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## NIA Project Registration and PEA Document

### Date of Submission

Nov 2022

### Project Reference Number

NIA\_UKPN0088

## Project Registration

### Project Title

Powercast

### Project Reference Number

NIA\_UKPN0088

### Project Licensee(s)

UK Power Networks

### Project Start

November 2022

### Project Duration

1 year and 4 months

### Nominated Project Contact(s)

innovation@ukpowernetworks.co.uk

### Project Budget

£274,725.00

## Summary

To support the increased uptake of low carbon technologies, it is very important that distributed network operators (DNOs) ensure their customers are supported through power cuts. The Powercast project aims to reduce customer detriment experienced during power cuts and explore use cases for openly sharing power cut data by partnering with [ev.Energy](#), a smart domestic EV charging platform, to provide notifications related to power cuts with tailored advice on how to get their EV charged for when they need it.

### Nominated Contact Email Address(es)

innovation@ukpowernetworks.co.uk

## Problem Being Solved

Over 200,000 of UK Power Network's customers rely on their electric vehicles (EV) being charged to get to work, school, hospital, shops etc. We forecast this number could increase to over 3.6m million customers by 2030. This makes these customers more vulnerable in the event of a power outage (planned or unplanned) which could prevent their vehicle from being charged and thus mean they are unable to travel. Extreme weather events in the UK, such as storms Ciara, Dennis and Eunice or the July 2022 heatwave are also becoming more common and threaten network reliability. The challenge is ensuring UK Power Networks' customers are [MP5] supported through unavoidable planned or unplanned power cuts as the uptake of low carbon technologies (LCTs) will make them even more reliant on the electricity network. There is a risk that UK Power Networks could be a barrier to switch to an EV if customers are unable to reliably charge their vehicles when they need it.

## Method(s)

The project will be carried out in partnership with ev.Energy, who have developed and operate a smart, cloud-based platform that automatically optimises domestic EV charging and work with energy suppliers and rapid charging networks. Powercast will engage

both vulnerable and typical customers with EVs who have domestic, off-street charge-points to inform them of planned power cuts and probability of outages due to adverse weather so they can plan their charging. This can reduce the detriment they experience during power outages by suggesting an alternative time and/or location to charge their car. Notifications will be tailored to customers, including vulnerable customers, by exploring options in the project trial to suggest specific locations based on frequently visited places and advice based on their profile and current location. Whilst the project focuses on customers with domestic, off-street charge points, the solution could have wider applicability in the future; for example, customers from any charging segment can benefit through notifications/advice provided by on-street charge-point operators, other LCT providers, satellite software navigation providers, and more.

All data used within this project is for the purposes described above, and therefore quality will be measured on this basis. The project will follow all data quality rules, logging, and prioritising issues as they arise in line with the approved methodology set out in our Enterprise Data Management Policy, which forms part of the UK Power Networks Integrated Management System.

Data quality will be measured across five dimensions where applicable:

- Accuracy
- Completeness
- Consistency
- Validity
- Uniqueness

Data quality rules for each of the appropriate data quality dimensions above will be set by the project, measuring them closely on a regular basis to identify quality issues.

Data quality issues will be logged in a central location and prioritised using an approved matrix which combines the importance of the issue, and the amount of data affected, this gives an indication of the issue's impact on the project and wider business, considering factors such as:

- The impact on the health and safety of the public and employees
- Whether it may result in a breach of our licence conditions or relevant regulations
- The impact on UK Power Networks' reputation
- The impact on our operations and efficiency
- The financial impact, including project delays and charges from external service providers

The project will then seek support for resolving the issues in priority order. All data and background information will be stored centrally and securely in a project specific Sharepoint folder or in our Enterprise Data Store if required by the wider business in accordance with data protection requirements.

## Scope

The scope will consist of the following stages:

The project partner will:

- Design customer experience based on user research and available input data
- Develop scalable technical solution for notifying customers for planned (typically no more than 6-8 hours in duration) and unplanned power cuts
- Recruit ev.Energy customers in UK Power Networks' areas with upcoming planned power cuts and test solution with up to 1,000 EV customers, including 100 vulnerable customers (based on ev.Energy's voluntary recruitment and processing of data on trial participants' vulnerability)
- Improve implementation based on customer feedback
- Publish full-scale notification solution to all ev.Energy customers in UK Power Networks' region

UK Power Networks will:

- Publish standalone Application Programming Interface (API) to enable other providers/suppliers to incorporate power cut data into their customer facing solutions

