Notes on Completion: Please refer to the appropriate NIA Governance Document to assist in the completion of this form. The full completed submission should not exceed 6 pages in total.

NIA Project Registration and PEA Document

Date of Submission

Mar 2024

Project Reference Number

NIA2_SGN0059

Project Registration

Project Title

Accessibility module for CO alarms (Phase 1)

Project Reference Number

NIA2_SGN0059

Project Licensee(s)

SGN

Project Start

March 2024

Project Duration

0 years and 5 months

Nominated Project Contact(s)

sgn.innovation@sgn.co.uk

Project Budget

£56,356.00

Summary

This Phase 1 project will deliver a feasibility study for the design and development of an accessible CO alarm. It will act as a primer for a Phase 2 project which will focus on the actual development of an accessible CO alarm product.

In particular, the project will conduct a desktop research on the current state of carbon monoxide alarms in the market, how the needs of vulnerable populations are currently addressed and to what extent, it will engage with end users and stakeholders in order to elicit the functional requirements and characteristics of an accessible CO alarm, and will analyse and evaluate collected data towards establishing the business case for developing the product and putting it in the market.

Third Party Collaborators

Policy Connect

Bournemouth University

Nominated Contact Email Address(es)

sgn.innovation@sgn.co.uk

Problem Being Solved

The problem statement for this project is that carbon monoxide poisoning is a significant health risk, particularly for vulnerable populations, such as low-income families, elderly individuals, and those with disabilities. Carbon monoxide poisoning can cause serious health issues and even death, and it is a preventable problem that requires an affordable and accessible solution.

The World Health Organisation has identified carbon monoxide poisoning as one of the top 50 improvement areas for global health.

Therefore, it is crucial to address this issue and develop a solution that can reduce the incidence of carbon monoxide poisoning among vulnerable populations.

The development of a verbal voice CO alarm that is affordable and accessible can provide a life-saving solution that can be easily implemented and widely adopted, ensuring that everyone has access to the technology they need to protect themselves and their families.

This project aims to address this problem and provide an effective solution that meets the specific needs and preferences of vulnerable communities, reducing the incidence of carbon monoxide poisoning and improving global health outcomes.

Method(s)

Measurement Quality Statement:

We will ensure measurement quality by employing rigorous data collection methods, utilising validated tools and techniques for analysis, and adhering to established standards and protocols. Regular data validation checks and peer reviews will be conducted to verify the accuracy and reliability of the measurements, ensuring that the findings/research are robust and actionable.

Data Quality Statement:

Our data quality standards will focus on ensuring completeness, accuracy, and consistency of the data collected from various sources, including stakeholder surveys, interviews, and literature reviews. Data validation procedures will be implemented to identify and address any discrepancies or errors, ensuring that the data used for analysis and decision-making is of high quality and reliability.

Scope

The objective of this feasibility study is to assess the benefits of using verbal voice carbon monoxide (CO) alarms compared to traditional beeping alarms for vulnerable customers, such as children, the elderly, or those with hearing impairments.

By conducting this study, we aim to demonstrate the feasibility of using verbal voice alarms to provide clearer communication, earlier detection, increased accessibility, reduced anxiety, and peace of mind to vulnerable customers. The study will involve conducting a literature review, gathering data on carbon monoxide poisoning in vulnerable populations, researching the benefits and limitations of verbal voice CO alarms, and collecting feedback from users. Based on the data collected, we will analyse and evaluate the feasibility of using verbal voice CO alarms for vulnerable customers, and develop recommendations for their implementation. We will also monitor and evaluate the implementation of verbal voice CO alarms, and communicate the results of the study to stakeholders.

Objective(s)

The objectives of the project are twofold. Firstly, to assess the feasibility of integrating IoT technology into CO alarms, focusing on enhancing their accessibility and functionality. This involves evaluating technical aspects, such as compatibility and usability, to ensure the successful integration of IoT features.

Secondly, the project aims to gather user-centric design recommendations through stakeholder engagement, particularly targeting individuals with visual or cognitive impairments. This process will involve conducting in-depth studies and extracting key insights from collaboration with the Policy Connect and other relevant stakeholders.

Furthermore, the project seeks to ensure that the developed accessibility module for CO alarms complies with established accessibility standards and guidelines. This involves conducting a thorough review to verify compliance and make necessary adjustments to enhance accessibility and usability for individuals with disabilities.

Additionally, the project will identify and assess potential technical risks associated with IoT implementation, proposing effective mitigation strategies to address these challenges proactively. This proactive approach aims to minimise disruptions and ensure the successful implementation of IoT technology in CO alarms.

