



Essential Power OPP, LLC, Essential Power Rock Springs, LLC, Lakewood Cogeneration, L.P., GDF SUEZ Energy Marketing NA, Inc., Oregon Clean Energy, LLC and Panda Power Generation Infrastructure Fund, LLC (“Complainants”) against PJM alleging the OATT is unjust and unreasonable because it does not include provisions to prevent the artificial suppression of prices by existing generation resources that are the beneficiaries of out of market revenues. Complainants propose a minimum offer price rule for existing units modeled on the Minimum Offer Price Rule (“MOPR”) in the current rules designed to protect the markets from noncompetitive new entry.<sup>3</sup>

The Market Monitor generally supports the complaint and its supporting rationale and urges that timely action be taken in this proceeding to address the issue raised in the complaint. The specific proposal included in the March 21<sup>st</sup> Complaint (at 34–38) is too ambitious for the short term problem, which must be dealt with by May 11, 2016, when the Base Residual Auction for the 2019/2020 Delivery Year (“2019/2020 BRA”) commences. The specific proposal is also insufficient to address the long term problem of dealing with noncompetitive subsidies to existing units in addition to the problem of noncompetitive subsidies to new entry. In these comments, the Market Monitor recommends changes to the mechanics of how the Complainants’ proposal operates. The Market Monitor also clarifies the derivation of the definition of a competitive offer in the Capacity Performance construct, and defines a minimum offer price level based on the definition of a competitive offer in the Capacity Performance construct as it is implemented in PJM. The Market Monitor also recommends that the rule be expanded to cover all units receiving out of market subsidies in order to ensure competitive market outcomes in the PJM wholesale power markets.

The Market Monitor proposes a two step solution that would require two Commission orders.

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<sup>3</sup> See OATT Attachment DD § 5.14(h).

In the first step, the proposed first order would require that the capacity market sellers of the units that are the subject of this complaint submit their intended offer to the Market Monitor for review immediately, and make a good faith attempt to develop an agreed upon competitive offer with the Market Monitor consistent with the definition of a competitive offer in the Capacity Performance design and as defined in Appendix C to these Comments. If no agreement can be reached and the capacity offer would have an impact on the capacity market clearing price, the proposed order would require that the issue be submitted to the Commission for review. This approach may require an order delaying the calculation and release of 2019/2020 BRA results for whatever time the Commission would need to conduct its own review and determine competitive offer floors.

In the second step, the proposed second order would require that the Minimum Offer Price Rule (MOPR) be extended to cover existing units in addition to new units (“MOPR-Ex”).

The Market Monitor provides redlined and clean copy versions of such a rule as Attachments A-1 and A-2. The MOPR-Ex is presented here as a standalone rule for clarity, but the Market Monitor expects that, if approved, PJM would incorporate the MOPR-Ex into a single revised MOPR in Section 5.14(h) of Attachment DD to the OATT that would apply to all Generation Capacity Resources.

## **I. COMMENTS**

### **A. Background**

The two recent Ohio state proceedings identified by Complainants have shown that the enactment of non-market subsidies for existing units pose the same threat to the competitive PJM market design as is posed by non-market subsidies for new entrant units. The Market Monitor filed testimony in these proceedings before the Ohio Public Utility Commission (“OPUC”) which explains the issue and the need for a response at the federal level to protect competitive wholesale markets when subsidies for existing units are approved at the state level. This testimony is included as Attachment B-1 (OPUC Case No.

16-1693) and Attachment B-2 (OPUC Case No. 12-1297). A third proceeding has been initiated before the OPUC in which the Market Monitor plans to submit similar testimony (OPUC Case No. 16-0395).

The OPUC decision assigned both Capacity Performance bonus payments and nonperformance penalties to the utility owners of the units. While this appears to be an even handed approach it creates incentive issues with unintended consequences, especially when combined with other incentives created by the decision. For example, the utility owners will have no incentive to limit spending on the units because customers will pay for the spending and because such spending will reduce the likelihood of nonperformance penalties and increase the likelihood of increased bonus payments. The higher spending on the units will increase net ACR. The utility owners have no incentive to reduce ACR because the owners will be better off if the units do not clear in the capacity market auction. In that case, the utility owners keep the bonus payments and have zero risk of nonperformance penalties while customers continue to be responsible to pay for full costs of the units.

PJM and the Commission addressed the threat to the market design posed by subsidized new entry by modifying the Minimum Offer Price Rule (MOPR).<sup>4</sup> The MOPR requires that participants offer new capacity at a defined competitive price or obtain an exception that separately alleviates competition related concerns.

Because the subsidies in this case have been approved just before the 2019/2020 BRA, the Market Monitor does not believe adequate time exists for the Commission to fully consider and approve a MOPR-Ex. As a result, the Market Monitor proposes an interim competitiveness review to ensure a competitive outcome and protect the 2019/2020 BRA from the potential for the exercise of market power, manipulation and inefficient, unjust and unreasonable clearing prices.

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<sup>4</sup> See OATT Attachment DD § 5.14(h).

## **B. Competitiveness Review for the 2019/2020 BRA**

In order to ensure competitive outcomes and to prevent the exercise of market power or manipulation in RPM Auctions for the 2019/2020 Delivery Year, the Market Monitor urges that FirstEnergy and AEP be directed to immediately provide offers for the units receiving subsidies (such units are identified in Attachments B-1 and B-2) (“Subsidized Units”) so that the Market Monitor can review the offers for competitiveness. FirstEnergy and AEP should be directed to participate in a special review process in good faith and to provide information that enables the calculation of a competitive offer price. If FirstEnergy and AEP cannot come to agreement on a competitive offer price with the Market Monitor before the auction commences and the offers submitted for the Subsidized Unit impacts the market clearing price, the matter should be immediately submitted to the Commission and the final clearing of the auction and the posting of the auction results should be postponed until the Commission decides the issue within a Commission defined time period in order to provide competitive outcomes and certainty to the market.

A special rule applicable to the Subsidized Units is appropriate and necessary in this matter. The Subsidized Units are located in Ohio, which is a retail restructured state. Unlike some other market participants, the Subsidized Units are not part of a fleet of units included in rate base from their initial construction to enable FirstEnergy or AEP to satisfy long term service obligations to franchise customers under cost of service regulation in a vertically integrated company. FirstEnergy’s and AEP’s circumstances can be distinguished from vertically integrated utilities and public power entities operating under the traditional cost of service approach. FirstEnergy and AEP have created this problem by obtaining subsidies for the continued operation of units that have been previously offered into PJM capacity markets, without regard to the harmful impacts on PJM’s competitive wholesale market design and market outcomes. It is reasonable to impose a requirement that offers consistent with competitive behavior are submitted for the Subsidized Units.

Use of such competitive offers for the Subsidized Units should be required for all RPM Auctions for the 2019/2020 Delivery Year, starting with the 2019/2020 BRA and including all related Incremental Auctions.

The Market Monitor proposes to calculate Capacity Performance competitive offers for the Subsidized Units based on the definition of a competitive offer in the Capacity Performance capacity market design, as set forth in Attachment C.<sup>5</sup> The Market Monitor proposes that this be the definition of a competitive offer.

For example, the Market Monitor has calculated the competitive offer for a sample resource in the 2019/2020 BRA in the relevant zones in Ohio using a hypothetical value for a resource's Net ACR of \$50,000 per MW installed capacity per year, expected availability during performance assessment hours (A) of 78 percent, and using an estimate for the value of capacity performance bonus rate (CPBR) of 80 percent of the capacity non-performance charge rate (PPR), an estimate for the expected number of performance assessment hours (H), and the average balancing ratio (B) during PAH in the historical three calendar years of 81 percent.<sup>6</sup> As described in detail in Attachment C, the equation for a competitive offer of an underperforming resource whose expected availability is lower than the average balancing ratio, and whose Net ACR is less than expected bonuses as an energy only resource ( $ACR \leq CPBR \times H \times \bar{A}$ ) is:<sup>7</sup>

$$p = CPBR \times H \times \bar{A} + PPR \times H \times (\bar{B} - \bar{A})$$

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<sup>5</sup> See Attachment C: Competitive offer for a Capacity Performance resource in PJM.

<sup>6</sup> For the purposes of this discussion, Net ACR is defined as the net going forward costs of a resource including ACR, APIR, PJM market net revenues but not a risk premium. Capacity Performance resources can include a risk premium in their offers that reflects the risk associated with the uncertainty in the variables used in the competitive offer equations. The assumptions for risk must be uniform throughout a market seller's portfolio.

<sup>7</sup> *Id.* Equation (3).

Table 1 shows the competitive offer for hypothetical Low ACR resources in the AEP, ATSI, Dayton and DEOK zones of PJM, where the Subsidized Units are located, using the competitive offer equation and expected 30 performance assessment hours.

**Table 1 Competitive offer for a hypothetical resource in Ohio assuming H = 30**

Zone	Net Cone (\$/MW-Day) (ICAP Terms)	Balancing Ratio, B (%)	Expected number of Performance Assessment Hours, H (hours/year)	Unit specific Availability A (%) (hypothetical resource)	Non-Performance Charge Rate (PPR) in \$/MWh (Net CONE *(365/30))	Capacity Performance Bonus Rate (CPBR) assumed to be 80% of PPR	Expected Bonus Revenues as an Energy Only Resource (\$/MW-year)	Net ACR (\$/MW-year) (hypothetical resource)	Competitive Offer of a poor performing Low ACR resource using CPBR = 80% of PPR	Default Offer Cap (Net CONE*B)
AEP	\$265.54	81%	30	78%	\$3,230.7	\$2,584.6	\$60,479.4	\$50,000.0	\$173.2	\$215.1
ATSI	\$246.63	81%	30	78%	\$3,000.7	\$2,400.5	\$56,172.4	\$50,000.0	\$160.9	\$199.8
DAY	\$259.04	81%	30	78%	\$3,151.7	\$2,521.3	\$58,999.0	\$50,000.0	\$168.9	\$209.8
DEOK	\$268.46	81%	30	78%	\$3,266.3	\$2,613.0	\$61,144.4	\$50,000.0	\$175.1	\$217.5

If the values for CPBR, H and A are reduced to the point that a resource’s expected bonus revenues as an energy only resource are lower than its Net ACR ( $ACR > CPBR \times H \times \bar{A}$ ), then the competitive offer equation for the resource is:<sup>8</sup>

$$p = ACR + PPR \times H \times (\bar{B} - \bar{A})$$

For example, if the expected number of performance assessment hours (H) is 10, the value for A is 78 percent and the value for CPBR is 80 percent of PPR, the expected bonuses as an energy only resource are lower than the Net ACR for the resource, meaning that the unit is defined to be a High ACR unit. The competitive offer for High ACR resources is a unit specific value equal to the resource’s Net ACR plus its expected non-performance charges. The definition of net ACR includes APIR. Table 2 shows the competitive offer for the hypothetical High ACR resources in the AEP, ATSI, Dayton and DEOK zones of PJM, where the Subsidized Units are located, using a value of 10 expected performance assessment hours.

