

NIA Project Registration and PEA Document

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.

Project Registration

Project Title

Future Flex

Project Reference

WPD_NIA_047

Project Licensee(s)

Western Power Distribution

Project Start Date

November 2019

Project Duration

2 years and 1 month

Nominated Project Contact(s)

Matt Watson

Project Budget

£693,018.00

Nominated Contact Email Address(es)

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Problem(s)

First generation DSO services are already being provided by large distribution-connected assets – as evidenced by Flexible Power, Pico, Power Potential, and more. Western Power Distribution (WPD) alone procured 28 MW of flexibility in 2018 with volumes expected to increase as the service develops. Distribution System Operator (DSO) services are being standardised across DSOs under the Open Networks project, initially focused on constraint management, and are becoming Business as Usual (BaU) across GB.

Whilst there are some smaller providers emerging, these services tend to be provided by relatively large (>200kW) assets, for instance batteries and generators. Flexibility providers to date have tended to be commercial actors for whom energy is core business (or a fundamental cost component of business), rather than individual householders.

But second generation DSO services will need to facilitate widespread participation from homes too. The market is fast developing new domestic flexibility solutions – spanning vehicle-to-grid (V2G), smart and hybrid heating, stationary batteries and more. The units of flexibility offered at domestic scale are individually small, often at the level of single kilowatts. This drives different requirements when participating in local flexibility markets. If DSOs are to be a neutral market facilitator, they must ensure a level playing field for these new domestic solutions.

Facilitating domestic participation means identifying – and addressing – unconscious biases in DSO service design. Example issues have been raised in National Grid Electricity System Operator's (ESO) live Residential Response project, which seeks to address some specific barriers to domestic flexibility providing Firm Frequency Response (FFR); this is not yet public domain but early findings have been shared with WPD. Barriers are also outlined in Everoze's Swarm Governance report under the Core4Grid project. In addition, Everoze's experience of acting as Independent Technical Expert (ITE) for frequency response testing is uncovering practical empirical lessons. Issues include:

- Dynamic allocation of Demand Side Response (DSR) assets within domestic portfolios
- Bid windows to accommodate rapidly changing asset availability
- Automation in testing and delivery to accommodate very large numbers of assets
- Metering and baselining
- Commercial incentive design and risk allocation.
- Possible standardisation of requirements between DSO and other services.

Method(s)

Future Flex is a participant-led trial of second generation DSO services, deploying step-change innovations for procurement, testing and delivery suitable for domestic scale assets. The project will focus on active power demand reduction services. The benefits will be increased market liquidity and competition – and resulting lower costs of flex service provision.

Scope

The Project is scoped in phases, as logged below.

1. Participant engagement

This data-gathering phase is the bedrock of the whole project, using workshops to secure meaningful, deliberated participant input, with follow-on semi-structured interviews, social media engagement and peer-review.

At the heart of this phase is two intensive workshops, informed by best practice in workshop design – with upfront participant priming on key topics, and careful curation of agenda, invitee list and seating plan to ensure meaningful feedback. The workshop methodology is substantially more intensive and bespoke than is typically deployed in the energy sector; for instance, drawing upon ‘priming’ theory from social sciences to set the interpretative frame – using an upfront written briefing and individual verbal calls prior to workshop delivery.

2A. Solution definition: Commercial

This phase turns participant feedback into a concrete commercial design for a rebooted customer journey – new testing methodology, bid options, contract definition, etc.

The focus is on step-change innovations – albeit ones that are achievable. Business as Usual tweaks are excluded from this phase, as they can already be implemented as incremental improvements to Flexible Power.

2B. Solution definition: System build

This phase converts the commercial design into a trial platform for the second generation services. Where needed, the commercial design is amended to reflect the reality of technical implementation.

A third party is expected to be contracted for system build.

3. Trial

This phase trials the new system with more than two participants – preferably physically or otherwise virtually. Participants with existing in-home assets are targeted to avoid lengthy and expensive participant recruitment processes.

It collates feedback on the new system, capturing empirical lessons learned.

Objectives(s)

The objective of the project is to understand current process limitations with regards to domestic flexibility providers with the aim to demonstrate and test solutions to those limitations.

Success Criteria

- Two intensive workshops, adopting workshop best practice methodology.
- A clear list of participant-led recommendations for second generation DSO services, segmented into step-change innovations and BaU tweaks, and clearly prioritised via impact/effort chart.
- Implementation of highest priority recommendations, via empirical trial, targeting at least two providers and 100 homes.
- Finalised designs following trial.

Technology Readiness Level at Start

TRL 3

Technology Readiness Level at Completion

TRL 7

Project Partners and External Funding

As project lead, Everoze is a technical and commercial energy consultancy with expertise in low carbon energy flexibility.

Smart Grid Consultancy (SGC), who is assigned to provide specialist input, has worked with WPD on multiple DSR projects.

National Grid ESO will act as Advisor.

Potential for New Learning

The key learning for each phase is:

Phase 1: What stakeholders want from second generation DSO services?

