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## NIA Project Registration and PEA Document

### Date of Submission

Jun 2021

### Project Reference Number

NIA\_WPD\_059

## Project Registration

### Project Title

Project Vulnerability and Energy Networks, Identification and Consumption Evaluation (VENICE)

### Project Reference Number

NIA\_WPD\_059

### Project Licensee(s)

National Grid Electricity Distribution

### Project Start

July 2021

### Project Duration

2 years and 2 months

### Nominated Project Contact(s)

Liza Troshka

### Project Budget

£1,698,626.00

## Summary

VENICE is a customer oriented project, the benefits align to those customers who might be left behind under the energy transition, they align to effective network management post the ongoing global pandemic and ensuring value for money for customers and they align to social value. These are real matters that affect many of our customers now and are expected to affect many more in the coming years. The key issue for WPD is that there is no viable way in which to highlight and address vulnerability today.

## Problem Being Solved

Predicting customer vulnerability is a complex matter but on the back of the global pandemic, the increasing focus on fuel poverty, the estimated costs of the energy transition it would be potentially beneficial if the industry could be proactive in highlighting vulnerability ahead of the transition to Low Carbon Technologies.

## Method(s)

The project will look at three different aspects of the energy challenge and the low carbon transition. Firstly it will look at the pandemic and how this has impacted on energy consumption and how changing behaviours may “stick” in order to inform our future planning approaches. The second will look at how it could be possible to predict if a customer has become vulnerable through their energy usage patterns and do this using exist known patterns for customers with vulnerabilities. The third will take a local community where poverty is high and develop new business models for those customers to keep them engaged and provide benefits to the distribution network. It will use insights from the other two work streams as well.

## Scope

The project consists of three work streams that look at the problem through different but aligned lenses. The first is being led by Frontier Economics and this will look at the impact of the COVID19 pandemic on energy networks and how behavioral changes may further impact networks in the future in order to inform network planning. This will also now be extended to cover the Cost of Living Crisis and investigate post winter how energy consumption has changed.

The second work package will be led by Frazer Nash Consultancy and will look at the challenge of not clearly understanding how to

identify, at a granular level, those citizens who require additional support from network operators and energy companies. A substantial amount of work has been done to identify vulnerability at a regional and Lower Layer Super Output Area (LSOA) level, but not at a household level. This project aims to understand power usage at a household level, by identifying and leveraging underlying trends in smart meter data which predict the likelihood of vulnerability, for example, lower energy usage at the end of month could indicate a lower income household.

The third work package will be led by Wadebridge Renewable Energy Network (WREN) a community energy initiative in the South West and this is looking at the challenge of meeting Net Zero in a fuel poor community. It will explore community schemes and business models to suit vulnerable consumers and benefit the distribution network.

## **Objective(s)**

Objectives are:

To measure the impact of the recent pandemic on networks and in particular persistence of behavioral changes in the future to inform network planning.

Model vulnerability in order to be able to predict if a customer has become vulnerable so that DNOs can improve the identification of vulnerable customers and be able to offer more support to the people that need it.

Using a community energy scheme determine the right approaches needed to engage the fuel poor in this transition. This will be done via new business models and schemes to attract them to Net Zero while benefitting the electricity distribution network.

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

N/A

## **Success Criteria**

Success Criteria for the project are quite extensive but include:

Visualise and Interpret results from both the research on the pandemic and vulnerability analyses.

Model of counterfactual demand on the system, to compare pre/post pandemic.

Persistence level report (ie how many behaviours will persist post pandemic) and network impact.

Proposed community led business model to benefit communities and the distribution network.

Methodology for communities developing NZC future scenarios.

## **Project Partners and External Funding**

Wadebridge Renewable Energy Network

Frontier Economics

Frazer Nash Consultancy

Total external contribution is £64,800

## **Potential for New Learning**

The development of systems and processes that will support our business in the identification of vulnerable customers, provide understanding how their behaviours might change in the future to inform network planning and find investigate community energy schemes that can support distribution network issues. The learning obtained will provide significant social value to consumers.

