

Innovation Funding Service: FEEDBACK

Competition: Vehicle-to-everything (V2X) bi-directional charging Phase 1

Scope

Assessor 1

Whilst the project does not target development of V2X technologies, it does offer the potential to: * develop innovative V2X commercial propositions which differ from the grid services and business models demonstrated in the UK to date * improve the consumer experience of V2X operation and is therefore within scope of the competition.

Assessor 2

This application is in scope.

Assessor 3

The purpose of this project is to build resilience amongst rural communities by demonstrating the capability of V2X technologies. The aim is investigate the barriers and challenges that could increase the deployment and uptake of V2X technology amongst such communities. Given the climatic changes, the need to build resilience amongst such communities is likely to increase.

Assessor 4

The project scope needs to be better defined but it could be seen to enable new bi-directional services.

Assessor 5

The proposal will investigate the potential benefits of an enhanced digital product to improve efficiency in energy management. If successful the proposers are well placed to exploit the IP generated in improving current the provision in the market.

Need of Challenge

Assessor 1

The primary project objective is to improve power system resilience to grid outages. Integration of other renewables and storage systems is mentioned. The potential to develop and expand a business model based upon this project is described. This is an interesting vision that could lead / support a "green transition" within rural areas, though research regarding other UK and funded projects including existing V2G and grid resilience projects are not discussed.

Assessor 2

The project, its value and the outputs are not clearly described. There isn't a strong connection between the events that took place (such as the power cut) and how this project is planning to address this. The business opportunity in relation to the project is also not well defined.

Assessor 3

This project aims to address the market opportunity by researching and developing business models suitable for small dwellings. It aims to explore business models for a rural community that would be scalable. This is a really exciting area to explore. However, it would be helpful to understand the financial and social impact of loss of power on the community, and also to explore a number of different energy configurations, including battery storage, community power hubs, wind and solar capabilities, in order to identify potential business opportunities.

Assessor 4

The need to service remote and rural communities and potential utilise more renewable energy and be less likely to face power outages is a worthwhile motivation. Clarification around if this solution would facilitate off-grid, grid connected or a mixture.

Assessor 5

the overview provided by the proposer identifies the particular challenges facing certain communities and also gives an indication of the possible solutions that could support them to benefit more from renewable and low carbon energy. further quantification of the scale of the issue and further estimation of the potential scale of improvement that the proposed solution could offer would provide further context.

Approach and Innovation

Assessor 1

The approach described suggests connecting EVs to homes that have lost power. The proposed development appears to be limited to a software package. No specifics of what system components are required or how they will integrate with the existing infrastructure is provided. The applicants clearly wish to support grid independence during power loss, but no information is provided to indicate how this might be achieved. the opportunity to provide further information within an appendix has not been taken.

Assessor 2

While the narrative is broadly understood, the approach is not very clear so are the project outputs. It is not clear how the V2X tech can increase resilience and provide support in the case of a power cut. The details of this project are not provided in this section.

Assessor 3

The education elements and impact assessment are interesting. A software package to register connected EVs to homes that have lost power and broadcasting the need for power to EVs who want to help is novel but not particularly innovative. For example, a vehicle may come to a home to help, but then needs to stay unless the home has battery storage.

Assessor 4

Additional information on the software package to be developed is needed, the attachment is a good opportunity to provide further information. Understanding if the houses without power are grid connected or off grid as there are potential issues of connecting a bi-directional charger in certain situations.

Assessor 5

the proposal describes the purpose of the product and gives an indication of the direct benefits to individual customers and their communities. however also indicating where existing IP and other platforms are being utilised. the specific innovative aspects of the project need to be clearly defined and appropriate methods and standards to assess their performance also stated.

Team and Resources

Assessor 1

The project appears to have a degree of support within the local community. The core team led by Moxie Energy appears to lack relevant experience in power grid / automotive / EV / charging / V2x technologies. There is clearly a desire for this project to succeed, but the team would need to acquire skills in these areas before proceeding. DNO involvement is not mentioned. A vehicle fleet and chargers are proposed to support this project. The route to supplying these vehicles is not clearly funded and the technology challenges presented by lack of CCS V2G support is not discussed.

Assessor 2

It would have been helpful if the roles within the team were identified as it is not clear how some of the individual's backgrounds are relevant and assigned to the project. The applicant mentions that they need to lease 25 electric cars and purchase 25 bi-directional charges. However, it is not clear how these will be sourced and financed within the timescales of the project.

Assessor 3

The team needs energy expertise as a core component. I suspect that part of the business case may be offering grid flexibility when vehicles are not supporting communities. Energy experts and data scientists will be needed to demonstrate the business model.

Assessor 4

The team is missing some significant experience in EV area and software development. Additionally given community engagement is a key part of this experience in community projects would be helpful.

Assessor 5

the team includes a number of staff with significant technical and commercial expertise which aligns with the needs of the project. collectively the team is strong and should be able to compete the project successfully. further specific input is needed from stakeholder representatives from the marketplace to help steer and inform the focus of the project to ensure it addresses the specific needs of the future customer base.

