

REMA – ESO Response: Executive Summary

ESO's Executive Summary from our response to BEIS' Review of Electricity Market Arrangements [consultation](#), informed by our [Net Zero Market Reform](#) (NZMR) analysis. This was submitted on Monday 10th October 2022. This is a public response and will be published by BEIS with all responses to the consultation.

Executive Summary

Introduction:

REMA represents the most far-reaching review of energy market arrangements since privatisation. Efficient and coherent electricity markets will be fundamental to achieving net zero. We, the Electricity System Operator (ESO), therefore hugely welcome REMA's long-term focus, and believe its outcomes will be transformative in delivering decarbonisation, system security and value for consumers.

The ESO has a dual responsibility: first, to operate and balance the electricity system in real-time, and second, to work with Government, Ofgem, industry and consumers to guide GB on the resources, markets and networks needed to deliver a future energy system that is secure, fair and clean for all.

We fully support the government in acting decisively to help consumers through the gas price and cost of living crisis. This does not detract from, and indeed reinforces, the need for GB to focus on the long-term vision and strategy for net zero markets – ensuring we are delivering a clean, secure and reliable system will help to mitigate the impact of any future crises on consumers.

This response outlines the ESO perspective on what market design reforms are needed to achieve a decarbonised electricity system by 2035. In summary, we believe that:

- Significant reform is needed to meet the scale of GB's decarbonisation ambitions. Defining a clear, holistic long-term vision, with a coherent and well-communicated transition, is vital
- In a high-renewables system, nodal pricing, which reveals the true value of electricity at different times and locations, is a critical enabler for both efficient investment and real-time operation
- As electricity generation becomes more weather-dependent, centralised market clearing and dispatch is increasingly appropriate for coordinating generation and demand
- Support mechanisms for low carbon technologies are key to maintain investor confidence to ensure investment at pace. Design enhancements that allow increased price exposure in operational timeframes could reduce system cost
- Retaining investor confidence during implementation of new market arrangements will be crucial. Transitional measures will be required for existing investments. Minimising any period of uncertainty should be a priority.

The ESO Net Zero Market Reform Programme:

We launched our [Net Zero Market Reform](#) (NZMR) programme in early 2021, to examine holistically the changes to GB electricity market design that would be required to achieve net zero. In May 2022, we published the third phase report relating to the elements of market design that address

operational issues. We are currently undertaking the fourth phase of the programme, focussing on market design mechanisms to deliver investment outcomes, as well as developing holistic market design packages that combine investment and operational elements. Such fundamental and wide-ranging reforms would impact the whole energy system, so we also consider wider system implications (e.g. gas, hydrogen, heat) from the outset.

We summarise below key points from our REMA response, informed by our NZMR programme analysis.

The wholesale market price must reflect where and when electricity is generated and consumed

In a high-renewables system, where and when electricity is generated and consumed is critical to its value. The current market design fails to communicate this value with sufficient accuracy, resulting in wasted renewable generation, rising balancing costs and suboptimal use of network capacity. Consumers are bearing excessively high system operation costs as a result, and without more effective locational signals will ultimately incur unnecessary cost from inefficient buildout of new energy production and transmission capacity.

Nodal pricing could deliver maximum value for consumers and accelerate decarbonisation

Nodal pricing reflects the value of electricity at high locational and temporal granularity. This would incentivise flexible resources to complement renewable generation, enabling GB to maximise use of its clean resource.

For regions where renewable supply commonly exceeds demand, nodal pricing would greatly reduce the frequency with which gas sets the price, driving down wholesale energy costs and benefitting consumers as a whole. Recent studies suggest locational pricing would save consumers c.£30bn by 2030 (ESC & Octopus) and £59bn by 2050 (Aurora). We expect a forthcoming Ofgem technical assessment to provide further evidence on consumer benefits from locational pricing. Ensuring nodal pricing accounts for consumer distributional impacts would be key to its success, and we believe there are several credible ways that it can be implemented to avoid or manage concerns around regional price variation.

