Default Market Seller Offer Cap in the Capacity Market

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MIC Special Session – Capacity Market Seller Offer Cap

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Objectives of Today's Meeting

1. Provide background and a refresher on the default Market Seller Offer Cap (MSOC) issue
2. Discuss PJM's current thinking on the FERC brief and potential options under consideration
3. Get stakeholder feedback

Purpose of Market Seller Offer Caps (Background)

Seller-Side Market Power Mitigation

- Address concerns that market sellers may have ability and incentive to increase prices above competitive levels through withholding of capacity
- Must offer requirement in capacity auctions intended to prevent physical withholding of capacity
- Offer caps intended to prevent economic withholding of capacity
  - Only resources of jointly pivotal suppliers are subject to offer caps
  - The default MSOC is the price threshold at which offers are subject to unit-specific cost review (above the cap), or are presumed competitive (below the cap)

Default MSOC Overview (Background)

- The current default MSOC was established as part of the Capacity Performance proceeding in 2015
- The current default MSOC is set by the opportunity cost of taking on a Capacity Performance commitment adjusted for expected non-performance charges and bonus credits
  - It assumes a resource that does not accept a capacity commitment will be eligible to receive bonus payments for its output during a Capacity Performance Assessment Interval (PAI).
  - The bonus revenue that would be foregone assumes the bonus rate and the penalty rate are equivalent. It also uses an assumption on the expected number of PAIs in a year.

Default MSOC Formula (Background)

The same number of expected PAIs is currently used in both the default MSOC calculation and the Penalty Rate (360 intervals, or 30 hours).

$$\text{Default MSOC} =$$

Penalty Rate:

$$\left(\frac{\text{Net CONE}}{\cancel{\text{\# Penalty PAIs (360)}}}\right) \times \cancel{\text{Expected PAIs (360)}} \times \text{Average Expected Balancing Ratio(B)}$$

$$= \textbf{Net CONE} \times \textbf{B} = \sim\$192/\text{MW-day for the 2022/2023 Delivery Year}$$

This serves as an effective trigger for supply-side market power screening as long as the marginal offer is above Net CONE x B

MSOC Complaints

- The IMM and the Consumer Advocates filed complaints with FERC regarding the default MSOC in early 2019
- The goal of the complaint was to ensure that the offers of resources that set clearing prices are reviewed prior to the auction to ensure competitive outcomes.
- They argued the existing default MSOC does not allow for effective market power mitigation.
  - 360 PAIs are no longer a reasonable expectation given a maximum of 24 PAIs have occurred over the last five years.
  - As a result, the default MSOC that relies on this expectation is overstated and results in too many resources bypassing unit-specific review.

FERC Order on MSOC Complaints

On March 18, 2021, FERC granted the IMM's and Consumer Advocates' complaints.

- FERC agreed that the assumption of 360 PAIs each year is too high given the actual number of PAIs in recent years.
- Further, they found that Net CONE times B has not been lower than the competitive offer estimate even for resources with a high avoidable cost rate.
- As a result, FERC found that the current MSOC is too high and inappropriate.

FERC concluded that the upcoming May Base Residual Auction for the 2022/2023 Delivery Year should still go forward as scheduled using the existing MSOC rules

FERC Directive

FERC invited parties to submit briefs by May 3, 2021, to inform the selection of an appropriate replacement rate. Briefs should address:

- The appropriateness of using different expectations for the number of PAIs in the numerator of the default MSOC calculation and the non-performance penalty rate calculation
- The appropriate method for setting each value
- Whether an alternative method for market power mitigation would better address the IMM's concern that use of a default offer cap precludes the IMM from reviewing and mitigating offers where appropriate

Assuming FERC rules on the replacement rate in a timely manner, the revised default MSOC will be used in the December Base Residual Auction for the 2023/2024 Delivery Year.