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<sup>8</sup> *Id.* Equation (6).

**Table 2 Competitive offer for a hypothetical resource in Ohio LDAs assuming H = 10**

Zone	Net Cone (\$/MW-Day) (ICAP Terms)	Balancing Ratio, B (%)	Expected number of Performance Assessment Hours, H (hours/year)	Unit specific Availability A (%) (hypothetical resource)	Non-Performance Charge Rate (PPR) in \$/MWh (Net CONE *(365/30))	Capacity Performance Bonus Rate (CPBR) assumed to be 80% of PPR	Expected Bonus Revenues as an Energy Only Resource (\$ per MW-year)	Net ACR (\$/MW-year) (hypothetical resource)	Competitive Offer of a poor performing High ACR resource using CPBR = 80% of PPR	Default Offer Cap (Net CONE*B)
AEP	\$265.54	81%	10	78%	\$3,230.7	\$2,584.6	\$20,159.8	\$50,000.0	\$139.3	\$215.1
ATSI	\$246.63	81%	10	78%	\$3,000.7	\$2,400.5	\$18,724.1	\$50,000.0	\$139.1	\$199.8
DAY	\$259.04	81%	10	78%	\$3,151.7	\$2,521.3	\$19,666.3	\$50,000.0	\$139.2	\$209.8
DEOK	\$268.46	81%	10	78%	\$3,266.3	\$2,613.0	\$20,381.5	\$50,000.0	\$139.3	\$217.5

If any of the Subsidized Units are offered as Base Capacity, the offer price floor should be calculated using net ACR. Base Capacity Resources operate under the prior RPM market design. The approach for a Unit-Specific Exception in the current MOPR cannot be used to define a competitive floor price for Capacity Performance offers because the incentives, payments and penalties and the corresponding definition of competitive behavior are significantly different under Capacity Performance than the preexisting RPM market design.

### C. MOPR for Existing Resources (MOPR-Ex)

Due to the threat that nonmarket subsidies for existing generation pose to the competitiveness of the PJM capacity market outcomes, the Market Monitor proposes an additional MOPR rule that would apply to all existing resources that receive revenue outside of normal Market Revenue. Market Revenue is defined as (i) revenue that is received under a tariff administered by PJM or other Regional Transmission System or Independent System Operator and regulated by the Commission; or (ii) revenue from the sale of a Renewable Energy Certificate (“REC”) or a Solar Renewable Energy Certificate (“SREC”).

#### 1. MOPR-Ex Screen

Existing generation resources that have only Market Revenue would be able to confirm their compliance with MOPR-Ex via their submittals to the Market Monitor’s electronic MIRA RPM/ACR system. Existing generation resources that have additional sources of funding beyond Market Revenues and that wish to submit a Sell Offer below the



default MOPR-Ex Floor Offer Price, must request either a Competitive Entry Exemption, Self-Supply Exemption, or a Unit-Specific Exception. Competitive Entry, Self-Supply Exemptions, Unit-Specific Exceptions, and the Exemption/Exception Process, will be conducted in a manner consistent with the current MOPR. Any existing generation resource that receives revenue other than Market Revenue, and does not obtain or is not eligible for an exemption, shall be subject to the default MOPR-Ex Floor Offer Price or a Unit-Specific exception as described in section C.2.

## **2. MOPR-Ex Level**

The resources that are subject to MOPR-Ex would have a default MOPR-Ex Floor Offer Price of net Cost of New Entry (“CONE”) (stated in dollars per MW ICAP terms) times the average balancing ratio (Net CONE \* B). This is equal to the competitive offer of a ‘Low ACR’ Capacity Performance resource using PJM’s definition of capacity non-performance charge rate and assuming that the expected number of performance assessment hours is equal to 30.<sup>9</sup> The proposed default MOPR-Ex Floor Offer Price is also identical to the default Market Seller Offer Cap (MSOC) for a Capacity Performance resource as defined in the PJM tariff.<sup>10</sup> The Market Monitor proposes that a MOPR-Ex Floor Offer Price for Base Capacity Resources equal the resource’s net going forward costs (ACR net any PJM market revenues).

The default MOPR-Ex Floor Offer Price level is based on PJM’s definition of capacity non-performance charge rate as net CONE (stated in terms of dollars per MW-day of installed capacity) for the LDA and Delivery Year for which such calculation is performed \* (365 / 30) and the assumption that the expected capacity bonus performance rate is equal to

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<sup>9</sup> A resource is classified as a Low ACR resource if it can recover all of its net going forward costs (Net ACR) from Capacity Performance bonus payments without a Capacity Performance obligation.

<sup>10</sup> OATT Attachment DD § 6.4(a) (Market Seller Offer Caps).

the non-performance charge rate.<sup>11</sup> If PJM were to revise the capacity non-performance charge rate in the future, the default MOPR-Ex Floor Offer Price would change to the corresponding competitive offer level calculated using the revised capacity non-performance charge rate. If the capacity bonus performance rate were to be reduced as a result of, for example, accepting excuses for nonperformance by any resources, the default MOPR-Ex Floor Offer Price would change to the corresponding competitive offer level calculated using a revised expected value for capacity bonus performance rate. The Market Monitor has provided the mathematics of competitive offer calculations for capacity performance resources in PJM in Attachment C to this submission.<sup>12</sup>

A Capacity Market Seller can make a request to the Market Monitor for a Unit-Specific Exception to the default MOPR-Ex Floor Offer Price if the capacity market seller submits a request based on unit specific assumptions that are different from those used in the default MOPR-Ex Floor Offer Price calculation. The capacity market seller will be required to justify the difference in assumptions based on supporting data and analysis. For example, if a capacity market seller assumes a value of 15 for the expected number of performance assessment hours (H) in a delivery year, and can justify the assumption based on historical or forward looking analysis, the resource can submit a lower competitive offer equal to  $[0.5 * (\text{Net CONE} * B)]$ .<sup>13</sup> Or, as another example, if a capacity market seller can support a capacity bonus performance rate that is eighty percent of the capacity non-performance charge rate, the resource can submit a competitive offer of  $[0.8 * (\text{Net CONE} * B)]$ .

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<sup>11</sup> OATT Attachment DD § 10A(e) (Charges For Non-Performance And Credits For Performance).

<sup>12</sup> See Attachment C (Competitive offer for a Capacity Performance resource in PJM).

<sup>13</sup> This maintains the assumptions that the capacity bonus performance rate equals the capacity non-performance charge rate and that the expected average balancing ratio is equal to the three year historical average. This also assumes that the resource is a Low ACR resource rather than a High ACR resource.

B)].<sup>14</sup> A capacity market seller can request a unit specific MOPR-Ex Floor Offer Price lower than the default MOPR-Ex Floor Offer Price using the mathematics of the competitive offer as detailed by the Market Monitor, using justified input assumptions in the Capacity Performance competitive offer equations.<sup>15</sup> Lower offers may be justified based on the definition of a competitive offer under Capacity Performance but cannot be less than net ACR based on the definition of High ACR units.

**D. The Market Rules Should Require Consistent Assumptions Across a Market Seller's Portfolio to Ensure Competitive Results and to Prevent Potential Manipulation.**

The Market Seller Offer Cap ("MSOC") in the capacity market is defined to be the default competitive offer of a Generation Capacity Resource. Any changes to the assumptions used in the calculation of a competitive offer by a capacity market seller to justify a lower MOPR-Ex Floor Offer Price will also affect the competitive offers of other resources offered by the same capacity market seller. It is important to address the potential manipulation of the capacity market by a market seller with a portfolio of resources, some of which have out of market revenues, and the balance with only Market Revenues, by using different assumptions for inputs in the competitive offers of its resources. For example, a market seller may assume a lower capacity performance bonus rate for resources with out of market revenues to justify a lower MOPR-Ex Floor Offer Price and at the same time, use a higher capacity performance bonus rate for other resources with only Market Revenues to justify a higher unit specific offer cap. To the extent that the input assumptions are based on unit specific performance and location, it is reasonable to use different assumptions within a market seller's portfolio. However, there is no valid reason

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<sup>14</sup> This maintains the assumptions that the expected number of PAH equals 30 and that the expected average balancing ratio is equal to the three year historical average. This also assumes that the resource is a Low ACR resource rather than a High ACR resource.

<sup>15</sup> See Attachment C at 5-8.

to use different assumptions for the same system variables for the same defined location. For example, the expected number of performance assessment hours (H) or the expected average balancing ratio (B) or the expected level of capacity bonus performance payments in an LDA must be consistent within a portfolio. A market seller's view of risk, used to calculate the capacity performance risk premium (CPQR), should also be consistent within a portfolio. A market seller's position on risk that is a result of uncertainty in system variables must be consistent within a portfolio. The Market Monitor recommends that failure to use common assumptions for the same system variables in the same location by the same market seller be explicitly identified as manipulative behavior and therefore not an acceptable basis for offers in the capacity market.

## II. CONCLUSION

The Market Monitor respectfully requests that the Commission afford due consideration to this pleading as the Commission resolves the issues raised in this proceeding.

Respectfully submitted,



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Dated: April 11, 2016

**CERTIFICATE OF SERVICE**

I hereby certify that I have this day served the foregoing document upon each person designated on the official service list compiled by the Secretary in this proceeding.

Dated at Eagleville, Pennsylvania,  
this 11<sup>th</sup> day of April, 2016.



