

3.3.1 Cost of New Entry

The value for Cost of New Entry (CONE) (in ICAP terms) is determined in accordance with Attachment DD of the Open Access Transmission Tariff (OATT), Section 5.10 (a) (iv). The Reference Resource is a combustion turbine (CT) generating station, configured with two General Electric Frame 7FA turbines as defined in the OATT.

For the Incremental Auctions for the 2015/2016, 2016/2017, and 2017/2018 Delivery Years, the Cost of New Entry for the PJM Region and each modeled LDA shall be the respective value used in the Base Residual Auction for such Delivery Year and LDA.

The gross Cost of New Entry values for the ~~PJM Region and~~ following ~~five~~four CONE Areas for the 201~~58~~/2016 Delivery Year are specified in the OATT, Section 5.10 (a) (iv)(A). :

- (1) AE, DPL, JCPL, PECO, PSEG, RECO (“CONE Area 1”);
- (2) BGE, PEPCO (“CONE Area 2”);
- (3) AEP, APS, COMED, DAYTON, DLCo, ATSI, DEOK, EKPC, Dominion (“CONE Area 3”);
- (4) METED, PENELEC, PPL (“CONE Area 4”); ~~and~~
- (5) ~~Dominion (“CONE Area 5”).~~

Effective for the 2018/2019 Delivery Year, the gross Cost of New Entry value for the PJM Region shall be the average of the gross CONE values for the four CONE Areas.

For the 201~~69~~/2017 Delivery Year, the gross CONE values specified in the OATT for the 201~~58~~/2016 Delivery Year shall be adjusted to reflect changes in generating plant construction costs based on changes in the applicable United States Bureau of Labor Statistics (BLS) Composite Index will be escalated by the applicable Handy Whitman Index for 2016/2017 Delivery Year to establish the CONE values used in the development of the Variable Resource Requirement Curves for the PJM Region and the modeled LDAs for all RPM Auctions for the 201~~69~~/2017 Delivery Year.

The applicable BLS Composite Index Handy Whitman Index (HWI) for a Delivery Year and CONE Area shall be the most recently published twelve-month change, at the time CONE values are required to be posted for the Base Residual Auction for such Delivery Year, in a composite of the BLS Quarterly Census of Employment and Wages for Utility System Construction (weighted 20%), the BLS Producer Index for Construction Materials and Components (weighted 50%), and the BLS Producer Price Index for Turbines and Turbine Generator Sets (weighted 30%). The Quarterly Census of Employment and Wages for Utility System Construction will be based on the state of New Jersey for CONE Area 1, Maryland for CONE Area 2, Ohio for CONE Area 3, and Pennsylvania for CONE Area 4. Total-Other Plant Production Plant Index shown in the Handy Whitman Index (HWI) of Public Utility Construction Costs. The North Atlantic Region HWI will be used for the PJM Region and for CONE Areas 1, 2, and 4. The North Central Region HWI will be used for CONE Area 3. The South Atlantic Region HWI will be used for CONE Area 5

For subsequent Delivery Years, the Benchmark CONE values will be the CONE values used in the development of the Variable Resource Requirement Curves for the prior Delivery



Year. The applicable HWBLS Composite Index for the Delivery Year will be applied to the Benchmark CONE values to establish the CONE values used in the development of the Variable Resource Requirement Curves for the PJM Region and the modeled LDAs for all RPM Auctions for such Delivery Year. ~~If an LDA covers more than one of the five CONE areas, the lowest escalated Benchmark CONE value is used in the development of the LDA's Variable Resource Requirement Curve.~~

3.3.2 Net Energy and Ancillary Services Offset

Pursuant to Attachment DD, Section 5.10(a)(v and vi) of the PJM Tariff, PJM determines a Net Energy and Ancillary Services (E&AS) Revenue Offset for the PJM Region and for each ~~sub-region of the PJM Region for which the Cost of New Entry is determined.~~Zone.

The Net E&AS Revenue Offset for the PJM Region for a Delivery Year is (a) the annual average of the revenues that would have been received by the Reference Resource from the PJM energy markets during a period of three consecutive calendar years preceding the Base Residual Auction for such Delivery Year plus (b) an assumed value for ancillary services revenues (\$/MW-year) as set forth in the OATT.