FERC Guidance in MSOC Order

- P 67 “The question addressed in this order is not whether market power has already been exercised, but rather whether the default offer cap enables the appropriate review of offers and imposition of mitigation in order to ensure competitive market outcomes. In order to do so, the default offer cap should be set at a level that permits the Market Monitor and PJM to review offers that may constitute an attempt to exercise market power and mitigate offers where appropriate. We find that the current default offer cap is not achieving this objective because, as discussed above, it is incorrectly calibrated.”

Thoughts on the Current Design

- The estimate of expected hours (H) of PAIs for a future Delivery Year plays a critical role in the current design of the default offer cap and penalty rate
- In practice, producing an accurate estimate of H is challenging and expectations are likely to vary between stakeholders
- We therefore think it prudent to consider alternative designs that diminish the reliance on this estimate
- For this brief, PJM is weighing the options of (a) keeping a design that relies on H, or (b) moving to an alternative method, with the thinking that either may best be presented as an interim solution to be revisited with Phase 2 work of the capacity market given the likely impact of those topics

Potential Options for the Default MSOC

H Options: rely on an expected number of hours (H) of PAIs

- **Same H** (status quo)
  - Use the same H estimate of PAIs in the penalty rate and default MSOC, but adjust to a value lower than 30
- **Bonus/Penalty Rate Ratio**
  - Scale the default offer cap down by the expected bonus rate to penalty rate ratio
- **Split H**
  - Use different H estimates (e.g. retain 30 hours in penalty rate and use 10 hours of Expected PAIs)

Alternative Options

- **ISO-NE Method**
  - Use an approach similar to the “Recalibration Method” recently filed and approved by the Commission for ISO-NE
- **Default ACR**
  - Use default ACR values for different technology classes

Same H (Set to value lower than 30): Overview

- Retain the current design of using the same expected hours (H) of PAIs in both the penalty rate and default offer cap
  - The hours of Penalty PAIs and Expected PAIs continue to cancel in the default offer cap formula

$$\text{Default MSOC}_{(\$/\text{MW-Year})} = \text{Hourly Penalty Rate:} \left(\frac{\text{Net CONE} \times 365}{\cancel{\text{H}_{\text{Penalty}}}}\right) \times \cancel{\text{H}_{\text{MSOC}}} \times \text{B}$$

- The penalty rate increases with lower H values
  - **H = 30**, Penalty Rate = **~3,000/MWh** (status quo for the 22/23 Delivery year)
  - **H = 15**, Penalty Rate = **~6,000/MWh**
  - **H = 10**, Penalty Rate = **~9,000/MWh**
  - **H = 5**, Penalty Rate = **~18,000/MWh**

Note: The minimum number of hours for a non-performing resource to hit the annual stop-loss decreases with a lower H value; where the stop-loss equals 1.5 x Net CONE x 365 x committed MW.

Minimum Hours to hit Stop-loss = 1.5x H

Bonus/Penalty Rate Ratio: Overview

- In this approach, the default offer cap is scaled down by the ratio of the expected bonus rate to penalty rate during PAIs

$$\text{Default MSOC} = \text{Net CONE} \times \text{B} \times \left(\frac{\text{Avg Expected Bonus Rate}}{\text{Avg Expected Penalty Rate}} \right)$$

- The Bonus Rate during a PAI is equal to the total penalty charges / total Bonus MW
  - Charges are allocated to over-performing units pro-rata based on each unit's Bonus MW
- Scaling the default offer cap down recognizes that the bonus rate may be less than the penalty rate during PAIs, mainly due to excused MW

Split H: Overview

- In this approach, the default offer cap is scaled down by the ratio of hours of expected PAIs used in the default MSOC formula to the Penalty PAIs

$$\text{Default MSOC} = \left(\frac{\text{Net CONE}}{H_{\text{Penalty}}}\right) \times H_{\text{MSOC}} \times B$$

$H_{Penalty}$	H_{MSOC}	MSOC Formula	Illustrative Example (22/23)
30	**30**	$\text{Net CONE} \times B$	~$192
30	**10**	$(\frac{1}{3}) \times \text{Net CONE} \times B$	~$64
15	**10**	$(\frac{2}{3}) \times \text{Net CONE} \times B$	~$128