Phase 1 will deliver:

- User research and digital product design requirements

- Trial design
- Digital product development

Phase 2 will deliver:

- Trial, analysis, and reporting
- Standalone API power cut feed
- Final digital product with improvements based on trial

## Objective(s)

The objectives and outcomes of the Powercast project are:

1. Develop and deliver a standalone API providing unplanned and planned power cut data which third party providers/suppliers can incorporate into their software solutions
2. Develop, trial (with up to 1000 ev.Energy customers), and deliver a power cut notifications product by ev.Energy to all ev.Energy domestic customers in EPN, LPN, and SPN (up to 40,000).
3. Confirm trial participants affected by power cuts receive notification(s) with advice on how to get their vehicle charged for when they need it
4. Investigate and understand the customer journey for EV charging during power cuts and risk factors contributing to quality of life and stress around EV access.
5. Receive reports throughout the project outlining steps, findings, and lessons learned from the user research, notification product development and trial, API product development and documentation, and deployment of final products.

## Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

The expected effects of the Methods and Solutions upon consumers in vulnerable situations are summarised in the following table.

Potential Impact: Dwelling and location (possibly including tenure)

Initial Assessment: The solution being provided by UK Power Networks is an API (Application Programming Interface) providing access to real-time power cut data affecting the UK Power Networks region. Electric Vehicle service providers will use this data to notify their users of planned and unplanned power cuts and could provide bespoke services based on dwelling and location type. Although this is not currently scoped in this specific project.

Potential Impact: Energy technology and usage profiles (for example, heating technology used)

Initial Assessment: The project is targeting electric vehicle service providers who provide charging services through digital tools to electric vehicle owners who are subscribed. However, this could be broadened to any energy technology.

Potential Impact: Readiness for digital technology

Initial Assessment: The experience of services supplied to electric vehicle customers will vary from provider to provider. The electric vehicle service providers targeted by the project typically provide their services through digital tools either through a web site or mobile application or via email or SMS. There will be opportunity to offer specific experiences that cater for customers who are less digital ready but not in the scope of this project.

Potential Impact: Financial (for example, whether a household uses a prepayment meter)

Initial Assessment: There is little impact to vulnerable customers from a financial perspective.

Potential Impact: Personal and social factors (for example, households with disabilities and medical conditions, or which speak English as a foreign language)

Impact Assessment: The experience of services supplied to electric vehicle customers will vary from provider to provider. There will be opportunity to offer specific experiences that cater for notifications to be received in alternative languages or supporting visually impaired. Service providers could extend the services to make recommendations of alternative charging options that are personalised if they hold relevant personal information, such as disabilities or medical conditions.

## Success Criteria

The project will be deemed successful when we:

- Test solution with up to 1,000 EV customers (including 100 vulnerable customers) prior to deployment of standalone API
- Confirm trial participants affected by power cuts receive notification(s) with advice on how to get their vehicle charged for when they

need it

- Collect learnings from the trial to understand customer journey for EV charging during power cuts and risk factors contributing to quality of life and stress around EV charging access
- Collect learnings on how useful the tailored notifications were to EV customers
- Publish the standalone API for ev.Energy and other third-party organisations to utilise

## Project Partners and External Funding

ev.Energy are a project partner and providing solution design and testing. There is no additional external funding to this project at this stage.

## Potential for New Learning

The project will generate learnings on how openly sharing power cut data can enable third-parties to provide exceptional service to customers around their low carbon technologies. It will capture the barriers, limitations, and opportunities around incorporating power cut data into their own systems and solutions, as well as explore the risk factors and needs surrounding EV customers and their dependence on their vehicle.

The trial will be the first in GB to test effectiveness of sending both power cut notifications and behavioural nudge (advice on where/when to charge) notifications and could demonstrate the value of deploying this solution at significant scale (to all ev.Energy customers across UK Power Networks' regions).

The learnings will be disseminated through different channels including:

- Publication of clear and accessible reports on findings and development methodology
- Events with relevant stakeholders e.g. other DNO's, local charge-point operators, energy suppliers, local authorities to share learnings; and
- Publication of relevant and accessible information for other third parties to get involved and utilise power cut data.

## Scale of Project

The project will deliver a digital product to the project partner's customers who live in areas where UK Power Networks will be carrying out planned power cuts throughout the duration of the trial (no more than two months) in order to get results that are representative and reliable. The trial will consist of sending power cut notifications with advice to trial participants and performing post surveys on their experience with usefulness of notifications. The scale of research and engagement is necessary to test the validity of our findings.

