

## NIA Project Registration and PEA Document

### Date of Submission

Aug 2022

### Project Reference Number

NIA2\_NGESO030

## Project Registration

### Project Title

Enduring Cross-Border Balancing

### Project Reference Number

NIA2\_NGESO030

### Project Licensee(s)

National Grid Electricity System Operator

### Project Start

September 2022

### Project Duration

0 years and 7 months

### Nominated Project Contact(s)

Christian Parsons

### Project Budget

£200,000.00

## Summary

Post-BREXIT, with the UK leaving the EU, the UK is no longer able to join TERRE (Territory, Energy & Employment) and MARI (Manually Activated Reserves Initiative) platforms which enabled the exchange of balancing energy with different lead times and different products. The Trade Cooperation Agreement instructs the UK to create a GB cross-border balancing market. This project is the first step in exploring the possibilities and implications associated with the introduction of a new balancing market in GB, able to interact with EU balancing markets. This modelling will explore the three proposed market models and create a CBA (Cost Benefit Analysis) for each one. BEIS would like to take the results to the Special Committee of Energy.

### Nominated Contact Email Address(es)

box.so.innovation@nationalgrid.com

## Problem Being Solved

Ahead of GB's withdrawal from the EU we were obligated by EU legislation to exchange balancing energy with the TSO's (Transmission System Operators) of other EU countries via platforms called TERRE (Territory, Energy & Employment) and MARI (Manually Activated Reserves Initiative).

TERRE & MARI enabled the exchange of balancing energy with different lead times and different products. As a result of BREXIT the requirements to implement and participate in TERRE and MARI have been removed from UK law.

The energy mix is changing and energy prices are fluctuating, so GB's need to have access to EU energy through cross-border trade is becoming more important. GB – EU is only becoming more interconnected going forward, with Interconnector capacity tripling by 2030.

We are now developing a new relationship with the EU under the TCA (Trade and Cooperation Agreement) and have a regulatory requirement to develop a procedure for cross-border balancing.

## Method(s)

This project, developing a CBA and simulation for a Cross-Border Balancing solution with all connected EU TSOS (RTE, ELIA, TENNET, Swissgrid, Energinet, Statnett, EirGrid plus SONI, SwissGrid and future interconnections will also be considered), with the outcome, to provide an ESO recommended approach. We will use the CBA to help with our conversations externally with GB industry and EU TSO's to get to a best-case outcome for all parties.

The project will be broken down into 3 work streams.

### **Workstream 1: Identification and pre-screening of the options for cross border balancing.**

- Provide an overview of the several scenarios for cross-border balancing, along with their characteristics and a ranking system followed by recommendations.

### **Workstream 2: Balancing market modelling and cost-benefit analysis.**

- Based on defined scenarios in workstream 1, we will leverage our balancing market model to forecast volumes and prices over the 2033-2036 period.
- This workstream will also consider the uncertainty around future market fundamentals.

### **Workstream 3: Multicriteria assessment and recommendations.**

- The objective of this workstream is to rank the different scenarios with regards to criteria that are not results from the modelling. The impact on concerned parties is a key consideration in implementing a new market.

A final report will be delivered describing the different solutions for a cross-border balancing market between GB and the EU and ranking those solutions.

The Risk Assessment Risk Threshold rating for this project is Low (Score 1)

TRL Steps = 1 (2 TRL steps)

Cost = 1 (£200k)

Suppliers = 1 (1 supplier)

Data Assumptions = 2

Total = 4 (Low)

## Scope

The scope of the project is to carry out CBA modelling on GB to EU ICs for a number of potential markets. The analysis will highlight the operational and financial benefits to both GB and the connected EU regions. This will help the ESO to determine which market is most suitable to develop. This project will include:

1. Potential Market optioneering and feasibility studies to determine the 3-4 market scenarios.
2. Economic analysis of the potential markets to assess benefit to each region.
3. Ranking and recommendations for the possible markets.

## Objective(s)

To deliver a final report outlining the financial and operational benefits, describing, and ranking, the different solutions for a cross-border balancing market between GB and the EU.

## 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

This project will provide an ESO-recommended approach that will support our external conversations with GB industry and EU TSO's

to get to a best-case outcome for all parties. In addition, the ESO has a high-level long-term plan to get to product go-live of ~2029 depending on the options selection. BEIS have advised that if the results are positive, they will look to accelerate the timeline by prioritising this work over existing aspects of the ESO balancing programme.

**Project Partners and External Funding**

FTI Compass Lexecon, no external funding contribution

**Potential for New Learning**

This project will produce a full report by region with recommendations. The supplier will host a dissemination session of the report with internal ESO stakeholders and complete an external webinar to GB industry. This will provide all stakeholders with confidence and understanding of the report and its recommendations.

**Scale of Project**

This project will span seven months with FTI Compass Lexecon delivering the work.

This is a research and analysis project producing a CBA and simulation.

**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**

£200k

## Project Eligibility Assessment Part 1

There are slightly differing requirements for RII-1 and RII-2 NIA projects. This is noted in each case, with the requirement numbers listed for both where they differ (shown as RII-2 / RII-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 RII-2 projects only)

Please answer **at least one** of the following:

#### How the Project has the potential to facilitate the energy system transition:

This project will provide a region by region break down of benefits for both EU and GB. We will use these results to begin discussions with EU TSO's to progress the balancing work between GB and the EU.

#### 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 (RII-1 projects only)

n/a

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

Not required as a research project.

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

This will be the output of the project. The scope of the project will cover the whole GB system.

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

The cost to rollout will be dependent on the final option chosen, which we are unable to provide at the point of registration.

### Requirement 3 / 1

Involve Research, Development or Demonstration

A RII-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

RII-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

This project is the first step in exploring the possibilities and implications associated with the introduction of a new balancing market in the GB, able to interact with EU balancing markets. This work will explore the three proposed market models and create a CBA for each one. The results and the main learnings of the study will be shared with the industry.

### 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.

We believe this project is a first and as such there should be no direct duplication.

### 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

This is the first piece of work of this kind since Brexit. It is unknown what this new market will/should look like, particularly as GB has never implemented a market of this kind before.

This would be a new tool for the ESO to obtain the IP for a simulation tool. It would help the ESO develop and identify new tools for the ESO to maintain efficiency and a reliable system operator.

### Relevant Foreground IPR

A final report will be delivered describing the different solutions for a cross-border balancing market between GB and the EU:

1. Potential Market optioneering and feasibility studies to determine the 3-4 market scenarios.
2. Economic analysis of the potential markets to assess benefit to each region.
3. Ranking and recommendations for the possible markets.

## 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](mailto: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](https://www.nationalgrideso.com/document/168191/download)" 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

We don't currently have the skills, resource or potential technology internally to deliver a high-quality result for a problem of this complexity due to the level of sophistication required. There is also a small chance that the results aren't positive and no further opportunities are identified.

## 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

The project will develop and assess market design options, as this type of market has never been implemented in GB before without researching and assessing those options, there is a significant risk of developing an inefficient market and/or one that the European TSOs will not participate in.

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

☒ Yes