Options that Rely on H: Considerations

Applicable to all H Options

Key Advantages

- Consistent with the original logic of the default MSOC as a representation of opportunity costs for a Capacity Performance resource with certain assumptions
- Relatively simple change from status quo

Key Concerns

- Continues to rely on an estimated hours of Expected PAIs for the future Delivery Year

Same H (but lower than 30)

- Maintains H consistency in formulas
- May result in penalty rates that introduce excessive risk and the potential to hit the stop-loss in limited hours, which can reduce future incentives to perform

Bonus/Penalty Rate Ratio

- Addresses concern of different bonus and penalty rates, but limited set of historical data to determine ratio

Split H

- Departs from original logic for the penalty rate as a representation of Net CONE over expected PAIs
- Able to lower H for the default offer cap while addressing the concerns of lowering H too far in the penalty rate

ISO-NE Method: Design Objectives

1. Prevent the exercise of market power
2. Limit unnecessary administrative interference in the auction that may reduce the market's efficiency
3. Use a transparent and robust calculation method

PJM agrees that these are appropriate objectives

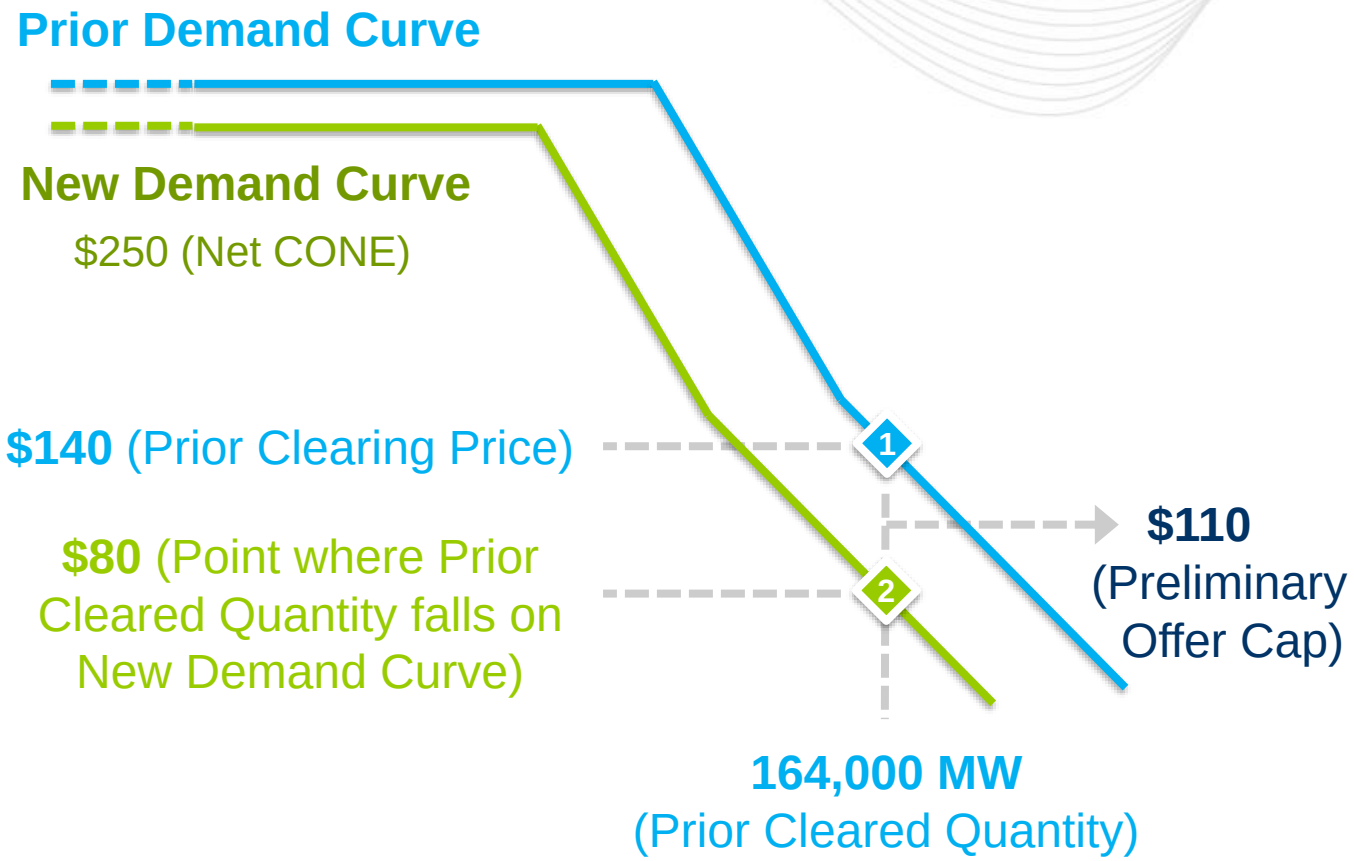
ISO-NE Method: Overview

Dynamic Delist Bid Threshold (DDBT) is functionally equivalent to PJM's default MSOC

Three Steps

1	**Calculate the preliminary DDBT as the simple average of two prices:** 1) System-wide clearing price from the last Forward Capacity Auction (FCA) 2) Price at which the total cleared supply quantity in the last FCA falls on the system-wide demand curve for the next FCA
2	**Bound the preliminary DDBT**, if necessary, by minimum and maximum constraints • No higher than 75% of Net CONE • No lower than 75% of the last FCA clearing price
3	**Add a sliding-scale "margin"** that is dependent on market conditions • Calculated using a ratio of (1) the difference between 75% of Net CONE and the preliminary DDBT, and (2) 75% of Net CONE, which is then multiplied by $1/kW-month (~$33/MW-day)

