Notes on Completion: Please refer to the appropriate NIA Governance Document to assist in the completion of this form. The full completed submission should not exceed 6 pages in total.

NIA Project Registration and PEA Document

Date of Submission

Sep 2023

Project Reference Number

NIA_UKPN0092

Project Registration

Project Title

Spotlight

Project Reference Number

NIA_UKPN0092

Project Licensee(s)

UK Power Networks

Project Start

October 2023

Project Duration

2 years and 7 months

Nominated Project Contact(s)

Andrew Burton

Project Budget

£2,370,000.00

Summary

Spotlight addresses the challenge of identifying Priority Services Register (PSR), Fuel Poor (FP), and Leaving No One Behind (LNB) customers at a household level, surpassing current methods limited to high-level demographic trends. To do so, the project seeks to access data from sectors such as telecommunications and finance to enhance customer identification. Additionally, the project aims to optimise engagement strategies with PSR, FP, and LNB customers. By utilising data insights, it plans to enhance operational team interactions through effective engagement channel selection, tailored to various customer needs and vulnerability categories.

Third Party Collaborators

CK Delta

Nominated Contact Email Address(es)

innovation@ukpowernetworks.co.uk

Problem Being Solved

The UK government's Net Zero strategy aims to ensure a just and equitable transition for all members of society, ascertaining that costs are shared according to ability to pay, and benefits are distributed widely. At UK Power Networks, we have committed to being a force for good in the communities we serve by going beyond delivering a safe and reliable service at an affordable price and doing more to protect the environment and support the communities. This goal is articulated across our three strategic Consumer Vulnerability focus areas:

1. Increase the overall number of vulnerable customers on the Priority Services Register (PSR)

2. Support customers that are at risk of, or have already entered Fuel Poverty (FP) status

3. Identify and support customers at risk of being left behind in the energy transition (referred to as Leaving No one Behind or LNB)

These needs require a significant increase in identifying and supporting vulnerable customers, given factors such as rising costs, digital exclusion, and evolving vulnerabilities. Sectors such as retail and telecommunications have excelled in understanding customers, presenting an excellent opportunity for us to draw insights from them. Thus, an innovative data-driven solution is essential for UK Power Networks to optimise engagement and enhance customer support, aligning with the UK government's Net Zero strategy for a fair energy transition.

Method(s)

Method:

Spotlight will leverage data modelling and machine learning to identify vulnerable customers at a granular level. The project seeks to bring together existing data sources, and bring new ones, into a single platform. Once the data is integrated centrally, it will be processed to enable data driven approach to supporting vulnerable customers. The data models will be developed to be scalable to any future data which becomes available.

Spotlight's innovative approach involves advanced clustering, machine learning techniques, and a diverse range of datasets to create a unique classification system for identifying vulnerable customers and those at risk of vulnerability. With the potential for nationwide replication, the project will focus on significantly increasing the granularity of vulnerability data, aiming for household-level insight rather than the current LSOA-level information. The project will target three categories: PSR, FP, and LNB. Spotlight aims to utilise new data modelling methods which have already been partially validated in other industries such as retail, telecoms, and technology. Spotlight seeks to adapt and apply these methods specifically to address customer vulnerability requirements in the electricity distribution sector.

Spotlight will validate the household level data through customer engagement activities, focusing on different channels for maximum customer engagement and content messaging. This will feed back into the model to enable the inclusion of the preferred channel and messaging content for each customer based on specific demographic data.

Measurement Quality Statement:

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 Statement:

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

Scope:

The scope of Spotlight is focused on PSR, FP and LNB customer identification and engagement approach modelling across EPN, LPN and SPN. The scope of work is categorised into three key work packages (WP 1-3).

WP1: Data collection and preparation

Objective: Identify relevant data sources and collect necessary data for the solution development. This involves data cleaning, pre-processing, and integration to ensure data quality and consistency.

WP2: Model development, testing, validation, and enhancement

Objective: With an iterative and agile approach, the project will use various machine learning techniques to develop robust models for identifying vulnerable customers in PSR, FP, and LNB categories. It will also implement an efficient data-driven customer engagement channel.

Utilising a specialist behavioural science marketing agency, we will test different channels and content to further enhance the customer engagement channel implemented and suggest the most relevant messaging content to be used for those customers.

