

# Market Monitoring 12 Month Review 2022



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## Purpose of this document

Following the establishment of the Market Monitoring function in September 2021, we have created this report to:

- Explain our role and how we monitor the market
- Share insights on the last 12 months of market activity
- Look more closely at how bid and offer prices are monitored,

We have endeavoured to be as open and transparent as possible with Market Participants. However, due to the sensitive nature of the matters we are dealing with, we are unable to provide specific information on our investigations. We hope that this report will provide some useful insight into our activities and general trends in the market. If you have any questions or feedback about the content, then please contact us at [marketreporting@nationalgrideso.com](mailto:marketreporting@nationalgrideso.com).

## Why the ESO Market Monitoring team exists

This team has been established to ensure we meet our licence condition (C28 j)<sup>1</sup> requiring the Electricity System Operator (ESO) to proactively monitor balancing services markets for breaches of Grid Code and we undertake this obligation alongside the role of a Person Professionally Arranging Transactions (PPAT) under the wholesale energy market regulation<sup>2</sup>. To fulfil these roles, the Market Monitoring function was established as a ringfenced area within the ESO. This is to enable scrutiny of ESO's internal actions alongside external actions in the wholesale markets which we facilitate, whilst recognising that ESO is also a market participant.

REMIT is Regulation (EU) No 1227/2011 on wholesale energy market integrity and transparency. Following the United Kingdom's departure from the EU, REMIT as it applies in the UK, has been retained as amended by The Electricity and Gas (Market Integrity and Transparency) (Amendment) (EU Exit) Regulations 2019 SI 2019/534 (the "Amending Regulation"). REMIT prohibits wholesale energy market manipulation and insider trading and obliges wholesale energy market participants (MPs) to publicly disclose inside information in a timely and effective manner. Further guidance on REMIT and its application can be found at the links below, first on Ofgem's website, and second in the EU Agency for the Cooperation of Energy Regulators (ACER) Guidance on the application of REMIT. Ofgem has indicated that until further notice it will continue to interpret REMIT regarding ACER's guidance when carrying out its monitoring and enforcement responsibilities.

<https://www.ofgem.gov.uk/energy-policy-and-regulation/policy-and-regulatory-programmes/remit-and-wholesale-market-integrity>

[https://documents.acer.europa.eu/en/remit/Documents/ACER\\_Guidance\\_on\\_REMIT\\_application\\_6th\\_Edition\\_Final.pdf](https://documents.acer.europa.eu/en/remit/Documents/ACER_Guidance_on_REMIT_application_6th_Edition_Final.pdf)

## What and how we monitor

Our surveillance work covers all the services procured by the ESO, including monitoring of balancing markets as these constitute wholesale energy markets or derivative products. All products and services procured by the ESO, including acceptance through the balancing mechanism, are monitored for market manipulation or insider trading.

To monitor the balancing service markets that we operate, we have:

- reviewed all existing policies, processes and procedures and implemented enhanced controls where required.
- created systems to provide automated alerting of potential suspicious activity based on data within ESO datasets; and

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<sup>1</sup> Licence condition C28 4(j)<sup>1</sup> National Grid ESO in its role as an economic, efficient & co-ordinated system operator is responsible for: "monitoring balancing services markets for potential breaches of the Grid Code, investigating where necessary and raising concerns to Ofgem where appropriate"

<sup>2</sup> Article 15 of REMIT: "Any person professionally arranging transactions in wholesale energy products who reasonably suspects that a transaction might breach Article 3 [Inside information trading] or Article 5 [Market Manipulation] shall notify the national regulatory authority [OFGEM] without further delay."

- implemented procedures for targeted sampling of audio and electronic communications channels.

We review all the data through a series of checks deploying a combination of absolute and statistical methods. In the last 12 months our systems have identified over 160,000 datapoints where the data has fallen outside a series of pre-defined criteria. These datapoints were then passed through a further level of refinement based on automated analysis to produce approximately 60,000 alerts for review.

We look at the holistic data available and seek to understand why the actions may have occurred considering wider circumstances such as market conditions and REMIT Inside Information Platform declarations and look to close the alert. Where an alert is not closed, we investigate for potential violations of the market rules. All investigations are recorded and logged for future analysis and further refinement of our processes. Where we cannot close an investigation following detailed review, we will either contact the owner-operator to attempt to resolve the alert or escalate as appropriate.