## **Scale of Project**

This is a desktop based research project across all four WPD areas.

## Technology Readiness at Start

TRL2 Invention and Research

## Technology Readiness at End

TRL3 Proof of Concept

## Geographical Area

The third work package will have a focus on Wadebridge, Cornwall.

## Revenue Allowed for the RIIO Settlement

N/A

## Indicative Total NIA Project Expenditure

£1,528,763 DNO Contribution is £169,682

## 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 social value of signing new customers up to the PSR has been calculated by each of the networks. For WPD, this value is £2.35 per customer (based on the paper: "WPD, Consumer Vulnerability Outcomes, 2018/19, Table 3.3").

Other networks calculate a benefit of similar magnitude, ranging from £1.09 per customer to £3.70 per customer.

WPD estimate the total number of vulnerable customers on their network to be around 5.7m, and the number of PSR records is 3.6m. WPD therefore suggest the total number outstanding vulnerable customers on the register is therefore around 2.1m (based on WPD social indicator mapping, here).

To illustrate the potential benefits, if this intervention identifies an additional 25% of missing vulnerable customers, this could create additional social value worth £1.25m to network customers. Being able to identify all of these missing vulnerable customers proactively would therefore create social value of c. £4.935m. if this was extrapolated to all DNO's and assuming 1m missing PSR records per DNO, this could equate to £11.75m of social value.

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

N/A

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

All DNO's could use the results from VENICE and moreover there are likely to be interesting outcomes for Suppliers which we intend to share throughout. Measuring and monitoring consumer vulnerability and being able to address this is a significant change in approach.

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

The costs for rolling out across GB would not be substantial, the tools being used are modelling tools using input data. Scaling it across GB would not vastly increase costs. The challenges are more likely to be around data security and privacy which we will look at. The community trial is difficult to quantify but again this is not likely to be cost prohibitive, as the principle we are looking at is keeping the fuel poor and vulnerable engaged.

## 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 learning from this project is readily replicable to other DNOs. Vulnerability is not limited to WPD's network and the models created are being done so in a way that would be easily transferable to another DNO. The findings will be made public and reports detailing the methods will be shared. It is our view that the value in this project is absolutely in the sharing of the outcomes given the sensitivity of this issue. The innovative solutions being trialled could make for significant benefit not only to DNO's, via the customer engagement approaches, but to wider businesses, customers and community groups.

The COVID research is based on standard data that all DNO's will have and therefore should another DNO wish to, we feel that it would again be relatively simple to take the learning outcomes from this project and take them forward into their businesses.

### 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.

This is the first time that such a project has been undertaken and the three workstreams are working together to maximize synergies and reduce duplication.

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

## Network Licensees.

We have also discussed this project with NPG and SPEN as they both are running or looking to run parallel projects around COVID and Vulnerability. We have agreed that VENICE differs from both and that SPEN will act as Peer Review and that we will run the projects side by side to ensure that there duplication is avoided. NPG's project is a customer based research project engaged with c.50 customers directly.

## Additional Governance And Document Upload

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

Predicting consumer vulnerability is a complex challenge, the changing face of energy and how we use it, especially in the context of the pandemic means that anything that can offer a lens into this challenge is not only welcome but also innovative. This has not been undertaken before and DNO's have a role to play in this and if we can offer learnings to other DNO's and Suppliers about this as well as providing models that could help with moving to this new emerging world this is a potentially significant new idea.

### 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

We would not normally under take customer behavioral research as business as usual. The Supplier Hub principles would rule this out. We are looking to work with a supplier though as part of this research to extend the learnings as far as we can.

### 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 above customer behavior research is not a normal activity for WPD. It does not have a natural place within the organization and as such an innovation trial, with key independent skills is the most sensible approach to it.

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

Yes