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NIA Project Registration and PEA Document

Date of Submission

Oct 2020

Project Reference Number

NIA_SSEN_0049

Project Registration

Project Title

Equal Electric Vehicles

Project Reference Number

NIA_SSEN_0049

Project Licensee(s)

Scottish and Southern Electricity Networks Distribution

Project Start

October 2020

Project Duration

1 year and 7 months

Nominated Project Contact(s)

Project Manager – Kate L Jones

Project Budget

£345,000.00

Summary

Disabled motorists are often overlooked with regards to EV charging. There is a need to investigate and understand the enablers for both public and domestic charging solutions, not just for drivers with a disability but also for a wider range of potentially vulnerable customers such as elderly people or those with chronic illnesses.

Third Party Collaborators

Impact Research

Nominated Contact Email Address(es)

fnp.pmo@sse.com

Problem Being Solved

There are over 2.3 million disabled parking badge holders in the UK, with approximately 630,000 vehicles registered through the Motability Scheme - a scheme focussed on vehicle leasing for motorists with disabilities and their carers. A typical journey distance for these vehicles is less than 20 miles per day.

The Motability Scheme already offers a variety of electric vehicles (EVs), but uptake remains low as a result of the unique barriers that are faced by disabled drivers trying to embrace EVs. For example, parking bays for people with disabilities are often not equipped with EV charge points that are appropriate for use by these drivers and the user experience of plugging in heavy, trailing charging cables can make charging almost prohibitive. Charge points are often located in difficult to access areas and even when in the right location are typically bulky and awkward to navigate around – particularly where protection bollards have been installed, multiple EV chargers are situated together, or through trailing charging cables from the charger itself, or from other connected vehicles.

Disabled motorists are often overlooked with regards to EV charging. There is a need to investigate and understand the enablers for both public and domestic charging solutions, not just for drivers with a disability but also for a wider range of potentially vulnerable customers such as elderly people or those with chronic illnesses. This may need to consider not just the charging points but also the surrounding infrastructure such as toilets, places to eat etc which may require more capacity on the network. In addition, the driving and

charging behaviours of disabled and otherwise vulnerable drivers warrants investigation whilst considering a range of scenarios such as off-street parking, communal parking for flats, public and on-street charging to develop solutions based on individual's specific needs, especially if there is a reliance on electricity for mobility.

SSEN will work together with Connected Kerb, a car Original Equipment Manufacturer (OEM) and disabled motorist groups to perform an initial feasibility study to understand the requirements and the barriers for disabled and vulnerable motorists adopting EVs and deliver recommendations to remove the barriers and ensure anyone with a disability or who is vulnerable in other respects has the confidence to switch to driving an EV.

It is recognised that a wireless charging solution simplifies the charging process, removing the need for handling heavy cables or plugging into difficult to access infrastructure. Wireless charging technology for passenger vehicles is still maturing but could offer a more convenient user experience. The electricity connection demand required for wireless charging is significantly higher than a regular EV charger. This project will test and trial a solution to work through the challenges from car manufacturer to charger provider to network connection to understand the different stages.

Furthermore, as we transition to low carbon technology which rely heavily on electricity, customers on our Priority Service Register (PSR) may have new resilience requirements around their electricity supply. This project presents an opportunity to understand how the services that Distribution Network Operators (DNOs) offer may need to adapt to take into account customers who could become vulnerable because of the inability to use transport when needed, perhaps due to supply interruptions. The project will also help us understand what extra support and protections these customers may need, such as home resilience to support them during power outages. The technical aspects of data sharing between DNOs and third party groups such as disabled groups will need to be understood so that customers are offered appropriate support. One option would be to explore Vehicle to Grid (V2G) technology which could give an added benefit for vulnerable customers switching to EVs by powering their properties and heating/medical equipment until power is restored. The project will explore how the systems would communicate between OEMs and DNOs to ensure EVs could respond to a signal from a DNO to provide the necessary resilience.

Method(s)

The method will follow the stages outlined below and at the end of each stage a decision will be made based on costs, funding availability and viability of technology whether to continue with the project.

Stage 1 – Feasibility Study

The project will investigate and understand the enablers and barriers for drivers with disabilities and those that are vulnerable adopting EVs. A focus group of industry experts will be set up to understand the challenges faced. Regional data from our PSR will be used to understand the most affected areas in SSEN's region and a report will be produced to highlight the challenges, outline the charging behaviours and produce recommendations for traditional and innovative solutions to resolve these. There will be no personal data used, stored or shared.