In the 12 months until the end of August 2022, we have carried out 1,748 investigations, closing the majority, with a summary of actions based on these investigations shown in table 1. Further action refers to raising an issue for discussion with Ofgem via various channels including submission of a formal Suspicious Transaction Report where this is appropriate<sup>3</sup>.

Table 1: Actions of investigations arising from proactive monitoring

Outcome	Number of Alerts	Number of Units
Solution was agreed and implemented with operator	642	39
Further action taken	177	27
Closed following further review	929	147

Alongside the automated monitoring described above we also receive communications from stakeholders to alert us to unusual behaviour or discuss balancing activities. A summary of actions arising from the communications is shown in table 2.

Table 2: Actions arising from reports by stakeholders

Outcome	Number of Alerts	Number of Units
Solution was agreed and implemented with operator	7	9
Reasonable technical justification was provided	1	4
Further action taken	43	42
Proactively informed of unit's operations	4	4
Held as intelligence	49	69

## Working with Market Participants

As well as fulfilling our REMIT and licence obligations, we endeavour to work with stakeholders to understand anomalies in data. Over the last year, we have engaged with 71 counterparties through various channels including: The balancing market review, looking at the high balancing cost days seen in the last quarter of 2021; The market monitoring team introductory workshop; And bilateral engagement following alerts being generated. This engagement has further supported our understanding of units' operations and the data being submitted to the Balancing Mechanism.

Market Participants are able report any suspicious behaviour relating to balancing markets to us by emailing [marketreporting@nationalgrideso.com](mailto:marketreporting@nationalgrideso.com), alternatively suspicious activity can be raised directly with Ofgem. We

<sup>3</sup> DIRECTIVE 2004/72/EC of 29 April 2004 implementing Directive 2003/6/EC as regards accepted market practices, the definition of inside information in relation to derivatives on commodities, the drawing up of lists of insiders, the notification of managers' transactions and the notification of suspicious transactions.

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2004:162:0070:0075:EN:PDF>

review every alert raised to us via the processes described above and where appropriate these instances may be reported to Ofgem.

We have also worked with market participants to improve the quality of data being submitted to help provide a more accurate and reflective market view of available generation and expected output. Table 3 shows that on many occasions we were able to agree a solution with operators through discussions, improving the quality of data in our systems and reducing the number of alerts detected. Where reasonable technical justification was provided by an operator, we were able to implement process changes which remove alerts for that occurrence.

Table 3: Outcomes of discussions with operators

Action Taken	Outcome	No. Of units	No. of alerts reviewed before contact	No. of alerts reviewed after contact
Contact with counterparty	Solution was agreed and implemented	21	308	62
	Reasonable technical justification was provided	9	123	24

## Overview of price trends

### Volume Weighted (VW) Average Electricity Prices over Time

● VW Intraday Price (£/MWhr) ● VW Day Ahead Price (£/MWhr) ● VW Offer Acceptance Price (£/MWhr)