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# **Attachment A-1**

## ATTACHMENT DD

### 5.14 Clearing Prices and Charges

#### h(i) Minimum Offer Price Rule for Certain existing Generation Capacity Resources (MOPR-Ex)

(1) General Rule. Any Sell Offer submitted in any RPM Auction for any Delivery Year based on a MOPR-Ex Screened Generation Resource shall have an offer price no lower than the MOPR-Ex Floor Offer Price for the period specified in this subsection (h(i)), unless the Capacity Market Seller has obtained a Self-Supply Exemption, a Competitive Entry Exemption, or a Unit-Specific Exception with respect to such MOPR-Ex Screened Generation Resource in such auction prior to the submission of such offer, in accordance with the provisions of this subsection. Nothing in subsection (c) of this section 5.14 shall be read to excuse compliance of any Sell Offer with the requirements of this subsection (h(i)).

(2) Applicability. A MOPR-Ex Screened Generation Resource shall be any existing Generation Capacity Resource with an installed capacity rating, combined for all units comprising such resource at a single point of interconnection to the Transmission System, of no less than 20 MW, that receives any revenue other than "Market Revenue." Market Revenue shall mean revenue that is received (i) under a tariff administered by PJM or other Regional Transmission System or Independent System Operator and regulated by the Commission or (ii) from the sale of a Renewable Energy Certificate ("REC") or a Solar Renewable Energy Certificate ("SREC"). A MOPR-Ex Screened Generation Resource shall include all existing Generation Capacity Resources located inside and outside the PJM Region that do not meet the foregoing criteria.~~A MOPR Screened Generation Resource shall be any Generation Capacity Resource, and any uprate to a Generation Capacity Resource that is being, or has been, modified to increase the number of megawatts of available installed capacity thereof by 20 MW or more, based on a combustion turbine, combined cycle, or integrated gasification combined cycle generating plant (including Repowering of an existing plant whenever the repowered plant utilizes combustion turbine, combined cycle, or integrated gasification combined cycle technology) with an installed capacity rating, combined for all units comprising such resource at a single point of interconnection to the Transmission System, of no less than 20 MW; provided, however, that a MOPR Screened Generation Resource shall not include: (i) the Installed Capacity equivalent (measured as of the time of clearing) of any of a resource's Unforced Capacity that has cleared any RPM Auction conducted prior to February 1, 2013 or an uprate of such resource to the extent that the developer or owner of the uprate timely submitted a request for, and PJM issued, an offer floor pursuant to the unit specific exception process of this subsection (h) before the start of the commencement of the Base Residual Auction for the 2016/2017 Delivery Year and the capacity associated with the uprate clears that auction; (ii) any unit primarily fueled with landfill gas; (iii) any cogeneration unit that is certified or self-certified~~

~~as a Qualifying Facility (as defined in Part 292 of FERC's regulations), where the Capacity Market Seller is the owner of the Qualifying Facility or has contracted for the Unforced Capacity of such facility and the Unforced Capacity of the unit is no larger than approximately all of the Unforced Capacity Obligation of the host load, and all Unforced Capacity of the unit is used to meet the Unforced Capacity Obligation of the host load. A MOPR-Screened Generation Resource shall include all Generation Capacity Resources located in the PJM Region that meet the foregoing criteria, and all Generation Capacity Resources located outside the PJM Region (where such Sell Offer is based solely on such resource) that entered commercial service on or after January 1, 2013, that meet the foregoing criteria and that require sufficient transmission investment for delivery to the PJM Region to indicate a long-term commitment to providing capacity to the PJM Region.~~

(3) MOPR-Ex Floor Offer Price. ~~The default MOPR-Ex Floor Offer Price for a Capacity Performance resource shall be the product of the Net Cost of New Entry (applicable for the Delivery Year and Locational Deliverability Area for which such Capacity Performance Resource is offered) times the average of the Balancing Ratios during the Performance Assessment Hours in the three consecutive calendar years that precede the Base Residual Auction for such Delivery Year. A capacity market seller may seek and obtain a unit specific exception to the default MOPR-Ex Floor Offer Price if it supports and obtains approval of an alternative floor offer price pursuant to the following procedures and standards: A capacity market seller must provide data and documentation to the Market Monitoring Unit and the Office of the Interconnection that justifies the proposed unit specific offer floor as a competitive offer of a capacity performance resource in the PJM Reliability Pricing Model Auctions. Such data and documentation must also support the inputs used in the calculation of the competitive offer of a capacity performance resource~~  
~~The MOPR Floor Offer Price shall be 100% of the Net Asset Class Cost of New Entry for the relevant generator type and location, as determined hereunder. The gross Cost of New Entry component of the Net Asset Class Cost of New Entry shall be, for purposes of the 2018/2019 Delivery Year and subsequent Delivery Years, the values indicated in the table below for each CONE Area for a combustion turbine generator ("CT"), a combined cycle generator ("CC"), and an integrated gasification combined cycle generator ("IGCC"), respectively, and shall be adjusted for subsequent Delivery Years in accordance with subsection (h)(3)(i) below. For purposes of Incremental Auctions for the 2015/2016, 2016/2017 and 2017/2018 Delivery Years, the MOPR Floor Offer Price shall be the same as that used in the Base Residual Auction for such Delivery Year. The estimated energy and ancillary service revenues for each type of plant shall be determined as described in subsection (h)(3)(ii) below.~~

	CONE Area 1	CONE Area 2	CONE Area 3	CONE Area 4



CT\$/MW-yr	132,200	130,300	128,900	130,300
CC\$/MW-yr	185,700	176,000	172,600	179,400
IGCC\$/MW-yr	582,042	558,486	547,240	537,306

~~i) Commencing with the Delivery Year that begins on June 1, 2019, the gross Cost of New Entry component of the Net Asset Class Cost of New Entry shall be adjusted to reflect changes in generating plant construction costs in the same manner as set forth for the cost of new entry in section 5.10(a)(iv)(B), provided, however, that the Applicable BLS Composite Index used for CC plants shall be calculated from the three indices referenced in that section but weighted 25% for the wages index, 60% for the construction materials index, and 15% for the turbines index, and provided further that nothing herein shall preclude the Office of the Interconnection from filing to change the Net Asset Class Cost of New Entry for any Delivery Year pursuant to appropriate filings with FERC under the Federal Power Act.~~

~~ii) For purposes of this provision, the net energy and ancillary services revenue estimate for a combustion turbine generator shall be that determined by section 5.10(a)(v)(A) of this Attachment DD, provided that the energy revenue estimate for each CONE Area shall be based on the Zone within such CONE Area that has the highest energy revenue estimate calculated under the methodology in that subsection. The net energy and ancillary services revenue estimate for a combined cycle generator shall be determined in the same manner as that prescribed for a combustion turbine generator in the previous sentence, except that the heat rate assumed for the combined cycle resource shall be 6.722 MMBtu/Mwh, the variable operations and maintenance expenses for such resource shall be \$3.23 per MWh, the Peak Hour Dispatch scenario for both the Day Ahead and Real Time Energy Markets shall be modified to dispatch the resource continuously during the full peak hour period, as described in section 2.46, for each such period that the resource is economic (using the test set forth in such section), rather than only during the four hour blocks within such period that such resource is economic, and the ancillary service revenues shall be \$3198 per MW year. The net energy and ancillary services revenue estimate for an integrated gasification combined cycle generator shall be determined in the same manner as that prescribed for a combustion turbine generator above, except that the heat rate assumed for the combined cycle resource shall be 8.7 MMBtu/Mwh, the variable operations and maintenance expenses for such resource shall be \$7.77 per MWh, the Peak Hour Dispatch scenario for both the Day Ahead and Real Time Energy Markets shall be~~

~~modified to dispatch the resource continuously during the full peak hour period, as described in section 2.46, for each such period that the resource is economic (using the test set forth in such section), rather than only during the four hour blocks within such period that such resource is economic, and the ancillary service revenues shall be \$3,198 per MW-year~~

(4) [Reserved for future use.]

~~Duration. The MOPR Floor Offer Price shall apply to any Sell Offer based on a MOPR Screened Generation Resource (to the extent an exemption has not been obtained for such resource under this subsection) until (and including) the first Delivery Year for which a Sell Offer based on the non-exempt portion of such resource has cleared an RPM Auction.~~

(5) Effect of Exemption or Exception. To the extent a Sell Offer in any RPM Auction for any Delivery Year is based on a MOPR-Ex Screened Generation Resource for which the Capacity Market Seller obtains, prior to the submission of such offer, either a Competitive Entry Exemption or a Self-Supply Exemption, such offer (to the extent of such exemption) may include an offer price below the MOPR-Ex Floor Offer Price (including, without limitation, an offer price of zero or other indication of intent to clear regardless of price). To the extent a Sell Offer in any RPM Auction for any Delivery Year is based on a MOPR-Ex Screened Generation Resource for which the Capacity Market Seller obtains, prior to the submission of such offer, a Unit-Specific Exception, such offer (to the extent of such exception) may include an offer price below the MOPR-Ex Floor Offer Price but no lower than the minimum offer price determined in such exception process. ~~The Installed Capacity equivalent of any MOPR Screened Generation Resource's Unforced Capacity that has both obtained such an exemption or exception and cleared the RPM Auction for which it obtained such exemption or exception shall not be subject to a MOPR Floor Offer Price in any subsequent RPM Auction, except as provided in subsection (h)(10) hereof.~~

