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

Aug 2019

### Project Reference Number

NIA_NGSO0027

## Project Registration

### Project Title

Testing Coordinated DSO-ESO Procurement and Dispatch

### Project Reference Number

NIA_NGSO0027

### Project Licensee(s)

National Energy System Operator

### Project Start

September 2019

### Project Duration

0 years and 11 months

### Nominated Project Contact(s)

Adrian Sellar

### Project Budget

£45,000.00

### Summary

The project will trial one simple route to multiple flexibility markets via one platform. This approach of coordinated procurement and dispatch of flexibility between ESO and DNOs is one of the Future Worlds outlined by the Open Networks project. This approach has not been trialed before, and there are many uncertainties and unknowns about how it would work in practice. This project will start to unpick those uncertainties by trialling the end-to-end process, from procurement, to utilization and settlement.

This project supports and builds upon WPD's 'Visibility Plugs and Sockets' project.

### Third Party Collaborators

Centrica

### Nominated Contact Email Address(es)

box.so.innovation@nationalgrid.com

### Problem Being Solved

There is a growing emergence of new flexibility markets and platforms (particularly led by Distribution Network Operators), and an increased number flexibility providers capable of offering services. There is a likelihood that this will lead to a fragmented, and inefficient flexibility market place that appears confusing to the flexibility provider.

The project will trial one simple route to multiple flexibility markets via one platform. This approach of coordinated procurement and dispatch of flexibility between ESO and DNOs is one of the Future Worlds outlined by the Open Networks project. This approach has not been trialed before, and there are many uncertainties and unknowns about how it would work in practice. This project will start to unpick those uncertainties by trialling the end-to-end process, from procurement, to utilization and settlement.

This project supports and builds upon WPD's 'Visibility Plugs and Sockets' project.

## Method(s)

The project will trial the procurement of flexibility by two market actors via a pay-as-clear auction that will provide uniform pricing per auction, no matter who the purchaser is. These auctions will comprise longer term reserve auctions and day-ahead and intraday utilisation auctions, in light of EBGL changes that will require split reserve and utilisation procurement. The platform will provide visibility of reserved (contracted) and utilized (instructed) volumes across flexibility buyers. In future phases of work, we will assess the benefit of this visibility to system operators in their control room decision making.

The flexibility sellers will consist of aggregators or larger demand-side customers. The procurers will be National Grid ESO and Western Power Distribution (WPD).

Procurement of flexibility will be around one GSP (Indian Queens) situated on WPD's network. Due to the locational nature to the trial, National Grid ESO will operate a 'shadow' market approach to avoid any unfair/uncompetitive procurement approaches. By 'shadow' market approach, we mean, all activities included in the trial will operate outside existing BAU Balancing Services, including tender, assessment, instruction, settlements, and spend. Project funding will allow NG ESO to pay for contracted reserve and utilisation through the platform. However, NG ESO will not be utilising/instructing any volume to resolve live system issues. Any volume instructed will be done solely for the purpose of achieving project learnings.

Flexibility procurement will take place via 3 month ahead, 1 month ahead, 1 week ahead, day ahead, and intraday pay-as-clear auctions, with flexibility allocated between procurers. Auction rules will take into account buyer requirements and ensure flexibility is allocated in an efficient manner.

Over 6 months, ESO and WPD will test various scenarios on the platform (procurement in isolation, procurement in parallel, utilisation). In each case, we will be procuring 500kW blocks of energy.

## Scope

Renewable generation and demand side provider participation in markets has been growing rapidly in number, and becoming more diverse by technology. Whilst this trend is projected to continue, there is the potential for the size (MW volume per asset) of demand side provider to decrease with the emergence of residential flexibility assets and electric vehicles all connecting on local distribution networks.

Existing flexibility markets are evolving and new markets are being developed, in particular by Distribution Network Operators, that may create a disparate world of uncoordinated, competing flexibility markets, confusing and overcomplicated for flexibility providers to understand and participate in. It may also lead to fractured market liquidity, and lead to conflicts in service delivery, particularly between DNOs and ESO.

There has also been significant work by the Energy Networks Association to develop 'future world' scenarios for operating a whole system approach. The Cornwall LEM trial closely aligns with Future World B, and will provide significant real life learnings. The platform has been developed in collaboration with WPD, who have been participating through their 'Visibility Plugs and Sockets' NIA project.

## Objective(s)

The trial is seeking to prove (or provide learning) on several fronts:

**The Platform**

- Does a single platform for multiple markets work in practice, does the end to end process hold up, can multiple buyers and multiple sellers trade effectively?
- Does the clearing algorithm work – does the auction clear and provide a single price across markets?