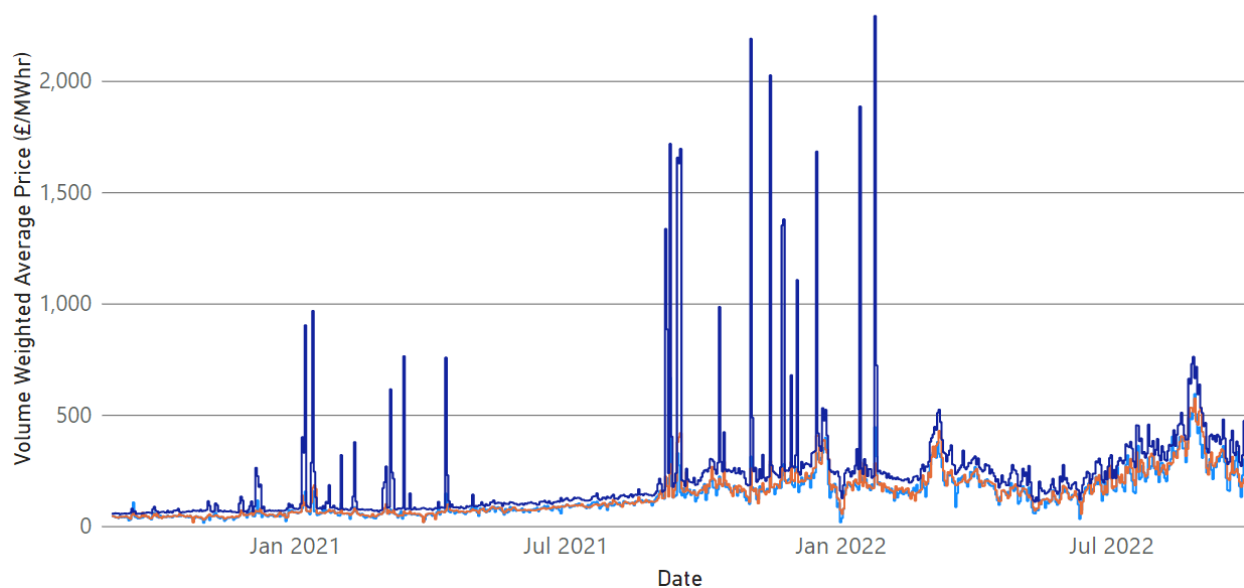


Figure 1: Graph demonstrating the change in historic energy prices across various markets

A key trend which has impacted the Market Monitoring team’s activity over the past 12 months is the increase in wholesale costs for energy. This change has been driven by the increased costs of wholesale gas which has set the marginal price for units in all marketplaces. The graph above demonstrates these changes from September 2020 through to September 2022. On most days the Day Ahead price (orange), Intraday price (Blue) and Accepted Offer price (Purple) are strongly correlated, with the accepted offer price typically being the highest priced market, reflecting the lower operating certainty of the units and lower transaction volumes. However, on days where the surplus energy capacity to requirement was low, the volume weighted average accepted offer price was substantially higher than the equivalent values in the day ahead and intraday markets. This was true in Winter 2020/2021 but became more apparent across Autumn to Winter 2021/2022, driving the ESO to review the 10 highest cost days resulting in the Balancing Market Review report.

This review identified that: “The size and inflexibility of the relevant units (embodied by declared dynamic parameters) meant ESO had to accept offers up to £4,000/MWh across multiple hours just to cover the peak.

- *With regard to coal plants, offers had to be accepted for the full minimum non-zero time (MNZT), typically around 6 hours.*
- *With regard to CCGTs, their minimum zero time of around 6 hours combined with a plan to desynchronise in the afternoon, often meant the ESO had to delay their planned desync to ensure they were available for the peak, resulting in accepted offers much earlier in the day.”*

This report found that “based on the information available to us, we have no clear evidence of behaviour inconsistent with the market rules”<sup>4</sup> and OFGEM’s response stated that “To date, we have similarly found no conclusive evidence of market participants acting outside of their obligations under REMIT, the Competition Act 1998, or the conditions in the generation licence.” However, Ofgem are “concerned that evidence showed behaviours of some generators that appear to be immoderate”.

The full report can be accessed [here](#).

Ofgem’s response can be accessed [here](#).

## Market Monitoring Areas of Activity

*The following section outlines the two key aspects of the balancing market we have monitored over the last year and how the rules may apply in these areas.*

### Focus Area 1: Bid Surveillance

From several years ahead through to real time delivery, ESO optimise the physical capabilities of the transmission system to determine secure operating characteristics set out in the Security and Quality of Supply Standard (SQSS)<sup>5</sup>. Where localised technical requirements exist, these may be possible to resolve through System tagged<sup>6</sup> bid and offer acceptances, and for this reason all accepted prices are assessed for compliance with market rules. When assessing bid prices, we will review the reasons that these bids are accepted and where these are system tagged actions, this will often be due to export constraint conditions.

Export constraints are those where the limitation is on the technical capability of the transmission system to get power out of the network area, congestion across these export boundaries typically occurs where there is high generation and low demand as this induces a power flow out of the group that may exceed the transmission system capability. To manage power flow congestion across an export constraint either the demand must be increased, or the generation must be decreased. The method to prevent these potential overloads is through accepting system tagged bids through the balancing mechanism or taking a system tagged trade to reduce power output or increase demand.