(6) Self-Supply Exemption. A Capacity Market Seller that is a Self-Supply LSE may qualify its MOPR-Ex Screened Generation Resource in any RPM Auction for any Delivery Year for a Self-Supply Exemption if the MOPR-Ex Screened Generation Resource satisfies the criteria specified below:

i) Cost and revenue criteria. The costs and revenues associated with a MOPR-Ex Screened Generation Resource for which a Self-Supply LSE seeks a Self-Supply Exemption may permissibly reflect: (A) payments, concessions, rebates, subsidies, or incentives designed to incent or promote, or participation in a program, contract, or other arrangement that utilizes criteria designed to incent or promote, general industry or industrial development in an area; or (B) payments, concessions, rebates, subsidies or incentives from a county or other local government authority designed to incent, or

participation in a program, contract or other arrangement established by a county or other local governmental authority utilizing eligibility or selection criteria designed to incent, siting facilities in that county or locality rather than another county or locality; (C) revenues received by the Self-Supply LSE attributable to the inclusion of costs of the MOPR-~~Ex~~ Screened Generation Resource in such LSE's regulated retail rates where such LSE is a Vertically Integrated Utility and the MOPR-~~Ex~~ Screened Generation Resource is ~~planned~~ consistent with such LSE's most recent integrated resource plan found reasonable by the RERRA to meet the needs of its customers; and (D) payments to the Self-Supply LSE (such as retail rate recovery) traditionally associated with revenues and costs of Public Power Entities (or joint action of multiple Public Power Entities); revenues to a Public Power Entity from its contracts having a term of one year or more with its members or customers (including wholesale power contracts between an electric cooperative and its members); or cost or revenue advantages related to a longstanding business model employed by the Self-Supply LSE, such as its financial condition, tax status, access to capital, or other similar conditions affecting the Self-Supply LSE's costs and revenues. A Self-Supply Exemption shall not be permitted to the extent that the Self-Supply LSE, acting either as the Capacity Market Seller or on behalf of the Capacity Market Seller, has any formal or informal agreements or arrangements to seek, recover, accept or receive: (E) any material payments, concessions, rebates, or subsidies, connected to the construction of an uprate, or clearing in any RPM Auction, of the MOPR-~~Ex~~ Screened Generation Resource, not described by (A) through (D) of this section; or (F) other support through contracts having a term of one year or more obtained in any procurement process sponsored or mandated by any state legislature or agency connected with the construction of an uprate, or clearing in any RPM Auction, of the MOPR-~~Ex~~ Screened Generation Resource. Any cost and revenue advantages described by (A) through (D) of this subsection that are material to the cost of the MOPR-~~Ex~~ Screened Generation Resource and that are irregular or anomalous, that do not reflect arms-length transactions, or that are not in the ordinary course of the Self-Supply LSE's business, shall disqualify application of the Self-Supply Exemption unless the Self-Supply LSE demonstrates in the exemption process provided hereunder that such costs and revenues are consistent with the overall objectives of the Self-Supply Exemption.

ii) Owned and Contracted Capacity. To qualify for the Self-Supply Exemption, the Self-Supply LSE, acting either as the Capacity Market Seller or on behalf of the Capacity Market Seller, must demonstrate that the MOPR-~~Ex~~ Screened Generation Resource is included in such LSE's Owned and Contracted Capacity and that its Owned and Contracted Capacity meets the criteria outlined below ~~after the addition of such MOPR Screened Generation Resource~~.

iii) Maximum Net Short Position. If the excess, if any, of the Self-Supply LSE's Estimated Capacity Obligation above its Owned and Contracted Capacity ("Net Short") is less than the amount of Unforced Capacity specified in or calculated under the table below for all relevant areas based on the specified type of LSE, then this exemption

criterion is satisfied. For this purpose, the Net Short position shall be calculated for any Self-Supply LSE requesting this exemption for the PJM Region and for each LDA specified in the table below in which the MOPR-Ex Screened Generation Resource is located (including through nesting of LDAs) to the extent the Self-Supply LSE has an Estimated Capacity Obligation in such LDA. If the Self-Supply LSE does not have an Estimated Capacity Obligation in an evaluated LDA, then the Self-Supply LSE is deemed to satisfy the test for that LDA.

Type of Self-Supply LSE	Maximum Net Short Position (UCAP MW, measured at RTO, MAAC, SWMAAC and EMAAC unless otherwise specified)
Single Customer Entity	150 MW
Public Power Entity	1,000 MW
Multi-state Public Power Entity	1,000 MW in SWMAAC, EMAAC, or MAAC LDAs and 1800 MW RTO
Vertically Integrated Utility	20% of LSE's Reliability Requirement

iv) Maximum Net Long Position. If the excess, if any, of the Self-Supply LSE's Owned and Contracted Capacity for the PJM Region above its Estimated Capacity Obligation for the PJM Region ("Net Long"), is less than the amount of Unforced Capacity specified in or calculated under the table below, then this exemption criterion is satisfied:

Self-Supply LSE Total Estimated Capacity Obligation in the PJM Region (UCAP MW)	Maximum Net Long Position (UCAP MW)
Less than 500	75 MW
Greater than or equal to 500 and less than 5,000	15% of LSE's Estimated Capacity Obligation
Greater than or equal to 5,000 and less than 15,000	750 MW

Greater than or equal to 15,000 and less than 25,000	1,000 MW
Greater than or equal to 25,000	4% of LSE's Estimated Capacity Obligation capped at 1,300 MW

~~If the MOPR Screened Generation Resource causes the Self Supply LSE's Net Long Position to exceed the applicable threshold stated above, the MOPR Floor Offer Price shall apply, for the Delivery Year in which such threshold is exceeded, only to the quantity of Unforced Capacity of such resource that exceeds such threshold. In such event, such Unforced Capacity of such resource shall be subject to the MOPR Floor Offer Price for the period specified in subsection (h)(4) hereof; provided however, that any such Unforced Capacity that did not qualify for such exemption for such Delivery Year may qualify for such exemption in any RPM Auction for a future Delivery Year to the extent the Self Supply LSE's future load growth accommodates the resource under the Net Long Position criteria.~~

v) Beginning with the Delivery Year that commences June 1, 2020, and continuing no later than for every fourth Delivery Year thereafter, the Office of the Interconnection shall review the Maximum Net Short and Net Long positions, as required by the foregoing subsection. Such review may include, without limitation, analyses under various appropriate scenarios of the minimum net short quantities at which the benefit to an LSE of a clearing price reduction for its capacity purchases from the RPM Auction outweighs the cost to the LSE of ~~a new~~ an existing generating unit that is offered at an uneconomic price, and may, to the extent appropriate, reasonably balance the need to protect the market with the need to accommodate the normal business operations of Self-Supply LSEs. Based on the results of such review, PJM shall propose either to modify or retain the existing Maximum Net Short and Net Long positions. The Office of the Interconnection shall post publicly and solicit stakeholder comment regarding the proposal. If, as a result of this process, changes to the Maximum Net Short and/or Net Long positions are proposed, the Office of the Interconnection shall file such modified Maximum Net Short and/or Net Long positions with the FERC by October 1, prior to the conduct of the Base Residual Auction for the first Delivery Year in which the new values would be applied.

vi) Officer Certification. The Self-Supply LSE, acting either as the Capacity Market Seller or on behalf of the Capacity Market Seller, shall submit a sworn, notarized certification of a duly authorized officer, certifying that the officer has personal knowledge of, or has engaged in a diligent inquiry to determine, the facts and circumstances supporting the Capacity Market Seller's decision to submit a Sell Offer into the RPM Auction for the MOPR-Ex Screened Generation Resource and seek an exemption from the MOPR-Ex Floor Offer Price for such resource, and to the best of his/her knowledge

and belief: (A) the information supplied to the Market Monitoring Unit and the Office of Interconnection in support of its exemption request is true and correct and the MOPR-Ex Screened Generation Resource ~~will be~~ Owned and Contracted Capacity for the purpose of self-supply for the benefit of the Self-Supply LSE; (B) the Self-Supply LSE has disclosed all material facts relevant to the exemption request; and (C) the Capacity Market Seller satisfies the criteria for the exemption.

vii) For purposes of the Self-Supply Exemption:

(A) “Self-Supply LSE” means the following types of Load Serving Entity, which operate under long-standing business models: Municipal/Cooperative Entity, Single Customer Entity, or Vertically Integrated Utility.

(B) “Municipal/Cooperative Entity” means cooperative and municipal utilities, including public power supply entities comprised of either or both of the same, and joint action agencies.

(C) “Vertically Integrated Utility” means a utility that owns generation, includes such generation in its regulated rates, owns generation for the purpose of meeting its a-defined load obligation, has a monopoly franchise to serve load, and earns a regulated return on its investment in such generation.

(D) “Single Customer Entity” means an LSE that serves at retail only customers that are under common control with such LSE, where such control means holding 51% or more of the voting securities or voting interests of the LSE and all its retail customers.

(E) All capacity calculations shall be on an Unforced Capacity basis.

(F) Estimated Capacity Obligations and Owned and Contracted Capacity shall be measured on a three-year average basis for the three years starting with the first day of the Delivery Year associated with the RPM Auction for which the exemption is being sought (“MOPR-Ex Exemption Measurement Period”). Such measurements shall be verified by PJM using the latest available data that PJM uses to determine capacity obligations.

(G) The Self-Supply LSE’s Estimated Capacity Obligation shall be the average, for the three Delivery Years of the MOPR-Ex Exemption Measurement Period, of the Self-Supply LSE’s estimated share of the most recent available Zonal Peak Load Forecast for each such Delivery Year for each Zone in which the Self-Supply LSE will serve load during such Delivery Year, times the Forecast Pool Requirement established for the first such Delivery Year, shall be stated on an

Unforced Capacity basis. The Self-Supply LSE's share of such load shall be determined by the ratio of: (1) the peak load contributions, from the most recent summer peak for which data is available at the time of the exemption request, of the customers or areas within each Zone for which such LSE will have load-serving responsibility during the first Delivery Year of the MOPR-~~Ex~~ Exemption Measurement Period to (2) the weather-normalized summer peak load of such Zone for the same summer peak period addressed in the previous clause. Notwithstanding the foregoing, solely in the case of any Self-Supply LSE that demonstrates to the Office of the Interconnection that its annual peak load occurs in the winter, such LSE's Estimated Capacity Obligation determined solely for the purposes of this subsection 5.14(hi) shall be based on its winter peak. Once submitted, an exemption request shall not be subject to change due to later revisions to the PJM load forecasts for such Delivery Years. The Self-Supply LSE's Estimated Capacity Obligation shall be limited to the LSE's firm obligations to serve specific identifiable customers or groups of customers including native load obligations and specific load obligations in effective contracts for which the term of the contract includes at least a portion of the Delivery Year associated with the RPM Auction for which the exemption is requested (and shall not include load that is speculative or load obligations that are not native load or customer specific); as well as retail loads of entities that directly (as through charges on a retail electric bill) or indirectly, contribute to the cost recovery of the MOPR-~~Ex~~ Screened Generation Resource; provided, however, nothing herein shall require a Self-Supply LSE that is a joint owner of a MOPR-~~Ex~~ Screened Generation Resource to aggregate its expected loads with the loads of any other joint owner for purposes of such Self-Supply LSE's exemption request.