## Technology Readiness at Start

TRL3 Proof of Concept

## Technology Readiness at End

TRL8 Active Commissioning

## Geographical Area

The project will cover all of UK Power Networks' license areas; Eastern Power Networks plc (EPN); London Power Networks plc (LPN); and, South Eastern Power Networks plc (SPN).

## Revenue Allowed for the RIIO Settlement

No revenue has been allowed in the RIIO-ED1 settlement for this project.

## Indicative Total NIA Project Expenditure

The total expenditure that UK Power Networks expects to incur for this project is £274,725 of which £249,750 will be recovered from NIA.

## 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:

Not applicable.

#### How the Project has potential to benefit consumer in vulnerable situations:

This project will enable customers in vulnerable circumstances to receive notifications related to planned and unplanned power cuts.

They will receive specific advice on how to get their EV charged based on their vulnerability circumstances and how reliant they are on their vehicle. The solution will also open the opportunity for carers for customers in vulnerable circumstances to sign up for these notifications on behalf of a vulnerable customer.

This project once rolled out has the potential to impact all customer types through the third parties who request access to power cut data to utilise in their customer facing solutions.

Furthermore, the communications made to users through EV service providers, like ev.Energy, will include information about the UK Power Networks Priority Services Register and highlight the benefits of being on that register.

### 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 estimated savings over the course of RIIO-ED1 and ED2 are £33k and £770k (NPV) respectively.

#### Please provide a calculation of the expected benefits the Solution

Cost: cost to deliver the project in 2022 = £268.19k

Benefits: (Avoidance of planned outage not carded calls) + (Reduction of EV calls related to No Supply Single Premise) + (Customer Service score improvement)

Net benefits: £470.4k

Avoidance of planned outage not carded calls (CMLs incurred) = calls per month \* 360 minutes outage duration

Reduction of EV calls related to No Supply Single Premise = calls per year \* (project partner customer base/UK Power Networks customer base) \* 10 minute call duration \* call handler hourly rate.

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

The method is replicable across GB. If the API feed is openly shared and demonstrated to effectively power the notification product, this could be replicated across all other DNO's to provide similar data for third parties to utilise. Standardisation would be necessary to reduce costs to users of the API feed.

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

Development costs of the API is the main consideration to openly sharing power cut data, £30k \* 5 DNO groups = £150k. This assumes that their power cut data is already in a form that can be shared via an API feed.

## 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

Phase 1 will help all DNOs understand what their customers utilise EVs for and how reliant they are on their vehicle, which in turn affects their customer experience during a power cut.

Phase 2 will provide evidence on how testing a digital product refined the requirements for the API feed and steps required to make the feed publicly available and useable.

### 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

### 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.**

A review of the ENA Smarter Networks Portal was undertaken and we have not found a similar project looking to demonstrate a use case for openly sharing power cut data in this manner. Specifically, there are no projects looking at providing tailored advice to customers on their LCTs at the time of a power cut and capturing their response to this advice both qualitatively and quantitatively.

**If applicable, justify why you are undertaking a Project similar to those being carried out by any other Network Licensees.**

Not applicable.

**Additional Governance And Document Upload**

**Please identify why the project is innovative and has not been tried before**

More and more customers will become reliant on the electricity network with the uptake of LCTs. Currently there is no notification system for power cuts and customers are required to call the DNO or visit the live online power cut map and sign up for SMS notifications. This project provides the opportunity for third parties to use the data UK Power Networks already have on planned and unplanned power cuts in real time to help their customers make better decisions and make them feel in better control of their lives.

**Relevant Foreground IPR**

The default IPR position will be applied. The Relevant Foreground IPR generated in the project will be the digital product developed and integrated into ev.Energy's existing product suit, an API feed for the network trials, and the reports and findings generated. The digital product will require the use of existing ev.Energy background IPR and API feed will require the use of existing UK Power Networks Background IPR.

**Data Access Details**

To view UK Power Networks' Innovation Data Sharing Policy, please visit [here](#).

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

This project involves the application of a technology that is not used in UK Power Networks as part of their business as usual activities. It involves research and trials and does not have certainty on its results.

**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**

The NIA funding will enable UK Power Networks to undertake a project which has technical and operational risks associated with it, in terms of a lack of certainty on results, in particular with regards to customer behaviour and response. In addition, UK Power Networks is working with a small supplier, for which there is a degree of commercial risk should their operations be affected for economic reasons.

**This project has been approved by a senior member of staff**

Yes