NIA Project Registration and PEA Document

Date of Submission

Mar 2020

Project Reference Number

NIA_SSEN_0045

Project Registration

Project Title

Future Fiscal Forecasting

Project Reference Number

NIA_SSEN_0045

Project Licensee(s)

Scottish and Southern Electricity Networks Distribution

Project Start

March 2020

Project Duration

0 years and 10 months

Nominated Project Contact(s)

SSEN Innovation Project Manager – George Simopoulos

Project Budget

£131,500.00

Summary

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 and disaggregate this into the corresponding GSPs 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.

Nominated Contact Email Address(es)

fnp.pmo@sse.com

Problem Being Solved

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 ; his 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 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 and disaggregate this into the corresponding GSPs 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:

·   assessment of 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

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

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.

Project Partners and External Funding

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.

Technology Readiness at Start

TRL8 Active Commissioning

Technology Readiness at End

TRL9 Operations

Geographical Area

SEPD DSA

Revenue Allowed for the RIIO Settlement

n/a

Indicative Total NIA Project Expenditure

The total expenditure expected from the project is £131,500.

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)

Taking SSEN's conventional forecasting performance over the past three years as an example, and projecting these over a five year period, the corrections needed to realign forecasts to actual would lead to ~£270K in enhanced interest rate adjustments. This may be further increased if the uptake of LCTs reduces the performance of conventional techniques.

Please provide a calculation of the expected benefits the Solution

The calculation is not required for a research project.

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

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.

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 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.

Or, please describe what specific challenge identified in the Network Licensee's innovation strategy that is being addressed by the project (RIIO-1 only)

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

☑ 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

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

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

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

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.

This project has been approved by a senior member of staff

☑ Yes