### Surveillance Process

One of the key market rules which bid prices are monitored against is included in the generator licence condition 20A<sup>7</sup>, the transmission constraint licence condition (TCLC). TCLC states that a “licensee must not obtain excessive benefit from electricity generation in relation to a Transmission Constraint Period”. Ofgem issued an open letter explaining that “The TCLC has been introduced in order to prevent generators from exploiting periods of transmission constraint.” In the guidance provided by Ofgem it states that, “The licensee shall be considered to have obtained an excessive benefit from electricity generation in relation to a Transmission Constraint Period if:

under the Relevant Arrangements and in connection with a reduction in electricity generation in the Transmission Constraint Period, either:

- (i) the licensee pays, or seeks to pay, the system operator an excessively low amount
- (ii) the licensee is paid, or seeks to be paid, an excessive amount by the system operator”

<sup>4</sup> Note the requirement for compliance with competition law and REMIT which were out of scope of this review

<sup>5</sup> <https://www.nationalgrideso.com/industry-information/codes/security-and-quality-supply-standards>

<sup>6</sup> <https://www.nationalgrid.com/sites/default/files/documents/APPENDIX%20D-SMAF.pdf>

<sup>7</sup> <https://epr.ofgem.gov.uk/Content/Documents/Electricity%20Generation%20Standard%20Licence%20Conditions%20Consolidated%20-%20Current%20Version.pdf>

Day ahead constraint limits and expected flows are published on the ESO data portal.  
<https://data.nationalgrideso.com/constraint-management/day-ahead-constraint-flows-and-limits>

## Trend analysis and insights: Export constraints

The chart below shows the direct cost from bid acceptance or trades taken to manage export constraints, alongside the minimum volume weighted average accepted bid price by BMU<sup>8</sup>, as accepted through the balancing mechanism.

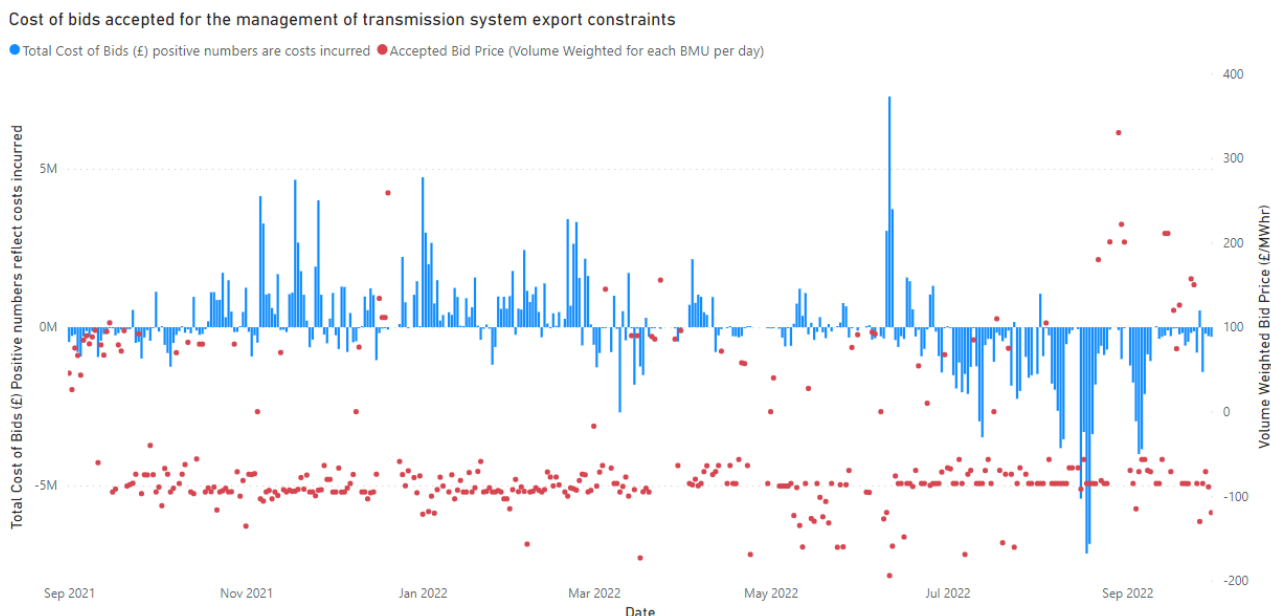


Figure 2: The total cost to manage export constraint conditions mapped against the lowest bid price accepted for the day (positive blue bars indicate that the cost of bids x volume of bids led to direct consumer cost from the action, the red dots indicate the minimum bid price accepted on the day) This does not include replacement energy costs.