WP3: Documentation

Objective: Create documentation that outlines the requirements, design development process, methodologies, and functionalities of the solution.

Update March 2026: The project has been extended by two months at no additional cost. The total project duration is now 31 months, with the project finishing 30 April 2026. The reason for the extension is due to a small number of anomalies in the combined PSR registry data that brings together two PSR registers into one place that need to be resolved. This will ensure a complete register and will ensure measures are put in place to prevent a repeat of these issues. This will ensure the business is able to use the combined register with confidence upon handover.

Benefits:

This project will deliver substantial societal advantages for vulnerable customers, including reduced stress during outages, relief from financial debt, and a contribution to reduced carbon emissions through participation in the energy transition. Moreover, Spotlight will also depict the intersections amongst essential datasets that impact both established and emerging segments of consumer vulnerability. These insights will provide valuable guidance for addressing intricate tasks or challenges. Furthermore, current customers will also gain from this initiative, as adding them to the PSR program grants access to extra support during power interruptions, including a 24/7 helpline and proactive outage updates.

Objective(s)

The project objectives are to:

· Create a data pipeline for integrating data sources and maintaining ongoing data quality.

· Develop multiple clustering/classification models across various vulnerability definitions, including:

o Segmenting existing customers into vulnerability clusters

o Generating outputs like sets of potentially vulnerable customers for PSR, FP, and LNB categories.

o Creating data outputs for the engagement channel to prioritise customer engagement.

Visualise the models` outputs to enable data driven identification of PSR, FP and LNB customers and appropriate engagement channel.

Consumer Vulnerability Impact Assessment

In designing this project, we have considered customers in vulnerable circumstances, including those at risk of FP and being left behind the energy transition. We aim to improve the identification of vulnerable customers for the PSR by utilising advanced data analysis methods. Moreover, we strive to offer appropriate support to customers responding to the energy transition and optimise engagement channels for improved customer satisfaction. Addressing data quality challenges will have a positive impact on vulnerable customer sign-up to PSR.

Success Criteria

Project Success Evaluation:

1. Data Source Identification and Integration: Identify and integrate relevant data sources into UK Power Networks' centralised data store.

2. Model Validation and Performance Metrics: Attain the model accuracy rate agreed upon during the project's validation phase.

3. Data Quality and Model Performance:

· Ensure the integrated dataset meets high-quality standards by maintaining a data quality score in accordance with the project agreement.

· Ensure that the developed models proficiently identify vulnerable customers in the PSR, FP, and LNB categories with an accuracy rate in line with the project agreement.

4. Solution Implementation and Deployment:

· Facilitate a seamless user transition in accordance with the terms outlined in the project agreement.

Secure approval from the solution owner for the models and engagement mechanism as specified in the project agreement.

5. Solution Impact: Identify PSR, FP, and LNB customer volumes as outlined by the solution owner during the project.

Project Partners and External Funding

Spotlight is delivered in partnership with CKDelta and Social Change. CKDelta will contribute £150k to the project budget in kind as summarised below:

1. CKDelta Contribution of £110,000 in data engineering services – CKDelta will pay the cost of an additional data engineer (FTE) that is required on UK Power Networks' side to enable build of data services with the Enterprise Data team.

2. CKDelta will contribute with own resources for the activities required to build a comms and dissemination plan both during and upon closure of the project for a value equivalent to £40,000 (consisting of CKDelta's standard publication and marketing costs).

Potential for New Learning

Expected Key Outputs:

By the end of the project, Spotlight aims to produce below key outputs which will be disseminated effectively.

· Data Gap Analysis Presentation: Summary of data source identification.

· Informed Customer Engagement Strategies: Research methods such as A/B testing provide insights into user experience, particularly regarding engagement channels. This approach can offer valuable insights on effective message content and engagement channels, from e-commerce practices to evaluate vulnerable customers' responses.

· Enhanced Support for Vulnerable Customers Report: Report highlighting actionable understanding of vulnerable customers, successful FP efforts, and effective support during the energy transition.

Dissemination approach

The planned dissemination activities include:

· Engagement with stakeholders: UK Power Networks will actively engage with stakeholders such as local authorities (LAs) and other companies who may have access to data throughout the project.

· Online event and materials: Spotlight will host an online/in-person event, in collaboration with CKDelta, to share the project's outcomes. Dissemination materials will be shared as required.