Finally, the project will compile all findings, recommendations, and insights into a comprehensive report. This report will serve as a valuable resource for informing decision-making and guiding the project's direction in subsequent phases, ensuring that the developed accessibility module meets the specific needs of vulnerable communities effectively.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

The development of a Verbal CO Alarm tailored to the needs of vulnerable communities will significantly enhance their safety and well-being. The incorporation of accessibility features such as verbal alerts and compatibility with assistive technologies will empower individuals with visual or cognitive impairments to respond effectively to potential CO incidents. Moreover, the project's focus on user-centric design and compliance with accessibility standards will ensure that the solution is intuitive and easy to use for individuals with diverse needs.

Success Criteria

The success criteria for the project to develop a verbal voice CO alarm for vulnerable populations include:

IoT Feasibility: Demonstration of the technical feasibility of integrating IoT technology into CO alarms, ensuring seamless functionality and compatibility.

User-Centric Design: Positive feedback from stakeholders, particularly individuals with visual or cognitive impairments, indicating that the design recommendations effectively address their needs and preferences.

Accessibility Compliance: Verification that the developed accessibility module for CO alarms meets established accessibility standards and guidelines, ensuring accessibility and usability for individuals with disabilities.

Risk Mitigation: Identification and mitigation of potential technical risks associated with IoT implementation, ensuring smooth project execution, and minimizing disruptions.
Comprehensive Report: Compilation of comprehensive findings, recommendations, and insights into a well-structured report, serving as a valuable resource for informing decision-making and guiding future project phases.

Stakeholder Satisfaction: High levels of stakeholder satisfaction with the project outcomes, indicating that the developed accessibility module effectively addresses their concerns and enhances safety for vulnerable communities.

Effective Collaboration: Positive feedback from collaborative partners, including Bournemouth University, Policy Connect, and other stakeholders, indicating effective collaboration and knowledge-sharing throughout the project.

Adherence to Timeline and Budget: Completion of project deliverables within the specified timeline and budget, demonstrating effective project management and resource allocation.

Impact on Vulnerable Communities: Measurable improvements in safety and accessibility for vulnerable communities, as evidenced by reduced incidents of CO exposure and increased awareness and understanding of CO alarms.

Project Partners and External Funding

Policy Connect - Specialise in supporting parliamentary groups, forums, and commissions, delivering impactful policy research and event programmes, and bringing together parliamentarians and government in collaboration with academia, business, and civil society to help shape public policy in Westminster and Whitehall.

Bournemouth University - Bournemouth University is an innovative, international university offering high quality student experience, research, and professional practice. BU brings high expertise in IoT networked systems and their interplay with other enabling ICT, such as Machine Learning and Blockchain. BU has a track record in algorithmic aspects of IoT data collection and management, end-to-end system architectures, elicitation of functional and technical requirements, and the development of Proof-of-Concept systems and testbeds.

Potential for New Learning

The parties involved in the project to develop a verbal voice CO alarm for vulnerable populations expect to learn several things, including:

- The specific needs and preferences of vulnerable populations when it comes to carbon monoxide safety and the use of CO alarms.
- The technical and financial feasibility of developing and manufacturing a verbal voice CO alarm that is affordable and accessible for vulnerable populations.
- The most effective ways to promote and distribute the verbal voice CO alarm to vulnerable populations.
- The effectiveness of the verbal voice CO alarm in reducing the incidence of carbon monoxide poisoning among vulnerable populations.
- The challenges and opportunities involved in building sustainable partnerships with organizations and stakeholders to support the project.
- The impact of the project on raising awareness and education about carbon monoxide safety among vulnerable populations.

The learning from the project will be disseminated through various channels, including:

- Reports and presentations outlining the project's findings and outcomes.
- Workshops and training sessions for vulnerable populations, community organizations, and other stakeholders.
- Collaboration with other organisations and stakeholders to share best practices and lessons learned.
- Ongoing monitoring and evaluation of the project's impact and outcomes, with regular reporting to stakeholders and the wider community.

Scale of Project

The scale of the project to develop a verbal voice CO alarm for vulnerable populations is justified by the potential benefits it can bring. Carbon monoxide poisoning is a serious health hazard that can cause long-term health effects or even death, especially among vulnerable populations who may be less able to recognise the signs of poisoning or take appropriate action. Investing in the development of a verbal voice CO alarm specifically designed for vulnerable populations can have significant benefits in reducing the incidence of carbon monoxide poisoning and improving the safety and well-being of these populations.