Export Constraints can be driven by factors such as high winds leading to high levels of generation in certain areas or reduced transmission capacity due to unavailability on the network. Higher levels of wind in October to February led to an increase in congestion management actions whilst reduced transmission capacity has had more of an effect in the summer months.

The differences between the economics of different types of generation mean that the bid prices accepted to manage transmission constraints may be negative, this would account for the requirements of units to make up for lost subsidy payments when operating in the balancing mechanism at a reduced power output.

The minimum accepted bid price is strongly correlated with the volumes and total costs of bid acceptance as bid prices deeper into the stack must be accepted to resolve constraints. The minimum bid price in England and Wales is often positive depending on the type of generation being instructed. Positive bid acceptance through the balancing mechanism still incurs costs due to the replacement energy required to balance the action, but the data in Figure 2 only shows the direct cost of bids reflecting the analysis undertaken by Market Monitoring.

The data in Figure 2 is aggregated across all export constraint conditions and the BMU specific data is anonymised. However, alerts are generated for all bid prices which are anomalous including those which are not accepted. Tools to measure the relative market positioning, the absolute pricing, changes made to pricing and overall trends when specific constraint conditions are active have been developed to scrutinise these alerts and test for consistency with market rules.

<sup>8</sup> A positive bid price reflects the amount a unit is willing to pay to reduce its power output, therefore, the minimum bid price is the figure used in understanding price appropriateness. When bid prices become negative, this reflects the amount paid to the unit to reduce power output.

## Focus Area 2: Offer Surveillance

Alongside proactive analysis of bid prices, offer prices are also monitored for compliance. All offer prices are evaluated and the reason for offer acceptance is reviewed as part of this analysis process. Voltage management or Import constraints being active are two key reasons for offer prices being accepted as system tagged actions and therefore additional scrutiny is applied where these deviate from wider market prices. These actions to increase energy output may be agreed through system tagged balancing mechanism acceptance or through system tagged trade actions.

### Surveillance Process

Voltage management is required where the limitation is on the technical capability of the transmission system to maintain Security and Quality of Supply Standards voltage requirements through the injection/absorption of reactive power. Due to the nature of reactive power this creates localised requirements on BMUs to provide reactive support.

The localised nature of Reactive Power requirements means there is a natural limitation on the number of generators that can provide the necessary voltage support in a region. A method to prevent these unacceptable voltage deviations is to accept system tagged offers or system tagged trades to ensure that BMUs are running which is a requirement to access their reactive power capability.

Import constraints are those where the limitation is on the technical capability of the transmission system to get power into a network area, congestion across these import boundaries typically occurs where there is low generation and high demand as this induces a power flow into the group that may exceed the transmission system capability. To manage power flow congestion across an import constraint either the demand must be reduced, or the generation must be increased, typically to prevent thermal overloading of the power lines. The method to prevent these potential overloads is through accepting system tagged offers through the balancing mechanism or taking a system tagged trade increase power output or reduce demand.

As with bid prices offer prices are proactively monitored for compliance. Article 5 of REMIT states that: "Any engagement in, or attempt to engage in, market manipulation on wholesale energy markets shall be prohibited" and manipulation is defined as "Manipulation on wholesale energy markets involves actions undertaken by persons that artificially cause prices to be at a level not justified by market forces of supply and demand, including actual availability of production, storage or transportation capacity, and demand".

