ISG207/04 – NOTE ON USE OF THE REPLACEMENT PRICE

MEETING NAME	ISG 207

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Purpose of paper	Information
Classification	Public
Summary	ELEXON monitors the Energy Imbalance Price calculation and has identified a change in the frequency that the Market Index Price (MIP) is used to calculate the Replacement Price. Where there are no priced actions the Replacement Price sets the Energy Imbalance Price. The MIP set the Energy Imbalance Price in 10% of all Settlement Periods in June 2018. In comparison between November 2018 and May 2018 the MIP Set the Energy Imbalance Price in 2% of Settlement Periods. The increase in use of the MIP is a result of increases in proportion of flagged sell balancing actions and an increase in the volume of actions Arbitrage Tagged.

1. Background

1.1 We have identified a change in the frequency to which the Market Index Price (MIP) is setting the Energy Imbalance Price. We are bringing this to the attention of the ISG for information. In this paper we are providing analysis to highlight the increased use of the Replacement Price set by Replacement Price Average Reference (RPAR) and MIP in June 2018.

1.2 The BSC is operating correctly and the Replacement Price is working as it was designed to. However, as the use of the Replacement Price and MIP has significantly increased ELEXON wanted to flag this to the ISG to consider its views on the following:

- Causes of the increase in use of the Replacement Price

- Effects on Energy Imbalance Prices

- Is there a detrimental effect on price signals

- Do we expect to see increased constraints on sell actions

- Any other thoughts

1.3 Flagging in the Imbalance Price calculation potentially reprices flagged actions to a Replacement Price that is representative of the prevailing market conditions. The System Operator (SO) and Continuous Acceptance Duration Limit (CADL) flagging mechanism was introduced as part of BSC Modification P217. This mechanism uses the weighted average price of the most expensive 1MWh of unflagged volume, called the RPAR, as the price representing prevailing market conditions. Where a Replacement Price is used to reprice flagged actions the Replacement Price will then set the Energy Imbalance Price.

1.4 When there are no unflagged actions remaining in the pricing stack after Net Imbalance Volume (NIV) tagging the Market Index Price (MIP) is used to set the Replacement Price. The MIP is used in the calculation

as a proxy for market conditions. The MIP is calculated from short term power exchange trades[1] and the calculation methodology reviewed annually by ELEXON.

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[1] For full calculation details see the Market Index Definition Statement

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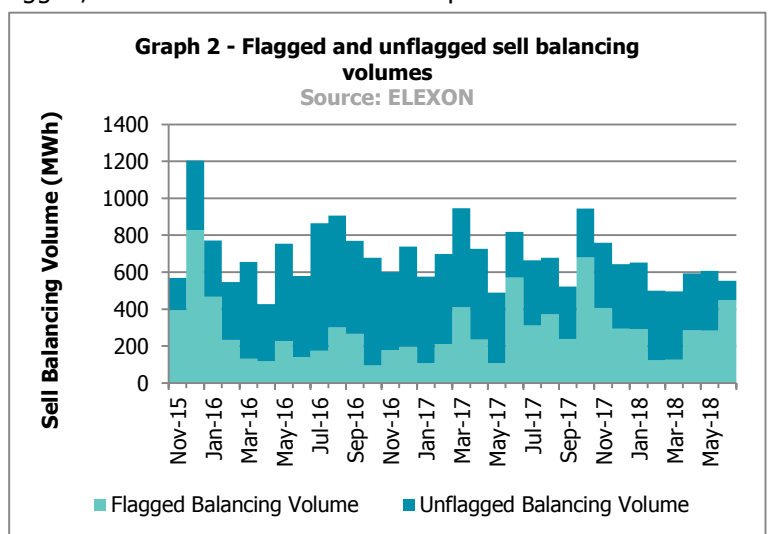
2.   Use of the Replacement Price

2.1   The Replacement Price was used in 5% of Short Settlement Periods and 21% of long Settlement Periods between November 2015 and June 2018. In June 2018 the Replacement Price was used in 58% of long Settlement Periods, and in 2% of short Settlement Periods.

