Date of Submission

05/03/2020

NIA Project Registration and PEA Document

Notes on Completion: Please refer to the **NIA Governance Document** to assist in the completion of this form. Please use the default font (Calibri font size 10) in your submission. Please ensure all content is contained within the boundaries of the text areas. The full-completed submission should not exceed 7 pages in total.

Project Registration

Project Title		**Project Reference**
Future Fiscal Forecasting		**NIA_SSEN_0045**
Funding Licensee(s)	**Project Start Date**	**Project Duration**
Southern Electric Power Distribution	March 2020	9 months
Nominated Project Contact(s)		**Project Budget**
SSEN Innovation Project Manager – George Simopoulos		£131,500

Contact Email Address

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Lead Sector

Electricity Distribution	☒	**Gas Transmission**	☐
Electricity Transmission	☐	**Gas Distribution**	☐

Other Sectors

Electricity Distribution	☐	**Gas Transmission**	☐
Electricity Transmission	☐	**Gas Distribution**	☐

Research Area

ED/ET - Network improvements and system operability	☐
ED/ET - Transition to low carbon future	☒
ED/ET - New technologies and commercial evolution	☐
ED/ET - Customer and stakeholder focus	☒
ED/ET - Safety, health and environment	☐
GD/GT - Future of gas	☐
GD/GT - Safety and emergency	☐
GD/GT - Reliability and maintenance	☐
GD/GT - Repair	☐
GD/GT - Mains replacement	☐
GD/GT - Environment and low carbon	☐
GD/GT - Security	☐

Problem(s)

Conventional forecasting approaches focus on projecting forward data from 'fiscal' metering (gathered through GB settlements) using regression techniques typically applied at a top-level of many 100,000s of meters.

It is anticipated that the increase in the uptake of Low Carbon Technologies (LCTs) such as Electric Vehicles (EVs) etc. will make forecasting more challenging. As well as this, established demand patterns will no longer be relevant. The timing and detection of this increased uptake may be particularly hard to identify through conventional techniques.

Likewise, the increased use of flexibility and the emergence of new retail products (such as Vehicle2Grid EV

batteries) from a diverse range of market entrants will add to the challenge of accurate forecasting. Prospective changes in industry charging rules driven by the Access and Forward-Looking Charges and Targeted Charging Review Significant Code Reviews (SCRs), also have the potential to intensify this issue and may require licensees to access more granular levels of data to exceed the range and accuracy of forecasts.

Additionally, there is an ever-increasing volume of data becoming available which could make future forecasting more accurate, this includes enhanced monitoring data from SCADA and smart metering data in combination with external data sets such as weather information and LCT uptake predictions. The use of advanced data analytics techniques has the potential to utilise these new data sources and develop potentially more detailed forecasting to help maintain accurate billing for customers.

Method(s)

This project will look to implement a new forecasting model from the USA to help inform future solutions across SSEN and the wider industry. This project will test the hypothesis that the use of GB Settlement sourced 'fiscal' metering (referring to recording electrical energy flow for each half hour for Settlement (Half Hourly Metering Systems)) in combination with SCADA data and weather data will lead to more accurate forecasts for fiscal purposes.

The project will utilise existing or readily available data sets (as mentioned in the above paragraph) in combination with an alternative to conventional forecasting techniques. This alternative technique is part of the new suggested in-house developed forecasting model that the supplier will use in this project. The project will primarily focus on the use of existing data sets currently available within the existing GB market, however, it will also develop insights to inform the use of data sets which may become available such as those from smart metering.

The project will use a blind back-cast technique (a method that starts with defining a desirable future and then works backwards to identify policies and programs that will connect that specified future to the present) to allow comparisons between forecast and actual data sets.

To accelerate analysis, the project will not implement enduring data exchange approaches and will instead adopt more adaptable and temporary methods (such as File Transfer Protocol) preserving all the necessary safeguards for GDPR etc.

Scope

This project will use GB Settlements sourced 'fiscal' metering in combination with SCADA data and weather data to;

1) forecast energy consumption for a Distribution Service Area (DSA) and disaggregate this into the corresponding Grid Supply Points (GSP)s i.e. the SEPD DSA and 18 GSPs.