### Trend analysis and insights: Import Constraints

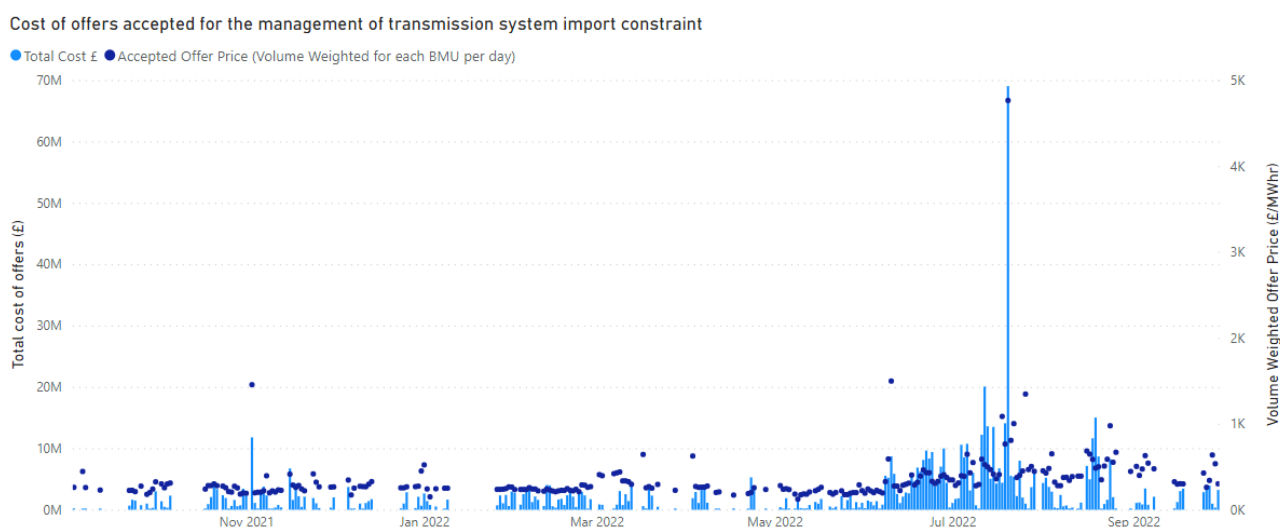


Figure 3: The total cost of accepted offers to manage import constraint conditions (Blue Bar) is mapped against the maximum offer price accepted for the day (Dark blue dot) This does not include replacement energy costs.

Figure 3 represents the total costs associated with accepting offers or trades to manage import constraints. Daily outliers such as the 20<sup>th</sup> of July 2022 trigger detailed investigations against all actions taken, to apply scrutiny to internal decision making and market participant prices and energy volumes. The general increasing trend of total costs is highly correlated with the increase in offer prices across the wider market as depicted in



Figure 1 but also represents an increase in the volume of actions taken to manage constraints resulting from increased interconnector exports over summer 2022.

## Trend analysis and insights: Voltage Constraints

The graph below shows the volume of trades and offers accepted to synchronise units to the system to provide reactive power support and the maximum offer or trade price accepted to achieve our Security and Quality of Supply requirements on voltage management. Voltage requirements are published on the ESO data portal page. <https://data.nationalgrideso.com/constraint-management/voltage-requirement>

