

DEFERRED MOD 11 22

V2 MODIFICATION SYSTEM ACTION REPRICING



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|| RECAP - CONTEXT OF PROPOSED MOD

- Modification objectives
 - This Mod aims to address system action repricing during periods an energy action has not been taken on the same side of the Net Imbalance Volume Stack.
 - The Mod aims to prevent Non Energy Actions unduly influencing cashout price setting.
 - It addresses structural flaws associated with high volume system actions within the relatively small ISEM balancing market.
 - The large physical volume behind IC actions make NIV tagging ineffectual, creating a high risk for System IC actions to inappropriately set Cashout prices
- One example of this occurrence was in July 2022 -
 - 12th July - Reliability Option was triggered by system Interconnector actions over East West IC,
 - As PMEA was set to PCEILING or €11.5k, the IC action kept its price, and this set cashout
 - 13th July – Same thing occurred but IC price was lower.
- This is a material and ongoing risk

|| RECAP ORIGINAL V1 CHANGE

E.3.4.2 For each Imbalance Pricing Period, φ , the Market Operator shall calculate the Marginal Energy Action Price ($PMEA_{\varphi}$) as follows:

- *If $QNIV_{\varphi} > 0$ and there are no $PBOuk_{\varphi}$ in the same direction as the NIV where $FIPuk_{\varphi} = 1$,*

$$PMEA_{\varphi} = \text{PCAP} \text{PMBU}_{\varphi}$$

Where PMBU_{φ} is the Market Backup Price which contains Imbalance Settlement Period, γ

|| PROPOSED V2 CHANGE

E.3.4.2 For each Imbalance Pricing Period, φ , the Market Operator shall calculate the Marginal Energy Action Price ($PMEA_{\varphi}$) as follows:

- *If $QNIV_{\varphi} > 0$ and there are no $PBOuk_{\varphi}$ in the same direction as the NIV where $FIPuk_{\varphi} = 1$,*

$$PMEA_{\varphi} = \text{PCAP} \max(PSTR, PMBU_{\varphi})$$

Where $PSTR$ is the strike price, $PMBU_{\varphi}$ is the Market Backup Price which contains Imbalance Settlement Period, γ

Data analysis to analyse price impact of Mod

- Data from publicly available SEMO Public API for 10 months April 2022 to January 2023
- > 14000 5 minutes Imbalance Pricing periods
- Includes Imbalance, Market Backup and Strike Prices
- Comparing current data ($PMEA\varphi = PCAP\varphi$) with data based on
 - V1 $PMEA\varphi = PMBU\varphi$ and
 - V2 $PMEA\varphi = \max(PSTR, PMBU\varphi)$
- Mod impacts price formation in 9853 / 69% Imbalance pricing periods in V1
- Mod impacts price formation in **19 / 0.1%** Imbalance pricing periods for V2
- We conclude that V2 is a much more targeted and limited approach to address this issue as it only impacts 0.1% of the 5 minute periods

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	K	S	V	W	X	Y	Z	AA	AB	AC	AD	AE
1	PUB_5MinImbalPrc	PUB_5MinImbalPrc_Mark	Pstrike								Mod V2	Mod 01
2	199.52	306.88	882.24	882.24	0	0	1			Impacted IPP (Imbalance Pricing	19	9853
3	199.52	289.03	882.24	882.24	0	0	1			Total IPP in look back timeframe	14279	14279
4	202.9	211.42	882.24	882.24	0	0	1			% Periods Impacted	0.1%	69.0%
5	182.96	272.63	882.24	882.24	0	0	1					
6	277.23	216.48	882.24	882.24	0	1	1					
7	236.86	366.88	882.24	882.24	0	0	1					
8	304.82	218.28	882.24	882.24	0	1	1					
9	199.3	217.58	882.24	882.24	0	0	1					
10	167.78	347.93	882.24	882.24	0	0	1					
11	182.38	268.02	882.24	882.24	0	0	1					
12	304.58	260.99	535.92	535.92	0	1	1					
13	220.16	316.63	882.24	882.24	0	0	1					
14	294.89	321.53	882.24	882.24	0	0	1					
15	199.52	289.03	882.24	882.24	0	0	1					
16	165.35	166.02	882.24	882.24	0	0	1					
17	147.26	156.21	882.24	882.24	0	0	1					
18	199.52	306.57	882.24	882.24	0	0	1					
19	294.86	256.49	535.92	535.92	0	1	1					
20	187.09	272.63	882.24	882.24	0	0	1					
21	199.52	289.03	882.24	882.24	0	0	1					
22	166.84	132.54	535.92	535.92	0	1	1					
23	199.52	305.41	882.24	882.24	0	0	1					
24	289.87	291.91	882.24	882.24	0	0	1					
25	199.52	306.88	882.24	882.24	0	0	1					
26	259.74	283.76	882.24	882.24	0	0	1					
27	230.71	246.98	535.92	535.92	0	0	1					
28	91.65	84.56	882.24	882.24	0	1	1					

