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

Mar 2018

Project Reference Number

NIA_SGN0126

Project Registration

Project Title

LTS Demand Forecasting Tool Scoping Study (Phase 1)

Project Reference Number

NIA_SGN0126

Project Licensee(s)

SGN

Project Start

March 2018

Project Duration

0 years and 6 months

Nominated Project Contact(s)

Alexander Webb, Innovation Project Manager

Project Budget

£52,000.00

Summary

This project aims to design and develop a robust LTS Demand Forecasting Tool Scoping Study based on a “bottom up” approach.

Nominated Contact Email Address(es)

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Problem Being Solved

Changes in the energy system mean that the future forecasting of gas demand may become more complex and not follow traditional relationships (where there has historically been a near linear relationship between gas demand for heating and the composite weather variable). Examples of these changes include:

- Diversity in gas heating technologies with lower carbon/ more efficient alternatives such as gas heat pumps, gas fired CHP, improved boiler efficiencies, and more sophisticated heating controls.
- The use of hybrid technologies such as hybrid heat pumps where non linear relationships between heat demand and gas demand exist Fuel switching to and from gas.
- Changes to the electricity system promoting the use of gas for peak generation plant.
- Improved efficiency of buildings and industrial processes reducing overall demand.
- Smart/connected systems, which may impact how homes and businesses use energy by allowing users and other players to influence demand patterns. Peak demands may not change, but more efficient buildings with smart storage control means demands profiles may be very different.

SGN have previously used an econometric “top down” process for forecasting demands, but this has limitations and draws heavily on historic trends which don’t necessarily represent evolving and future load profiles. Whilst it can reflect wider macro impacts such as changes to the economy, it cannot represent the finer micro variances in technologies, fuel switching, etc, as described above.

SGN therefore require a robust technically led “bottom up” demand forecasting approach which can accommodate a greater range of current and future variables, changes in technology use and characteristics, and can consider a wide range of factors describing the

transition in energy use.

Method(s)

This project, currently outlined as three phases, will aim to develop a new forecasting toolkit that will be able to forecast demand in line with National Transmission System (NTS) Long Term Demand Forecasting requirements. The first phase of the project, the scoping study, will look to develop an understanding of demand forecasting requirements and produce a high-level specification for the tool kit. This element of the project will largely be desktop research however, it will include horizon scanning and workshops with relevant industry experts to support scope development.

The research will broadly be broken into six segments:

1. Identify user requirements
2. Review of existing top-down methodology
3. Assess drivers
4. Outline specification development
5. Outline CBA
6. Initial long-term operation and maintenance strategy

Scope

This project aims to design and develop a robust LTS Demand Forecasting Tool Scoping Study based on a “bottom up” approach. This will allow SGN the opportunity to evaluate how a new method of bottom up demand forecasting can be used to identify and accommodate present and future network changes.
This will include the following work conducted by Delta-ee:

1. Identify user requirements
Define user requirements while identifying key operations through hosted workshops and key stakeholder meetings.

2.Review of existing top-down methodology
Review existing methodology to understand the types of scenarios and metrics modelled, the limitations of the approach, and identify any interfaces which are needed with a new bottom-up toolkit.

3. Assess drivers
Identify and prioritise the range of drivers associated with the transition in the energy system to a more diverse and downstream orientated system, which are likely to impact on future gas demands on the distribution network. Provide an assessment of the scale of demand change resulting from these drivers and how that may change over time, so that the sensitivities can be quantified.

4. Outline specification development
Outline scope including, but not limited to, inputs and sources of data, outputs to meet forecasting requirements, functionality relating to processes and required calculations and interface requirements with other tools and systems.

5. Outline Cost Benefit Analysis (CBA)
A CBA, benchmarked against current methods shall outline costs associated with developing, implementing and maintaining a toolkit that incorporates a wide range of new and existing variables.

6. Initial long-term operation and maintenance strategy
Identify and select options for the ongoing management of the tool, which can be used to inform the toolkit development.

Objective(s)

The key objectives of this project are:

- To undertake review and assessment of current practices and methodology for LTS demand forecasting
- To carry out horizon scanning with a view to identifying available relevant datasets in line with industry energy futures scenarios
- To outline specification for model development considering available data sets and user requirements in line with SGN’s long term operation and planning strategy
- To produce full CBA of the modelling toolkit to inform further stages of development
- To fully report on project outcomes and outline recommendations for Stage 2

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

The success criteria for the project are to:
Report on assessment of current LTS demand forecasting.

- Produce a comparative assessment of potential for a bottom up demand forecasting system against current industry top-down processes outline benefits to GDNs
- Outline the scope for further project phases that will look to develop and implement a novel demand forecasting tool with consideration to ongoing operation and maintenance
- Disseminate learning to all key stakeholders and licensees through full project reporting via the Smarter Networks Portal and any additional project reporting on request

If successful, the project will inform phase two where the detail of the toolkit will be developed and tested.

Project Partners and External Funding

n/a

Potential for New Learning

n/a

Scale of Project

The project involves reviewing current gas demand forecasting.

Technology Readiness at Start

TRL2 Invention and Research

Technology Readiness at End

TRL3 Proof of Concept

Geographical Area

The learning from this project is relevant to all GB GDNs.

Revenue Allowed for the RIIO Settlement

N/A

Indicative Total NIA Project Expenditure

The total expenditure is £52,000, 90% (£46,800) of which will be recovered via the NIA funding mechanism in line with the funding conditions.

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)

This is a low TRL research project and will not directly realise financial benefits however, this work is required as the first step in developing a new demand forecasting tool that has the potential to deliver financial benefits in the future. Further details of the potential savings will be detailed within the CBA being developed at part of this workstream.

Please provide a calculation of the expected benefits the Solution

N/A

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

N/A

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

N/A

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 gained from this project aims to inform Network Licensees of the potential areas of data where demand forecasting could be informed and the value proposition of developing a new bottom-up forecasting tool. The learning from the project could form the foundation of a new demand forecasting tool development.

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

☑ 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.

n/a

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

n/a

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

n/a

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

n/a

This project has been approved by a senior member of staff

- [x] Yes