· CKDelta's network: CKDelta will leverage its network and contacts to disseminate the outcomes of Spotlight, ensuring wide reach and impact.

UK Power Networks will look to share project successes and discoveries via its social media channels with the possibility of publishing external press media where appropriate.

Scale of Project

The scale of investment aligns with the project's multifaceted challenges and potential benefits. It addresses the necessity for granular insights in identifying vulnerable customers at the household level, a larger project is imperative. New data sources enhance accuracy. The project optimises engagement and employs data-driven approaches. Comprehensive scope, including versatile tool development, targeted engagement, research, and validation, ensures efficacy. Diverse datasets are crucial for detailed insights. The scale of the project is vital to identify and support vulnerable customers across all three CV pillars (PSR, FP and LNB). The scale also accounts for targeted customer engagement, research, and continuous A/B testing and content validation throughout the project. A smaller project would not provide the granular insights needed.

Technology Readiness at Start

TRL4 Bench Scale Research

Technology Readiness at End

TRL8 Active Commissioning

Geographical Area

Trial participants will be located within UK Power Networks' licence areas (Eastern Power Networks plc, London Power Networks plc and South Eastern Power Networks plc.). Exact locations for the customer engagement model testing are to be defined during the consumer research phase.

Revenue Allowed for the RIIO Settlement

No allowances were allowed in the RIIO settlement to address the specific issue targeted in this project as this is looking at addresses the challenge of identifying PSR, FP, and LNB customers at a household level, surpassing current methods limited to high-level demographic trends.

Indicative Total NIA Project Expenditure

The total expenditure that UK Power Networks expects to incur for this project is £2,131,984.80 from NIA funding.

Project Eligibility Assessment Part 1

Requirement 1

Facilitate the energy system transition and/or benefit consumers in vulnerable situations

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:

In designing this project, we have considered customers in vulnerable circumstances, including those at risk of FP and being left behind the energy transition. We aim to improve the identification of vulnerable customers for the PSR by utilising advanced data analysis methods. Adding customers to PSR has an associated value from simply being on the PSR. According to the SROI proxy bank, these values represent the reduced stress during the outage (£35 per customer) and PSR advice (£2 per customer). customer).

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

N/A

Please provide a calculation and/or description of the expected benefits of the solution

Societal Gains:

To estimate the societal benefits, we followed guidance from the SROI proxy bank, which considers factors such as the reduction in stress during an outage, resulting in an improved quality of life for customers. Additionally, being added to PSR brings associated value, including reduced outage-related stress (£35 per customer) and PSR advice (£2 per customer).

Furthermore, our estimation takes into account various factors such as success rate, optimal bias, and attrition factors, as per the guidelines outlined in the "RIIO-ED2 Consumer Vulnerability Incentive Social Return on Investment Rulebook". These factors, combined with key assumptions, particularly the identification of eligible PSR participants, contribute to our estimated social benefits. The estimated societal benefits amount to £1.36 million.

Additionally, we conducted an SROI analysis, which estimated the social return on investment. This analysis is rooted in the model, which combines existing PSR data with proprietary data. These assumptions will be subject to validation during the project.

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

The project will consider standardisation of data sources that are largely available nationwide to deliberately improve the opportunity to reapply the learning of this project industry and nation-wide in UK. This could be rolled out to all licence areas, as all licenced network operators have a vulnerable and disadvantaged customer base.

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

The annual method costs for GB scale are in the order of £4m.

Requirement 3 / 1

Involve Research, Development or Demonstration

Projects 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

Involve Research, Development or Demonstration - Please select all that apply

☐ 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

n/a

The project aims to develop a distinctive classification system to identify vulnerable customers and those at risk, potentially at a household level. Insights gained from Data Gap Analysis and A/B testing and message content will enhance support for vulnerable customers, offering actionable insights into their needs, successful engagement strategies, and effective assistance during the energy transition. These advancements will pave the way for innovative commercial arrangements, support solutions, and resource allocation, fostering a fair and inclusive journey towards achieving net-zero emissions.

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. Networks must explicitly mention similar projects that they have considered and how these differ.

Please demonstrate below that no unnecessary duplication will occur as a result of the Project.

