



PJM Manual 18 Updates

Conforming Changes for MOPR and Forward Net EAS

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- Revisions to PJM Manual 18: PJM Capacity Market conforming with MOPR order (EL16-49, EL18-178, ER18-1314) and Forward Net EAS order (EL19-58)
- Revisions were endorsed at the 1/12/2021 MIC meeting

- Two conforming changes made prior to MIC endorsement
 - OVEC zone mapped to Columbia-Appalachia TCO fuel pricing point and AEP-Dayton Hub
 - Clarifies hierarchy of evidence for use of an alternate asset life in resource-specific MOPR floor price calculation
- Two conforming changes made subsequent to MIC endorsement
 - Use of average equivalent availability factor of all PJM nuclear resources to account for refueling outages in the calculation of the forward net E&AS offset for existing nuclear units
 - No requirement to submit sell offer at the resource-specific value under certain circumstances

- Previously unmapped OVEC Zone now mapped in Section 3.2.2 as shown on the next two slides:
 - OVEC mapped to the Columbia-Appalachia TCO fuel pricing point as shown in updated Table of Section 3.2.2
 - OVEC mapped to the AEP-Dayton Hub in determination of Forward Hourly LMPs



OVEC Zone / Fuel Pricing Point Mapping

Zone to Fuel Pricing Point Mapping

The fuel pricing point used for the purpose of establishing the Net E&AS Offset for each Zone is provided in the table below.

Zone	Fuel Pricing Point
AE, BGE, DPL, & JCPL	Transco-Z6 (non-NY)
COMED	Chicago Citygates
DUQ, METED, PECO, & PPL	TETCO M3
PEPCO & DOM	Transco Z5 Div
AEP, OVEC	Columbia-Appalachia TCO
DAY, DEOK, ATSI	Mich Con
APS & PENELEC	Dominion South
PSEG & RECO	Transco Z6 (NY)
EKPC	Tenn LA 500 Leg

In the determination of Forward Hourly LMPs, the ComEd Zone is mapped to the N. Illinois Hub, the AEP, ATSI, DAY, DEOK, DUQ, ~~and~~ EKPC **and OVEC** Zones are mapped to the AEP-Dayton Hub, and all other Zones are mapped to the Western Hub. In the determination of Forward Hourly Ancillary Service Prices for Regulation, the real-time forward hourly LMP of the Western Hub is used. In addition, several of the fuel pricing points of the table below lack sufficient liquidity and are therefore mapped to more liquid hubs for the purposes of calculating Forward Daily Natural Gas Prices. For the purpose of calculating Forward Daily Natural Gas Prices, Columbia-Appalachia TCO is used in place of Tenn LA 500 Leg, Transco-Z6 (non-NY) is used in place of Transco-Z5 Dlv, and Transco-Z6 (non-NY) is used in place of Transco-Z6 (NY).

- Conforming revisions were made to clarify that the seller's financial accounting statements should serve as the primary form of evidence for use of asset life greater than 20 years in the resource-specific exception process for MOPR floor price calculations
 - Other forms of evidence as listed may be acceptable as evidence to the extent the seller has not executed project financing for the resource
- This revision is contained in the 3rd paragraph of section 5.4.5.5(A) (page 136) as shown on next slide:



Hierarchy of Evidence for Use of an Alternate Asset Life

The financial modeling assumptions for calculating Cost of New Entry for Generation Capacity Resources and generation-backed Demand Resources shall be: (i) nominal levelization of gross costs, (ii) asset life of twenty years, (iii) no residual value, (iv) all project costs included with no sunk costs excluded, (v) use first year revenues (which may include revenues from the sale of renewable energy credits for purposes other than state-mandated or state-sponsored programs), and (vi) weighted average cost of capital based on the actual cost of capital for the entity proposing to build the Capacity Resource. Notwithstanding the foregoing, a Capacity Market Seller of a New Entry Capacity Resource with State Subsidy that seeks to utilize an asset life other than twenty years (but no greater than 35 years) shall provide evidence to support the use of a different asset life, including but not limited to, the asset life term for such resource as utilized in the Capacity Market Seller's financial accounting (e.g., independently audited financial statements). ~~or To the extent the seller has not executed project financing for the resource, the Capacity Market Seller may submit project financing documents for the resource or~~ evidence of actual costs or financing assumptions of recent comparable projects ~~to the extent the seller has not executed project financing for the resource (e.g., independent project engineer opinion or manufacturer's performance guarantee) , or~~ opinions of third-party experts regarding the reasonableness of the financing assumptions used for the project itself or in comparable projects. ~~Capacity Market Sellers may also rely on~~, or evidence presented in federal filings, such as its FERC Form No. 1 or an SEC Form 10-K, to demonstrate an asset life other than 20 years of similar asset projects.

