Electricity Balancing Market in the United Kingdom

Time to Rebalance Participants’ Interests

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About KAPSARC

KAPSARC is an advisory think tank within global energy economics and sustainability providing advisory services to entities and authorities in the Saudi energy sector to advance Saudi Arabia's energy sector and inform global policies through evidence-based advice and applied research.

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During the four months of winter (November to February) of 2021/22, the costs of keeping supply and demand matched through the United Kingdom's electricity balancing market reached a record high of over £1.5 billion.

This cost was more than three times the total balancing cost incurred by the National Grid (Figure 1) for the winter months between 2017 and 2020 (Ofgem 2021). The annual balancing costs required to prevent blackouts and match electricity supply and demand reached a staggering £4.1 billion in 2022/23 (Figure 2), an approximately 250% increase on the £1.2 billion in 2019 (Ofgem 2023). According to one analysis, the annual balancing costs of 2022/23 are equivalent to every household in Britain paying an extra £150 annually (Mavrokefalidis 2023). Using expensive imported gas to bridge the shortfall in electricity generation and unreasonably low wind-load factors were cited as the clearest direct reasons for the soaring cost of balancing the grid. However, Ofgem investigated the high balancing costs during the winter of 2021/22, and found that some electricity generators were profiting by withholding their supplies during peak demand to fetch a higher offer price for them in the balancing market when the grid needed additional support to match high demand (Ofgem 2021; Millard, Sheppard, and Pickard 2023). In other words, these generators received higher payments for participating in the balancing market than they did in the energy market.

Prima facie, one could argue that such behavior by electricity generators is a clear case of abusing the system to garner excessive financial benefits at the expense of electricity consumers. Indeed, it could be said that their actions in the balancing market cause exceptionally high balancing costs to the Electricity System Operator (ESO), which electricity consumers ultimately bear. However, Ofgem's report in June 2023 stated that it had not found "any conclusive evidence of market participants acting outside of their obligations under REMIT, the Competition Act 1998, or the conditions in the generation license" (Ofgem 2023). In its review of this issue, the ESO expressed a similar opinion (ESO UK 2023).

How did generators get away with such market behavior without fear of being penalized by the market watchdog? Under existing balancing market rules, generators have the right to revisit their Physical Notification from a positive megawatt (MW) value to zero MW within the operational day. This serves as a signal to the ESO that their units will not generate electricity in the run-up to and during peak demand when generation is needed the most. Once these units cease to generate electricity, balancing market rules require them to remain at zero output for a minimum period to comply with the unit's minimum zero-time requirement (typically set to six hours for thermal units). In practice, this means that after completing this cooling period, generators are allowed to revisit the Physical Notification of their units from zero to a positive value and approach the ESO with their revised offer bids. During the winter, this action helped them create supply scarcity by withdrawing from the market, which drove prices up during tight supply margins. They subsequently agreed to generate a much higher offer price during peak demand through balancing the market. The ESO had no choice but to accept their offers to minimize the gap between demand and supply, as existing rules do not prohibit generators from submitting high offer prices in the balancing market or charging higher prices for power; they are generated in other wholesale markets. As an independent energy regulator, Ofgem has now intervened in this matter and developed proposals to safeguard consumer interests. However, this issue provides the following takeaways for policymakers and regulators in other regions.

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First, designing electricity markets is an ongoing and evolving process rather than a one-shot job. New issues and challenges require midcourse correction over time. For example, in 2012 in the United Kingdom, Ofgem observed that flexibility and peak generation were not valued appropriately and therefore not providing the right price signals for participating in the balancing market. Nor did they encourage investment in capacity to ensure an efficient level of supply security. Consequently, it recommended aligning imbalance prices (also known as ‘cash out’) with the most expensive action the system operator takes to balance the system for each settlement period (Ofgem 2018). Several other changes have also been implemented to design the balancing market as it exists today. However, this design is still under investigation and requires further attention.

Second, as electricity systems embrace higher volumes of intermittent capacity in the future, managing the balancing market will become more complex. With more weather-driven renewables coming onstream, both transaction volumes and procurement frequencies in seeking balancing services are likely to increase. This supply transformation is expected to present heightened operational challenges to not only grid operators but also the regulator. Regulators must design an efficient and more balanced way of compensating market participants likely to offer balancing services with a newer and wider set of technologies than historically used. This requires a careful and balanced approach to designing incentives that neither create barriers to entry to new market participants, especially low-carbon flexible assets, nor allow them to make windfall profits.

Third, the continuous monitoring and evaluation of the design and performance of the balancing market, along with the wholesale market and electricity sector as a whole, will be crucial. Timely and appropriate interventions can support the achievement of the desired policy goals while keeping electricity sector transformation on track.

Finally, many countries have made significant strides in designing and implementing market-based wholesale electricity and balancing markets. Other countries have standard balancing markets in which system operators continue to procure balancing services using the classic method at an agreed price and terms with flexible generators. No instances of profiteering have been reported through such contracts.

Thus, no one-size-fits-all approach exists. Nonetheless, policymakers and regulators must be forward-looking and act appropriately and promptly.
Figure 2. System and energy balancing costs, 2020–2022.


Notes: RoCoF = Rate of change of frequency

References