The potential benefits include:

- Improved health outcomes for vulnerable populations, including reduced incidence of carbon monoxide poisoning and related health effects.
- Reduced healthcare costs associated with treating carbon monoxide poisoning and related health issues.
- Increased public awareness and education about carbon monoxide safety, leading to more widespread adoption of CO alarms and improved safety practices.
- Strengthened partnerships with community organizations and stakeholders, leading to improved collaboration and support for future projects.

The scale of the project is also important for the potential learning that can be gained from it. A larger-scale project allows for more comprehensive research, testing, and evaluation of the effectiveness of the verbal voice CO alarm in reducing the incidence of carbon monoxide poisoning among vulnerable populations. This can lead to more robust findings and recommendations, as well as more effective strategies for promoting and distributing the CO alarm to targeted communities. A smaller-scale project may not have the same level of impact or potential for learning and may not be able to achieve the same level of community engagement and support.

Technology Readiness at Start

TRL2 Invention and Research

Technology Readiness at End

TRL4 Bench Scale Research

Geographical Area

Project undertaken by SGN for the alarm to be used in our footprint. However, the alarm will be available for purchase and use across the UK and European standard.

Manufacturing and Development: Bournemouth University

Surveys and meetings: Remote across the United Kingdom and face to face in chosen locations

Revenue Allowed for the RIIO Settlement

N/A

Indicative Total NIA Project Expenditure

The total project expenditure is £56,356 of which will be recovered via the NIA funding mechanism in line with the funding conditions. Total project value is £62.618.

Project Eligibility Assessment Part 1

There are slightly differing requirements for RIIO-1 and RIIO-2 NIA projects. This is noted in each case, with the requirement numbers listed for both where they differ (shown as RIIO-2 / RIIO-1).

Requirement 1

Facilitate the energy system transition and/or benefit consumers in vulnerable situations (Please complete sections 3.1.1 and 3.1.2 for RIIO-2 projects only)

Please answer **at least one** of the following:

How the Project has the potential to facilitate the energy system transition:

N/A

How the Project has potential to benefit consumer in vulnerable situations:

The project to develop a verbal voice CO alarm for vulnerable populations has the potential to benefit consumers in vulnerable situations in several ways. Firstly, vulnerable populations such as the elderly, disabled, and low-income households are at higher risk of carbon monoxide poisoning due to factors such as poor ventilation, lack of access to medical care, and limited mobility. The verbal voice CO alarm can provide an added layer of protection by alerting occupants of the potential danger in a clear and understandable way, which can be particularly important for those with hearing or cognitive impairments.

Secondly, the verbal voice CO alarm can be more effective than traditional beep alarms for vulnerable populations who may have difficulty hearing or understanding the beeping sound. The verbal alarm can provide additional information about the source of the danger and what actions to take, which can help to prevent panic and confusion in a potentially life-threatening situation. Finally, the project has the potential to benefit vulnerable populations by increasing public awareness and education about the dangers of carbon monoxide and the importance of having a CO alarm in the home. This can help to promote safer practices and reduce the incidence of carbon monoxide poisoning, particularly among those who may not have been aware of the risks or had access to a CO alarm before. Overall, the project to develop a verbal voice CO alarm for vulnerable populations has the potential to provide a valuable safety tool for those who are most at risk, as well as increased awareness and education about carbon monoxide safety for the broader community.

Requirement 2 / 2b

Has the potential to deliver net benefits to consumers

Project must have the potential to deliver a Solution that delivers a net benefit to consumers of the Gas Transporter and/or Electricity Transmission or Electricity Distribution licensee, as the context requires. This could include delivering a Solution at a lower cost than the most efficient Method currently in use on the GB Gas Transportation System, the Gas Transporter's and/or Electricity Transmission or Electricity Distribution licensee's network, or wider benefits, such as social or environmental.

Please provide an estimate of the saving if the Problem is solved (RIIO-1 projects only)

N/A

Please provide a calculation of the expected benefits the Solution

N/A

Please provide an estimate of how replicable the Method is across GB

Rolling out the verbal voice CO alarm across the UK and other gas distribution networks and charities would require a coordinated effort between various stakeholders. One possible approach would be to partner with gas distribution networks and charities to pilot the verbal voice CO alarm in select regions or communities with a high concentration of vulnerable populations.

This feasibility could provide valuable feedback and data on the potential effectiveness and usability of the alarm, as well as identify any potential barriers to implementation.

This could involve working with gas distribution networks and charities to provide discounted or subsidised alarms for vulnerable populations, as well as launching a public awareness campaign to promote the importance of having a CO alarm and the benefits of the verbal voice CO alarm.

