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NIA Project Annual Progress Report Document

Date of Submission

Jul 2024

Project Reference Number

NIA2_NGESO053

Project Progress

Project Title

Exploring the Economic Benefits of Co-optimising Procurement of Energy, Response and Reserve

Project Reference Number

NIA2_NGESO053

Project Start Date

September 2023

Project Duration

0 years and 7 months

Nominated Project Contact(s)

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Scope

The project consists of four work packages. These will be delivered through both qualitative and quantitative assessments. This project is an initial exploration of co-optimisation in a GB context, and we expect more detailed phases of work would be needed before any introduction of a co-optimised system.

Work package 1: Qualitative discussion of hypothesised pros and cons of co-optimising energy and ancillary services in the context of GB's wider market reform work. This work will consider potential issues such as computation complexity and cross-border trading in a co-optimised model.

Work package 2: Assessment of the historical-cost savings of co-optimised day-ahead and/or real time procurement of energy and ancillary services in the GB market.

- By modelling a reliable representation of the GB electricity market, the model then considers the counterfactual scenario wherein energy and Ancillary Services (AS) have been co-optimised. This in turn will provide a historic assessment of cost savings for a specific year.

Work package 3: Quantify the potential efficiency savings for GB from 2025 – 2035 co-optimising procurement of energy and ancillary services.

- In taking the current electricity market as the counterfactual, this work package would compare this against a fully co-optimised system. Doing so returns a future cost saving.

Work package 4: Quantitative assessment of the potential efficiency savings from the co-optimised procurement of energy and AS in a GB nodal market from 2025 – 2035.

- This work package tests the hypothesis that the procurement and utilisation of resources would be more optimal in a more locational pricing system as market participants would consider the physical realities and constraints of the transmission network and reflect this knowledge in their day-ahead and real-time bids and offers.

If this project finds substantial potential benefits from co-optimisation, next steps may include developing the work into a further phase

to understand the design/deliverability challenges in more depth.

Objectives

The key objectives are to:

1. Enhance understanding of the advantages and disadvantages of implementing a co-optimised system within GB.
2. Assess historic and future efficiency savings which stem from co-optimising across energy, response and reserve products.
3. Explore the relative merits of locational pricing for optimised ancillary service procurement.
4. Disseminate key findings to stakeholders and inform the debate on the role of a co-optimised. electricity system, informing the wider REMA discussion about future dispatch mechanism options

Success Criteria

The project will be considered successful upon the delivery of:

- A qualitative assessment of the relative merits and shortfalls of a co-optimised system which enhances understanding of key potential issues such as cross-border trading compatibility.
- A robust quantitative assessment of the historic and future efficiency savings of co-optimisation of energy, response and reserve.
- A robust quantitative assessment of the future efficiency savings of co-optimisation of energy, response and reserve in the context of a nodal wholesale market.
- The above findings in a timely manner which allows us to inform industry, DES-NZ and Ofgem of the merits/shortfalls in pursuing central dispatch and co-optimisation.

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 Exploring the Economic Benefits of Co-optimising Procurement of Energy, Response and Reserve NIA2_NGESO053 (“Project”) in a manner which is, as far as possible, objective, using information collected and compiled by NG 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 NG and the Project partners).

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The project is delivering learning that can support future innovation projects within the ESO about dispatch, and, importantly, is providing valuable qualitative and quantitative analysis to feed into the REMA process.

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

The project has so far largely followed the planned approach, with refinements along the way around the focus areas for each party and splitting the reports in to an initial qualitative and subsequent quantitative edition.

The complexity of modelling sequential markets and of calibrating the models has extended the timeline of the project but has been worthwhile to ensure the results are robust and representative.

Lessons Learnt for Future Projects

To be confirmed at the end of the project

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

The project has so delivered useful qualitative insight into the theory and practicalities of the co-optimisation of energy, ancillary

services and transmission, along with background about the considerations for implementing such a change in GB. The quantitative results are still in draft, but show that there is scope for savings on both system cost (the cost of producing electricity) and cost to end consumer (the total amount that bill payers would pay) both historically and in to the future.

Data Access

Details on how network or consumption data arising in the course of NIA funded projects 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.

National Grid Electricity System Operator already publishes much of the data arising from our NIC/NIA projects at 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.

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