Stage 2 – Solution Development

The outputs from stage 1 will inform this stage but this stage will include:

- developing and testing a wireless charging solution.
- Understanding changes to or new services and support required for those that may become vulnerable when reliant on electricity for transport. Including if there is opportunities to share data between DNOs, OEMs and third parties including disabled groups which may enhance any support or services. This will specifically include investigating the potential for a V2G resilience package, and will understand the systems interactions between OEMs and DNOs to facilitate resilience in the face of network outages.

Stage 3 – Cost Benefit Analysis

Stage 1 and 2 will provide an overview of the challenges and the options for potential solutions, this stage will produce a cost benefit analysis to indicate investment necessary for the wider roll out for each solution.

Stage 4 – Closure

Over the duration of the project learning and knowledge will be shared via social media and other appropriate means. Finally, on conclusion of the project dissemination events for local and national stakeholders, as well as network licensees will be held.

Scope

The scope of the project is to carry out an initial desktop study of the enablers and barriers for disabled motorists as well as differences in charging behaviour. The project will recommend and develop an innovative solution to overcome challenges including trialling wireless charging technology. This project will also investigate the changes and new support and services to be offered to vulnerable customers by DNO.

Objective(s)

1 Identify the enablers and barriers for EV adoption for drivers with disabilities, along with recommending traditional and innovation solutions for making EV and EV infrastructure more accessible.

- 2 Trial the use of wireless EV charging solutions to consider contactless charging for disabled and otherwise vulnerable customers.
- 3 Investigate V2G technology for offering at-home resilience for vulnerable customers.
- 4 Explore how the services that DNOs offer need to adapt to support vulnerable customers adopting EVs.
- 5 Explore how best to data share between DNOs, OEMS and organisations like mobility to facilitate vulnerable customer's needs.
- 6 Develop a cost benefit analysis to understand the viability of wider roll out and adoption of innovative solutions.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

If the project delivers the anticipated learning to GB stakeholders, then it is deemed successful.

Project Partners and External Funding

Connected Kerb

Funding could be provided from a third party to develop wireless charging infrastructure in Stage 2. All stakeholders have significant knowledge and experience in their respective areas, which will help to ensure that the device is relevant and reflective of the requirements of the project.

Potential for New Learning

1. A better understanding of challenges and behaviours of people with disabilities who drive an EV.
2. Improved understanding of impacts on the network, connections and car manufacturers from the use of wireless charging.
3. Understanding data sharing opportunities to improve PSR services.

Scale of Project

This medium-scale project will, over 18 months, start with an initial feasibility study to understand the scale of the issue, followed by a trial of innovative charging solution and final report to understand future PSR services as well as cost benefit analysis for wider roll out of solution. A smaller scale project would not allow a trial to take place.

Technology Readiness at Start

TRL4 Bench Scale Research

Technology Readiness at End

TRL7 Inactive Commissioning

Geographical Area

The desktop study will be UK wide focussed with any trials taking place in SSEN's North and South distribution areas.

Revenue Allowed for the RIIO Settlement

n/a

Indicative Total NIA Project Expenditure

The total expenditure expected from the project is £345,000. 90% of which is allowable NIA Expenditure (£310,500).

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:

n/a

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)

The project will produce a cost benefit analysis to understand this.

Please provide a calculation of the expected benefits the Solution

The calculation is not required for a research project.

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

This is a challenge for all GB DNOs, so this could be replicated across the whole of GB.

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

The project will produce a cost benefit analysis to understand this.

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

The outcomes from the project will be directly relevant to other network licensees as they look to address decarbonisation and equality for all drivers.

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

- Has the Potential to Develop Learning That Can be Applied by all Relevant Network Licensees

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.

The Energy Networks Association portal has been checked to confirm there is no duplication.

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

The project will understand all barriers for EV adoption for disabled motorists from car manufacturer to infrastructure to electricity network connection to develop an informed solution to ensure motorists with disabilities have the option to consider an EV.

Relevant Foreground IPR

n/a

Data Access Details

n/a

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

The scale of the challenge is not yet known and the types of solutions are unproven and need to be better developed and understood to be introduced as business as usual.

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

EV uptake is low in the disabled mobility schemes. This emerging stakeholder group may potentially need additional support to ensure

that network considerations do not prevent a transition to electric vehicles in the future. The project's outputs will help understand the specific requirements for disabled motorists and develop an understanding of how possible solutions may impact on the network in future.

This project has been approved by a senior member of staff

Yes