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## NIA Project Annual Progress Report Document

### Date of Submission

Jul 2022

### Project Reference Number

NIA2\_NGESO005

## Project Progress

### Project Title

Stability Market Design

### Project Reference Number

NIA2\_NGESO005

### Funding Licensee(s)

NG ESO - National Grid ESO

### Project Start Date

June 2021

### Project Duration

1 year and 7 months

### Nominated Project Contact(s)

Sophie Van Caloen

## Scope

The overall scope of the project is to create options for the delivery of a stability market for GB, assessing these options and recommending one stability market design.

Operational costs arise due to the management of stability levels. Inertia has traditionally been available as a by-product through market despatch of synchronous generation in the Balancing Mechanism. Additional operational cost has also been seen from constraints caused by low short circuit levels.

In stability pathfinder phase one the ESO spent £328 million on 12. 5GVA.s for services delivering between 2020 and 2026. (<https://www.nationalgrideso.com/future-of-energy/projects/pathfinders/stability>)

The introduction of a market for stability will create competition which should lead to lower prices for end consumers. It will create an additional revenue stream for providers as well as a more transparent, open process. It is also expected to enhance the security of the system. Because no such market exists, the ESO can't fully assess the potential cost reduction, but this research project will evaluate the potential benefits.

Currently traditional fossil fuel plant provides a lot of the stability services. The ESO aims to create a market which allows all sources to compete in the provision of stability to the network. This will enable providers to access to an additional revenue stream which will also enhance the business case for renewable generation.

## Objectives

The objective of this project is to recommend a market design for stability. The project will first understand the current stability situation in the GB market, then create different options for a stability market, assess those options and choose a preferred one.

## Success Criteria

A recommendation for an end-to-end design for a stability market, backed up with an assessment of different options.

## Performance Compared to the Original Project Aims, Objectives and Success Criteria

*National Grid Electricity System Operator (“NGESO”) has endeavoured to prepare the published report (“Report”) in respect of Stability Market Design\_NIA2\_NGESO005 (“Project”) in a manner which is, as far as possible, objective, using information collected and compiled by NGESO and its Project partners (“Publishers”). Any intellectual property rights developed in the course of the Project and used in the Report shall be owned by the Publishers (as agreed between NGESO and the Project partners).*

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## Project overview

The project recommended a high-level stability market design. The report of the project has been published here and includes a description of the case for change, the objective framework, an assessment of market options and a description of the recommended market design. This is aligned with the initial objective of this project.

## Project activities

WP1: Alignment, vision, objectives (Completed)

- Scene setting: What are the realities? Establish ‘givens’ and make assumptions on all relevant topics
- Objectives: What do we want to achieve? Establish the design principles for the market

WP2: Design elements, strengths, weaknesses (Completed)

- Market building blocks: Define the key design choices that can materially impact market outcomes
- Straw-man options: Define conceptual design options to assess – exploring alternative philosophies
- Assessment: Appraise design options qualitatively against objectives
- Assessment: Appraise design options quantitatively

WP3: Industry views, refinement, finalisation (Completed)

- Refinement: Highlight the preferred option; make improvements to increase performance against our objectives
- NIA desirable option: Recommend a desirable design for stability market and way forward

Stakeholder engagement has been carried out and fed into our assessment. Two industry webinars were held to share initial findings and seek feedback (recording available here). A survey was also conducted to gather information and evidence from industry such as technology costs, investment issues, lead times, interaction with other services, cost structures, decision-making in dispatch timeframes.

## Required Modifications to the Planned Approach During the Course of the Project

The modelling plan has been changed to enable the modelling of three Future Energy Scenarios (FES) for two years. The possibility to change and increase the modelling was foreseen as an optional work package modification of the initial scope. The modelling of three scenarios enabled us to test our recommendation within a wider range of future energy systems and therefore improve the robustness of our conclusion.

## Lessons Learnt for Future Projects

The core recommendation of the Stability Market Design innovation project is to develop a combination of a dedicated short-term market (day-ahead) with a long-term market (building on the well-functioning pathfinder approach) for stability services, while retaining the Balancing Mechanism (BM) option as a backstop.

Other key recommendations:

- Future arrangements should target and facilitate a diverse mixture of different technologies to provide stability solutions at least cost to consumers.
- An enduring solution is required so that participants are able to optimise their asset stability characteristics in the design phase against expected stability revenues.
- Long term procurement should continue and be formalised into a systematic process so that providers are given the opportunity to develop a pipeline of solutions. Efficient signals for investment planning must be in place.
- The addition of a short-term market would offer a route for providers that aren't able to make long term commitments and is expected to bring benefits in terms of dispatch efficiency and carbon reduction.
- Contract types should (initially) be simple to promote transparency and reduce complexity of solution value assessments. We are proposing a single duration & definition contract at each market timeframe to help manage complexity.
- We are proposing different eligibility in different timeframes. Long term multi-year contracts to underpin investment, year-long (T-1) contracts to manage forecast error and influence closure decisions, and short-term day-ahead contracts to fine tune positions and broaden the pool of potential providers – lowering barriers to entry and promoting competition.

Further research topics regarding the more detailed development and design questions could include:

- Exploring the interactions between stability and other services, such as voltage and frequency response.
- Refining some of the market design options, as well as our procurement strategy including:
  1. Which providers should be eligible for participation and payment?
  2. What would be the volume split between the long-and-short-term markets?
  3. What is the optimal contract duration for a long-term market?

A thorough cost benefit analysis with an expanded modelling horizon beyond 2030.

Note: The following sections are only required for those projects which have been completed since 1st April 2013, or since the previous Project Progress information was reported.

## The Outcomes of the Project

This study-based innovation project explored a potential enduring market design for the procurement of stability services. The primary objective of our stability market is to ensure cost-efficient provision of services needed to maintain system stability and security in the interests of consumers.

Stakeholder input was critical to shaping the case for change and informing decisions on key market design choices. We co-created with industry through industry webinars ([available here](#)) and a survey that allowed stakeholders to provide detailed views and feedback to design an effective market.

The recommendation for the enduring stability market design was developed based on a qualitative and quantitative assessment of different market design options. The analysis used AFRY's BID3 model and ESO's stability requirement analysis based on FES 2019 data.

The core recommendation of the Stability Market Design innovation project is to develop a combination of a dedicated short-term market (day-ahead) with a long-term market (building on the well-functioning pathfinder approach) for stability services, while retaining the BM option as a backstop. This approach combines the benefits of both the long- and short-term markets while mitigating the drawbacks of procurement in a single timeframe. This hybrid approach over multiple timeframes also aligns with stakeholders' feedback during our engagement, with the majority favouring a combination of short- and long-term markets.

## Data Access

Details on how network or consumption data arising in the course of a NIC or NIA funded project can be requested by interested parties, and the terms on which such data will be made available by National Grid can be found in our publicly available "Data sharing policy related to NIC/NIA projects" and [www.nationalgrideso.com/innovation](http://www.nationalgrideso.com/innovation).

National Grid Electricity System Operator already publishes much of the data arising from our NIC/NIA projects at [www.smarternetworks.org](http://www.smarternetworks.org). You may wish to check this website before making an application under this policy, in case the data which

you are seeking has already been published.

### **Foreground IPR**

Reports and materials will be uploaded to the Smarter Networks Portal and are available on the ESO Stability Market Design [webpage here](#). This includes the project report with 4 annexes.