NIA Project Registration and PEA Document

Date of Submission

Sep 2022

Project Reference Number

NIA2_NGESO024

Project Registration

Project Title

REVEAL

Project Reference Number

NIA2_NGESO024

Project Licensee(s)

National Energy System Operator

Project Start

September 2022

Project Duration

0 years and 5 months

Nominated Project Contact(s)

Caroline Rose-Newport

Project Budget

£400,000.00

Summary

Given the necessary rate of change as we move toward net zero and away from traditional technology, we need to be able to test and launch new market services more quickly.

This project will investigate the feasibility of, and develop a proof of concept for, a National Grid Electricity System Operator (ESO) hosted, digitally ringfenced, balancing and constraint market which enables the ESO (supported by groups of energy sector service providers) to act autonomously in building innovative concepts, services and solutions to accelerate the ESO's Markets Roadmap and drive to net zero.

Preceding Projects

NIA2_NGESO0013 - Advanced Dispatch Optimisation

Third Party Collaborators

Capgemini

Nominated Contact Email Address(es)

box.so.innovation@nationalgrid.com

Problem Being Solved

Through our business plan we have committed to developing a 'sandbox' type environment in which new services can be tested and refined before launching to the wider market.

Customer feedback gathered to date is that the current platforms are designed for traditional generators and not for new technologies e.g., EV chargers.

Given the necessary rate of change as we move toward net zero and away from traditional technology, we therefore need to be able to test and launch new services more quickly, with the support and feedback of market participants.

Method(s)

The project will be delivered through a multiphase approach:

Phase 1: Agree the future vision and purpose

Gather ESO stakeholder views, including National Control, Operational Transparency Forum and Market Delivery, identify and gather market participant views and assess and identify regulatory impacts (including consultation with Ofgem regarding the existing sandbox process).

Phase 2: Develop a pilot design and asses the feasibility of the proposed system

Phase 2 will answer the following key questions:

- "What should the system do?"
Identifying further questions/issues raised by stakeholders and the regulator to create central use cases, take key learnings from the previous incarnations and subject matter experts (SMEs) to build use case suite, provide measurable cases in financial and carbon terms with alignment to RoI and Net Zero
- "What is the solution?"
Map requirements of the system to business capabilities of existing application estate and present a fit/gap analysis, produce a high-level design of processes for market testing through to BAU launch, build a risk/barrier assessment detailing key risks.
- "How will it be piloted and funded?"

A potential Phase 3 (proof of concept) will follow a go/no go decision at the end of Phase 2. A final report will be prepared to include identification of future funding requirements.

Risk Assessment:

In line with the ENA's ENIP document, the risk rating is scored Low.

TRL Steps = 2

Cost = 1 (£400k)

Suppliers = 1 (1 Supplier)

Data Assumptions = 1

Scope

The purpose of this project is to investigate the feasibility of, and develop, a proof of concept (POC) for an ESO hosted, digitally ringfenced, balancing and constraint market which enables the ESO (supported by groups of energy sector service providers) to act autonomously in building innovative concepts, services and solutions to accelerate the ESO's Markets Roadmap and drive to net zero.

Throughout the project we will engage key SMEs internally and externally to gather their views on the development of such a system. Activities will include:

- Conduct markets scan and review of Future Market Reform
- Run a "future vision" event with Industry Innovators on user requirements
- Event output/documentation review and brainstorming session, validate hypothesis
- Review tie-in with the ESO's Single Markets Platform and the Digital Engagement Platform

- Development and delivery of a high-level business case, risk/barrier assessment and scoping document
- Development and delivery of a pilot fit/gap analysis and estimated costs and feasibility study

Objective(s)

1. Deliver a vision statement, agreed ESO and market stakeholder purposes and a regulatory position statement
2. Through engagement with internal and external stakeholders identify, and answer, key questions
3. Produce a high-level POC design
4. Map requirements to business capabilities and present a fit/gap analysis
5. Propose how the system could be piloted and funded

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

The ESO does not have a direct connection to consumers, and therefore is unable to differentiate the impact on consumers and those in vulnerable situations. Benefits to all consumers are detailed below.

This project has been assessed as having a neutral impact on customers in vulnerable situations because it is a transmission project.

Success Criteria

The project will be deemed a success with delivery of a:

- High-level business case and risk barrier assessment
- PoC and scoping document
- Pilot fit/gap analysis and estimated costs and feasibility study

Project Partners and External Funding

Capgemini will be delivering this project, no external funding contribution.

Potential for New Learning

The ESO does not have a system based 'sandbox' type environment to test new products prior to market launch and allowing market participants to test their own services with these proposed products, feeding back on their experiences. This project will allow the market participants and the ESO, to discuss and learn about what the requirements could/should be and allow all parties to learn about what is important to other stakeholders.

The potential cost of building and implementing the system will be estimated and a POC design will be proposed.

All the above will be published in a final report on the Smarter Networks Portal.

Scale of Project

This research project will take approximately five months and produce a number of deliverables including a high-level business case, a POC and scoping document, and a pilot fit/gap analysis and feasibility study.

Technology Readiness at Start

TRL2 Invention and Research

Technology Readiness at End

TRL3 Proof of Concept

Geographical Area

This project will cover the whole of the GB network.