ISO-NE Method: Illustrative Example



Calculation Steps

1. Preliminary Offer Cap = **$110**
   = ($140 + $80) / 2

2. Bound by Minimum and Maximum
   Min = $105 (75% * $140)
   Max = $187 (75% * $250)

3. Margin Adder = **$13.60**
   $= \left(\frac{(75\% \text{ x } \$250) - \$110}{75\% \text{ x } \$250} \right)$ x $33/MW-day

Final Default Offer Cap = $123.60

ISO-NE Method: Considerations

Key Advantages

- Moves away from an approach that requires an estimation of Expected PAIs
- Relatively simple and straight-forward approach
- Uses inputs that are transparent to the market
- Recently approved by the Commission for ISO-NE

Potential Concerns

- May be sensitive to market changes that materially impact either (a) bidding behavior and the supply curve, or (b) shape of the demand curve
- Partly relies on historical results and assumes competitive behavior with those results

ISO-NE Method: Considerations (cont'd)

Additional Questions for Consideration

- How to address concerns of using historical results if deemed uncompetitive?
- Should more than one historical clearing price be considered in the averaging?
- Is it appropriate to only consider the RTO clearing prices for the default MSOC?
- Is the Margin Adder appropriate if we use an ISO-NE style approach?

Comparison of Approaches

Auction	RTO Clearing Price (1)	Status Quo (2) (Net CONE * B)	Split H Approach (3)	ISO-NE Method
18/19 BRA	$165	$239	$80	$152
19/20 BRA	$100	$226	$75	$151
20/21 BRA	$77	$215	$72	$97
21/22 BRA	$140	$238	$79	$114
22/23 BRA	-	$192	$64	$120

(1) RTO clearing price for Capacity Performance in 18/19 and 19/20
(2) Status Quo values show default offer caps for the RTO
(3) Split H Approach assumes a one-third ratio (e.g. 30 hours in penalty rate and 10 hours in offer cap) for purposes of this comparison

Next Steps

PJM will be considering feedback provided by stakeholders and the IMM in preparing our brief due May 3

PJM will provide an update on what we intend to file during the April 28th capacity market session

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