

SIF Project Registration

Date of Submission

Jul 2023

Project Reference Number

10057788

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Project Title

EV Respond

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10057788

Project Licensee(s)

National Grid Electricity Distribution

Project Start

April 2023

Project Duration

3 Months

Nominated Project Contact(s)

Liza Troshka

Project Budget

£134,872.00

Project Summary

Provide a summary of your project and describe:

- how your project meets the aim of the specific SIF Innovation Challenge
- the energy network innovation involved
- an overview of the experience and capability to deliver their part of the project for each Project Partners or subcontractor
- the potential users of your innovation and how your project addresses their needs

You must download the Project Management Template and complete the Skills and Expertise tab. The Project Management Template must be uploaded in response to question 12.

This question covers Eligibility Criterion 1: Projects must address the Innovation Challenge set by Ofgem and Eligibility Criterion 6: Projects must include participation from a range of stakeholders as outlined in chapter 2 of the SIF Governance Document.

Third Party Collaborators

West Midlands Combined Authority

Centre for Energy Equality

Regen

Problem Being Solved

The supply of electricity is critically linked to health and wellbeing of energy consumers, with loss of supply having a severe impact on people's lives, particularly those living in vulnerable circumstances and with certain health conditions. Current measures involve deployment of diesel generators which are costly to deploy, carbon-emitting and take up time of DNO resources; preventing them from fixing the underlying course.

Project Approaches And Desired Outcomes

The Big Idea

The current energy supply crisis has shone an increasing light on vulnerability, in a way not imagined pre-pandemic. The supply of electricity is critically linked to health and wellbeing of energy consumers, with loss of supply having a severe impact on people's lives, particularly those living in vulnerable circumstances and with certain health conditions. And, with media heightened interest in blackouts, now is the time to investigate other forms of system resilience.

EV-Respond will provide a revolutionary new solution to this challenge that utilises the bidirectional charging capability of Electric Vehicles combined with a digital solution to facilitate a community led, rapid response service that safeguards households with individuals who have a critical reliance on their electricity supplies. It will enable individual EV-Owners and fleet operators, including distribution networks, to help reinstate the power supply for vulnerable people in close proximity.

EV-Respond will deliver extensive consumer, network and wider societal benefits.

- For consumers, EV-Respond will provide assurance their network and electricity supplies have a reliable back up system, and also create additional opportunities to use EVs for good.
- For distribution networks it will provide a low carbon, rapid response solution to power supply reinstatement as well as providing community-led resilience that could result in investment efficiencies.
- And, for society more widely the project will help stimulate the market for EVs and Vehicle to Grid technologies leading to an increased pace towards Net Zero, reduce healthcare costs associated power-loss incidents, and create new revenue generating opportunities for businesses and individuals.

The project will be delivered with the end users of the system at its heart, with the primary goal to help safeguard those who are most vulnerable to losing their electricity supply. Therefore during the project a Community Impact Panel (CIP) will be consulted consisting of people (or those who represent them) living in vulnerable situations. This input, along partners and customers of the service, will be used to develop the EV-Respond solution to ensure the widest network and societal impact.

The project will be delivered by a consortium of experts with representation from distribution networks, Local Authorities and a consumer representative company who also have extensive expertise in delivering challenging technical solutions for vulnerable customers.

Innovation Justification

The problem: The supply of electricity is critically linked to health and wellbeing of energy consumers, with loss of supply having a severe impact on people's lives, particularly those living in vulnerable circumstances and with certain health conditions. Current measures involve deployment of diesel generators which are costly to deploy, carbon-emitting and take up time of DNO resources; preventing them from fixing the underlying course.

Innovation: EV-Respond will provide a novel solution that utilises bidirectional charging technology combined with a digital solution to facilitate a community led, rapid response service that safeguards households with individuals who have a critical reliance on their electricity supplies. EV-Respond will also deliver innovation to enable networks to work with stakeholders and within communities to scale the solution's impact (see Appendix).

Gaps in current work: The use of bidirectional charging has not been used, at scale, for restoration of vulnerable household's energy supplies. There is also no solution that alerts people or organizations when a fault occurs and prioritises vulnerable customers so that a targeted response can occur.

However, there are projects that have investigated alternative solutions to restore power during outages. The Discovery project shall incorporate learning from these projects.

- Silent Power; this project is using vans with large batteries installed within them to help resupply community buildings as an alternative to diesel generators.
- Security of Supply for Vulnerable Customers (SSVC); has been carrying out work to understand how small electric power stations could support vulnerable people during power outages.

Value: The counterfactual solution uses diesel generators to resupply local substations whilst the network is fixed. EV-Respond would provide the following value in comparison:

- **Economic:** The solution would be cost effective as would use assets (EVs) already existing in communities and fleets. It would be more targeted and quicker to deploy, enabling network staff to focus on addressing the underlying cause.
- **Sustainability:** EVs are non-polluting, and the project would use assets already in existence (so better from resource consumption perspective). Being community led, much shorter distances would need to be travelled.