Graph 1 - Use of the Replacement Price and flagged actions since P305 when the maket is long
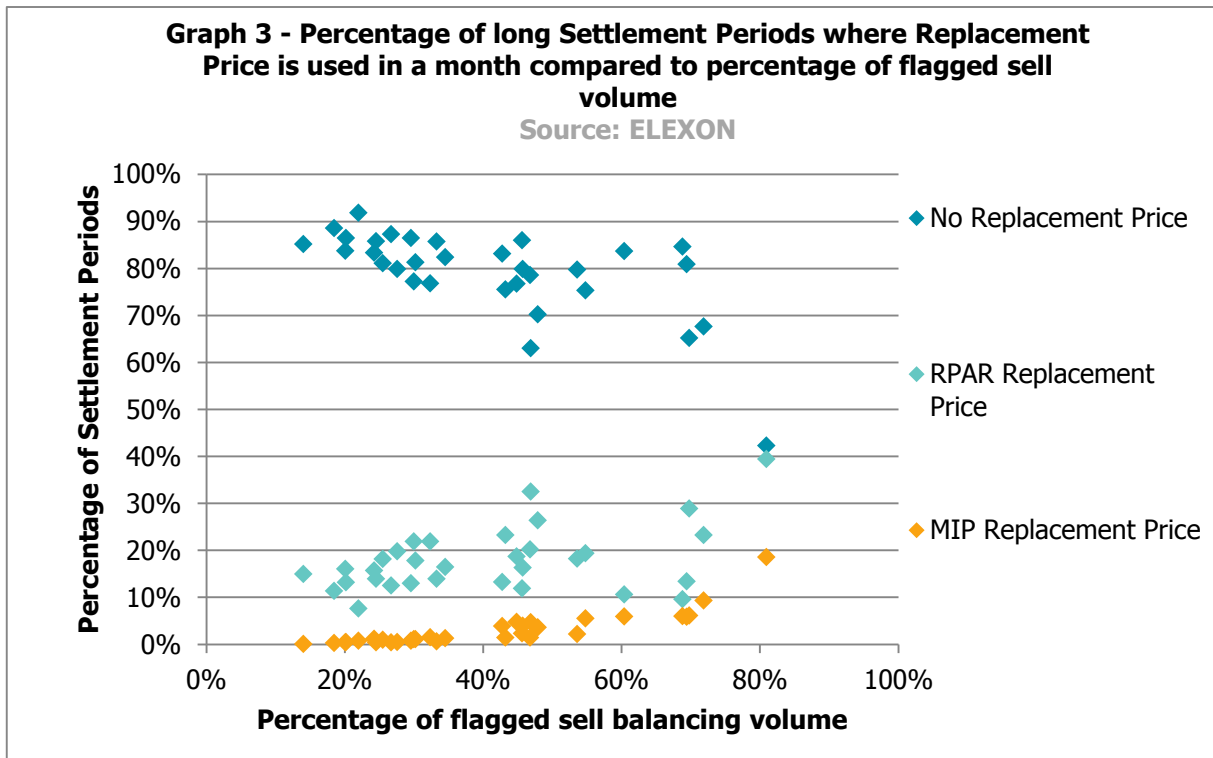Source: ELEXON
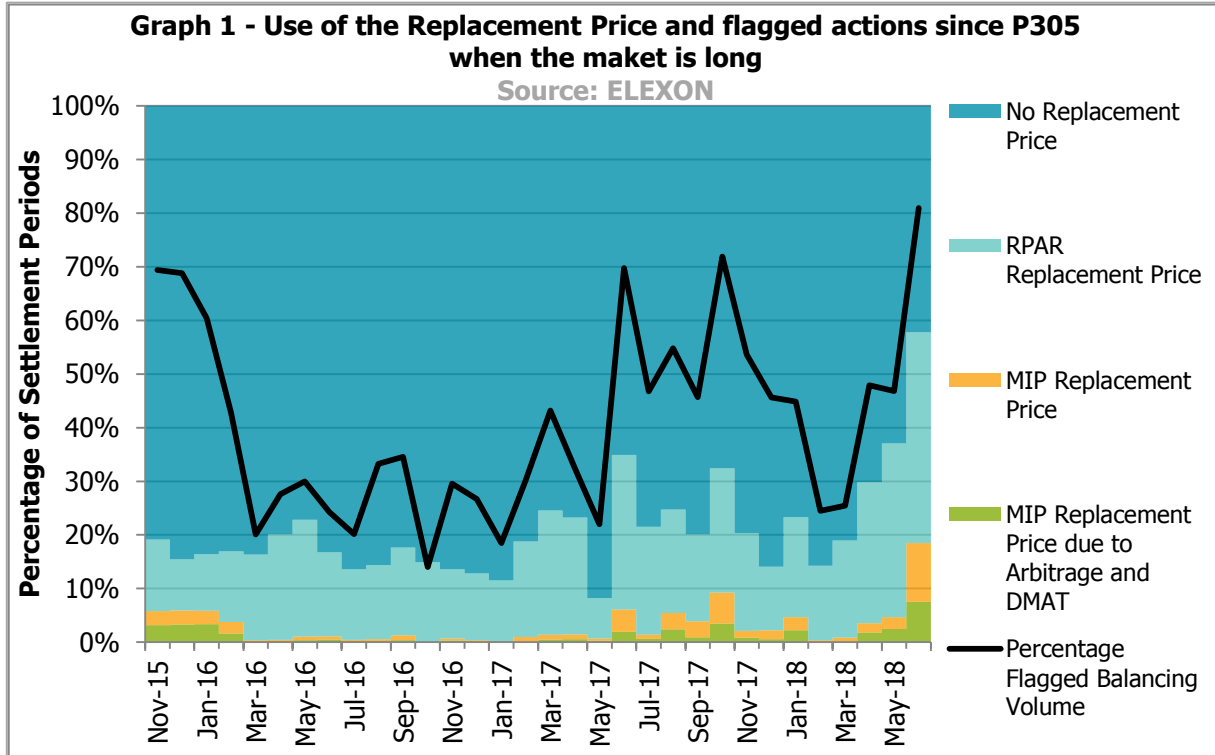
2.2   **Graph 1** shows the percentage of long Settlement Periods where the Replacement Price set the price and the percentage of flagged sell balancing volume. In 18% of long June Settlement Periods the Imbalance Price was set by the MIP compared to an average of 3% of long Settlement Periods since the introduction of P305.