(H) "Owned and Contracted Capacity" includes all of the Self-Supply LSE's qualified Capacity Resources, whether internal or external to PJM. For purposes of the Self-Supply Exemption, Owned and Contracted Capacity includes Generation Capacity Resources without regard to whether such resource has failed or could fail the Competitive and Non-Discriminatory procurement standard of the Competitive Entry Exemption. To qualify for a Self-Supply Entry exemption, the MOPR-~~Ex~~ Screened Generation must be used by the Self-Supply LSE, meaning such Self-Supply LSE is the beneficial off-taker of such generation such that the owned or contracted for MOPR-~~Ex~~ Screened Generation is for the Self-Supply LSE's use to supply its customer(s).

(I) If multiple entities will have an ownership or contractual share in, or are otherwise sponsoring, the MOPR-~~Ex~~ Screened Generation Resource, the positions of each such entity will be measured and considered for a Self-Supply Exemption with respect to the individual Self-Supply LSE's ownership or contractual share of such resource.

(7) Competitive ~~Entry~~ Exemption. A Capacity Market Seller may qualify a MOPR-Ex Screened Generation Resource for a Competitive ~~Entry~~ Exemption in any RPM Auction for any Delivery Year if the Capacity Market Seller demonstrates that the MOPR-Ex Screened Generation Resource satisfies all of the following criteria:

i) No costs of the MOPR-Ex Screened Generation Resource are recovered from customers either directly or indirectly through a non-bypassable charge, except in the event that Sections 5.14(~~hi~~)(7)(ii) and (iii), to the extent either or both are applicable to such resource, are satisfied.

ii)-     No costs of the MOPR-Ex Screened Generation Resource are supported through any contracts having a term of one year or more obtained in any state-sponsored or state-mandated procurement processes that are not Competitive and Non-Discriminatory. The Office of the Interconnection and the Market Monitoring Unit may deem a procurement process to be “Competitive and Non-Discriminatory” only if: (A) both new and existing resources may satisfy the requirements of the procurement; (B) the requirements of the procurement are fully objective and transparent; (C) the procurement terms do not restrict the type of capacity resources that may participate in and satisfy the requirements of the procurement; (D) the procurement terms do not include selection criteria that could give preference to new or existing resources; and (E) the procurement terms do not use indirect means to discriminate against new or existing capacity, such as geographic constraints inconsistent with LDA import capabilities, unit technology or unit fuel requirements or unit heat-rate requirements, identity or nature of seller requirements, or requirements for new construction.

iii)-     The Capacity Market Seller does not have any formal or informal agreements or arrangements to seek, recover, accept or receive any (A) material payments, concessions, rebates, or subsidies directly or indirectly from any governmental entity connected with ~~the~~continued operation or construction of an uprate, or clearing in any RPM Auction, of the MOPR-Ex Screened Generation Resource, or (B) other material support through contracts having a term of one year or more obtained in any state-sponsored or state-mandated procurement processes, connected to the continued operation or construction of an uprate, or clearing in any RPM Auction, of the MOPR-Ex Screened Generation Resource. These restrictions shall not include (C) payments (including payments in lieu of taxes), concessions, rebates, subsidies, or incentives designed to incent, or participation in a program, contract or other arrangement that utilizes criteria designed to incent or promote, general industry or industrial development in an area; (D) payments, concessions, rebates, subsidies or incentives designed to incent, or participation in a program, contract or other arrangements from a county or other local governmental authority using eligibility or selection criteria designed to incent, siting facilities in that county or locality rather than another county or locality; or (E) federal government



production tax credits, investment tax credits, and similar tax advantages or incentives that are available to generators without regard to the geographic location of the generation.

iv) The Capacity Market Seller shall submit a sworn, notarized certification of a duly authorized officer, certifying that the officer has personal knowledge of, or has engaged in a diligent inquiry to determine, the facts and circumstances supporting the Capacity Market Seller's decision to submit a Sell Offer into the RPM Auction for the MOPR-Ex Screened Generation Resource and seek an exemption from the MOPR-Ex Floor Offer Price for such resource, and, to the best of his/her knowledge and belief: (A) the information supplied to the Market Monitoring Unit and the Office of Interconnection to support its exemption is true and correct and the resource is being ~~constructed or contracted for~~ offered into the RPM Auction ~~purposes of~~ on a competitive basis entry by the Capacity Market Seller; (B) the Capacity Market Seller has disclosed all material facts relevant to the request for the exemption; and (C) the exemption request satisfies the criteria for the exemption.

(8) Unit-Specific Exception. A Capacity Market Seller intending to submit a Sell Offer in any RPM Auction below the MOPR-Ex Floor Offer Price for any Delivery Year based on a MOPR-Ex Screened Generation Resource may, at its election, submit a request for a Unit-Specific Exception in addition to, or in lieu of, a request for a Self-Supply Exemption or a Competitive Entry Exemption, for such MOPR-Ex Screened Generation Resource. A Sell Offer meeting the Unit-Specific Exception criteria in this subsection shall be permitted and shall not be re-set to the MOPR-Ex Floor Offer Price if the Capacity Market Seller obtains a determination from the Office of the Interconnection or the Commission, prior to the RPM Auction in which it seeks to submit the Sell Offer, that such Sell Offer is permissible because it is consistent with the competitive, cost-based, fixed, net cost of new entry ~~where~~ the resource to rely solely on revenues from PJM-administered markets. The following requirements shall apply to requests for such determinations:

i) The Capacity Market Seller shall submit a written request with all of the required documentation as described below and in the PJM Manuals. For such purpose, per subsection (h)(9)(i) below, the Office of the Interconnection shall post a preliminary estimate for the relevant Delivery Year of the MOPR-Ex Floor Offer Price expected to be established hereunder. If the MOPR-Ex Floor Offer Price subsequently established for the relevant Delivery Year is less than the Sell Offer, the Sell Offer shall be permitted and no exception shall be required.

ii) As more fully set forth in the PJM Manuals, the Capacity Market Seller must include in its request for an exception under this subsection documentation to support the ~~fixed development, construction, operation, and maintenance~~ costs of the MOPR-Ex Screened Generation Resource, as well as ~~estimates of~~ offsetting net revenues. ~~Estimates of costs~~ Costs or revenues shall be supported at a level of detail

comparable to the cost and revenue ~~estimates~~ used to support the Net Asset Class Cost of New Entry established under ~~this~~ section 5.14(h). As more fully set forth in the PJM Manuals, supporting documentation for ~~project~~the costs may include, as applicable and available, a complete ~~project~~unit description; environmental permits; vendor quotes for ~~plant or~~ equipment; evidence of actual costs ~~of recent comparable projects; bases for;~~ electric and gas interconnection costs and any cost contingencies; ~~bases and~~ support for property taxes, insurance, operations and maintenance (“O&M”) contractor costs, and other fixed O&M and administrative or general costs; ~~financing documents for construction period and permanent financing or evidence of recent debt costs of the seller for comparable investments; and the bases and support for the claimed capitalization ratio, rate of return, cost recovery period, inflation rate, or other parameters used in financial modeling.~~ Such documentation also shall identify and support any sunk costs that the Capacity Market Seller has reflected as a reduction to its Sell Offer. The request shall include a certification, signed by an officer of the Capacity Market Seller, that the claimed costs accurately reflect, in all material respects, the seller’s reasonably expected costs of ~~new entry~~continued operation and that the request satisfies all standards for a Unit-Specific Exception hereunder. The request also shall identify all revenue sources relied upon in the Sell Offer to offset the claimed fixed costs, including, without limitation, long-term power supply contracts, tolling agreements, or tariffs on file with state regulatory agencies, and shall demonstrate that such offsetting revenues are consistent, over a reasonable time period identified by the Capacity Market Seller, with the standard prescribed above. In making such demonstration, the Capacity Market Seller may rely upon forecasts of competitive electricity prices in the PJM Region based on well defined models that include fully documented estimates of future fuel prices, variable operation and maintenance expenses, energy demand, emissions allowance prices, and expected environmental or energy policies that affect the seller’s forecast of electricity prices in such region, employing input data from sources readily available to the public. Documentation for net revenues also may include, as available and applicable, plant performance and capability information, including heat rate, start-up times and costs, forced outage rates, planned outage schedules, maintenance cycle, fuel costs and other variable operations and maintenance expenses, and ancillary service capabilities.

iii) A Sell Offer evaluated under the Unit-Specific Exception shall be permitted if the information provided reasonably demonstrates that the Sell Offer’s competitive, cost-based, fixed, ~~net cost of new entry is~~costs are below the ~~MOPR-Ex~~ Floor Offer Price, based on competitive cost advantages relative to the costs implied by the ~~MOPR-Ex~~ Floor Offer Price, including, without limitation, competitive cost advantages resulting from the Capacity Market Seller’s business model, financial condition, tax status, access to capital or other similar conditions affecting the applicant’s costs, or based on net revenues that are reasonably demonstrated hereunder to be higher than those implied by the ~~MOPR-Ex~~ Floor Offer Price. Capacity Market Sellers shall be asked to demonstrate that

claimed cost advantages or sources of net revenue that are irregular or anomalous, that do not reflect arm's-length transactions, or that are not in the ordinary course of the Capacity Market Seller's business are consistent with the standards of this subsection. Failure to adequately support such costs or revenues so as to enable the Office of the Interconnection to make the determination required in this section will result in denial of a Unit-Specific Exception hereunder by the Office of the Interconnection.