Spotlight's innovative methodology has not been used before and therefore will not result in any duplication. Spotlight focuses on comprehensive identification of vulnerable customers addresses emerging challenges like increased living costs, digital exclusion, and higher energy expenses. By employing advanced techniques including clustering, machine learning, and diverse datasets, we're building an advanced vulnerability classification system. Unlike current LSOA-level data, our approach provides household-level insights. This enables a substantial leap in identifying and supporting vulnerable customers across the UK.

It's worth noting a project known as National Grid's project VENICE (Vulnerability and Energy Networks, Identification and Customer Evaluation), has focussed primarily on assessing the impact on the network and customer behaviours, mainly due to the pandemic, with some consideration for the cost-of-living crisis. We intend to incorporate all the valuable lessons learned from the project VENICE to ensure that our efforts complement rather than duplicate existing initiatives.

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

We are aware of other initiatives which attempt to identify vulnerable customers, such as UK Power Networks' Socially Green and SSEN's VIVID. Nevertheless, while these projects focused on developing insights into vulnerability identification factors, Spotlight's objective is to identify customers at a much more detailed and granular level. Moreover, these tools possess restricted potential for frequent updates and the incorporation of extra data fields. Spotlight synergises with these projects well, as it can use them as source data to drive more granular outputs and support identification of vulnerable customers, along with the development of efficient engagement strategies.

Additional Governance And Document Upload

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

Spotlight is a project focused on leveraging data modelling and machine learning to identify vulnerable customers at a granular level. The project seeks to bring together existing data sources, and bring new ones, into a single platform. Once the data is integrated centrally, it will be processed to enable data driven approach to supporting vulnerable customers. The data models will be developed to be scalable to any future data, which becomes available. Spotlight's innovative approach involves advanced clustering, machine learning techniques, and a diverse range of datasets to create a unique classification system for identifying vulnerable customers and those at risk of vulnerability. With the potential for nationwide replication, the project will focus on significantly increasing the granularity of vulnerability data, aiming for household-level insight rather than the current LSOA-level information. Moreover, the project seeks to predict customer exclusion beyond existing definitions and formulate sophisticated engagement strategies employing methods like A/B testing and message content.

Relevant Foreground IPR

The data created, outputs and deliverables produced as part of the project will conform to the default IPR.

Data Access Details

For all data access requests, please view the full Innovation Data Sharing Policy available on UK Power Networks' website here:

https://innovation.ukpowernetworks.co.uk/wp-content/uploads/2021/11/UK-Power-Networks-Innovation-Data-Sharing-Policy-.pdf

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

The project involves forward-looking research with uncertain elements and risky trials to develop engagement strategies for identifying and assisting vulnerable customers. It employs innovative methods like using diverse data sources, advanced techniques such as clustering and machine learning, and improving vulnerability data precision. These efforts extend beyond the Network Licensee's usual scope and require collaboration with other sectors. Additionally, the project aims to predict customer exclusion beyond current definitions and create advanced engagement strategies using techniques such as A/B testing and message content testing using behavioural science methods and techniques. Due to the risks and transformative nature of these goals, additional support is necessary for success. The high risk, lower technology readiness, and overall uncertainty of the business case prevent these activities from being carried out as part of UK Power Networks' regular operations.

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 is essential for the Project due to its technical and commercial risks, where outcomes are uncertain. Key reasons for requiring NIA support include:

1. Broader Data and Granularity: Spotlight involves innovative collaboration to access new data sources from various sectors, such as telecoms and finance. Advanced methods including clustering, machine learning, and diverse datasets will be used to establish a unique classification system for identifying vulnerable customers and those at risk. The aim is to significantly enhance vulnerability data granularity to household-level insights rather than current LSOA-level information.

2. Customer Identification: In an environment where emerging factors create new categories of vulnerability, the project goes beyond industry-standard methods. These methods, commonly used in sectors such as retail and telecoms, will be applied to predict and model customer exclusion beyond current definitions. This phase requires advanced analytical techniques.

3. Customer Engagement: Utilising advanced techniques, including A/B testing and behavioural science, Spotlight aims to pinpoint vulnerable customers accurately and develop tailored engagement strategies. A/B testing involves comparing versions of content and channels to determine effectiveness. This iterative approach will assess customer response and refine engagement strategies, although this process will require co-design and development before reaching full maturity.

Overall, the NIA support is crucial to manage the risks associated with the project's innovative and transformative objectives.

This project has been approved by a senior member of staff

☑ Yes