**Open Networks Future Worlds B**

- How the end-to-end process of World B works in practice? What might need to change in:

1. Contract terms
2. Procurement
3. Utilization
4. Settlement

- How might a platform deal with service conflict?
- Does this simplify the procurement process (qualitative feedback from providers)?
- We aim to support the realization of benefits set out in WPD's 'Visibility Plugs and Sockets' project

**Balancing Services: Reform of Reserve**

- What is the impact of different timescales of procurement of a reserve-type product on:

1. Types and number of providers
2. Volume tendered
3. Volume accepted
4. Price

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

n/a

## Success Criteria

The project will be a success if we can

- Demonstrate how different procurement time frames (e.g. 3 month ahead, 1 month ahead, 1 week ahead, 1 day ahead, and intraday) effect tendered and contracted volumes and prices of a reserve-type product.
- Through continued provider tendering, contracting, delivery, and settlement, that a single route to multiple markets is achievable. To be fed back to Open Networks Future World development.
- Demonstrate how different utilisation approaches (e.g. independent, in parallel, and in series) affect delivery / performance of flexibility providers.
- Learn if visibility of 3rd Party contracted volumes and utilisations might result in more efficient system balancing
- Develop robust scenarios for coordinated procurement and dispatch of flexibility for future trials
- Support the success of WPD's 'Visibility Plugs and Sockets' project

## Project Partners and External Funding

- Centrica – activity will be funded by European Regional Development Fund and Centrica
- WPD
- National Grid ESO - £45,000 of NIA funding and ~£15,000 of totex

## Potential for New Learning

This project will be the first trial of coordinated procurement and dispatch of flexibility services across transmission and distribution. As such, it will provide valuable practical learning around how this end-to-end process works, and inform the optimal (from a coordination perspective) design of:

- flexibility products
- procurement, dispatch and settlement platforms, including the further development of the Cornwall LEM platform
- flexibility service contracts

The trial will also provide learning around:

- The impact of different timescales of procurement on the liquidity and price of reserve-type products
- The validity of Centrica's market platform procurement and dispatch rules

The trial will build upon the learnings from WPD's ongoing 'Visibility Plugs and Sockets" project.

## Scale of Project

From an ESO perspective the trial will take place in a 'shadow market' and outside business as usual flexibility procurement. It will not require trading team or control-room input. We will work with the project partners to ensure potential procurement and utilisation conflicts are tested.

## Technology Readiness at Start

TRL5 Pilot Scale

## Technology Readiness at End

TRL7 Inactive Commissioning

## Geographical Area

The project will seek to procure flexibility around the Indian Queens GSP on the south west peninsula.

## Revenue Allowed for the RIIO Settlement

None

## Indicative Total NIA Project Expenditure

£45,000

# 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 value to end-consumers of coordinated procurement of flexibility across T&D is highly complex to estimate, and is not the purpose of this small trial. Here, we aim to test the practicalities of the end-to-end process, and to inform future trials of coordination where we will answer this question of value.

Ultimately, we believe the coordinated procurement of flexibility across the whole electricity system will increase liquidity of flexibility, lowering overall costs to consumers. It will also bring more low-carbon sources into the market, supporting the low-carbon energy transition.

We also aim to support the realization of the benefits outlined in WPD's 'Visibility Plugs and Sockets' projects.

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

As this project is purely to test the end-to-end process of Future World B, there is no defined consumer benefit. This will come from later trials.

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

The Method should be replicable across all DNO regions in GB, if successful.

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

Estimated £2 – 3m.

## 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

Project learnings will be valuable to all DNOs in their transition to become a DSO, moving towards a whole-system approach, and procuring flexibility efficiently and in a coordinated manner with the ESO.

### 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.

This will be the first physical trial of Future World B – coordinated procurement and dispatch of flexibility across T&D.

WPD's 'Visibility Plugs and Sockets' project has been focusing on the design of the platform and the testing and trialling of only WPD procuring services. This project builds on this activity by testing the coordinated procurement by ESO and WPD.

### 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

Flexibility is currently procured by individual network operators, for one sole purpose. There has not been a case where two procurers have bought different services from the same MW of one DER, simultaneously on one market platform.

### 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

There is currently not enough liquidity of locally-concentrated DERs for us to procure constraint management from. We are not funded to run shadow markets to test concepts.

## 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 concept is unproven and risky, and so needs to be tested first before rolling out. The project is not attempting to solve a problem or issue solely owned by National Grid ESO. Many of the potential benefits will aid DNO and whole-system thinking. However, for these learnings to be realised the project requires Transmission System Operator collaboration.

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

- [x] Yes