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## NIA Project Registration and PEA Document

### Date of Submission

Feb 2018

### Project Reference Number

WPDEN03

## Project Registration

### Project Title

Electricity Flexibility and Forecasting System (EFFS)

### Project Reference Number

WPDEN03

### Project Licensee(s)

National Grid Electricity Distribution

### Project Start

January 2018

### Project Duration

3 years and 11 months

### Nominated Project Contact(s)

Sam Rossi Ashton

### Project Budget

£3,338,895.75

## Summary

The transition from DNO to DSO will involve performing new functions. These new functions will in turn require new systems to support them. This project is to explore in detail the additional functionality required as a DSO, to evaluate the potential options and implement systems that provide that new functionality.

This will include;

- i. Creating weather adjusted forecasts for load and generation at different time-frames, in order to determine the nature, duration and frequency of expected constraints.
- ii. Evaluating the suitability of flexibility services to resolve those constraints.
- iii. Communicating flexibility services requirements to the market and creating commercial agreements for those services.
- iv. Executing flexibility services including arming, execution, validation of delivery and payment.
- v. Sharing information with interested parties to avoid conflicts in flexibility service use

The project will consider the optimum degree of integration with existing systems and whether simplified alternatives to full optimised powerflow analysis can provide sufficiently reliable information.

## Third Party Collaborators

AMT-Sybex Ltd

Capita

Smarter Grid Solutions

EDF Energy

Centrica

## Problem Being Solved

## Method(s)

## Scope

The Electricity Flexibility and Forecasting System (EFFS or “The Project”) project supports the transition from DNO to DSO by specifying and trialling a new system to plan and procure flexibility services in operational timescales. The Project was funded through Ofgem’s Network Innovation Competition (NIC) and had a budget of £3,338,798. EFFS was registered in September 2018 and completed during September 2021. The aim of EFFS was to provide DNOs with a proven system for flexibility forecasting management that could support the functions of a DSO via the following objectives:

- Enhancing the output of the ENA Open Networks project, looking at the high-level functions a DSO must perform, providing a detailed specification of the new functions validated by stakeholders, and the inclusion of specifications for data exchange.
- Determining the optimum technical implementation to support those new functions.
- Creating and testing that technical implementation by developing software and integrating hardware as required.
- Using and testing the technical implementation, which will involve modelling the impact of flexibility services. As well as proving the system, this testing phase will create learning relevant to forecasting the likely benefits of flexibility services and the impact of changing network planning standards.

This aimed to result in a set of blueprints, best practice guides and other learning from which DNOs can create their own technical implementations that meet the same standards or embark on their own product procurements if that would provide better value for money. Streamlining the specification, design, and testing work for these new tools will reduce the time and cost for DSO transition, thereby accelerating the benefits from flexibility services. Key functions required for the system included:

- Create weather adjusted forecasts for load and generation at different timeframes to determine the nature, duration and frequency of expected network constraints.
- Model how constraints can be managed, using either flexibility services or existing network solutions.
- Determine the optimum way to resolve predicted constraints which will involve selecting the most effective mix of network technology and flexibility interventions.
- Communicate flexibility services requirements to the market and creating an optimised set of services from those available.
- Execute flexibility services in an optimal way.
- Share information with interested parties to avoid conflicts in flexibility service use.
- Optimise the use of DNO controlled assets across multiple services.
- Support analytics and reporting.

The project operationalised its objectives through four workstreams:

- WS1: Forecasting Evaluation and Requirements
- WS2: Implementation
- WS3: Testing and Trials
- WS4: Collaboration and Learning

## Objective(s)

The project method is to deliver a robust DSO system capability, by:

### 1 – Forecasting Evaluation

Determine optimal forecasting arrangements for short term (2-5 days ahead) and near real time forecasting. This considers the sources of data, methods of forecasting, accuracy of forecasts and critical timings for other processes e.g. gate closure. It considers available load forecasts provided by National Grid, whether combining forecasts is beneficial and options for improvement such as within-day correction.

### 2 – Co-ordination

Determine optimal arrangements for co-ordination and conflict resolution with other parties using flexibility services. This could include different providers e.g. direct provision or via a third party (aggregator or supplier), or price signals for real-time trading, advanced notification, dynamic amendment of systems e.g. ANM or merit

### 3 - Determine Requirements

Incorporate the learning from Methods 1 & 2 to determine and then specify the system requirements for:

- a. long term flexibility service assessments and cost benefit analysis, and
- b. short term assessment and implementation.

This will determine whether a single system is required for long and short term requirements or whether these are better managed separately. This will maximise the use of open standards and modular solutions using data available to all DNOs. DSOs may take on further responsibilities such as local network balancing on behalf of the TSO. Any proposed systems should be able to support the potential range of DSO activities and will involve data exchanges with third parties including triggering services.

### 4 – Implementation & Testing

The systems specified by Method 3 will then be built, implemented and tested to prove their suitability. Method 4 is anticipated to

involve development of AMT Sybex Networkflow software suite.

Academic / independent experts will provide oversight and assurance for Methods 1 & 2.

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

n/a

### **Success Criteria**

The success criteria for EFFS are as follows:

- To provide DNOs with a system that can support new flexibility forecasting functions of a DSO.
- Confirm the functionality required of DSOs.
- Consider technical options for delivering that functionality.
- Test a technical implementation of the system in practice.

### **Project Partners and External Funding**

n/a

### **Potential for New Learning**

n/a

### **Scale of Project**

n/a

### **Geographical Area**

### **Revenue Allowed for the RIIO Settlement**

### **Indicative Total NIA Project Expenditure**

## 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)

n/a

#### 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**

n/a

**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

**Please demonstrate how the learning from the project can be successfully disseminated to Network Licensees and other interested parties.**

**Please describe how many potential constraints or costs caused, or resulting from the imposed IPR arrangements.<**

**Please justify why the proposed IPR arrangements provide value for money for customers.**

## 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**

Yes