Market Awareness

Assessor 1

The applicants describe rural communities as their potential market and the scale of rural communities globally as 1.1 billion people. The route to accessing these local and global markets is not discussed. No estimates are made of the revenue potential of these markets or the scale of the addressable market.

Assessor 2

The applicant is targeting rural communities. Within the rural environment, it would have been necessary to identify the market and the key clients (whether this is the direct consumers or local government and communities). Some market segmentation should have been also provided.

Assessor 3

Rural microgrids are already being deployed in global settings. What is potentially very interesting about this project is the deployment of a microgrid in a rural setting to support resilience and enhance grid flexibility. If there were proven business models, the market in the UK alone would be significant.

Assessor 4

The potential for microgrids globally is potentially large and EVs could play a role in this. However the UK focus is not clearly linked to the use case. Refining the project goals would help better define the market.

Assessor 5

the proposal includes a clear description of the potential communities who may benefit from this product but additional data is also needed to illustrate the current revenue scale and anticipated growth of equivalent products and services which this project will inform and/or compete with in terms of the development of disruptive approaches to service provision.

Outcomes and Route to Market

Assessor 1

Northern Power Grid is proposed as an initial target customer, though as the local DNO they also for an essential part of the implementation of the project. DNO awareness of the project is not mentioned. The value proposition to Northern Power Grid is unclear. Growth through the increased sale of frequency regulation services is mentioned, but this is only one service V2g can support and the core objective of grid replacement during power failure is not mentioned here. Revenue forecasts and employee increases as a result of growth are not described.

Assessor 2

It would have been very helpful to identify what the business strategy is and the role of Moxie Energy Group within this strategy. It is not clear what the product is as there is very little information about the technical and commercial details of this project

Assessor 3

There is little about the value proposition. The target customer is named, but other DNOs may also be potential customers. And this may be a service that is offered to DNOs, run separately. More thought is needed about the service proposition.

Assessor 4

There are very broad benefits and potential outcomes that are listed here, linking them more to the project scope and outputs as it is quite a generic list.

Assessor 5

the proposal describes the current status of the business and also the planned route to develop a viable commercial offering. this is clear and target customers are indicated. further details of how this might compare with other community energy provision products and services and what the gap between current practice is and developing appropriate buy in to implement this approach. further indication of the scale of revenue and profit that is anticipated over the first 5 years of operation should be included to illustrate the ambitions on business size.

Wider Impacts

Assessor 1

Some convincing arguments are made for the wider benefit this project could generate. Increases in EV take up, accelerating the transition to carbon neutrality is a key benefit for the nation, and the potential to reduce electricity costs and improve resilience are key benefits for the consumer. Regional benefits to the North East are mentioned, though it's less clear how these benefits will be realised. Supply chain jobs and local revenues are not estimated.

Assessor 2

There is a broad range of benefits identified. However, these lack detail and relevance to the proposed application.

Assessor 3

These are all good reasons. I would like to add that the project also has a social impact - by keeping elderly people warm, for example.

Assessor 4

There are some really positive potential impacts that could help communities and the environment, however the link between these and the project are unclear due to the broad and unclear project scope.

Assessor 5

the proposal does provide description of a range of potential wider impacts that could be achieved covering economic and environmental aspects. further details and quantification of the anticipated scale of improvement that can be achieved, either in carbon or other resource savings and also revenue/job increases in the supply chain. further details of the advancement of knowledge and understanding in the research community as a consequence of this work should also be described.

Project Management

Assessor 1

Four work packages are described and approximate costings provided. These work packages do not seem to reflect well the work content. For example the setup and planning package includes hardware installation. It also represents two thirds of the project cost. The Gantt chart provided an overview of tasks, however many of these are non-specific such as "Begin early-stage data analysis". It is difficult to see how the project can be controlled from a non specific plan without deliverables. No detailed information is provided around how the project will be managed.

Assessor 2

The work packages are provided (within a Gantt Chart which is the only place within this application where the project is described in some detail). It is not clear what the key objective is and what the output from this R&D will be.

Assessor 3

Much of the project spending is on vehicles and chargers. It is not clear why a smaller pilot may be better, using with a selection of microgrid arrangements and data scientists assessing the value of flexibility, in order to understand the best business case..

Assessor 4

The details of the work packages are not detailed enough, SMART goals (Specific, Measurable, Achievable, Relevant, and Time-Bound) can be a helpful way to develop work plans. Better defined costing would be expected.

Assessor 5

the overall approach to project management that will be adopted is stated and also an overview of the main phases or work described. the attached chart indicates the individual tasks and the timescales to complete them. further details of the work content of each task, including specific experimental methods that will be deployed should be included to provide insight of the scale of work and the level of detail. further indication of the interdependencies of tasks should be included.