The annual average of energy revenues for the PJM Region is based on (1) heat rate and other characteristics of such Reference Resource; (2) daily natural gas prices averaged across the fuel pricing points specified in the table below; (3) assumed variable operation and maintenance expenses for such Reference Resource as set forth in the OATT; (4) actual PJM hourly average LMP prices recorded in the PJM Region during such period; and (5) an assumption that the Reference Resource would be dispatched for both Day-Ahead and Real-Time Energy Markets on Peak-Hour Dispatch basis.

For the Incremental Auctions for the 2015/2016, 2016/2017, and 2017/2018 Delivery Years, PJM will employ for the purposes of developing the RTO and modeled LDA VRR Curves for such Delivery Years the same calculated values of RTO and modeled LDA Net E&AS Revenue Offsets that were used in the BRA for such Delivery Year.

For the 2018/2019 and subsequent Delivery Years, ~~the~~ Net E&AS Revenue Offset for each ~~CONE Area~~Zone for a Delivery Year is determined using the same procedures and methods used to determine the Net E&AS Revenue Offset for the PJM Region; provided, however, that (1) actual hourly average LMPs for ~~the such Zone in which the Reference Resource was assumed to be installed for a CONE Area (as set forth in table below)~~ shall be used in place of the PJM Region hourly average LMPs; and (2) daily natural gas prices at the fuel pricing points specified in the table below.

~~For each CONE Area, the Zone for which the Reference Resource was assumed to be installed and t~~he fuel pricing point used for the purpose of establishing the Net E&AS Offset for each ~~CONE Area~~Zone is provided in the table below.

<u>CONE Area</u> <u>Zone(s)</u>	<u>Zone for which Reference Resource was assumed to be installed</u>	Fuel Pricing Point
<u>CONE Area 1</u> <u>AE, BGE, DPL, PEPSCO, PSEG, & RECO</u>	<u>AE</u>	Transco-Z6 (non-NY)
<u>CONE Area 2</u>	<u>BGE</u>	<u>Transco-Z6 (non-NY)</u>



<u>CONE Area 3</u> <u>COMED</u>	<u>ComEd</u>	<u>Chicago Citygates</u>
<u>CONE Area 4</u> <u>JCPL</u> , <u>METED</u> , <u>PECO</u> , & <u>PPL</u>	<u>MetEd</u>	<u>TETCO M3</u>
<u>CONE Area 5</u> <u>DOM</u>	<u>Dominion</u>	<u>Transco-Z5 (non-WGL)</u>
<u>AEP</u> , <u>APS</u> , <u>ATSI</u> , <u>DAY</u> , <u>DEOK</u> , <u>DUQ</u> , & <u>EKPC</u>		<u>Columbia-APP</u>
<u>PENELEC</u>		<u>Dominion-NORTH</u>

Peak-Hour Dispatch means, for purposes of calculating the energy revenues in the Energy and Ancillary Services Revenue Offset, that the Reference Resource is committed in the Day-Ahead Energy Market in four distinct blocks of four hours of continuous output for each block from the peak-hour period beginning with the hour ending 0800 EPT through to the hour ending 2300 EPT for any day when the average day-ahead LMP for the area for which the Net Cost of New Entry is being determined is greater than, or equal to, the cost to generate (including the cost for a complete start and shutdown cycle) for at least two hours during each four-hour block, where such blocks shall be assumed to be committed independently; provided that, if there are not at least two economic hours in any given four-hour block, then the Reference Resource shall be assumed not to be committed for such block; and to the extent not committed in any such block in the Day-Ahead Energy Market under the above conditions based on Day-Ahead LMPs, is dispatched in the Real-Time Energy Market for such block if the Real-Time LMP is greater than or equal to the cost to generate under the same conditions as described above for the Day-Ahead Energy Market.

[3.3.3 Net Cost of New Entry](#)

[The Net Cost of New Entry \(Net CONE\) for the PJM Region is the gross Cost of New Entry for the PJM Region minus the Net E&AS Revenue Offset for the PJM Region.](#)

[For the 2015/2016, 2016/2017, and 2017/2018 Delivery Year, the Net CONE for a modeled LDA shall be the Net CONE used for such modeled LDA in the Base Residual Auction for such Delivery Year.](#)

[Effective with the 2018/2019 Delivery Year, PJM shall determine the Net Cost of New Entry for each Zone that comprises the modeled LDA. The Net Cost of New Entry for a Zone is the applicable gross Cost of Net Entry value for such Zone minus the Net E&AS Revenue Offset for such Zone. The Net Cost of New Entry for a modeled LDA shall be the average of the Net CONE values of all zones within the modeled LDA.](#)