Funding justification: This is a novel idea that sits outside BAU activity. Bidirectional technologies are emerging and there are complex technical challenges to resolve. Consumer engagement will be key, particularly given that the solution may be targeted towards vulnerable customers. The project may also trial utilizing NGED fleet vehicles to provide response services which would be a shift from the BAU status quo.

Project Plans And Milestones

Project Plan And Milestones

Agile Approach: An agile approach will be taken to allow the project to adapt to changes in user preferences, technological developments and other uncertainties.

WP1: Consumer Research (20% expenditure. Delivery by CEE, WMCA, Regen and NGED): Consumer understanding and appetite is vital to this project and so we will work with stakeholders to understand how the response process would be implemented in practice, monitored and delivered safely. This will include direct consumer engagement via CEE's CIP and working with WMCA to understand how the solution would work in their community.

WP2: Technology Development (35% expenditure. Delivery by CEE and Regen): Research shall be conducted into viable bidirectional charging technologies, including information gathering from equipment suppliers. This will allow us to create a trajectory for the technologies required to allow EV-Respond scale. This will include further research into:

- Adapters for CHAdeMO charging connectors able to power individual loads such as dialysis machines.
- Methodologies for using the above adapters to connect to an entire home.
- CHAdeMO and CCS fast chargers for V2H.
- Vehicles that come supplied with bidirectional adapters.

WP3: Software Integration (25% expenditure. Delivery by CEE Lead with partner support): Consider the integrated response software required to facilitate response and supply reinstatement. Utilizing input from partners and the CIP to establish requirements and mock-up dashboards – ready for development in later stages.

WP4: Synthesis and CBA (20% expenditure. Delivery by all partners): Taking account of WP1-3, a view of different EV-Respond delivery models shall be considered, along with the associated costs. Demographic and geographic data shall be gathered and analysed to quantify the problem. This will then be fed into a high-level CBA that shall inform later project phases.

Deliverables/Success Criteria: The primary project deliverable will be a clearly structured report outlining the findings of each WP including options as to how EV-Respond would work in practice (technology and software), potential delivery models, a CBA and proposed next steps in Alpha/Beta and beyond.

Risks/Constraints: There are a variety of risks/constraints to be considered to maximise EV-Respond's impact. For example:

- Availability of stakeholders and the time available to deliver the program.
- Technology exists but will require new integration methodologies to work cost-effectively and at scale. Pace of adoption of EVs widely in society could constrain impact.
- Regulatory incentives may need to adapt to support the cost-benefit for stakeholders.

Route To Market

BAU adoption: EV-Respond will consider a range of stakeholder needs so that the final solution is as user friendly (particularly for vulnerable consumers) as possible, increasing the likelihood of adoption at scale.

Consortium partners will remain involved in the roll-out of the solution and intend to attract other partners in later project phases including vehicle manufacturers and charge point developers. We shall disseminate the solution widely, including production of marketing materials to raise awareness and scale BAU adoption rapidly.

Competition: This is a new solution that does not currently exist on the market and therefore wouldn't undermine competitive markets.

Responsibility for innovation: There are a range of stakeholders responsible for different aspects of the service. NGED have overall responsibility for the challenge associated with loss of electricity supply and are motivated to solve the challenge. WMCA have responsibility for safeguarding and care in their community of which EV-Respond will support. CEE will be the solution developer and owner and are therefore responsible for the technical solution development. All partners are committed to EV-Respond and scaling the solution to maximise impact.

Customer segment: The main customer segment for EV-Respond are distribution networks as they hold the responsibility for power restoration during faults. However, other customer segments may be found including care providers, Local Authorities, and private

networks.

Value proposition: EV-Respond will deliver efficiency savings, protection against fines and regulatory penalties, as well as reputational and social benefits. Exact benefits would be unique to specific organization's and customer segments but examples include:

Efficiencies gained in the amount of time it takes to respond to customers in need of supply

- Reinstatement (reduced customer minutes lost).
- Reducing penalties associated with loss of supply. For example, DNOs are fined £70 per household that suffers a loss of supply for over 48 hours and £70 more per additional 12 hours. Therefore, a village with 3000 houses off supply for 36 hours results in £630,000 in costs.
- Reduced legal cases and risk of fines associated with inability to safeguard energy consumers.
- Other stakeholders also have similar incentives. This wider value proposition will be investigated in WP4.

Funding strategy: We would intend to fund a large trial in later SIF phases. At this point we anticipate that a Minimum Viable Product would have been developed so that NGED can fund continuous improvements and scale-up via BAU mechanisms as we recognize the value proposition versus the existing counterfactual.

Costs

Total Project Costs

134872

SIF Funding

121384

This project has been approved by a senior member of staff

Yes