



# 2022 Quadrennial Review

Rebecca Carroll, Sr. Director  
Melissa Pulong, Lead Analyst

Markets & Reliability Committee  
July 27, 2022

## At least every four years, PJM must review:

Shape of Variable Resource Requirement (VRR) Curve

- Establishes level of capacity needed to meet reliability needs
- Establishes maximum price PJM is willing to pay for a given quantity of capacity

Calculation of the Cost of New Entry (CONE)

Determines the price signal needed to incentivize a new capacity resource

Methodology for determining Energy & Ancillary Services (E&AS) revenue offset

Estimates revenues that reference resource will collect through Energy & Ancillary Service Markets

PJM has hired an independent consultant, Brattle, to perform this analysis



# Stakeholder Process Work Plan

| 2021/2022 Quadrennial Review Work Plan              | MIC SPECIAL SESSIONS: QUADRENNIAL REVIEW |                                    |                                    |                                    |                                    |                                    |                                    |                                    |                         |                                     |                         |                                     |                          |                                     |                          |                           |                               |
|---|--|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|-------------------------|-------------------------------------|-------------------------|-------------------------------------|--------------------------|-------------------------------------|--------------------------|---------------------------|-------------------------------|
|   | MTG 1<br>8/6/21<br>Special<br>MIC        | MTG 2<br>8/17/21<br>Special<br>MIC | MTG 3<br>8/27/21<br>Special<br>MIC | MTG 4<br>10/8/21<br>Special<br>MIC | MTG 5<br>12/8/21<br>Special<br>MIC | MTG 6<br>2/11/22<br>Special<br>MIC | MTG 7<br>3/25/22<br>Special<br>MIC | MTG 8<br>4/22/22<br>Special<br>MIC | MTG 9<br>5/11/22<br>MIC | MTG 10<br>5/20/22<br>Special<br>MIC | MTG 11<br>6/8/22<br>MIC | MTG 12<br>6/21/22<br>Special<br>MIC | MTG 13<br>7/13/22<br>MIC | MTG 14<br>7/18/22<br>Special<br>MIC | MTG 15<br>7/27/22<br>MRC | MTG 16<br>8/24/22<br>MRC* | MTG 17<br>8/24/22<br>MC Call* |
| Education & Stakeholder Feedback                    | X  | X                                  | X                                  | X                                  | X                                  | X                                  |                                    |                                    |                         |                                     |                         |                                     |                          |                                     |                          |                           |                               |
| Review of IMM Recommendations                       |  |                                    |                                    |                                    |                                    | X                                  | X                                  | X                                  |                         | X                                   |                         |                                     |                          |                                     |                          |                           |                               |
| Review of Stakeholder Recommendations               |  |                                    |                                    |                                    |                                    | X                                  |                                    |                                    |                         |                                     |                         |                                     |                          |                                     |                          |                           |                               |
| Review of draft Brattle Recommendations             |  |                                    |                                    |                                    |                                    |                                    | X                                  |                                    |                         |                                     |                         |                                     |                          |                                     |                          |                           |                               |
| Stakeholder Feedback on Final Quadrennial Report    |  |                                    |                                    |                                    |                                    |                                    |                                    | X                                  |                         |                                     |                         |                                     |                          |                                     |                          |                           |                               |
| PJM to review preliminary recommendations           |  |                                    |                                    |                                    |                                    |                                    |                                    |                                    | X                       |                                     |                         |                                     |                          |                                     |                          |                           |                               |
| CBIR Process – identify interests & develop options |  |                                    |                                    |                                    |                                    |                                    |                                    |                                    |                         | X                                   | X                       |                                     |                          |                                     |                          |                           |                               |
| CBIR Process – develop packages                     |  |                                    |                                    |                                    |                                    |                                    |                                    |                                    |                         |                                     | X                       | X                                   |                          | X                                   |                          |                           |                               |
| First Read  |  |                                    |                                    |                                    |                                    |                                    |                                    |                                    |                         |                                     |                         |                                     |                          |                                     | X                        |                           |                               |
| Vote  |  |                                    |                                    |                                    |                                    |                                    |                                    |                                    |                         |                                     |                         |                                     | X                        |                                     |                          | X                         | X                             |

|                 | Status Quo                                  | Package A               | Package B           | Package C         | Package D         |
|-----------------|---|-------------------------|---------------------|-------------------|-------------------|
| Reference Tech  | Combustion Turbine (CT)                     | 1x1 Combined Cycle (CC) | Same as Package A   | Same as Package A | Status Quo        |
| Fuel Assumption | Dual Fuel                                   | Firm Transportation     | Same as Package A   | Same as Package A | Same as Package A |
| VOM             | Major Maintenance + Operating Cost Included | Status Quo              | Only Operating Cost | Same as Package A | Same as Package A |

|   | Status Quo                | Package A              | Package B          | Package C         | Package D         |
|---|---------------------------|------------------------|--------------------|-------------------|-------------------|
| Simulation Method for calculating Net Energy Revenues | Peak Hour Dispatch        | Optimized Dispatch     | Same as Package A  | Same as Package A | Status Quo        |
| Net E&AS Revenue Offset Input Data Time Horizon       | Historical-Looking Inputs | Forward-Looking Inputs | Same as Package A* | Status Quo        | Same as Package C |