3.4 Plotting the Variable Resource Requirement Curve

[For the 2015/2016, 2016/2017, and 2017/2018 Delivery Years, the Variable Resource Requirement Curve is plotted on a graph on which Unforced Capacity is on the x-axis and price is on the y-axis using the following three points \(a\), \(b\), and \(c\):](#)



a. The price is equal to the greater of [the Cost of New Entry or 1.5 times (the Cost of New Entry minus the Net E&AS Revenue Offset, referred to as “Net CONE”)] divided by (one minus Pool-Wide Average EFORd) and Unforced Capacity is equal to [PJM Region Reliability Requirement multiplied by (100% plus the approved IRM% minus 3%) divided by (100% plus approved IRM %)] minus the RTO Short-Term Resource Procurement Target

Basis for Price at Point a:

$$\frac{\text{Greater of } [CONE \text{ or } 1.5(CONE - E \& AS)]}{1 - \text{Pool Wide EFORd}}$$

Basis for Quantity at Point a:

$$\left[\text{Rel Req} \frac{(100\% + IRM - 3\%)}{(100\% + IRM)} \right] - \text{Short - Term Resource Procurement Target}$$

b. The price is equal to Net CONE divided by (one minus Pool-Wide Average EFORd) and Unforced Capacity equals [PJM Region Reliability Requirement multiplied by (100% plus the approved IRM% plus 1%) divided by (100% plus approved IRM%)] minus the RTO Short-Term Resource Procurement Target.

Basis for Price at Point b:

$$\frac{[1.0(CONE - E \& AS)]}{1 - \text{Pool Wide EFORd}}$$

Basis for Quantity at Point b:

$$\left[\text{Rel Req} \frac{(100\% + IRM + 1\%)}{(100\% + IRM)} \right] - \text{Short - Term Resource Procurement Target}$$

c. The price is equal to 0.2 times the Net CONE divided by (one minus Pool-Wide Average EFORd) and Unforced Capacity equals [PJM Region Reliability Requirement multiplied by (100% plus the approved IRM% plus 5%) divided by (100% plus approved IRM %) minus the RTO Short-Term Resource Procurement Target.

Basis for Price at Point c:

$$\frac{[0.2(CONE - E \& AS)]}{1 - \text{Pool Wide EFORd}}$$

Basis for Quantity at Point c:

$$\left[\text{Rel Re } q \frac{(100\% + \text{IRM} + 5\%)}{(100\% + \text{IRM})} \right] - \frac{\text{Short - Term Resource}}{\text{Procurement Target}}$$

For the 2018/2019 Delivery Year and subsequent Delivery Years, the Variable Resource Requirement Curve is plotted on a graph on which Unforced Capacity is on the x-axis and price is on the y-axis using the following three points (a), (b), and (c):

a. The price is equal to the greater of [the Cost of New Entry or 1.5 times (the Cost of New Entry minus the Net E&AS Revenue Offset, referred to as “Net CONE”)] divided by (one minus Pool-Wide Average EFORd) and Unforced Capacity is equal to [PJM Region Reliability Requirement multiplied by (100% plus the approved IRM% minus 0.2%) divided by (100% plus approved IRM %)] minus the RTO Short-Term Resource Procurement Target

Basis for Price at Point a:

$$\frac{\text{Greater of } [\text{CONE or } 1.5(\text{CONE} - E \& AS)]}{1 - \text{Pool Wide EFORd}}$$

Basis for Quantity at Point a:

$$\left[\text{Rel Re } q \frac{(100\% + \text{IRM} - 0.2\%)}{(100\% + \text{IRM})} \right] - \frac{\text{Short - Term Resource}}{\text{Procurement Target}}$$

b. The price is equal to 0.75 times Net CONE divided by (one minus Pool-Wide Average EFORd) and Unforced Capacity equals [PJM Region Reliability Requirement multiplied by (100% plus the approved IRM% plus 2.9%) divided by (100% plus approved IRM%)] minus the RTO Short-Term Resource Procurement Target.