(9) Exemption/Exception Process.

i) The Office of the Interconnection shall post, by no later than one hundred fifty (150) days prior to the commencement of the offer period for an RPM Auction, a preliminary estimate for the relevant Delivery Year of the MOPR-Ex Floor Offer Price.

ii) The Capacity Market Seller must submit its request for a Unit-Specific Exception, Competitive Entry Exemption or a Self-Supply Exemption in writing simultaneously to the Market Monitoring Unit and the Office of Interconnection by no later than one hundred thirty five (135) days prior to the commencement of the offer period for the RPM Auction in which such seller seeks to submit its Sell Offer. The Capacity Market Seller shall include in its request a description of its MOPR-Ex Screened Generation Resource, the exemption or exception that the Capacity Market Seller is requesting, and all documentation necessary to demonstrate that the exemption or exception criteria are satisfied, including without limitation the applicable certification(s) specified in this subsection (h). In addition to the documentation identified herein and in the PJM Manuals, the Capacity Market Seller shall provide any additional supporting information reasonably requested by the Office of the Interconnection or the Market Monitoring Unit to evaluate the Sell Offer. Requests for additional documentation will not extend the deadline by which the Office of the Interconnection or the Market Monitoring Unit must provide their determinations of the exemption request. The Capacity Market Seller shall have an ongoing obligation through the closing of the offer period for the RPM Auction to update the request to reflect any material changes in the request.

iii) As further described in Section II.D. of Attachment M-Appendix to this Tariff, the Market Monitoring Unit shall review the request and supporting documentation and shall provide its determination by no later than forty-five (45) days after receipt of the exemption or exception request. The Office of the Interconnection shall also review all exemption and exception requests to determine whether the request is acceptable in accordance with the standards and criteria under this section 5.14(h) and shall provide its determination in writing to the Capacity Market Seller, with a copy to the Market Monitoring Unit, by no later than sixty-five (65) days after receipt of the exemption or exception request. The Office of the Interconnection shall reject a requested exemption or exception if the Capacity Market Seller's request does not comply

with the PJM Market Rules, as interpreted and applied by the Office of the Interconnection. Such rejection shall specify those points of non-compliance upon which the Office of the Interconnection based its rejection of the exemption or exception request. If the Office of the Interconnection does not provide its determination on an exemption or exception request by no later than sixty-five (65) days after receipt of the exemption or exception request, the request shall be deemed granted. Following the Office of the Interconnection's determination on a Unit-Specific Exception request, the Capacity Market Seller shall notify the Market Monitoring Unit and the Office of the Interconnection, in writing, of the minimum level of Sell Offer, consistent with such determination, to which it agrees to commit by no later than five (5) days after receipt of the Office of the Interconnection's determination of its Unit-Specific Exception request. A Capacity Market Seller that is dissatisfied with any determination hereunder may seek any remedies available to it from FERC; provided, however, that the Office of the Interconnection will proceed with administration of the Tariff and market rules unless and until ordered to do otherwise by FERC.

(10) Procedures and Remedies in Cases of Suspected Fraud or Material Misrepresentation or Omissions in Connection with Exemption Requests.

In the event the Office of the Interconnection reasonably believes that a request for a Competitive Entry Exemption or a Self-Supply Exemption that has been granted contains fraudulent or material misrepresentations or fraudulent or material omissions such that the Capacity Market Seller would not have been eligible for the exemption for that resource had the request not contained such misrepresentations or omissions, then:

i) if the Office of the Interconnection provides written notice of revocation to the Capacity Market Seller no later than thirty (30) days prior to the commencement of the offer period for the RPM Auction for which the seller submitted a fraudulent exemption request, the Office of the Interconnection shall revoke the exemption for that auction. In such event, the Office of the Interconnection shall make any filings with FERC that the Office of the Interconnection deems necessary, and

ii) if the Office of the Interconnection does not provide written notice of revocation no later than 30 days before the start of the relevant RPM Auction, then the Office of the Interconnection may not revoke the exemption absent FERC approval. In any such filing to FERC, the requested remedies shall include (A) in the event that such resource has not cleared in the RPM Auction for which the exemption has been granted and the filing is made no later than 5 days prior to the commencement of the offer period for the RPM Auction, revocation of the exemption or, (B) in the event that the resource has cleared the RPM Auction for which the exemption has been granted and the filing is made no later than two (2) years after the close of the offer period for the relevant RPM Auction, suspension of any payments, during the pendency of the FERC proceeding, to the Capacity

Market Seller for the resource that cleared in any RPM Auction relying on such exemption; and suspension of the Capacity Market Seller's exemption for that resource for future RPM Auctions.

iii) Prior to any automatic revocation or submission to FERC, the Office of the Interconnection and/or the Market Monitoring Unit shall notify the affected Capacity Market Seller and, to the extent practicable, provide the Capacity Market Seller an opportunity to explain the alleged misrepresentation or omission. Any filing to FERC under this provision shall seek fast track treatment and neither the name nor any identifying characteristics of the Capacity Market Seller or the resource shall be publicly revealed, but otherwise the filing shall be public. The Capacity Market Seller may apply for a new exemption for that resource for subsequent auctions, including auctions held during the pendency of the FERC proceeding. In the event that the Capacity Market Seller is cleared by FERC from such allegations of misrepresentations or omissions then the exemption shall be restored to the extent and in the manner permitted by FERC. The remedies required by this subsection (h)(10) to be requested in any filing to FERC shall not be exclusive of any other remedies or penalties that may be pursued against the Capacity Market Seller.

## **AttachmentA-2**

## ATTACHMENT DD

### 5.14 Clearing Prices and Charges

(i) Minimum Offer Price Rule for existing Generation Capacity Resources (MOPR-Ex)

(1) General Rule. Any Sell Offer submitted in any RPM Auction for any Delivery Year based on a MOPR-Ex Screened Generation Resource shall have an offer price no lower than the MOPR-Ex Floor Offer Price for the period specified in this subsection (i), unless the Capacity Market Seller has obtained a Self-Supply Exemption, a Competitive Entry Exemption, or a Unit-Specific Exception with respect to such MOPR-Ex Screened Generation Resource in such auction prior to the submission of such offer, in accordance with the provisions of this subsection. Nothing in subsection (c) of this section 5.14 shall be read to excuse compliance of any Sell Offer with the requirements of this subsection (i).

(2) Applicability. A MOPR-Ex Screened Generation Resource shall be any existing Generation Capacity Resource with an installed capacity rating, combined for all units comprising such resource at a single point of interconnection to the Transmission System, of no less than 20 MW, that receives any revenue other than "Market Revenue." Market Revenue shall mean revenue that is received (i) under a tariff administered by PJM or other Regional Transmission System or Independent System Operator and regulated by the Commission or (ii) from the sale of a Renewable Energy Certificate ("REC") or a Solar Renewable Energy Certificate ("SREC"). A MOPR-Ex Screened Generation Resource shall include all existing Generation Capacity Resources located inside and outside the PJM Region that do not meet the foregoing criteria.

(3) MOPR-Ex Floor Offer Price. The default MOPR-Ex Floor Offer Price for a Capacity Performance resource shall be the product of the Net Cost of New Entry (applicable for the Delivery Year and Locational Deliverability Area for which such Capacity Performance Resource is offered) times the average of the Balancing Ratios during the Performance Assessment Hours in the three consecutive calendar years that precede the Base Residual Auction for such Delivery Year. A capacity market seller may seek and obtain a unit specific exception to the default MOPR-Ex Floor Offer Price if it supports and obtains approval of an alternative floor offer price pursuant to the following procedures and standards: A capacity market seller must provide data and documentation to the Market Monitoring Unit and the Office of the Interconnection that justifies the proposed unit specific offer floor as a competitive offer of a capacity performance resource in the PJM Reliability Pricing Model Auctions. Such data and documentation must also support the inputs used in the calculation of the competitive offer of a capacity performance resource.

(4) [Reserved for future use.]

(5) Effect of Exemption or Exception. To the extent a Sell Offer in any RPM Auction for any Delivery Year is based on a MOPR-Ex Screened Generation Resource for which the Capacity Market Seller obtains, prior to the submission of such offer, either a Competitive Entry Exemption or a Self-Supply Exemption, such offer (to the extent of such exemption) may include an offer price below the MOPR-Ex Floor Offer Price (including, without limitation, an offer price of zero or other indication of intent to clear regardless of price). To the extent a Sell Offer in any RPM Auction for any Delivery Year is based on a MOPR-Ex Screened Generation Resource for which the Capacity Market Seller obtains, prior to the submission of such offer, a Unit-Specific Exception, such offer (to the extent of such exception) may include an offer price below the MOPR-Ex Floor Offer Price but no lower than the minimum offer price determined in such exception process.

(6) Self-Supply Exemption. A Capacity Market Seller that is a Self-Supply LSE may qualify its MOPR-Ex Screened Generation Resource in any RPM Auction for any Delivery Year for a Self-Supply Exemption if the MOPR-Ex Screened Generation Resource satisfies the criteria specified below:

i) Cost and revenue criteria. The costs and revenues associated with a MOPR-Ex Screened Generation Resource for which a Self-Supply LSE seeks a Self-Supply Exemption may permissibly reflect: (A) payments, concessions, rebates, subsidies, or incentives designed to incent or promote, or participation in a program, contract, or other arrangement that utilizes criteria designed to incent or promote, general industry or industrial development in an area; or (B) payments, concessions, rebates, subsidies or incentives from a county or other local government authority designed to incent, or participation in a program, contract or other arrangement established by a county or other local governmental authority utilizing eligibility or selection criteria designed to incent, siting facilities in that county or locality rather than another county or locality; (C) revenues received by the Self-Supply LSE attributable to the inclusion of costs of the MOPR-Ex Screened Generation Resource in such LSE's regulated retail rates where such LSE is a Vertically Integrated Utility and the MOPR-Ex Screened Generation Resource is consistent with such LSE's most recent integrated resource plan found reasonable by the RERRA to meet the needs of its customers; and (D) payments to the Self-Supply LSE (such as retail rate recovery) traditionally associated with revenues and costs of Public Power Entities (or joint action of multiple Public Power Entities); revenues to a Public Power Entity from its contracts having a term of one year or more with its members or customers (including wholesale power contracts between an electric cooperative and its members); or cost or revenue advantages related to a longstanding business model employed by the Self-Supply LSE, such as its financial condition, tax status, access to capital, or other similar conditions affecting the Self-Supply LSE's costs and revenues. A Self-Supply Exemption shall not be permitted to the extent that the Self-Supply LSE, acting either as the Capacity Market Seller or on behalf of the Capacity Market Seller, has any formal or informal agreements or arrangements to seek, recover, accept or receive: (E) any material payments, concessions,



rebates, or subsidies, connected to the construction of an uprate, or clearing in any RPM Auction, of the MOPR-Ex Screened Generation Resource, not described by (A) through (D) of this section; or (F) other support through contracts having a term of one year or more obtained in any procurement process sponsored or mandated by any state legislature or agency connected with the construction of an uprate, or clearing in any RPM Auction, of the MOPR-Ex Screened Generation Resource. Any cost and revenue advantages described by (A) through (D) of this subsection that are material to the cost of the MOPR-Ex Screened Generation Resource and that are irregular or anomalous, that do not reflect arms-length transactions, or that are not in the ordinary course of the Self-Supply LSE's business, shall disqualify application of the Self-Supply Exemption unless the Self-Supply LSE demonstrates in the exemption process provided hereunder that such costs and revenues are consistent with the overall objectives of the Self-Supply Exemption.

ii) **Owned and Contracted Capacity.** To qualify for the Self-Supply Exemption, the Self-Supply LSE, acting either as the Capacity Market Seller or on behalf of the Capacity Market Seller, must demonstrate that the MOPR-Ex Screened Generation Resource is included in such LSE's Owned and Contracted Capacity and that its Owned and Contracted Capacity meets the criteria outlined below.

iii) **Maximum Net Short Position.** If the excess, if any, of the Self-Supply LSE's Estimated Capacity Obligation above its Owned and Contracted Capacity ("Net Short") is less than the amount of Unforced Capacity specified in or calculated under the table below for all relevant areas based on the specified type of LSE, then this exemption criterion is satisfied. For this purpose, the Net Short position shall be calculated for any Self-Supply LSE requesting this exemption for the PJM Region and for each LDA specified in the table below in which the MOPR-Ex Screened Generation Resource is located (including through nesting of LDAs) to the extent the Self-Supply LSE has an Estimated Capacity Obligation in such LDA. If the Self-Supply LSE does not have an Estimated Capacity Obligation in an evaluated LDA, then the Self-Supply LSE is deemed to satisfy the test for that LDA.