In addition, the project team could work with government agencies and regulatory bodies to promote the adoption of the verbal voice CO alarm as a standard safety requirement in all homes, particularly those housing vulnerable populations. This could involve advocating for changes to building codes and regulations, as well as working with local authorities to provide incentives or subsidies for the installation of the alarms.

Overall, rolling out the verbal voice CO alarm across the UK and other gas distribution networks and charities would require a collaborative and multifaceted approach, involving partnerships, pilot testing, public awareness campaigns, and advocacy efforts to promote adoption and implementation.

Please provide an outline of the costs of rolling out the Method across GB.

Undetermined

Requirement 3 / 1

Involve Research, Development or Demonstration

A RIIO-1 NIA Project must have the potential to have a Direct Impact on a Network Licensee's network or the operations of the System Operator and involve the Research, Development, or Demonstration of at least one of the following (please tick which applies):

☐ A specific piece of new (i.e. unproven in GB, or where a method has been trialled outside GB the Network Licensee must justify repeating it as part of a project) equipment (including control and communications system software).

☐ A specific novel arrangement or application of existing licensee equipment (including control and/or communications systems and/or software)

☐ A specific novel operational practice directly related to the operation of the Network Licensees system

☐ A specific novel commercial arrangement

RIIO-2 Projects

☑ A specific piece of new equipment (including monitoring, control and communications systems and software)

☐ A specific piece of new technology (including analysis and modelling systems or software), in relation to which the Method is unproven

☐ A new methodology (including the identification of specific new procedures or techniques used to identify, select, process, and analyse information)

☐ A specific novel arrangement or application of existing gas transportation, electricity transmission or electricity distribution equipment, technology or methodology

☐ A specific novel operational practice directly related to the operation of the GB Gas Transportation System, electricity transmission or electricity distribution

☐ A specific novel commercial arrangement

Specific Requirements 4 / 2a

Please explain how the learning that will be generated could be used by the relevant Network Licensees

To ensure knowledge transfer and dissemination, the project can utilise various channels such as industry conferences, reports, webinars, and collaborative platforms to share findings, recommendations, and expertise with relevant gas networks and stakeholders. This collaborative approach fosters safety improvements across the gas industry, benefiting vulnerable communities nationwide.

Or, please describe what specific challenge identified in the Network Licensee's innovation strategy that is being addressed by the project (RIIO-1 only)

N/A

Is the default IPR position being applied?

☑ Yes

Project Eligibility Assessment Part 2

Not lead to unnecessary duplication

A Project must not lead to unnecessary duplication of any other Project, including but not limited to IFI, LCNF, NIA, NIC or SIF projects already registered, being carried out or completed.

Please demonstrate below that no unnecessary duplication will occur as a result of the Project.

There is no product readily available which uses Verbal communication and is only Carbon Monoxide

If applicable, justify why you are undertaking a Project similar to those being carried out by any other Network Licensees.

N/A

Additional Governance And Document Upload

Please identify why the project is innovative and has not been tried before

This project is innovative because it seeks to address a significant public health issue in a novel way by developing a verbal voice CO alarm that specifically caters to the needs of vulnerable populations. The project leverages advances in voice recognition and potential artificial intelligence technology to create an alarm that can communicate in plain language and provide clear and concise instructions to vulnerable individuals, who may have difficulty understanding or interpreting traditional beeping alarms.

Moreover, the project seeks to incorporate the insights and feedback of vulnerable communities into the development of the alarm, through an extensive research and engagement process. This inclusive approach ensures that the final product is not only technically advanced but also practical and effective for its intended users.

In addition, the project has the potential to wider adoption of the verbal voice CO alarm, not just among vulnerable populations but also in mainstream households, by highlighting the benefits of a more user-friendly and informative alarm system.

The project also demonstrates the potential of cross-sector collaboration, bringing together gas distribution networks, charities, and technology experts to address a pressing public health issue in a creative and innovative way.

Overall, this project offers a unique and innovative approach to improving the safety and well-being of vulnerable populations and has the potential to make a significant impact in reducing the incidence of CO poisoning in the UK and beyond.

Relevant Foreground IPR

Findings generated from the project will be available on the smarter network's portal and available upon request from the project partners

Data Access Details

Data and project information can be obtained by contacting the project managers

Please identify why the Network Licensees will not fund the project as apart of it's business and usual activities

The BAU activities within SGN do not scope development and manufacturing.

Please identify why the project can only be undertaken with the support of the NIA, including reference to the specific risks(e.g. commercial, technical, operational or regulatory) associated with the project

The NIA framework offers a robust, open framework to support this work and ensures the results are disseminated to all licenses.

This project has been approved by a senior member of staff

☑ Yes