|| APPENDIX – STRIKE PRICE AND MARKET BACKUP PRICE

- The proposal is a modification to the calculation of the Marginal Energy Action Price PMEA to reflect the max of the Strike price and the Market Backup price PMBU rather than the Market Price Cap PCAP during periods when no energy action has been identified in the direction of the Net Imbalance Volume
- The Strike Price PSTR is the strike price in a month m used for the calculation of difference charges and difference payments
- The Market Backup Price PMBU 'reflects the price of all ex-ante market trades relevant to that Imbalance Settlement period ' (TSC Part B Glossary).
- E.5 MARKET BACK UP PRICE
- E.5.1.1 For each Imbalance Settlement Period, γ , the Market Operator shall calculate the Market Back Up Price (PMBU γ) as the quantity-weighted average price of the prices associated with each Day-ahead Trade Quantity (q_{TDAxuh} , q_{TDAxvh}) and Intraday Trade Quantity (q_{TIDxuh} , q_{TIDxvh}) for all Generator Units, u , and Supplier Units, v , in the Imbalance Settlement Period, γ . (TSC Part B)

APPENDIX - INTERCONNECTOR EVENT ON 12TH/ 13TH JULY 2022

StartTime	System	Jurisdiction	Unit ID	Unit Name	PBOA	QBOA	SO Flag	NIV Tag	Filtered PBOAS	Filtered QBOAS	PMEA	BOA
12/07/2022 16:25:00	Short	NI	LROIEWIC	EirGrid Interconnector Designated Activity Company Portan Converter Station	839.93	104.00	SO Flag				11,581.37	Offer
12/07/2022 16:25:00	Short	NI	LROIEWIC	EirGrid Interconnector Designated Activity Company Portan Converter Station	839.93	710.00	SO Flag	839.93	839.93	120.70	11,581.37	Offer
12/07/2022 16:25:00	Short	ROI	DSU_401660	Powerhouse Generation Limited SAL	610.53	3.00	SO Flag	610.53			11,581.37	Offer
12/07/2022 16:25:00	Short	ROI	DSU_401490	Veolia Alternative Energy Ireland Limited MO1	580.00	2.87	SO Flag	580.00			11,581.37	Offer
12/07/2022 16:25:00	Short	ROI	GU_401010	Cushaling Power Limited ED 3	500.24	20.00	SO Flag	500.24			11,581.37	Offer
12/07/2022 16:25:00	Short	ROI	DSU_402180	Endeco - Wirelite Sensors Limited SAL	500.00	8.00	SO Flag	500.00			11,581.37	Offer
12/07/2022 16:25:00	Short	ROI	DSU_401530	Endeco - Wirelite Sensors Limited SAL	500.00	13.00	SO Flag	500.00			11,581.37	Offer
12/07/2022 16:25:00	Short	ROI	GU_401011	Cushaling Power Limited ED 5	498.96	20.00	SO Flag	498.96			11,581.37	Offer
12/07/2022 16:25:00	Short	ROI	GU_400780	SSE Generation Ireland Ltd Tavinaghmore 1	498.50	12.00	SO Flag	498.50			11,581.37	Offer
12/07/2022 16:25:00	Short	ROI	GU_400770	SSE Generation Ireland Ltd Rhode1	498.00	12.00	SO Flag	498.00			11,581.37	Offer
12/07/2022 16:25:00	Short	ROI	DSU_403520	Electricity Exchange Limited ETD DSU4	492.30	2.90	SO Flag	492.30			11,581.37	Offer
12/07/2022 16:25:00	Short	ROI	DSU_403520	Electricity Exchange Limited ETD DSU4	492.30	8.10	SO Flag	492.30			11,581.37	Offer
12/07/2022 16:25:00	Short	ROI	DSU_401400	Electricity Exchange Limited ETD DSU4	492.15	30.00	SO Flag	492.15			11,581.37	Offer
12/07/2022 16:25:00	Short	ROI	GU_400360	ESB TH	404.00	5.00	SO Flag	404.00			11,581.37	Offer
12/07/2022 16:25:00	Short	ROI	DSU_401270	EnerNOC Ireland Limited GU_404560	383.32	16.00	SO Flag	383.32			11,581.37	Offer
12/07/2022 16:25:00	Short	ROI	DSU_401330	ESB ABWF	350.00	7.91	SO Flag	350.00			11,581.37	Offer
12/07/2022 16:25:00	Short	ROI	DSU_401620	EnerNOC Ireland Limited GU_404560	307.88	9.00	SO Flag	307.88			11,581.37	Offer
12/07/2022 16:25:00	Short	ROI	GU_400183	ESB AT14	306.00	35.00	SO Flag	306.00			11,581.37	Offer
12/07/2022 16:25:00	Short	ROI	DSU_403120	EnerNOC Ireland Limited ENS	296.63	5.00	SO Flag	296.63			11,581.37	Offer
12/07/2022 16:25:00	Short	NI	GU_500041	ESB GT8	294.95	30.00	SO Flag	294.95			11,581.37	Offer
12/07/2022 16:25:00	Short	ROI	GU_400183	ESB AT14	246.73	40.00	SO Flag	246.73			11,581.37	Offer
12/07/2022 16:25:00	Short	ROI	GU_400182	ESB AT12	233.44	39.06	SO Flag	233.44			11,581.37	Offer
12/07/2022 16:25:00	Short	ROI	DSU_403470	EnerNOC Ireland Limited ENS	149.32	14.58	SO Flag	149.32			11,581.37	Offer
12/07/2022 16:25:00	Short	ROI	GU_400210	ESB ER1	120.00	10.00	SO Flag	120.00			11,581.37	Offer
12/07/2022 16:25:00	Short	ROI	GU_400200	ESB AA1	120.00	12.00	SO Flag	120.00			11,581.37	Offer
12/07/2022 16:25:00	Short	ROI	GU_400251	ESB U2	120.00	15.00	SO Flag	120.00			11,581.37	Offer
12/07/2022 16:25:00	Short	ROI	GU_400220	ESB ER3	120.00	23.00	SO Flag	120.00			11,581.37	Offer