Revenue Allowed for the RIIO Settlement

None

Indicative Total NIA Project Expenditure

£400k

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:

With the move from traditional sources of generation towards new technology types and the need for new sources of flexibility as we transition to a zero carbon electricity system, it is more important than ever to accelerate the rate at which new products can participate in the market. A sandbox environment will facilitate this transition, utilising these new technologies and working with new providers to understand clearly how their solutions can participate in the market - what works and what does not - and how they, and the ESO, can refine them. This dedicated trial environment will expedite the development of new products, these market solutions and the exchange of knowledge and experience which future products and services can build on.

Trialling services that will facilitate the transition to Net Zero, prior to launch to the wider market, will create a shared sense of exploration and enable the involvement of wider range of market participants.

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

Not required as this is a research project.

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

An ESO hosted sandbox, ring-fencing part of the live market, will enable new products to be trialled, immediate feedback to be gained and learnings to be shared amongst participating parties.

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

This feasibility study will consider whether it is possible to develop this type of system by identifying and answering key questions. A high level POC will be developed along with a fit/gap analysis which will lead to a high-level cost estimate being presented in the final report. This will be subject to refinement in future phases of the project.

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 will be relevant to all market participants and potential market participants. External stakeholders will have participated in the study to help identify potential barriers to operating this type of service allowing us to consider and communicate the potential mitigations within the published learnings. This proof of concept will allow stakeholders and external service providers to consider how they may interact with the service in the future.

The outcomes of this feasibility study will be the foundation for the development of a larger programme if this project proves that it is feasible and service providers may decide, as a result, that they would like to participate in future development work.

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

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.

There has never been a live, system based ringfenced market within the ESO with a focus on 'test and learn' to gather the feedback from participants.

ESO National Control previously ran a 'desk' focussed on flexibility providers starting to connect. It was used as an opportunity for the ESO, and the providers to learn about the impact of those providers allowing them to build the necessary capability and allowing the ESO to support flexibility providers participating in the Balancing Mechanism (BM). The desk was decommissioned as it was no longer needed once lessons about this particular group of providers had been learnt and incorporated into BAU. Although it was similar to the proposed new system, in that it was an opportunity to collaborate and learn in a safe environment, the focus was different, and it was manual rather than system based.

The Advance Dispatch Optimisation (NIA2_NGESO0013) NIA project was a scoping study to assess user needs and suggest innovative options and approaches for any future tool development to support BM dispatch. The future tool will employ AI techniques to assess the variability of the different input variables and enable optimisation across a range of likely scenarios. This tool would effectively be the first step in developing a future Digital Twin of the GB energy system. The REVEAL system is similar but will be a live system. There may be the opportunity once both systems are operational to test the accuracy of the ADO modelling against reality.

Recent trials run through ESO National Control e.g., DRS and PowerLoop have been carried out using a number of manual workarounds. As we start to consider and engage e.g., consumers in the BM, for example as part of the Crowdflex SIF project and other future trials, having an easier and more structured way to run trials becomes essential. Although not the focus of this project, the REVEAL system could offer a route to doing this as part of later phase/future development.

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

There has never been a live, system based ringfenced market within the ESO with a focus on 'test and learn' to gather the feedback from participants. This project will investigate whether a new, safe 'test' system can feasibly be developed and launched as it may not be technically possible to do this. There is also a risk that we may not secure any derogation needed to operate a portion of market in this way.

Relevant Foreground IPR

The following Foreground IPR will be generated from the project:

- High-level business case and risk barrier assessment
- PoC and scoping document
- Pilot fit/gap analysis and estimated costs and feasibility study

Data Access Details

Data for this project and all other projects funded under the Network Innovation Allowance (NIA), Network Innovation Competition (NIC) or the new Strategic Innovation Fund (SIF) can be found or requested in a number of ways:

1. A request for information via the Smarter Networks Portal at https://smarter.energynetworks.org, to contact select a project and click 'Contact Lead Network'. National Grid ESO already publishes much of the data arising from our innovation projects here so you may wish to check this website before making an application.
2. Via our Innovation website at https://www.nationalgrideso.com/future energy/innovation
3. Via our managed mailbox innovation@nationalgrideso.com

Details on the terms on which such data will be made available by National Grid ESO can be found in our publicly available "Data sharing policy relating to NIC/NIA projects" at https://www.nationalgrideso.com/document/168191/download

Please identify why the Network Licensees will not fund the project as apart of it's business and usual activities

This is a complex project with many inputs and stakeholder views to consider. As a result, there is no clear design or path to delivery until key questions are answered and a POC is developed. Therefore, it is deemed too high risk for BAU funding to be used at this stage.

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

There are a number of risks associated with this project.

We believe that this 'sandbox' environment will meet the needs of the ESO to develop and launch new services more quickly, within an increasingly complex environment, giving more certainty when live services are launched to the wider market. However, the market/external stakeholders may not accept that what is proposed meets their needs. There is therefore a risk that the suggested approach does not have the support it requires to be successful if implemented. This project seeks to mitigate this risk by involving stakeholders in the development of the POC.

The proposed design may ultimately prove too complex and costly to implement into BAU.

This project has been approved by a senior member of staff

☑ Yes