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NIA Project Registration and PEA Document

Date of Submission

Jul 2019

Project Reference Number

NIA_SSEN_0038

Project Registration

Project Title

E Tourism

Project Reference Number

NIA_SSEN_0038

Project Licensee(s)

Scottish and Southern Electricity Networks Distribution

Project Start

July 2019

Project Duration

3 years and 3 months

Nominated Project Contact(s)

SSEN NIA Programme Delivery Manager –Colin Mathieson

Project Budget

£401,000.00

Summary

See problem statement

Third Party Collaborators

Element Energy

Nominated Contact Email Address(es)

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Problem Being Solved

Since 2010, tourism has been the fastest growing sector in the UK in employment terms. Britain is forecast to have a tourism industry worth over £257 billion by 2025 ([1] <https://www.visitbritain.org/visitor-economy-facts>), with nearly 38m overseas visitors having come to the UK in 2018. During the same period, Visit Britain indicate that there were nearly 11m domestic tourists. Many of these visitors will travel to the more remote parts of the country such as the Highlands of Scotland.

Due to limited public transport options, driving is the only viable means to visit many of Scotland's key attractions. Additionally, the Scottish Government have committed to phase out petrol and diesel cars and vans by 2032, eight years ahead of the rest of the UK. Therefore, electric vehicles (EVs), and the supporting charging infrastructure, will be critical to delivering this ambition.

The increase in EVs will result in significant peaks in demand during the tourist season, as visitors look to charge their vehicles, failure to provide the infrastructure will result in inconvenience, incidences of stranding and ultimately a negative economic impact.

Consequently, it is essential to better understand the scale, location and duration of this increased charging demand during tourist seasons, to allow appropriate actions to be developed and deployed to ensure network resilience and security whilst facilitating the continued growth of EVs and minimise damage to the tourism sector. In addition, there has also been limited development of local flexibility solutions to help manage network peaks.

This NIA project will develop a broad understanding of potential impacts of EV charging because of tourism and local EV use across the North of Scotland. This will be followed by an in-depth study of specific typical locations before considering a range of conventional and innovative actions to inform the need for future investment in Network, local flexibility, distributed generation and other innovative solutions.

The project will engage local communities to explore the development of new flexible solutions to help address any areas of constraint caused by EV charging. Furthermore, this may include options for improving resilience outside of the tourist season as customers become increasingly reliant on electricity for transport and heat.

Method(s)

This project will be carried out using a staged approach to bring together the learning from research, modelling, design and development phases to identify significant peaks in demand during the tourist season and where suitable, local flexible solutions which could be utilised and trialled as part of the project. The learnings from each stage will be used to inform the strategic investment required to ensure continued security and resilience of the network, whilst facilitating the continued growth of EVs.

The project will build on the existing work on Regional Energy Scenarios currently being undertaken by Regen and collaborating and consulting with stakeholders such as Transport for Scotland, Visit Scotland and local authorities. All these stakeholders have significant knowledge and experience in their respective areas.

The method will follow the stages outlined below:

Stage 1 – Research

This will be the initial plan for data requirements to understand current and future tourist growth, areas of significant tourist attractions and season traffic flows in the North of Scotland. The aim will be to develop understanding of potential EV vehicle flows based on current conventional vehicle movements. It will also be established which use cases will be investigated further, for example:

1. Journey starting points – where EVs will be collected/returned
2. Stopping points – where EVs will need to charge whilst tourists visit an attraction
3. Accommodation – where tourists will have overnight stays
4. Arterial Routes – flows of traffic between key hubs

Network data will be gathered to understand the current network status, capability and predicted future energy demands for each use case. This will be supported by SSEN Regional Scenario Modelling which will be delivered by Regen in Summer 2019 as part of a separate project.

Stage 2 – Modelling

Using the data gathered as part of Stage 1, the project will model this data to understand the impacts of EV charging against the agreed use cases. The model will provide a technical view for inclusion and analysis in system planning as well as visibility for external stakeholders to signpost potential issues. The model will identify which use cases highlight network constraints and therefore required to be focused on to maintain resilience particularly during the tourist season.

Stage 3 - Design and Development of local flexibility solutions

This stage will focus on identifying, through stakeholder workshops (such as local communities) and/or tendering exercises suitable flexibility solutions which will assist with any constraint issues identified as part of Stage 2 and meeting the increased demand identified as part of the modelling in stage 2. These solutions will add resilience to the network during the tourist season and winter.

Recommendations will be reported to highlight priorities (both conventional and innovative) for each specific use case and if appropriate, suitable local flexibility solutions and funding arrangements which may be trialled as part of this project will be identified.

Stage 4 - Trial of Local Flexibility Solution

The selected flexibility solution(s) methods will be developed and trialled where appropriate. A conclusion report will be developed to determine its success.

Stage 5 – Reporting on outputs / Dissemination

The final stage will consist of reporting of recommendations for each use case for the network strategic investment (both conventional and innovative methods) and final recommendations for local flexibility solutions to ensure security and resilience of the network, whilst facilitating the continued growth of EVs and the tourism sector. This report will contain guidance on the issues, methods and options for those authorities with responsibility for providing EV charging infrastructure. It will also provide the DNO community with recommendations on how the current connections process should be modified to support efficient delivery. The learning will be disseminated to local and national stakeholders, DNOs and Charge Point Providers.