Type of Self-Supply LSE	Maximum Net Short Position (UCAP MW, measured at RTO, MAAC, SWMAAC and EMAAC unless otherwise specified)
Single Customer Entity	150 MW
Public Power Entity	1,000 MW
Multi-state Public Power Entity	1,000 MW in SWMAAC, EMAAC, or MAAC LDAs and 1800 MW RTO

Vertically Integrated Utility	20% of LSE's Reliability Requirement
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iv) Maximum Net Long Position. If the excess, if any, of the Self-Supply LSE's Owned and Contracted Capacity for the PJM Region above its Estimated Capacity Obligation for the PJM Region ("Net Long"), is less than the amount of Unforced Capacity specified in or calculated under the table below, then this exemption criterion is satisfied:

Self-Supply LSE Total Estimated Capacity Obligation in the PJM Region (UCAP MW)	Maximum Net Long Position (UCAP MW)
Less than 500	75 MW
Greater than or equal to 500 and less than 5,000	15% of LSE's Estimated Capacity Obligation
Greater than or equal to 5,000 and less than 15,000	750 MW
Greater than or equal to 15,000 and less than 25,000	1,000 MW
Greater than or equal to 25,000	4% of LSE's Estimated Capacity Obligation capped at 1,300 MW

v) Beginning with the Delivery Year that commences June 1, 2020, and continuing no later than for every fourth Delivery Year thereafter, the Office of the Interconnection shall review the Maximum Net Short and Net Long positions, as required by the foregoing subsection. Such review may include, without limitation, analyses under various appropriate scenarios of the minimum net short quantities at which the benefit to an LSE of a clearing price reduction for its capacity purchases from the RPM Auction outweighs the cost to the LSE of an existing generating unit that is offered at an uneconomic price, and may, to the extent appropriate, reasonably balance the need to protect the market with the need to accommodate the normal business operations of Self-Supply LSEs. Based on the results of such review, PJM shall propose either to modify or retain the existing Maximum Net Short and Net Long positions. The Office of the Interconnection shall post publicly and solicit stakeholder comment regarding the proposal. If, as a result of this

process, changes to the Maximum Net Short and/or Net Long positions are proposed, the Office of the Interconnection shall file such modified Maximum Net Short and/or Net Long positions with the FERC by October 1, prior to the conduct of the Base Residual Auction for the first Delivery Year in which the new values would be applied.

vi) Officer Certification. The Self-Supply LSE, acting either as the Capacity Market Seller or on behalf of the Capacity Market Seller, shall submit a sworn, notarized certification of a duly authorized officer, certifying that the officer has personal knowledge of, or has engaged in a diligent inquiry to determine, the facts and circumstances supporting the Capacity Market Seller's decision to submit a Sell Offer into the RPM Auction for the MOPR-Ex Screened Generation Resource and seek an exemption from the MOPR-Ex Floor Offer Price for such resource, and to the best of his/her knowledge and belief: (A) the information supplied to the Market Monitoring Unit and the Office of Interconnection in support of its exemption request is true and correct and the MOPR-Ex Screened Generation Resource is Owned and Contracted Capacity for the purpose of self-supply for the benefit of the Self-Supply LSE; (B) the Self-Supply LSE has disclosed all material facts relevant to the exemption request; and (C) the Capacity Market Seller satisfies the criteria for the exemption.

vii) For purposes of the Self-Supply Exemption:

(A) "Self-Supply LSE" means the following types of Load Serving Entity, which operate under long-standing business models: Municipal/Cooperative Entity, Single Customer Entity, or Vertically Integrated Utility.

(B) "Municipal/Cooperative Entity" means cooperative and municipal utilities, including public power supply entities comprised of either or both of the same, and joint action agencies.

(C) "Vertically Integrated Utility" means a utility that owns generation, includes such generation in its regulated rates, owns generation for the purpose of meeting its defined load obligation, has a monopoly franchise to serve load, and earns a regulated return on its investment in such generation.

(D) "Single Customer Entity" means an LSE that serves at retail only customers that are under common control with such LSE, where such control means holding 51% or more of the voting securities or voting interests of the LSE and all its retail customers.

(E) All capacity calculations shall be on an Unforced Capacity basis.

(F) Estimated Capacity Obligations and Owned and Contracted Capacity shall be measured on a three-year average basis for the three years starting with the first day of the Delivery Year associated with the RPM Auction for which the exemption is being sought (“MOPR-Ex Exemption Measurement Period”). Such measurements shall be verified by PJM using the latest available data that PJM uses to determine capacity obligations.

(G) The Self-Supply LSE’s Estimated Capacity Obligation shall be the average, for the three Delivery Years of the MOPR-Ex Exemption Measurement Period, of the Self-Supply LSE’s estimated share of the most recent available Zonal Peak Load Forecast for each such Delivery Year for each Zone in which the Self-Supply LSE will serve load during such Delivery Year, times the Forecast Pool Requirement established for the first such Delivery Year, shall be stated on an Unforced Capacity basis. The Self-Supply LSE’s share of such load shall be determined by the ratio of: (1) the peak load contributions, from the most recent summer peak for which data is available at the time of the exemption request, of the customers or areas within each Zone for which such LSE will have load-serving responsibility during the first Delivery Year of the MOPR-Ex Exemption Measurement Period to (2) the weather-normalized summer peak load of such Zone for the same summer peak period addressed in the previous clause. Notwithstanding the foregoing, solely in the case of any Self-Supply LSE that demonstrates to the Office of the Interconnection that its annual peak load occurs in the winter, such LSE’s Estimated Capacity Obligation determined solely for the purposes of this subsection 5.14(i) shall be based on its winter peak. Once submitted, an exemption request shall not be subject to change due to later revisions to the PJM load forecasts for such Delivery Years. The Self-Supply LSE’s Estimated Capacity Obligation shall be limited to the LSE’s firm obligations to serve specific identifiable customers or groups of customers including native load obligations and specific load obligations in effective contracts for which the term of the contract includes at least a portion of the Delivery Year associated with the RPM Auction for which the exemption is requested (and shall not include load that is speculative or load obligations that are not native load or customer specific); as well as retail loads of entities that directly (as through charges on a retail electric bill) or indirectly, contribute to the cost recovery of the MOPR-Ex Screened Generation Resource; provided, however, nothing herein shall require a Self-Supply LSE that is a joint owner of a MOPR-Ex Screened Generation Resource to aggregate its expected loads with the loads of any other joint owner for purposes of such Self-Supply LSE’s exemption request.

(H) “Owned and Contracted Capacity” includes all of the Self-Supply LSE’s qualified Capacity Resources, whether internal or external to PJM. For purposes of the Self-Supply Exemption, Owned and Contracted Capacity includes

Generation Capacity Resources without regard to whether such resource has failed or could fail the Competitive and Non-Discriminatory procurement standard of the Competitive Entry Exemption. To qualify for a Self-Supply Entry exemption, the MOPR-Ex Screened Generation must be used by the Self-Supply LSE, meaning such Self-Supply LSE is the beneficial off-taker of such generation such that the owned or contracted for MOPR-Ex Screened Generation is for the Self-Supply LSE's use to supply its customer(s).

(I) If multiple entities will have an ownership or contractual share in, or are otherwise sponsoring, the MOPR-Ex Screened Generation Resource, the positions of each such entity will be measured and considered for a Self-Supply Exemption with respect to the individual Self-Supply LSE's ownership or contractual share of such resource.

(7) Competitive Exemption. A Capacity Market Seller may qualify a MOPR-Ex Screened Generation Resource for a Competitive Exemption in any RPM Auction for any Delivery Year if the Capacity Market Seller demonstrates that the MOPR-Ex Screened Generation Resource satisfies all of the following criteria:

i) No costs of the MOPR-Ex Screened Generation Resource are recovered from customers either directly or indirectly through a non-bypassable charge, except in the event that Sections 5.14(i)(7)(ii) and (iii), to the extent either or both are applicable to such resource, are satisfied.

ii) No costs of the MOPR-Ex Screened Generation Resource are supported through any contracts having a term of one year or more obtained in any state-sponsored or state-mandated procurement processes that are not Competitive and Non-Discriminatory. The Office of the Interconnection and the Market Monitoring Unit may deem a procurement process to be "Competitive and Non-Discriminatory" only if: (A) both new and existing resources may satisfy the requirements of the procurement; (B) the requirements of the procurement are fully objective and transparent; (C) the procurement terms do not restrict the type of capacity resources that may participate in and satisfy the requirements of the procurement; (D) the procurement terms do not include selection criteria that could give preference to new or existing resources; and (E) the procurement terms do not use indirect means to discriminate against new or existing capacity, such as geographic constraints inconsistent with LDA import capabilities, unit technology or unit fuel requirements or unit heat-rate requirements, identity or nature of seller requirements, or requirements for new construction.

iii) The Capacity Market Seller does not have any formal or informal agreements or arrangements to seek, recover, accept or receive any (A) material payments, concessions, rebates, or subsidies directly or indirectly from any governmental

entity connected with continued operation or construction of an uprate, or clearing in any RPM Auction, of the MOPR-Ex Screened Generation Resource, or (B) other material support through contracts having a term of one year or more obtained in any state-sponsored or state-mandated procurement processes, connected to the continued operation or construction of an uprate, or clearing in any RPM Auction, of the MOPR-Ex Screened Generation Resource. These restrictions shall not include (C) payments (including payments in lieu of taxes), concessions, rebates, subsidies, or incentives designed to incent, or participation in a program, contract or other arrangement that utilizes criteria designed to incent or promote, general industry or industrial development in an area; (D) payments, concessions, rebates, subsidies or incentives designed to incent, or participation in a program, contract or other arrangements from a county or other local governmental authority using eligibility or selection criteria designed to incent, siting facilities in that county or locality rather than another county or locality; or (E) federal government production tax credits, investment tax credits, and similar tax advantages or incentives that are available to generators without regard to the geographic location of the generation.

iv) The Capacity Market Seller shall submit a sworn, notarized certification of a duly authorized officer, certifying that the officer has personal knowledge of, or has engaged in a diligent inquiry to determine, the facts and circumstances supporting the Capacity Market Seller's decision to submit a Sell Offer into the RPM Auction for the MOPR-Ex Screened Generation Resource and seek an exemption from the MOPR-Ex Floor Offer Price for such resource, and, to the best of his/her knowledge and belief: (A) the information supplied to the Market Monitoring Unit and the Office of Interconnection to support its exemption is true and correct and the resource is being offered into the RPM Auction on a competitive basis by the Capacity Market Seller; (B) the Capacity Market Seller has disclosed all material facts relevant to the request for the exemption; and (C) the exemption request satisfies the criteria for the exemption.