- Subsequent to MIC endorsement, a conforming update has been made to second paragraph of 5.4.5.7 as shown on next slide
- This change conforms with the language of Attachment DD, Section 5.14(h-1)(2)(B)(ii) of PJM OATT
 - Clarifies that an average equivalent availability factor of all PJM nuclear resources will be used to account for refueling outages in the calculation of the forward net E&AS offset for existing nuclear units

The default Net EAS value of an existing generation resource shall be determined in accordance with the applicable resource type net energy and ancillary services revenue determination methodology set forth in Tariff, Attachment DD, section 5.14(h-1)(2)(A)(i) through (ix) and using the subject resource's operating parameters as determined based on (a) offers submitted in the Day-ahead Energy Market and Real-time Energy Market over the calendar year preceding the time of the determination for the RPM Auction; (b) the resource-specific operating parameters approved, as applicable, in accordance with Operating Agreement, Schedule 1, section 6.6(b) and Operating Agreement, Schedule 2 (including any Fuel Costs, emissions costs, Maintenance Adders, and Operating Costs); (c) the resource's EFORd; (d) Forward Hourly LMPs at the generation bus as determined in accordance with Tariff, Attachment DD, section 5.10(a)(v-1)(C)(6); and (e) the resource's stated annual revenue requirement for reactive services; plus any unit-specific bilateral contract. In addition, the following resource type-specific parameters shall be considered; (f) for combustion turbine, combined cycle, and coal resource types: the installed capacity rating, ramp rate (which shall be equal to the maximum ramp rate included in the resource's energy offers over the most recent previous calendar year preceding the determination for the RPM Auction), and the heat rate as determined as the resource's average heat rate at full load as submitted to the IMM and PJM, where for combined cycle resources heat rates will be determined at base load and at peak load (e.g., without duct burners and with duct burners), as applicable; (g) for nuclear resource type: ~~anticipated refueling schedule~~ **an average equivalent availability factor of all PJM nuclear resources to account for refueling outages**; (h) for solar and wind resource types: the resource's output profiles for the most recent three calendar years, as available; and (i) for battery storage resource type: the nameplate capacity rating (on a MW / MWh basis).

- Subsequent to MIC endorsement, a conforming update has been made to the paragraphs of 5.4.5.4 as shown on next slide
- This change conforms with the 1/19/21 MOPR Compliance Order rejecting these sentences
- PJM will file additional compliance filing by Feb. 3, 2021 to remove the rejected sentence from Attachment DD, section 5.14(h-1) in accordance with FERC order

No Requirement to Submit Sell Offer at Resource-Specific Value

Notwithstanding the foregoing, a Capacity Market Seller must seek a resource-specific MOPR Floor Offer Price for the following scenarios:

- The resource is a New Entry Capacity Resource with State Subsidy and the applicable default New Entry MOPR Floor Offer Price exceeds the applicable Market Seller Offer Cap of the resource. ~~In this instance, the Capacity Market Seller may only submit a sell offer price equal to the resource-specific MOPR Floor Offer Price.~~ Failure to obtain a resource-specific MOPR Floor Offer Price will result in the Office of the Interconnection rejecting any Sell Offer for such resource for the relevant RPM Auction.
- The resource is a Cleared Capacity Resource with State Subsidy and the MOPR Floor Price of the resource based on the default gross ACR net of projected net energy and ancillary service revenues exceeds the applicable Market Seller Offer Cap of the resource. ~~In this instance, the Capacity Market Seller may only submit a sell offer price equal to the resource-specific MOPR Floor Offer Price.~~ Failure to obtain a resource-specific MOPR Floor Offer Price will result in the Office of the Interconnection rejecting any Sell Offer for such resource for the relevant RPM Auction.

Appendix – Previously Reviewed Revisions

Section 3.3.2 Demand in RPM: Apply Forward-looking Net EAS to Reference Resource CT starting with 2022/2023 Delivery Year

Section 5.4.4 Sell Offer Caps: Apply Forward-looking Net EAS to generation resources seeking Unit-Specific Exception Requests

Section 5.4.5 Minimum Offer Price Rule (MOPR): Describe various new terms, business rules and processes associated with expanded MOPR and use of Forward Net EAS for MOPR purposes

Section 8.8 Replacement Resources: Describe limitations on Capacity Resources with State Subsidy as replacement capacity

Glossary of Terms: Added State Subsidy and Jointly-Owned Capacity Resource with State Subsidy

Net EAS of Reference CT for Determination of VRR Curve

- Up to 2021/2022, Net EAS of Reference Resource CT is determined using Peak-Hour Dispatch Methodology, historical hourly LMPS and historical daily gas prices
- Effective with the 2022/2023 Delivery Year, Net EAS of Reference Resource CT is determined using Projected EAS Dispatch Methodology, Forward Hourly LMPS, Forward Hourly Ancillary Service Prices and Forward Daily Natural Gas Prices

Projected PJM Market Revenues of Generating Units seeking Unit-Specific Market Seller Offer Cap