2.3   In June 82% of Sell balancing volume was SO or CADL Flagged. The average percentage of flagged sell balancing volume between November 2018 and June 2018 is 42%. In October 2017 there is also a spike in flagging, 72% of sell balancing volume was flagged, in October the MIP set the Replacement Price in 9% of Settlement Periods.

2.4   **Graph 2** shows that the volume of flagged actions is not much greater than at other times of the year. However, the proportion of flagged actions is higher due to less unflagged balancing actions.
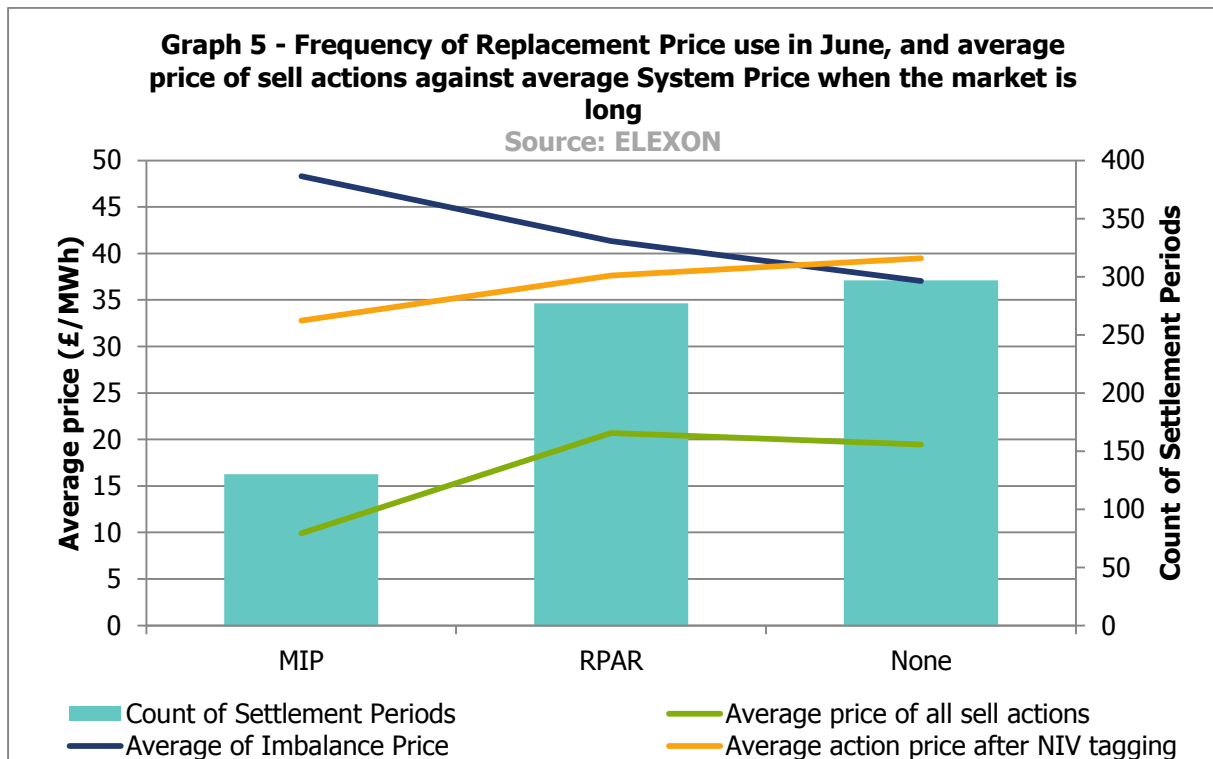