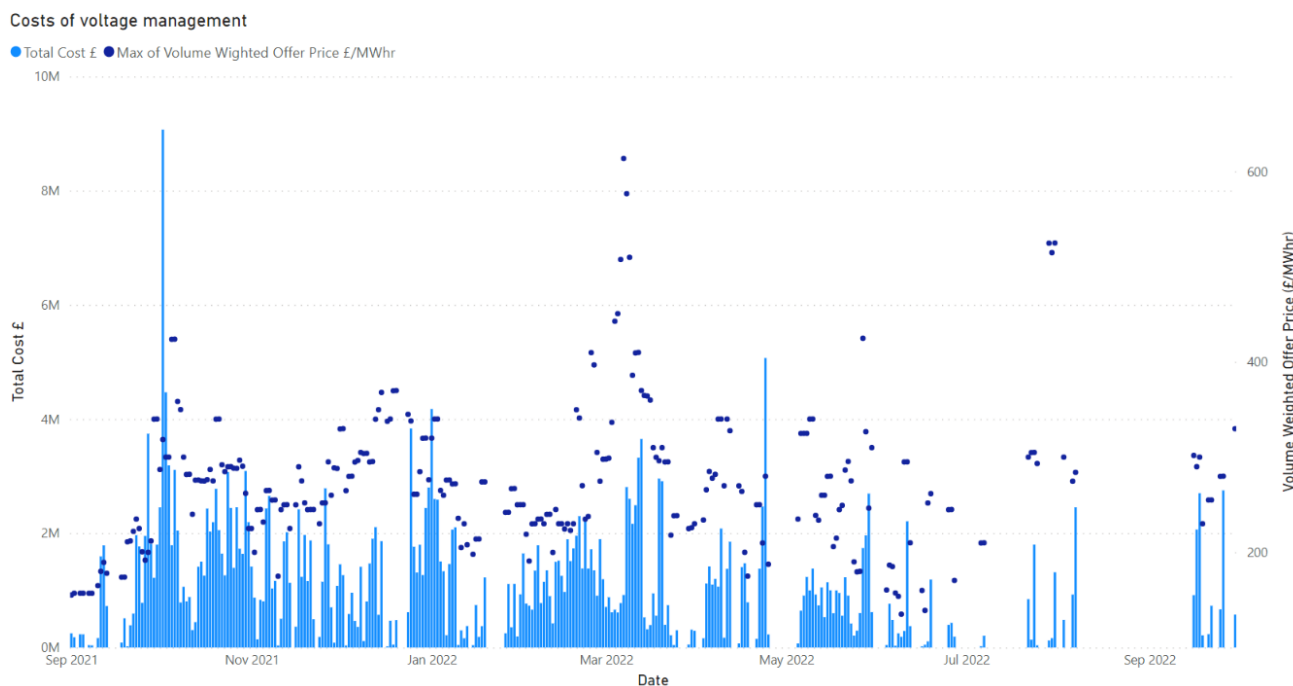


Figure 4: The total cost of offer acceptance and offer prices required to synchronise units to provide voltage support

Alerts have also been established to identify anomalous offer prices for actions taken to synchronise machines to provide voltage support. As voltage requirements are highly localised, trend analysis is used to test for changes in pricing behaviours when these system requirements exist.

Figure 4 shows that the overall cost for voltage management was lower this summer due to lower volumes of voltage tagged offer acceptance. However, the accepted offer price has an increasing trend over the year consistent with changes in wholesale energy costs. Interconnector exports have led to higher demands than would normally be observed during the summer months, reducing the volume of energy procured for the purpose of voltage management. Therefore, the requirement to synchronise units for voltage support reduced through June and July.

## Closing Remarks

This report demonstrates a subset of review processes undertaken by the ESO market monitoring function, and illustrates wider trends observed over the past year by the Market Monitoring team.

A review of the link between wholesale electricity prices in different timescales, bid prices, and offer prices was presented. These represent key areas which have been investigated and provide detail on the monitoring processes, summary datasets and a discussion of any trends present in the data.

- Anomalies in the links between day ahead markets, intraday markets and the balancing market can be seen on days in which the overall energy margin was low. This led to the balancing market review report to assess market behaviour against relevant market rules.
- The review of bid prices detailed that the transmission constraint licence condition is a key market rule monitored. A combination of absolute and statistical modelling is used to identify anomalies and

longer-term trend analysis with consideration of wider market factors and technology economics is then used to investigate these events further.

- The review of offer prices detailed that the localised nature of reactive power requirements and import constraint conditions can lead to acceptance occurring at prices outside of energy merit order. The analytical procedures which are used to evaluate these alerts seek to build a systematic link between the requirement being active and pricing behaviour to detect this and test against market rules on price artificiality.

The review areas considered by this report represent a sample of the alert types and datasets used in monitoring the Balancing Mechanism. However, ESO monitors all balancing services markets, and reviews activities against all applicable market rules. Across the year, from over 160,000 datapoints and 1,748 investigations, 177 alerts have led to further action being taken. However, over 350% more instances are resolved by working with the provider, resulting in greater consistency with market rules and more accurate data submission.

You can contact the team for clarity on market rules or to report an issue observed through: [MarketReporting@nationalgrideso.com](mailto:MarketReporting@nationalgrideso.com).

## Bibliography

### **Acer guidance on the application of REMIT:**

[https://documents.acer.europa.eu/en/remit/Documents/ACER\\_Guidance\\_on\\_REMIT\\_application\\_6th\\_Edition\\_Final.pdf](https://documents.acer.europa.eu/en/remit/Documents/ACER_Guidance_on_REMIT_application_6th_Edition_Final.pdf)

### **Ofgem's REMIT guidance:**

<https://www.ofgem.gov.uk/energy-policy-and-regulation/policy-and-regulatory-programmes/remit-and-wholesale-market-integrity>

### **Day ahead constraint Limits:**

<https://data.nationalgrideso.com/constraint-management/day-ahead-constraint-flows-and-limits>

### **Voltage Requirements:**

<https://data.nationalgrideso.com/constraint-management/voltage-requirement>