Scope

The scope of the project is to carry out traffic flow and network modelling to understand the impact of EV charging. It will also design and develop a trial of specific network and local flexibility solutions to assist with security of electric supply to EV charging hubs to deal with highly seasonal charging peaks in the tourist season.

The geographical scope of the project will be a 'tourist route' suitably representative of the primary tourist routes.

The output will be proven through a modelling tool highlighting geographical areas of improvement calibrated against a real-life trial of a local flexibility solution(s).

The output of both the modelling tool and real-life trial of the flexible solution will feed into a report which captures all learnings and provides system planning with appropriate guidance of areas of focus for investment on the network. The method will be transferrable to other parts of the UK where the appropriate data is available.

Objective(s)

1. Understand how increased EV uptake and tourist patterns will impact seasonal peak demand on the network.
2. Identify the scale, location and duration of any increased charging demand broadly for the North of Scotland followed by an in-depth study of specific locations.
3. Enhance stakeholder engagement for helping local community groups, local authorities and other organisations to understand impacts of heightened EV tourism will have on local demand.
4. Identify suitable local flexible solutions to assist in demand management during seasonal peaks but also benefiting residents all year round. These solutions may extend beyond charge points only to options such as valet charging.
5. Inform investment strategies for network development based on expected impacts of EV uptake and tourist patterns.

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

The project will be run under the Strategic Partnership Agreement between Scottish Government, Scottish and Southern Electricity Networks and Scottish Power Energy Networks.

Potential for New Learning

The project will:

1. Identify the predicted load growth and seasonal demand associated with current and future electric vehicle tourism against suitable use case scenarios.
2. Highlight tourist hot spots where the network may be vulnerable.
3. Identify locations where traditional supply security may be inadequate during extreme events
4. Identify a series of options for local flexibility solutions which may also benefit local communities outside of the tourist season from a resilience perspective as well.
5. Establish replicable techniques for the above.

Scale of Project

The project is a small-scale sample-based study to investigate seasonal demands for EV in tourist hot spots, followed by development of innovative flexible solutions and an in-depth detailed plan for each tourist hot spot use case and a trial of suitable solutions.

Technology Readiness at Start

TRL3 Proof of Concept

Technology Readiness at End

TRL7 Inactive Commissioning

Geographical Area

Scottish Hydro Electric Power Distribution and Southern Electric Power Distribution network areas

Revenue Allowed for the RIIO Settlement

n/a

Indicative Total NIA Project Expenditure

The total expenditure expected from the project is £401,000. 90% (£360,900) of which is allowable NIA expenditure.

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)

E- tourism will help generate more granular data to enable more detailed understanding of future network and local business/authority investment requirements. This is essential to facilitate the wide spread adoption of EVs in GB in areas which are likely to see demand profiles which are different from those across the wider network due to the influence of high numbers of seasonal visitors. Previous innovation projects, such as SSENs My Electric Avenue, in addition to studies by the ENA suggest that significant network investment will be required between now and 2032. However, this figure could be significantly reduced through the use of innovative solutions, which can only be implemented with the improved availability of forecasting and modelling information.

Please provide a calculation of the expected benefits the Solution

Not required for first stage. Outputs of project will inform this.

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

This is a challenge for all UK 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 cost of rolling out will be determined by the success of the method and as a result the answer to this question will be an output from the project itself.

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

The learning from the project will be directly relevant and transferable to other license areas, which have large numbers of season visitors.

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.

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

To date there has been no GB projects which have looked to understand the impact on peak demand of high volumes of seasonal tourists driving electric vehicles in the remote areas. This project will be the first to develop that dataset as well investigating flexible solutions to ease network constraints during these times

Relevant Foreground IPR

n/a

Data Access Details

n/a

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

There is very limited understanding of the impact on peak demand caused by tourism related EV drivers in remote areas. There are a significant number of external factors which will influence any demand increase in demand, including local and national government policy , availability and uptake of EVs , overall growth in tourism and availability of accommodation. This is likely to result in demand patterns which are highly seasonal and potentially quite localized, therefore, are extremely difficult to predict using conventional techniques. Therefore, there is a high degree of uncertainty around the scale and location of any load growth due to e-tourism, given this uncertainty on the outcomes, it is appropriate that NIA is used to fund this project. If successful, this project will identify potentially innovative commercial solutions which will reduce the overall costs whilst facilitating the shift to a lower carbon economy.

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

There are a wide range of external factors which will influence the extent to which e-tourism related load growth will impact on the network. This includes government policy, availability and uptake of EVs and the overall growth in tourism in GB. There are new patterns of customer demand which need to be identified and studied to fully understand the scale, duration and location of any peaks in demand driven by tourists, these demand patterns are likely to be highly seasonal and localized and therefore, difficult to predict using established methods. These demand patterns will be driven by a wide range of external factors which will influence the nature of any EV charging infrastructure in these tourist areas, such are of public charging points, availability of charging at key hubs such as ferry ports or attractions and availability of charging at accommodation such as campsites. There are various stakeholders interested in how this EV charging infrastructure will be developed in these remote areas, which may result in new business models being developed, which will in turn impact of electrical demand, introducing further risk and uncertainty.

This project has been approved by a senior member of staff

Yes