StartTime	System	Jurisdiction	Unit ID	Unit Name	PBOA	QBOA	SO Flag	NIV Tag	Filtered PBOAS	Filtered QBOAS	PMEA	BOA
12/07/2022 16:25:00	Short	ROI	GU_400363	ESB TH	60.00	-8.00	SO Flag				11,581.37	Bid
12/07/2022 16:25:00	Short	ROI	GU_400363	ESB TH	70.00	-19.94	SO Flag				11,581.37	Bid
12/07/2022 16:25:00	Short	ROI	GU_400324	ESB PBA	100.00	-31.99	Energy				11,581.37	Bid
12/07/2022 16:25:00	Short	ROI	GU_400325	ESB PBB	100.00	-31.99	SO Flag				11,581.37	Bid
12/07/2022 16:25:00	Short	ROI	GU_400930	Bord Gais Energy Limited GU_400930	110.00	-20.00	SO Flag				11,581.37	Bid
12/07/2022 16:25:00	Short	ROI	GU_400930	Bord Gais Energy Limited GU_400930	162.40	-27.74	Energy				11,581.37	Bid
12/07/2022 16:25:00	Short	ROI	GU_400850	ESB AD2	173.27	-45.94	Energy				11,581.37	Bid
12/07/2022 16:25:00	Short	NI	GU_500130	NIE Power Procurement Business B31	183.07	-30.00	SO Flag				11,581.37	Bid
12/07/2022 16:25:00	Short	NI	GU_500131	NIE Power Procurement Business B32	183.07	-30.00	SO Flag				11,581.37	Bid
12/07/2022 16:25:00	Short	NI	GU_500130	NIE Power Procurement Business B31	183.08	-4.75	SO Flag				11,581.37	Bid
12/07/2022 16:25:00	Short	NI	GU_500131	NIE Power Procurement Business B32	183.08	-4.75	SO Flag				11,581.37	Bid
12/07/2022 16:25:00	Short	NI	GU_500140	NIE Power Procurement Business B10	192.68	-5.00	SO Flag				11,581.37	Bid
12/07/2022 16:25:00	Short	NI	GU_500140	NIE Power Procurement Business B10	192.69	-12.00	SO Flag				11,581.37	Bid
12/07/2022 16:25:00	Short	ROI	GU_400540	Energia Power Generation Limited HN2	222.45	-31.00	SO Flag				11,581.37	Bid

- Over **800MW** of actions taken over EWIC at **€839/MWh** with no system offers. The bid stack was around 100MW (**full PAR stack consisted of this IC action**)
- **Pre-Mod 01_20**: this IC action would have been repriced to the highest priced energy bid or offer (**€173** which would have set cash-out)
- As **PMEA** was set to **PCEILING** or €11.5k, the **IC action kept its price**, and this set cash-out
- The BOA's stacks below are relevant for one 5-minute period but the same thing happened in 19 of 24 five minute periods in the 2 hours when the RO was called
- **This is a material and ongoing risk**