Graph 2 - Flagged and unflagged sell balancing volumes
Source: ELEXON

Graph 3 - Percentage of long Settlement Periods where Replacement Price is used in a month compared to percentage of flagged sell volume

Source: ELEXON

2.5 **Graph 3** takes the same data as **graph 1** with the percentage of flagged sell balancing actions on the x-axis. This graph shows the relationship between the percentage of flagged sell balancing volume when the market is long and use of the Replacement Price in a month. The use of an RPAR and MIP Replacement Prices increase with the percentage of flagged sell volume. In a scenario of 100% flagged sell balancing volume, the MIP will set the Replacement Price, and consequently the Imbalance Price in 100% of Settlement Periods.

2.6 Another factor in the increase in the use of the MIP is the number of Arbitrage Tagged actions. For 8% of long Settlement Periods in June the Replacement Price was set to the MIP due to Arbitrage or De Minimis Acceptance Threshold (DMAT) Tagging, shown in **graph 1**. This happens when unflagged actions are taken but removed from the calculation before classification by DMAT and Arbitrage Tagging.

2.7 The percentage of Arbitrage Tagged volume in June 2018 was 1.72% and Arbitrage Tagging occurred in 312 Settlement Periods.

2.8 **Graph 4** shows the percentage and number of arbitrage active Settlement Periods is higher than the average (0.67% and 143 Settlement Periods). However, more Arbitrage Tagging occurred in April and May 2018.

2.9 While Arbitrage Tagged volumes are a factor in the increase in the use of the MIP, the higher proportion of flagged sell balancing volumes is the key driver of the increase.

Graph 4 - Percentage of actions that are Arbitrage Tagged and number of arbitrage active Settlement Periods

Source: ELEXON

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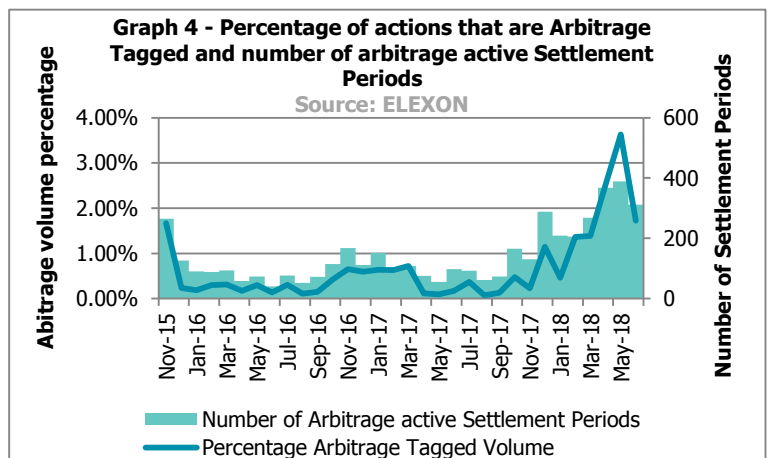
3. Effect on the Imbalance Price

3.1 The Replacement Price is applied to Stage 2 Flagged actions after NIV Tagging, before Price Average Reference (PAR) Tagging.

Graph 5 - Frequency of Replacement Price use in June, and average price of sell actions against average System Price when the market is long

Source: ELEXON

Legend:
- Count of Settlement Periods
- Average price of all sell actions
- Average of Imbalance Price
- Average action price after NIV tagging

3.2 **Graph 5** shows the average of the Energy Imbalance Price, price or sell actions and price of actions after NIV Tagging by Replacement Price when the market is long. The average price of all actions less than the average Energy Imbalance Price as NIV Tagging removes the most expensive actions first. The greatest difference in average actions and System Prices is £38.40/MWh where the MIP has set the price, compared to a difference of £17.59/MWh where no replacement price was used.

3.3 Where a Replacement Price has been used the average Imbalance Price is greater than the average action price after NIV tagging, by £3.71/MWh for RPAR and by £15.53/MWh for MIP.

