



# Quadrennial Review of VRR Curve Parameters: PJM Preliminary Recommendations

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- In accordance with the Tariff, PJM staff has developed preliminary recommendations based on review of the analysis and reports prepared by The Brattle Group with regard to:
  - Cost of New Entry (CONE)
  - Shape of the Variable Resource Requirement (VRR) Curve
  - Net Energy & Ancillary Services Revenue (E&AS) Offset methodology
- Preliminary recommendations focus on ensuring PJM maintains adequate resources to meet reliability requirements at a reasonable cost
- Preliminary recommendations used to kickoff discussion with stakeholders

- Adopt Combined Cycle (CC) as the Reference Resource
  - 1x1 double train, single shaft
  - 1,156 MW w/ duct firing
  - Natural gas firm transportation
  - Cooling towers to air-cooled condensers
- Adopt updated CONE values based on CC Reference Resource
- Adopt CC weighting of the Bureau of Labor Statistics (BLS) composite cost index used in the escalation of CONE each year
  - Labor: 40%, Materials: 45%, Turbine: 15%

- Recommendation: Adopt 1x1 CC single shaft (1,156 MW w/ duct firing) double train
  - Current Reference Resource: Single GE Frame Model 7HA.02 CT (320 MW)
- Rationale:
  - Current trend is moving towards 1x1 CC with multiple units on site
  - Offers flexible operational parameters similar to simple cycle CT with efficiency of CC



# CONE – PJM Preliminary Recommendations: Adopt CC Gross CONE Values

- Adopt CC Gross CONE values (\$/MW-Year ICAP)

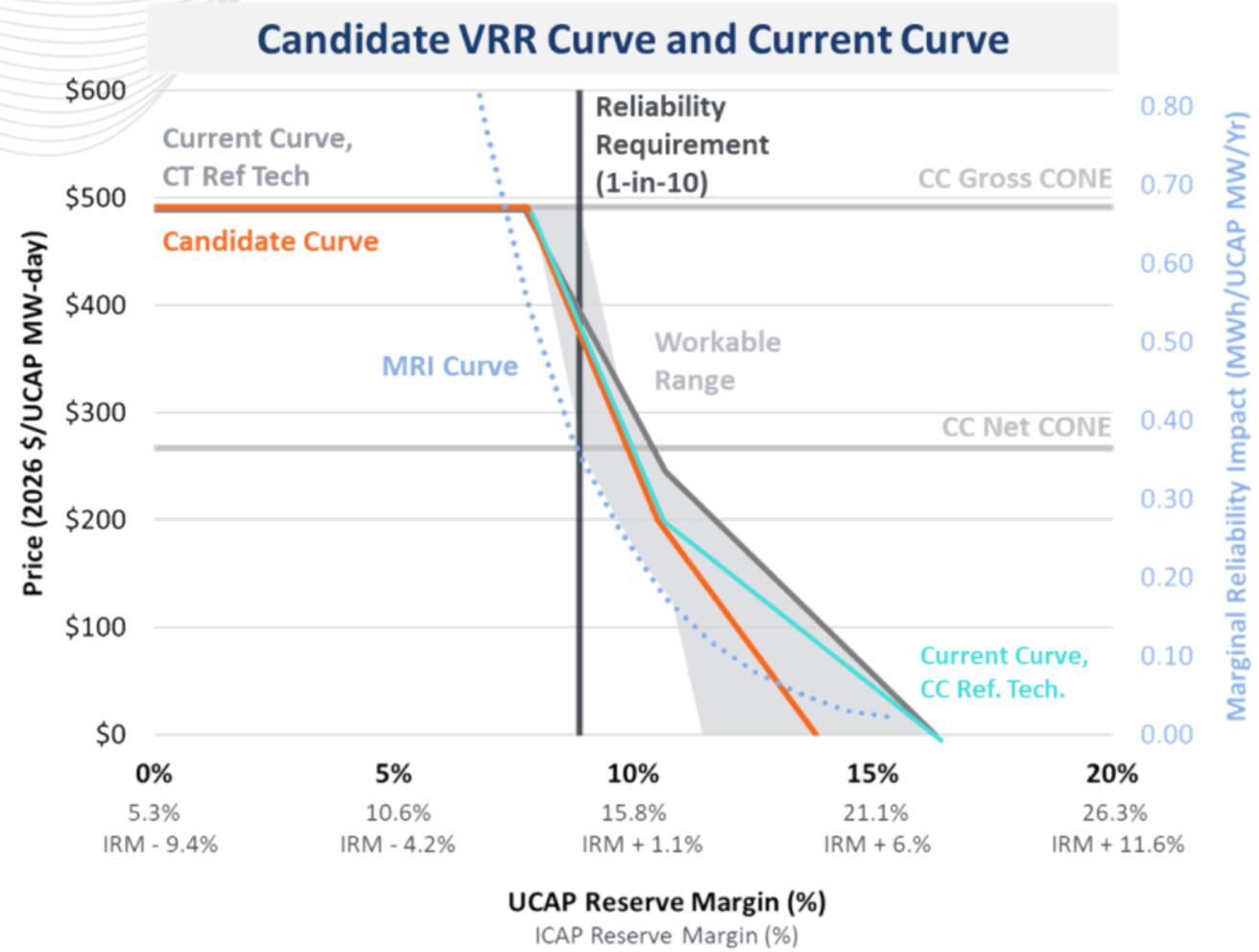
| <b>CONE Area</b> | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> |
|------------------|----------|----------|----------|----------|
| CONE Value       | 182,700  | 178,700  | 183,100  | 184,500  |

