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NIA Project Registration and PEA Document

Date of Submission

Dec 2020

Project Reference Number

NIA_WPD_056

Project Registration

Project Title

Temporary Event Charging

Project Reference Number

NIA_WPD_056

Project Licensee(s)

National Grid Electricity Distribution

Project Start

December 2020

Project Duration

0 years and 11 months

Nominated Project Contact(s)

Ryan Huxtable

Project Budget

£117,923.32

Summary

Temporary events, including festivals and sporting events, attract a large number of attendees each year, with a large proportion of these attendees needing to travel by car due to the limited travel infrastructure available in rural areas. As the number of electric vehicles (EVs) increases in line with government targets to decarbonise transport there will be a need for significant charging capacity at these events. Currently events provide limited charging points and existing charging methods include utilisation of diesel generation or making permanent network connections which is not economically viable for a short period of use.

This project will be a feasibility study consisting of designing solutions for charging EVs used to travel to events and assessing their feasibility for further trial and development. The study will consist of two work packages. The first of which will involve carrying out background research before defining case studies for development. The second will design and develop solutions to each case study and could include temporary network connections and battery storage. Cost benefit analysis (CBA) will be carried out to demonstrate the benefit of these solutions in comparison to traditional connection methods. The findings will be reported with recommendations made for a potential future trial.

The project will be primarily carried out by Connected Kerb. GHD will act as a technical advisor and WPD will provide input to ensure solutions are suitable for use on the distribution network.

Third Party Collaborators

Connected Kerb

GHD

Problem Being Solved

Temporary events, including festivals and sporting events, attract a large number of attendees each year, with a large proportion of these attendees needing to travel by car due to the limited travel infrastructure available in rural areas. Every year there are over 500 festivals across the UK which host 4.9 million festival goers. As the number of Electric Vehicles (EVs) increases in line with government targets to decarbonise transport there will be a need for significant charging capacity at these events. Currently events provide limited charging points and existing charging methods include utilisation of diesel generation or making permanent network connections which is not economically viable for a short period of use. Providing connections to these sites would come at a large cost

which would be split between the site owner and the distribution network operator (DNO) and its customers, therefore an alternative solution is required for this problem.

Method(s)

Temporary Event Charging is a feasibility study which will design solutions for charging the EVs used to travel to events and assess their feasibility for further trial and development. Scenarios where charging infrastructure would be required will be defined and solutions to these will be developed and could include temporary network connections and battery storage. This will be split across two work packages:

1. Site selection and case study development (4 months)

This work package will consist of identifying sites that require temporary charging solutions and investigating the solutions that may be suitable. These sites will make up case studies for later work and as such will need to include the existing and required site capacity, current charging infrastructure, potential temporary charging solutions, and other use cases for the solutions (e.g. visual and audio, concession stands, hospitality etc.).

The output of this work package will be a report that includes the background, case studies identified, charging solutions identified and a plan for case study analysis.

2. Case study analysis and designs (4 months)

This second work package will analyse the case studies outlined in the first work package and in doing so feed into the further development of solutions. The solutions will need to be agreed within WPD to ensure connections are compliant with WPD policy. Cost Benefit Analysis (CBA) will then be carried out with a focus on the saving for DNO customers who would have met a proportion of the traditional connection cost.

The output of this work package will be a report containing a high level design solution for each case study, reporting on how this will be coordinated with WPD policy, projected costs including cost benefits for DNOs and their customers, a summary of learning, and conclusions and recommendations.

Scope

The Temporary Event Charging project will develop solutions for charging EVs at scale at temporary events held in areas where there is a need for attendees to travel by car. The project will ensure that these solutions will be possible for use on the distribution network while providing cost benefit to the DNO and its customers, before making a recommendation on if a trial project would be suitable.