Centralised dispatch could offer substantial efficiency improvements through better alignment of the market with the physical and energy balancing needs of the electricity grid

The choice of self or central dispatch determines how resources are selected to run. The current GB market is theoretically self-dispatch, meaning decision-making is decentralised; however, the increasing divergence of wholesale market outcomes from the physical capability of the grid means that ESO is frequently unwinding dispatch decisions to secure system reliability. We believe this structure is inefficient and results in unnecessarily high balancing costs.

Phase 3 of NZMR found that central dispatch combined with nodal pricing would most effectively coordinate the electricity system by enabling the market to resolve system constraints. Irrespective of locational wholesale market design, we believe more centralised dispatch has several advantages in a decarbonised system: from improved pooling of information in operational timescales, price visibility, and enabling co-optimisation of energy and ancillary services. We are therefore assessing the potential for a centrally dispatched wholesale market design, both with and without locational energy pricing, to improve balancing and overall system outcomes.

Investment support mechanisms are key to reaching net zero; however, reform is needed to ensure assets contribute to system security and reliability, across supply and demand

Significant market reform inherently creates uncertainty for investment, but a clear long-term vision, transparent process and a well-managed transition can mitigate much of that uncertainty.

The Electricity Market Reform (EMR) policies have successfully facilitated early-stage investment in low carbon technologies. We believe both reformed and additional policy instruments are now required to achieve a cost-efficient balance of weather-dependent and flexible resources.

The wholesale market and dispatch design reforms set out above are the critical first steps in aligning investment signals with system needs: sending accurate and granular signals for assets across the system will send clearer investment signals for flexible technologies and will avoid or mitigate renewables price cannibalisation.

While we have yet to conclude our NZMR Phase 4 analysis of investment market design, we have identified the following key issues and considerations for solutions:

- Asymmetry of both market signal exposure and financial de-risking policy support across supply- and demand-side will lead to unnecessary renewables curtailment and price cannibalisation. Future market and policy design can address this imbalance to incentivise an optimal mix of renewables, demand and flexibility.
- CfDs are needed to drive investment in zero carbon technologies at the pace required, but the current design can disincentivise generators from reducing system costs by shielding them from real-time price signals. We believe CfD design enhancements that introduce some wholesale price exposure are desirable.
- The Capacity Market does not always accurately reward resources for addressing emerging system needs. Design options that link remuneration more closely to system value, including Reliability Options and Reverse Reliability Options may be preferable to the current design. We are aware of the need to carefully manage the exit of high carbon plant and therefore also suggest further exploring strategic reserves.

Proposals to split the wholesale market could risk negative unintended consequences. Alternative mechanisms are available to address the issues of expensive price-setting resources

While there is no real-world evidence to draw upon (as it is not a market design that exists anywhere globally), we are concerned that splitting the wholesale market by technology type to move away from marginal pricing risks unintended consequences. These could include:

- Inaccurate signals of system value and limited price exposure of some parties weaken incentives to help reduce system costs, driving increased balancing costs
- Perverse incentives for cross-border trading if neighbouring countries do not split their markets
- Reduced competition and liquidity in balancing and ancillary services markets, where intermittent renewable generation would not be incentivised to participate

To address gas setting the marginal price of electricity, alternative measures to market splitting in the short term include expanded use of CfDs. In the longer term, proven solutions such as nodal or zonal pricing would significantly reduce the prevalence of wholesale prices being set by gas. Measures to unlock full-chain flexibility would stimulate a far greater contribution from demand-side response and reduce dependency on gas flexibility. More generally, accelerating deployment of demand-side energy efficiency will reduce the number of periods in which gas is required to meet demand.

ESO will continue to reform operability markets as we progress to net zero, but the simultaneous reform of wholesale markets and dispatch would result in much more efficient operability outcomes

ESO is undertaking extensive reform of its balancing services markets to ensure they are fit for net zero, delivering security and minimising costs as much as possible within the scope of the current wholesale market design. Improving wholesale market design via dynamic locational signals will make a substantial contribution to resolving existing inefficiencies in balancing services procurement and dispatch.

We commend again the long-term outlook, breadth and depth of this consultation. We look forward to working with BEIS, Ofgem and the wider industry to help design and deliver the market reform outcomes that REMA has set out to achieve for GB consumers.

Please find our full response to BEIS' REMA consultation [here](#).