- Up to 2021/2022, Projected PJM Market Revenues are based on historical 3-year average of net PJM energy market revenues received by the resource
- Effective with the 2022/2023 Delivery Year, Projected PJM Market Revenues must be based on forward-looking energy and fuel prices as described further in new section 5.4.5.7 of M18

- Existing language of this section describes current MOPR applicable to certain new Generation Capacity Resources (i.e., the MOPR of Attachment DD, section 5.14(h) of PJM OATT)
- This section of M18 has been expanded to also include the new MOPR applicable to Capacity Resources with State Subsidy (i.e., the MOPR of Attachment DD, section 5.14(h-1) of PJM OATT)
- Given the significant number of new MOPR-related provisions, this section has been broken into several sub-sections to allow for clearer reference to relevant rules and processes

Sub-Section 5.4.5.1: Applicability

- Describes current MOPR applicability to certain new Generation Capacity Resources (i.e., the MOPR of Attachment DD, section 5.14(h) of PJM OATT)
- Describes MOPR applicability to Capacity Resources with State Subsidy (i.e., the MOPR of Attachment DD, section 5.14(h-1) of PJM OATT)
 - Capacity Resource with State Subsidy
 - Cleared Capacity Resource with State Subsidy
 - New Entry Capacity Resource with State Subsidy

Sub-Section 5.4.5.2: Categorical Exemptions Applicable to Capacity Resources with State Subsidy

- A. Competitive Exemption (and consequences for accepting State Subsidy following election of Competitive Exemption)
- B. Self-Supply Entity Exemption
- C. Renewable Portfolio Standard Exemption
- D. DR and EE Resource Exemption
- E. Capacity Storage Resource Exemption

Sub-Section 5.4.5.3: Capacity Market Seller Certification of Capacity Resource with State Subsidy Status

- Describes process and timing requirements for seller certification of Capacity Resource with State Subsidy status

Sub-Section 5.4.5.4: MOPR-Related Business Rules and Process Timeline

- Specifies the timeline for pre-auction activities related to MOPR
- Provides high-level business rules describing the MOPR Floor Offer Prices applicable to:
 - Certain new Generation Capacity Resources that are not State Subsidized
 - New Entry Capacity Resources with State Subsidy
 - Cleared Capacity Resources with State Subsidy
 - Commercially Aggregated Capacity Resources

Sub-Section 5.4.5.5: Resource-Specific Exception Process for MOPR Floor Offer Prices

- Describes the documentation required in a resource-specific exception request for:
 - A. New Capacity Resources (i.e., certain new Generation Capacity Resources that are not State Subsidized and New Entry Capacity Resources with State Subsidy)
 - B. Cleared Capacity Resources with State Subsidy

Sub-Section 5.4.5.6: Default MOPR Floor Offer Prices

- Describes the determination of the Default MOPR Floor Offer Prices of specified resource types for:
 - A. Certain new Generation Capacity Resources that are not State Subsidized
 - B. New Entry Capacity Resources with State Subsidy
 - C. Cleared Capacity Resources with State Subsidy
 - In the case of Cleared Capacity Resources with State Subsidy, this section describes the determination of the Default Gross ACR of specified resource types with the Net EAS determination as described further in new section 5.4.5.7 of M18

Sub-Section 5.4.5.7: Resource-Specific Net EAS Determinations

- A resource-specific Net EAS calculation is required for any resource seeking a resource-specific MOPR exception and such calculation must be based on forward-looking dispatch models
- The IMM will develop default EAS values for all resources seeking a resource-specific exception using the Projected EAS Dispatch Model or assumed output model, a set of standard inputs based on the resource's actual operating parameters, cost data and pricing points, and Forward Hourly LMPS and Forward Daily Fuel Prices relevant to the resource
- Sellers may submit adjustments to resource-specific operating parameters to the IMM and PJM for review and consideration in the simulated dispatch with supporting documentation; however, sellers may only seek a customized EAS value if they are also seeking a resource-specific Gross CONE or ACR

Sub-Section 5.4.5.7: Resource-Specific Net EAS Determinations (CONT.)

- Alternatively, sellers may also rely upon their own models to determine the Net EAS offset with supporting documentation as described in this sub-section
- The resource-specific Net EAS determination of this sub-section is equally applicable to resources that seek a unit-specific exception request for sell offer cap purposes

Added language describing limitations on Capacity Resources with State Subsidy as replacement capacity

- Available capacity of a Capacity Resource with State Subsidy for which the Capacity Market Seller has not elected to forego receipt of any State Subsidy for the relevant Delivery Year and does not qualify for one of the categorical exemptions may not be used to replace the commitment of a Capacity Resource that (1) is not a Capacity Resource with State Subsidy or (2) is a Capacity Resource with State Subsidy for which the Capacity Market Seller elected the competitive exemption and reported that it will forego receipt of any State Subsidy for the relevant Delivery Year or (3) a Capacity Resource with State Subsidy that qualifies for one of the categorical exemptions.

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