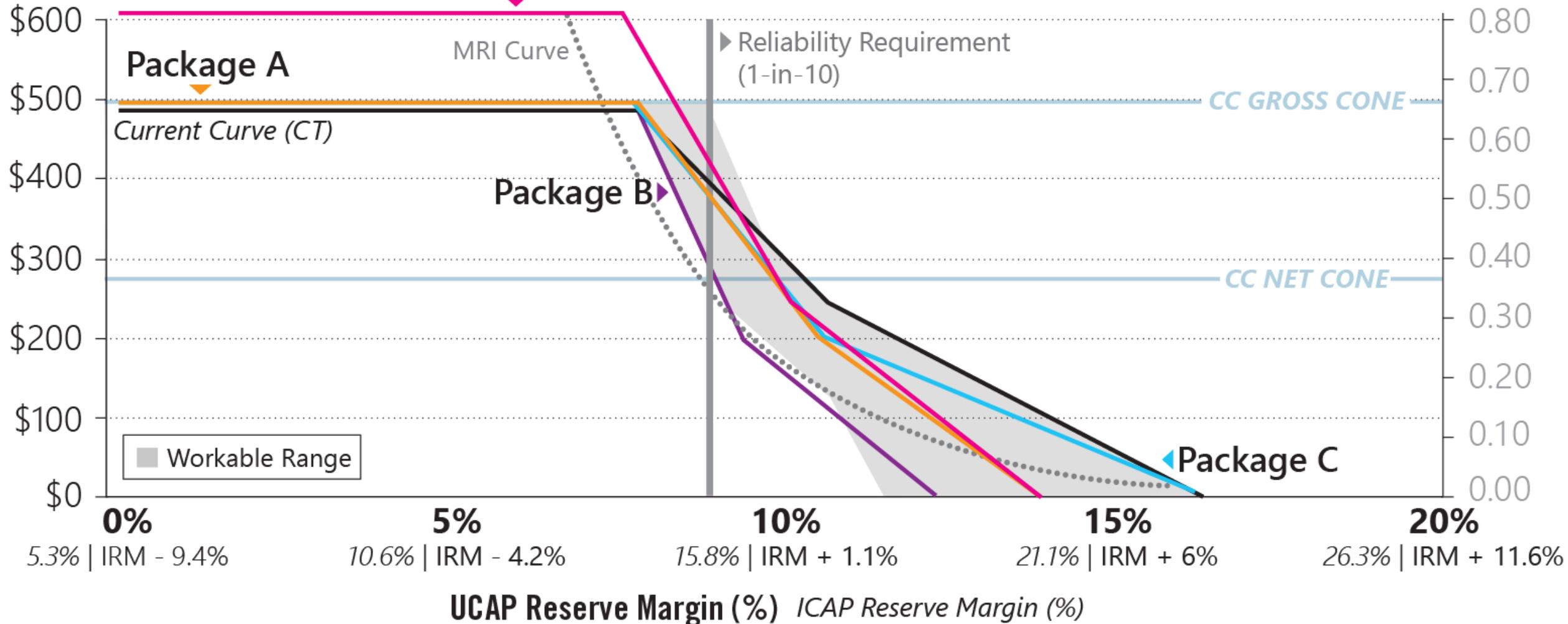
\*See matrix for differences in input assumptions

|         | Status Quo   | Package A   | Package B  | Package C         | Package D                               |
|---------|--|---|--|-------------------|---|
| Point A | quantity = IRM - 1.2%,<br>price = greater (Gross CONE or 1.5*Net CONE) | quantity = IRM - 1.1%*<br>price = greater (Gross CONE or 1.75*Net CONE) | quantity = IRM - 1.2%,<br>price = greater (Gross CONE or 1.5*Net CONE) | Same as Package A | Same as Package A, but CT for CONE Calc |
| Point B | quantity = IRM + 1.9%,<br>price = 0.75*Net CONE                        | quantity = IRM + 1.7%*<br>price = 0.75*Net CONE                         | quantity = IRM + 0.95%,<br>price = 0.75*Net CONE                       | Status Quo        | Same as Package A, but CT for CONE Calc |
| Point C | quantity = IRM + 7.8%,<br>price = 0                                    | quantity = IRM + 5.2%*<br>price = 0                                     | quantity = IRM + 3.9%,<br>price = 0                                    | Status Quo        | Same as Package A, but CT for CONE Calc |

\*Package A quantities expressed in IRM equivalent for ease of comparison to status quo. See matrix for Reliability Requirement calculation.

Price (2026 \$/UCAP MW-Day)

Marginal Reliability Impact (MWh/UCAP MW/Yr.)





Facilitator:  
Rebecca Carroll,  
[Rebecca.Carroll@pjm.com](mailto:Rebecca.Carroll@pjm.com)

Secretary:  
Nikki Militello,  
[Nikki.Militello@pjm.com](mailto:Nikki.Militello@pjm.com)

SME/Presenter:  
Melissa Piong,  
[Melissa.Piong@pjm.com](mailto:Melissa.Piong@pjm.com)

## 2022 Quadrennial Review



### Member Hotline

(610) 666 – 8980

(866) 400 – 8980

[custsvc@pjm.com](mailto:custsvc@pjm.com)

**PROTECT THE  
POWER GRID**  
**THINK BEFORE  
YOU CLICK!**



Be alert to  
malicious  
phishing emails.

**Report suspicious email activity to PJM.**  
(610) 666-2244 / [it\\_ops\\_ctr\\_shift@pjm.com](mailto:it_ops_ctr_shift@pjm.com)