Risks

Assessor 1

A list of potential risks has been provided and some effort has been taken to estimate the likelihood and severity of the risks, though this is presented in an unconventional and difficult to interpret way. Technical risks in general and those associated with the selection and integration of suitable home V2x charging hardware and how it can be controlled to match the objectives of the project in particular are not considered. The software development, which was the primary product of the project is not mentioned.

Assessor 2

The project seems to be very uncertain at this point and there are quite a few critical risks. Mitigation measures are unlikely to be sufficient.

Assessor 3

I believe lack of energy expertise, data science expertise and business value proposition expertise on the project are the main risks. I think the lack of a business proposition may be the highest risk of the overall endeavour, but I suspect and hope there could be a winning solution.

Assessor 4

There are some major risks not included in the attachment, particularly undefined scope, potential solution encouraging people to driving in storms/extreme weather.

Assessor 5

the proposal includes a summary of the overall risk management approach that will be adopted. there is also a risk register which illustrates the relative scale of impact vs likelihood for each individual risk. however, further details are needed to explain how each risk will be mitigated and how this will affect the position of each risk in the grid.

Added Value

Assessor 1

It is clear that public funding will enhance the profile of this project and support this local community in particular. However it's not made clear what will happen to the project without Innovate UK support. One other source of public funding is mentioned, but the result of this is not made clear. Conventional funding through loans or external investment is not discussed in any detail.

Assessor 2

The applicant describes the impact of funding. It would have been helpful to describe why it cannot be funded by themselves and whether other sources of funding is explored.

Assessor 3

The company is new and funding would give other investors more trust in the activities. However, the project needs to develop a highly innovative service or product and bring in the expertise that is needed to do so.

Assessor 4

The community focus is positive however the scope needs to be tightened and value demonstrated more in order to justify public funding.

Assessor 5

the proposal indicates the need for additional funds by the SME proposer to be able to access appropriate levels of additional resources and expertise to complete the work programme. the proposal does state that other funding sources have been considered. further details of options to share the costs with new potential partners should be considered and included.

Costs and value for money

Assessor 1

Edinburgh Innovations, YKGD and Sean Matterson appear to be providing there services for no / low cost, though the actual work content for each of these partners is not clear. Moxie appears to be providing 1 full time staff. This does not appear to be enough to support this scale of project. A £100k budget is set aside for bi directional chargers, though no details have been provided as to the source of these components or the cost. Moxie is showing a £128k overhead cost. This is simply not credible for an SME, should be 20%, i.e. £8k.

Assessor 2

There is no breakdown of costs and the funds allocated to the subcontractors do not seem to be sufficient.

Assessor 3

Most of the funding is on vehicles and chargers. Money would be better spent on a smaller pilot, and investment in expertise to build a business and value proposition. However, there could be potential in this area.

Assessor 4

The project costs are not well justified or explained. Sean Michael Matheson rate per day is too low and other partners don't have costs allocated. Additionally justification of the 25 bi-directional charges is needed, could the information not be ascertained with a smaller group of households. There is also a significant amount of money going towards marketing, including a 20k subcontract. More information on this is needed as the focus should be R&D not marketing.

Assessor 5

the stated overall cost is within scope but further details are needed to assess if this is appropriate to the work programme described. an indication of the split between manpower vis external costs including materials and/or specialist services should b included. an indication of the scale of growth of revenue and profit will support an assessment of the return on investment.

Overall

Assessor 1

The purpose of the project and desires of the project team are admirable. Providing grid resilience to a local community and the prototyping of a model that can be rolled out across the UK and globally is clearly a great objective. Unfortunately the proposal does not demonstrate a clear route through to designing or implementing such a system and appears to be missing many of the skills and engineering capabilities required to deliver it.

Assessor 2

This application is very confusing. It is not clear what is actually proposed and what is likely to be achieved by the end of this project. The approach and the technical details are not provided (Gantt Chart is the only information). All other details such as the project costs, the team and the wider stakeholders, and the route to the market are not clear at all and most importantly the value proposition is not provided in any detail.

Assessor 3

This project aims to explore using v2X technologies to make rural communities more resilient to power outages. It is difficult to understand the value proposition. There may be a service using microgrid technology of which V2X is a part but this would need energy, data science and business expertise on the project in order to explore what is viable. I suspect that some gains would be made by offering flexibility to the grid as part of the proposition. In summary, this is an exciting area but a wider set of team expertise is needed to identify a value proposition.

Assessor 4

The project scope needs to be better defined as it is has elements of a pilot, software development or community research project mentioned in different parts of the application.



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The potential for bi-directional services to assist in remote areas or critical situations is potential worthwhile to explore but the application hasn't demonstrated a good understanding of the issue (e.g. is it off grid or on grid) or the solution (what is the main goal).

Defining these will help with other sections of the application.

Assessor 5

The proposal describes the development of an innovative system to support the optimisation of energy use and uptake in community level provision. the team are experienced and have a clear view on the route to market. further details to indicate the estimated business opportunity and anticipated profit growth should be included.