Phase 2: How stakeholder requests can be implemented in practice – what specifically need to change.

Phase 3: Which step-change innovations work in practice, and which do not.

Scale of Project

The question of scale applies to Phase 1 & 3.

Phase 1 – Participant engagement: We propose two workshops (of 15-20 participants each), five interviews, two peer-reviewers, five LinkedIn posts.

Justification: Consulting broadly in this way is essential to be genuinely participant-led – and to ensure that a diversity of industry perspectives are captured.

Phase 3 – Trial: We target trialling with at least two industry participants (e.g. energy suppliers, aggregators), spanning >100 homes. We are open to increasing this if there is sufficient industry interest.

Justification: Trialling with at least two participants is essential to capture meaningful empirical lessons in the field – and reach robust 'learning-by-doing' conclusions on what works.

Geographical Area

The geographic area will be determined during Phase 2, rather than upfront. This is a purposeful decision, guided by two considerations:

The project is focused on DSO procurement processes, rather than solving a specific network issue: As such we are agnostic to geographic area – unless participant feedback suggests otherwise. This leads to our second consideration.

We seek to be participant led: Whilst our research to date flags up themes which are likely to emerge, we are eager to confirm the geographic area following meaningful participant feedback. For instance, if the participant workshops identify particular challenges in dispatching flexibility in rural areas, then we want to retain freedom to focus our trial on such an area.

Revenue Allowed for in the RIIO Settlement

N/A

Indicative Total NIA Project Expenditure

£623,716.00

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 the 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 Licensee's 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 explain how the learning that will be generated could be used by relevant Network Licenses.

The innovations deployed are expected to apply across all licence areas: The project is inherently focused on procurement specifications and process, and hence is not DNO specific. We aspire that successful innovations will be rolled out to other license areas.

2b. Is the default IPR position being applied?

Yes

☒

2c. Has the Potential to Deliver Net Financial Benefits to Customers?

Yes

☒

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

If the problem was solved, in the long run we would expect to see increased liquidity within DNO DSR markets and a corresponding reduction in pricing. The value of DNO DSR could reach up to £12.1m/year by the end of ED1 (£3.38m/year within WPD). This is based on the deferral of half the total EHV and 132kV reinforcement by three years. If increased liquidity drove a 10% saving in this value, the savings would be £340k/year across WPD or £1.21m/year across the UK. The 10% saving is deemed reasonable given National Grid ESO prior experience with frequency response.

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).

Base cost: 12.1m/year
Method cost: $12.1 \times 0.9 = £10.9\text{m/year}$
Financial benefits: £1.21m/year

It should be noted that a number of initiatives are currently underway to improve liquidity in DNO flexibility markets. The value attributed to each, and the total value created is unknown at this stage.

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.

The method is not site-specific, and hence is replicable across GB, including to other Network Licensees. As the method largely process rather than asset-based, the costs of roll-out are low once the benefits are proven, entailing a one-off upfront cost of updating procurement processes.

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

The roll out cost will depend on the solution taken forward.

2d. Does not Lead to Unnecessary Duplication

Yes

X

Please demonstrate below that no unnecessary duplication will occur as a result of the Project.

The project is designed by industry participants and implemented by a DSO, rather than designed by a DSO and implemented by participants. We are hopeful that this fundamentally novel approach will deliver novel outcomes – injecting the fresh insight required to deliver second generation DSO services.

If applicable, justify why you are undertaking a Project similar to those being carried out by any other Network Licensees.

The project will build on the findings of the Residential Response Project run by National Grid ESO. This has identified potential improvements to make the provision of FFR services more accessible for domestic providers. WPD will use the learning to feed into the services designed in this project. WPD is an advisor on that project, National Grid ESO will be an advisor on this project.

Additional Governance Requirements

Please identify

that the project is innovative (ie not business as usual) and has an unproven business case where the risk warrants a limited Research and Development or Demonstration Project to demonstrate its effectiveness

X

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

The project is innovative in both its area of focus and its delivery method. Building on the delivery of flexibility services into BaU, this trial will look to investigate ways of improving access for domestic providers through a stakeholder led process. It is anticipated that suggested improvements will range in both their complexity, risk and value to customers. The project will ensure it only takes forward genuinely innovative improvements and ensure that low risk improvements are allocated to the BaU flexibility team for any further development required.

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

This project holds both technical and commercial risks with any potential returns expected to beyond ED1. As such the project could not be carried out as part of BaU activities. This goes beyond simple feedback, as conducted by BaU activities, and looks at fundamental process changes that can increase liquidity.

iii) Please identify why the Project can only be undertaken with the support of the NIA, including reference to the specific risks (eg commercial, technical, operational or regulatory) associated with the Project

This project is looking for innovative techniques to widen access to DSO flexibility services. NIA support is essential to support this process. The output of phase 1 is deliberately uncertain to enable the latest industry thinking to be captured. Phase 2 and 3 will be specifically

designed to take for the elements that cannot be taken forward without NIA support due to the associated risk. These are expected to be commercial, technical and operational.

This project has been approved by a senior member of staff