out in Section 9 of the SIF Governance Framework.

The partners recognise that knowledge transfer is one of the key aims of the SIF, and that the benefits of this project will be maximised by the ability of other licensees to be able to learn from the project so as to create improved outcomes or reduce costs for consumers. The partners do not anticipate that the Alpha Phase (or any potential subsequent phases) will result in the creation of IPR that cannot be freely disseminated, and have no expectation of creating income streams or royalties from IPR outside of participation in a competitive marketplace for services that may be informed or stimulated via the outcomes of the project.

Commercialisation, route to market and business as usual

CommsConnect aims to help electricity networks enhance their network resilience; creating the framework required to implement such a solution, without being prescriptive on specific vendors that would be required to deliver it, thus enabling a competitive marketplace.

Primary beneficiaries for this solution are electricity networks and other critical infrastructure owners who are looking to improve their network resilience. This will enable these organisations to develop and implement a scalable, resilient, future-proofed communications network to support their critical assets.

The solution has a clear route to market as it is closely aligned with 3GPP TR 28.829, which is a technical report providing a technical specification on network and service operations for energy utilities. TR 28.829 is a feasibility study that identifies use cases and requirements for exposing capabilities of the 3GPP management system to energy utility service providers. The study also considers how management capabilities or what information can be provided to MNOs by the external energy utility service providers. CommsConnect will work closely with advisors and industry partners working with 3GPP to implement and demonstrate the capabilities described in TR 28.829. CommsConnect will not be developing or promoting a specific product, but it will provide DNOs and MNOs with technical requirements, testing facilities, and lab trialled designs by the end of the Alpha Phase, and a live network trial by the end of Beta Phase.

The following partner aspirations would support development beyond the Beta Phase:

· Nokia – Nokia have existing solutions for managing 5G network infrastructure for MNOs; CommsConnect will assist with the development and testing of new and existing Nokia solutions while contributing to prevailing 3GPP standards.

· PNDC – A facility to safely test large-scale electrical components without risk of consumer interruption already exists at the PNDC; CommsConnect will enhance this capability to include testing for DNO/MNO integration and use cases. This will provide DNOs, MNOs and technology partners with the opportunity to test new solutions and use cases after the CommsConnect project.

· UKPN - UKPN are invested in the offering of DSO services such as flexibility in RIIO-ED2; with potential direct benefits of the DSO estimated at £400m, with wider system benefits with NPV of £0.8-2.6bn by 2040. These services require mobile communications for assets in remote areas, and reliable mobile communication increases the confidence of customers that their generation assets will not be curtailed due to an unnecessary loss of communications. This approach can be scaled to other electricity networks

Policy, standards and regulations (not scored)

There are no regulatory or policy barriers that will hinder progress for the Alpha or Beta Phases of CommsConnect.

Evidence to influence future policy and regulations:

There is a need to ensure regulatory mechanisms around value-for-money also considers cyber-security and resilience, since an open market will deliver cheaper solutions which lack resilience and/or security features, due to a lack of robust standardisation. We propose to evaluate value for money between public and private networks, leveraging learnings from past projects and connectivity solutions to build evidence that a new approach to policy is required here.

Policy consideration for long term implementation:

There is a need to enable a level of cooperation between different DNOs, since individual DNO licence areas don't necessarily correspond to where MNOs would deploy communications infrastructure. We do not see this as a blocker, rather as an enabling opportunity, but getting DNO 1 good coverage at an optimal price may be best delivered by installing a site within DNO 2's area. Enabling both DNOs to use the site would be sensible, but this will require technically oriented rather than business-oriented separation of systems.

There are other opportunities for DNOs to provide resilient comms to CNI sites (e.g. water utilities), which would be constrained by their own regulatory requirements. There will need to be research into implications of this, specifically where Ofcom and Ofgem regulatory areas may overlap. There may also be potential regulatory overlap between the Telecoms Security Act.

Derogation:

The project does not require any derogation.

Exemptions:

Telecoms Security Act (Ofcom-regulated) and the Network Information Systems (NIS) directive (Ofgem-regulated, for a DNO) which will require careful evaluation from a DNO perspective, before exploring opportunities to work with other sectors in realising wider community benefits. This is likely to require a more joined-up approach to regulatory policy across the private sector CNI ecosystem, delivered through outcomes-based regulation, which recognise the need to holistically consider complex systems like energy networks which are dependent on both communications assets and energy assets.

Value for money

Project Costs and Contributions:

The total cost is £463,335 while the total amount of SIF funding requested is £403,382. This can be broken down across Project Partners by:

UK Power Networks:

· Total: £95,625

· Contribution: £9,563 (10%) with labour in-kind contribution

· SIF Funding Request: £86,062

PNDC:

· Total: £245,109

· Contribution: £24,510 (10%) with labour in-kind contribution

· SIF Funding Request: £220,599

Nokia:

· Total: £111,220

· Contribution: £14,500 (13%) with licensing and in-kind contribution

· SIF Funding Request: £96,720

SSEN-T:

· Total: £11,401

· Contribution: £11,400 (99.9%) with labour in-kind contribution

· SIF Funding Request: £1

Value for Money:

· CommsConnect is targeted at delivery lower cost, more resilient communications networks that are critical for increasingly intelligent electricity networks.

· Uses stakeholder engagement activities to design a solution that largely meets the needs of all power network companies, whilst highlighting any specific differences that cannot be addressed.

· Being hardware and technical solution agnostic at this stage ensuring that the most cost effective and appropriate solutions are developed.

· Focusses Alpha Phase on the key gaps and learnings required to develop a solution at Beta Phase.

· PNDC, as part of the University of Strathclyde, providing a 25% discount from their commercial rates towards project outcomes. This is to both to demonstrate value for money to the customers, and to demonstrate our commitment to project objectives.

· PNDC will be using existing facilities to rapidly build and test prototypes of the solution during the alpha phase. The facility has all the necessary test and communications equipment to adequate trail the proposed solutions. This will lower R&D costs and the overall cost of the project.

· Provides access to facility investment through the expansion of PNDC testing sites and equipment.

· The project team has been specifically assembled with the required skills, prior knowledge, and existing stakeholder relationships to ensure that this project can be delivered, quickly, efficiently, and to high quality.

· An estimated £276.91m whole life NPV of costs avoided for one DNO for the installation of batteries with 72 hours of battery life at critical sites (based on the replacement of batteries at 337 sites vs 6,000 counterfactual).

Associated Innovation Projects

- ○ Yes (Please remember to upload all required documentation)
- ◉ No

Supporting documents

File Upload

CommsConnect - Alpha - Show and Tell (for upload).pdf - 2.6 MB
CommsConnect - Alpha - End Point Meeting (for upload).pdf - 3.7 MB
CommsConnect - Alpha - Mid Point Meeting 18-01-2024 (for upload).pdf - 1.4 MB
SIF Alpha Round 2 Project Registration 2024-01-25 9_35 - 79.0 KB

Documents uploaded where applicable?

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