2) forecast energy consumption for a sample of HV feeders with a high uptake of demand or generation (two generation dominated, and two demand dominated).

Project findings will be communicated in a written report and shared amongst GB DNO experts via a face to face workshop.

Objective(s)

The project objectives include:

- investigation into the availability and suitability of current and future data sources which could provide more detailed fiscal forecasting of energy volumes;
- an assessment of methodology to be used; and
- a quantitative evaluation of the level of accuracy of the new forecasting model

Success Criteria

If the project delivers the anticipated learning (whether the new forecasting model in trial provides accurate forecasting) to GB stakeholders, then it is deemed successful.

Technology Readiness Level at Start	Technology Readiness Level at Completion
8	9

Project Partners and External Funding

Project partner Innowatt is the specialist US supplier with previous experience of a successful implementation in North America.

Potential for New Learning

Novel fiscal forecasting model of existing and future datasets with potentially higher accuracy than the conventional fiscal forecasting techniques.

Scale of Project

Small scale demonstration for one Distribution Service Area (DSA), which will be replicable across other DSAs.

Geographical Area

SEPD in the south of England

Revenue Allowed for in the RIIO Settlement

None

Indicative Total NIA Project Expenditure

The total expenditure expected from the project is £131,500. 90% (£118,350) of which is allowable NIA expenditure.

Project Eligibility Assessment

Specific Requirements 1

1a. A 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 systems and 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	☐

Specific Requirements 2

2a. Has the Potential to Develop Learning That Can be Applied by all Relevant Network Licensees ☒

Please answer one of the following:

i) Please explain how the learning that will be generated could be used by relevant Network Licenses.

The outcomes from the project will be directly relevant to other network licensees as they look to address decarbonisation but continue to improve fiscal forecasting of electricity volumes.

ii) Please describe what specific challenge identified in the Network Licensee's innovation strategy that is being addressed by the Project.

This project is addressing challenges associated with carrying out accurate fiscal forecasting while addressing decarbonisation and flexibility.

Is the default IPR position being applied?

Yes	☒
No	☐

If no, please answer i, ii, iii before continuing:

i) Demonstrate how the learning from the Project can be successfully disseminated to Network Licensees and other interested parties

n/a

ii) Describe how any potential constraints or costs caused, or resulting from, the imposed IPR arrangements

n/a

iii) Justify why the proposed IPR arrangements provide value for money for customers

n/a

2b. Has the Potential to Deliver Net Financial Benefits to Customers ☒

Please provide an estimate of the saving if the Problem is solved.

Forecasting errors result in DUoS charges which either under or over-recover the revenues necessary to operate a distribution network. These errors are corrected in subsequent years by adjusting future target revenues - excessive adjustment can result in price volatility for energy suppliers and their customers. Network charges are set to be cost-reflective so they enable economically efficient investment decisions by customers, suppliers, generators and other service providers – volatility resulting from forecasting errors has the potential to affect the efficacy of these decisions and could potentially lead to a less optimal overall energy system.

Please provide a calculation of the expected financial benefits of a Development or Demonstration Project (not required for Research Projects). (Base Cost – Method Cost, Against Agreed Baseline).

The calculation is not required for a research project.

Please provide an estimate of how replicable the Method is across GB in terms of the number of sites, the sort of site the Method could be applied to, or the percentage of the Network Licensees system where it could be rolled-out.

This is a challenge for all GB 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.

2c. Does Not Lead to Unnecessary Duplication ☒

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 like those being carried out by any other Network Licensees.

n/a

Additional Governance Requirements

Please identify that the project is innovative (i.e. not business as usual) and has an unproven business case where the risk warrants a limited Research, Development or Demonstration Project to demonstrate its effectiveness ☒

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

Whilst the underlying method has been trialed in North America it has never been attempted within the GB settlement or regulatory environment.

ii) Please identify why the Network Licensee will not fund such a Project as part of its business as usual activities

This is a new method which is yet unproved and needs to be better developed and validated to be introduced as business as usual.

iii) 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

This is a new method which is yet unproved and needs to be better developed to support the technical specification and anticipated benefits. The method developed by the project will be replicable across all network areas, therefore it requires NIA support.

Please confirm this project has been approved by a senior member of staff ☒