3.4   **Graph 6** shows the Energy Imbalance Price and calculation method against the NIV. Where the NIV is less than -100MWh 29% of System Prices are set by the MIP, 17% of Prices are set by RPAR and the majority 54% of prices, are not set by a Replacement Price. Where the NIV is less than -100MWh 15% of Energy Imbalance Prices are set by the MIP, 48% of Energy Imbalance Prices are set by RPAR and 37% are not set by a Replacement Price.

Graph 6 - Imbalance Price compared to the NIV by Replacement Price in June 2018
Source: ELEXON
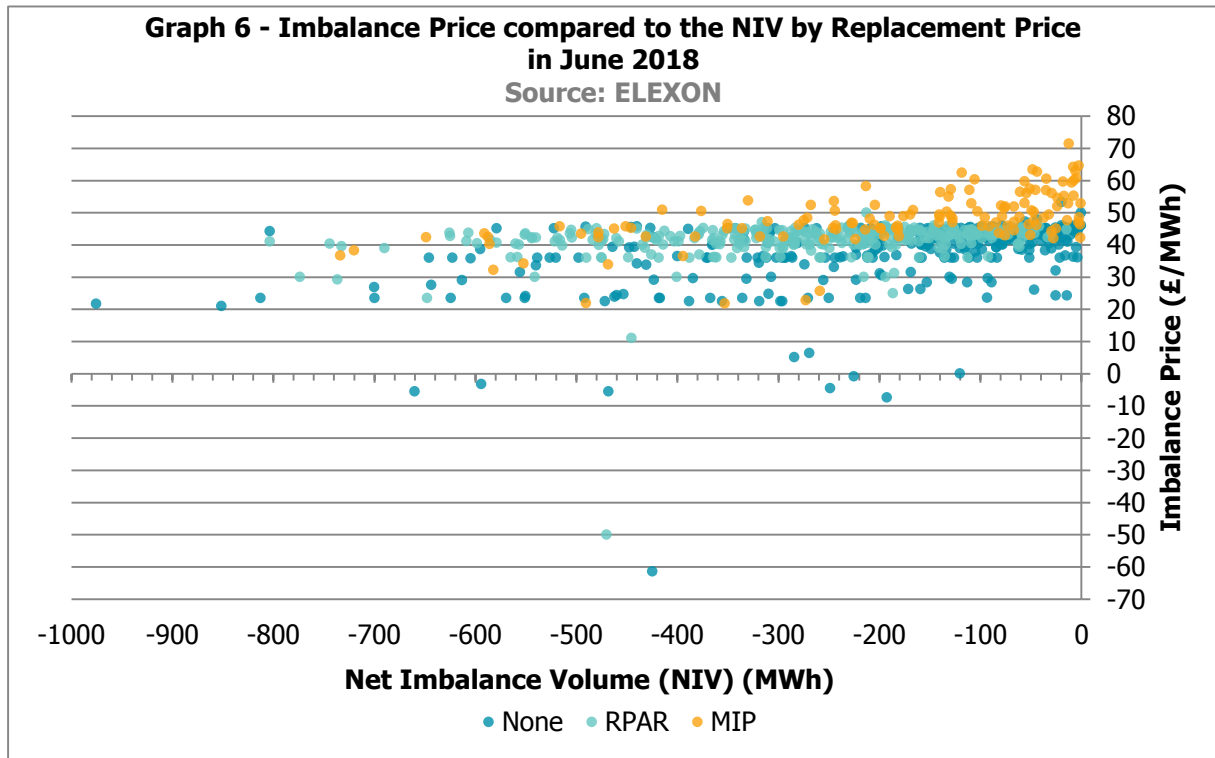
3.5   The greatest NIV with a price set by the MIP is -733MWh when the MIP was £36.63/MWh. Despite the buy actions being entirely Flagged as constrained, the system is long as these flagged actions provide energy to the system.

4. Next Steps

4.1 ELEXON will continue to monitor Imbalance Prices and highlight any trends in the [System Price Analysis Report](#).

4.2 The analysis on the increased use of the MIP included here will be incorporated into the next scheduled Market Index Definition Statement review. This will be presented to the ISG at its August 2018 meeting.

4.3 The Imbalance Price Calculation will be changing in November 2018 with the introduction of PAR of 1MWh, Value of Lost Load (VoLL) of £6,000/MWh and Dynamic Loss of Load Probability (LoLP).

4.4 The validity of the MIP as a default may be considered as part of a European Harmonisation Modification, scheduled to be implemented in 2020.

5. Recommendations

5.1 We invite you to:

a) **NOTE** the increased frequency of the Market Index Price being used as a default value in the Energy Imbalance Price calculation.

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