Objective(s)

This project is a feasibility study with the aim to improve knowledge on how to accommodate charging at temporary events, design solutions for charging at a range of events, determine the benefits of using temporary connections to achieve this and determine whether a demonstration project is appropriate.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

- A set of concept designs for providing temporary event charging at festivals for a number of case studies are presented.
- Capital costs are outlined for each design and this feeds into CBA in respect to DNOs and their customers.
- Benefits of making temporary connections over existing methods of connection or on site generation are presented.
- Outline of how solutions will fit within WPD policy and PSD practices is documented.
- A conclusion is given on whether a trial is suitable for temporary connection solutions.

Project Partners and External Funding

The project partners are Connected Kerb and GHD.

Potential for New Learning

This feasibility study will provide learning on how increasing demand for EV charging at temporary events can be met without the need for significant network reinforcement costs or the use of fossil fueled generation. The case studies presented will demonstrate a range of scenarios and designs which will be applicable across all DNO license areas and represent a range of event types and scales. Learning will also include the cost benefits to the DNO and its customers of using temporary charging solutions when compared to making traditional connections. If the result of this learning demonstrates value in the solutions developed this may lead on to a trial project.

Scale of Project

This project is a 10 month feasibility study with the aim to find use cases for event EV charging before creating and assessing temporary charging solutions to determine whether a demonstration project is appropriate. This is an appropriate scale at this stage

as the value of charging solutions needs to be proven before trials are carried out.

Technology Readiness at Start

TRL2 Invention and Research

Technology Readiness at End

TRL4 Bench Scale Research

Geographical Area

Areas in which large temporary events without existing means of connection to the network take place will be the areas studied within this work. Large events happen across all four WPD license areas with examples for consideration including Glastonbury in the South West and Download Festival in the East Midlands, exact geographical areas will be identified during this feasibility study project.

Revenue Allowed for the RIIO Settlement

N/A

Indicative Total NIA Project Expenditure

£106,130.99 of NIA funding will be used in the project.

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)

Financial savings can be seen by all DNO customers where a reduced cost temporary connection solution is found. As this is a research project financial benefits are an estimate. The financial benefit for each temporary connection is estimated at £0.66m, where a solution is expected to cost £0.3m after the trial stage instead of an estimated £0.96m substation and connection cost. CBA will be completed in the project and more detailed costs will become part of the project learning.

Please provide a calculation of the expected benefits the Solution

This project is a research project during which the financial benefits will be outlined during work package 2.

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

This method will be replicable across GB at events which are not permanent fixtures and therefore do not have permanent network connections. As an example over 500 music festivals happen annually and there will soon be the need for charging at all events. This can also be applied in other areas where a temporary increase in charging demand can be seen including tourist hot spots and city centres. This method could therefore be rolled out across the majority of the network licensees.

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

The cost of rolling this method out across GB will be demonstrated following the project.

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

RIO-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

This project will produce learning on EV charging solutions for temporary events including cost saving for DNOs and customers and high level design solutions. As temporary events take place across the whole of the UK these findings will be applicable for all distribution network licensees. The cost saving would be valid for all DNOs who would experience the same existing high connection cost and the designs agreed with WPD policy and PSD will be suitable for use on other networks. Any policy or standard techniques developed will be shared with other DNOs.

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

There are currently no NIA projects looking into the charging of electric vehicles at scale at temporary events.

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 will integrate electric vehicle charging points (EVCP) with the network via means of a new temporary connection methodology to avoid limited charging capacity and the need for diesel generation when charging EVs at temporary events. Temporary connections have never before been used for charging solutions.

Relevant Foreground IPR

n/a

Data Access Details

n/a

Please identify why the Network Licensees will not fund the project as part of its business and usual activities

The technology is a low TRL level and there is currently little information available without carrying out a feasibility study.

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

As the demand for EV charging at events increases DNOs will need to understand methods for providing connections on a temporary basis without the need for the high costs associated with making connections to the network. There is currently no suitable method available for charging solutions and there is therefore a low TRL applied to the project, therefore NIA is a suitable means of carrying out this feasibility study.

This project has been approved by a senior member of staff

Yes