|  |
|--|
| CONE Area 1: AE, DPL, JCPL, PECO, PS, RECO   |
| CONE Area 2: BGE, PEPCO  |
| CONE Area 3: AEP, APS, ATSI, ComEd, Dayton, DEOK, Dominion, Duquesne (DLC <sub>o</sub> ), EKPC, OVEC |
| CONE Area 4: MetEd, Penelec, PPL   |



# VRR Curve Shape – PJM Preliminary Recommendation: Adopt Candidate Curve

- Similar to existing curve, but moderately steeper
- Well within the ‘Workable Range’



| Points on the VRR Curve | Current Curve   | Candidate Curve  |
|-------------------------|---|--|
| A                       | quantity = IRM - 1.2%<br>price = greater (CONE or 1.5*Net CONE) | quantity = IRM - 1.1%<br>price = greater (CONE or 1.75*Net CONE) |
| B                       | quantity = IRM + 1.9%<br>price = 0.75*Net CONE                  | quantity = IRM + 1.7%<br>price = 0.75*Net CONE                   |
| C                       | quantity = IRM + 7.8%<br>price = 0                              | quantity = IRM + 5.2%<br>price = 0                               |



# E&AS Offset – PJM Preliminary Recommendations: Summary

- Adopt a forward-looking E&AS methodology
- Apply updated Reference Resource characteristics and cost

# E&AS Offset – PJM Preliminary Recommendations: Adopt Forward-Looking E&AS Offset

- Recommendation: Adopt forward-looking E&AS Offset methodology
  - Utilize Projected E&AS Dispatch
  - Incorporate the following updates:
    - Remove regulation
    - Scale historical hourly sync and non-sync reserve prices by forward energy prices
    - Update EKPC gas hub from Columbia-App TCO to MichCon
    - Remove variable gas transportation cost
- Rationale: Reflects expected market conditions developers will face upon entry into market

- **CONE**
  - Adopt Combined Cycle (CC) as the Reference Resource
  - Adopt CC Gross CONE values
  - Adopt CC weighting of BLS composite cost index
- **Shape of the VRR Curve**
  - Update to a CC-based VRR curve shape for RTO and LDAs
  - Adopt the Candidate Curve
- **E&AS Offset**
  - Adopt Forward-Looking E&AS Offset Methodology
  - Update Reference Resource characteristics and costs

- **PJM's Preliminary Recommendations by May 15**
  - Posted May 4, 2022
- **PJM Member Vote by August 31**
  - MRC/MC vote scheduled August 24, 2022
- **FERC Filing by October 1**
  - Following PJM Board approval in September

PJM will be holding multiple meetings between May and August to work with stakeholders to develop recommendations

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## 2022 Quadrennial Review



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