Basis for Price at Point b:

$$\frac{[0.75(\text{CONE} - E \& AS)]}{1 - \text{Pool Wide EFORd}}$$

Basis for Quantity at Point b:

$$\left[\text{Rel Re } q \frac{(100\% + \text{IRM} + 2.9\%)}{(100\% + \text{IRM})} \right] - \frac{\text{Short - Term Resource}}{\text{Procurement Target}}$$

c. The price is equal to zero and Unforced Capacity equals [PJM Region Reliability Requirement multiplied by (100% plus the approved IRM% plus 8.8%) divided by (100% plus approved IRM %) minus the RTO Short-Term Resource Procurement Target.

Basis for Price at Point c: \$0/MW-day

Basis for Quantity at Point c:

$$\left[\text{Rel Re } q \frac{(100\% + \text{IRM} + 8.8\%)}{(100\% + \text{IRM})} \right] - \text{Short - Term Resource Procurement Target}$$

3.4.1 Plotting the Variable Resource Requirement Curves

The graph below illustrates the process for plotting the Variable Resource Requirement curves for Delivery Years prior to 2018/2019 Delivery Year. The VRR Curve is plotted by combining a horizontal line from the y-axis to point (a), a straight line connecting points (a) and (b), a straight line connecting points (b) and (c), and a vertical line from point (c) to the x-axis.

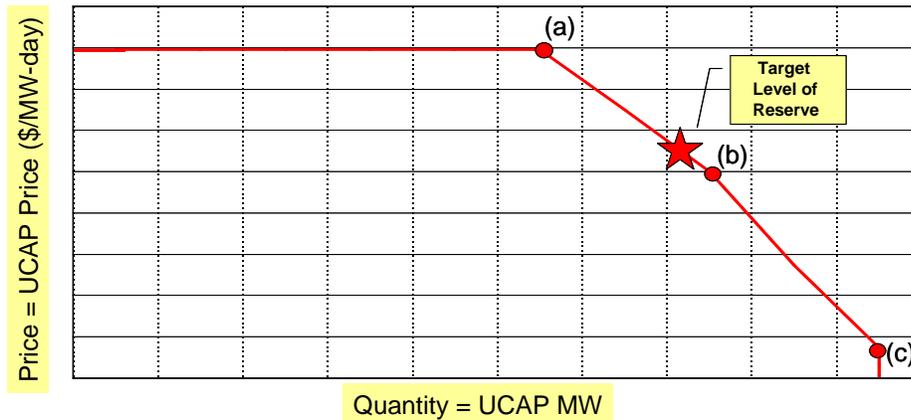


Exhibit 1: Illustrative Example of a Variable Resource Requirement Curve

Effective with the 2018/2019 Delivery Year, the VRR Curve is plotted by combining a horizontal line from the y-axis to point (a), a straight line connecting points (a) and (b), a straight line connecting points (b) and (c). The price associated with point (c) is \$0/MW-day; therefore, no vertical line is needed to connect point (c) to the x-axis.

The same process shall be used to establish the Variable Resource Requirement Curve for each LDA, except that the Locational Deliverability Area Reliability Requirement for such



LDA shall be substituted for the PJM Region Reliability Requirement, and the LDA Short-Term Resource Procurement Target for the Zones associated with such LDA shall be substituted for the RTO Short-Term Resource Procurement Target and the FRR adjustments will be for the FRR Entities in the LDA.

~~In 2014~~ Beginning with the 2018/2019 Delivery Year and continuing no later than for every fourth Delivery Year thereafter, PJM will perform a review of the shape of the Variable Resource Requirement Curve, CONE values, and Energy & Ancillary Services methodology, and any FERC approved changes resulting from this review will be incorporated into the appropriate RPM Auctions. ~~BRA that is conducted in May 2015 for the 2018/2019 Delivery Year. Such a review will be conducted again in 2018 and every fourth year thereafter.~~

The Variable Resource Requirement Curve ~~of Exhibit 4~~ will be further adjusted to reflect the impact of any PRD that is proposed in a PRD Plan and that is reviewed and accepted by PJM. To reflect accepted PRD Plans, the Variable Resource Requirement Curve will be shifted leftward along the horizontal axis by a quantity equal to the Nominal PRD Value multiplied by the FPR. This quantity represents the quantity of Unforced Capacity that would have been procured in the RTO on behalf of the PRD load but that is now not needed due to the PRD loads' commitment to reduce consumption. The curve will be shifted leftward in this manner only for those portions of the curve that are at or above the PRD Reservation Price, since the PRD load can be excluded only if the auction clears at or above that price. The Variable Resource Requirement Curve for each LDA in which the PRD resides (including the RTO curve) will be shifted in the exact same manner.