(8) Unit-Specific Exception. A Capacity Market Seller intending to submit a Sell Offer in any RPM Auction below the MOPR-Ex Floor Offer Price for any Delivery Year based on a MOPR-Ex Screened Generation Resource may, at its election, submit a request for a Unit-Specific Exception in addition to, or in lieu of, a request for a Self-Supply Exemption or a Competitive Entry Exemption, for such MOPR-Ex Screened Generation Resource. A Sell Offer meeting the Unit-Specific Exception criteria in this subsection shall be permitted and shall not be re-set to the MOPR-Ex Floor Offer Price if the Capacity Market Seller obtains a determination from the Office of the Interconnection or the Commission, prior to the RPM Auction in which it seeks to submit the Sell Offer, that such Sell Offer is permissible because it is consistent with the competitive, cost-based, fixed, net cost of new entry were the resource to rely solely on revenues from PJM-administered markets. The following requirements shall apply to requests for such determinations:

i) The Capacity Market Seller shall submit a written request with all of the required documentation as described below and in the PJM Manuals. For such purpose, per subsection (h)(9)(i) below, the Office of the Interconnection shall post a preliminary estimate for the relevant Delivery Year of the MOPR-Ex Floor Offer Price expected to be established hereunder. If the MOPR-Ex Floor Offer Price subsequently established for the relevant Delivery Year is less than the Sell Offer, the Sell Offer shall be permitted and no exception shall be required.

ii) As more fully set forth in the PJM Manuals, the Capacity Market Seller must include in its request for an exception under this subsection documentation to support the costs of the MOPR-Ex Screened Generation Resource, as well as offsetting net revenues. Costs or revenues shall be supported at a level of detail comparable to the cost and revenue used to support the Net Asset Class Cost of New Entry established under section 5.14(h). As more fully set forth in the PJM Manuals, supporting documentation for the costs may include, as applicable and available, a complete unit description; environmental permits; vendor quotes for equipment; evidence of actual costs; electric and gas interconnection costs and any cost contingencies; support for property taxes, insurance, operations and maintenance (“O&M”) contractor costs, and other fixed O&M and administrative or general costs. Such documentation also shall identify and support any sunk costs that the Capacity Market Seller has reflected as a reduction to its Sell Offer. The request shall include a certification, signed by an officer of the Capacity Market Seller, that the claimed costs accurately reflect, in all material respects, the seller’s reasonably expected costs of continued operation and that the request satisfies all standards for a Unit-Specific Exception hereunder. The request also shall identify all revenue sources relied upon in the Sell Offer to offset the claimed fixed costs, including, without limitation, long-term power supply contracts, tolling agreements, or tariffs on file with state regulatory agencies, and shall demonstrate that such offsetting revenues are consistent, over a reasonable time period identified by the Capacity Market Seller, with the standard prescribed above. In making such demonstration, the Capacity Market Seller may rely upon forecasts of competitive electricity prices in the PJM Region based on well defined models that include fully documented estimates of future fuel prices, variable operation and maintenance expenses, energy demand, emissions allowance prices, and expected environmental or energy policies that affect the seller’s forecast of electricity prices in such region, employing input data from sources readily available to the public. Documentation for net revenues also may include, as available and applicable, plant performance and capability information, including heat rate, start-up times and costs, forced outage rates, planned outage schedules, maintenance cycle, fuel costs and other variable operations and maintenance expenses, and ancillary service capabilities.

iii) A Sell Offer evaluated under the Unit-Specific Exception shall be permitted if the information provided reasonably demonstrates that the Sell Offer’s competitive, cost-based, fixed, costs are below the MOPR-Ex Floor Offer Price, based on

competitive cost advantages relative to the costs implied by the MOPR-Ex Floor Offer Price, including, without limitation, competitive cost advantages resulting from the Capacity Market Seller's business model, financial condition, tax status, access to capital or other similar conditions affecting the applicant's costs, or based on net revenues that are reasonably demonstrated hereunder to be higher than those implied by the MOPR-Ex Floor Offer Price. Capacity Market Sellers shall be asked to demonstrate that claimed cost advantages or sources of net revenue that are irregular or anomalous, that do not reflect arm's-length transactions, or that are not in the ordinary course of the Capacity Market Seller's business are consistent with the standards of this subsection. Failure to adequately support such costs or revenues so as to enable the Office of the Interconnection to make the determination required in this section will result in denial of a Unit-Specific Exception hereunder by the Office of the Interconnection.

(9) Exemption/Exception Process.

i) The Office of the Interconnection shall post, by no later than one hundred fifty (150) days prior to the commencement of the offer period for an RPM Auction, a preliminary estimate for the relevant Delivery Year of the MOPR-Ex Floor Offer Price.

ii) The Capacity Market Seller must submit its request for a Unit-Specific Exception, Competitive Entry Exemption or a Self-Supply Exemption in writing simultaneously to the Market Monitoring Unit and the Office of Interconnection by no later than one hundred thirty five (135) days prior to the commencement of the offer period for the RPM Auction in which such seller seeks to submit its Sell Offer. The Capacity Market Seller shall include in its request a description of its MOPR-Ex Screened Generation Resource, the exemption or exception that the Capacity Market Seller is requesting, and all documentation necessary to demonstrate that the exemption or exception criteria are satisfied, including without limitation the applicable certification(s) specified in this subsection (h). In addition to the documentation identified herein and in the PJM Manuals, the Capacity Market Seller shall provide any additional supporting information reasonably requested by the Office of the Interconnection or the Market Monitoring Unit to evaluate the Sell Offer. Requests for additional documentation will not extend the deadline by which the Office of the Interconnection or the Market Monitoring Unit must provide their determinations of the exemption request. The Capacity Market Seller shall have an ongoing obligation through the closing of the offer period for the RPM Auction to update the request to reflect any material changes in the request.

iii) As further described in Section II.D. of Attachment M-Appendix to this Tariff, the Market Monitoring Unit shall review the request and supporting documentation and shall provide its determination by no later than forty-five (45) days after receipt of the exemption or exception request. The Office of the



Interconnection shall also review all exemption and exception requests to determine whether the request is acceptable in accordance with the standards and criteria under this section 5.14(h) and shall provide its determination in writing to the Capacity Market Seller, with a copy to the Market Monitoring Unit, by no later than sixty-five (65) days after receipt of the exemption or exception request. The Office of the Interconnection shall reject a requested exemption or exception if the Capacity Market Seller's request does not comply with the PJM Market Rules, as interpreted and applied by the Office of the Interconnection. Such rejection shall specify those points of non-compliance upon which the Office of the Interconnection based its rejection of the exemption or exception request. If the Office of the Interconnection does not provide its determination on an exemption or exception request by no later than sixty-five (65) days after receipt of the exemption or exception request, the request shall be deemed granted. Following the Office of the Interconnection's determination on a Unit-Specific Exception request, the Capacity Market Seller shall notify the Market Monitoring Unit and the Office of the Interconnection, in writing, of the minimum level of Sell Offer, consistent with such determination, to which it agrees to commit by no later than five (5) days after receipt of the Office of the Interconnection's determination of its Unit-Specific Exception request. A Capacity Market Seller that is dissatisfied with any determination hereunder may seek any remedies available to it from FERC; provided, however, that the Office of the Interconnection will proceed with administration of the Tariff and market rules unless and until ordered to do otherwise by FERC.

(10) Procedures and Remedies in Cases of Suspected Fraud or Material Misrepresentation or Omissions in Connection with Exemption Requests.

In the event the Office of the Interconnection reasonably believes that a request for a Competitive Entry Exemption or a Self-Supply Exemption that has been granted contains fraudulent or material misrepresentations or fraudulent or material omissions such that the Capacity Market Seller would not have been eligible for the exemption for that resource had the request not contained such misrepresentations or omissions, then:

i) if the Office of the Interconnection provides written notice of revocation to the Capacity Market Seller no later than thirty (30) days prior to the commencement of the offer period for the RPM Auction for which the seller submitted a fraudulent exemption request, the Office of the Interconnection shall revoke the exemption for that auction. In such event, the Office of the Interconnection shall make any filings with FERC that the Office of the Interconnection deems necessary, and

ii) if the Office of the Interconnection does not provide written notice of revocation no later than 30 days before the start of the relevant RPM Auction, then the Office of the Interconnection may not revoke the exemption absent FERC approval. In any such filing to FERC, the requested remedies shall include (A) in the event that such

resource has not cleared in the RPM Auction for which the exemption has been granted and the filing is made no later than 5 days prior to the commencement of the offer period for the RPM Auction, revocation of the exemption or, (B) in the event that the resource has cleared the RPM Auction for which the exemption has been granted and the filing is made no later than two (2) years after the close of the offer period for the relevant RPM Auction, suspension of any payments, during the pendency of the FERC proceeding, to the Capacity Market Seller for the resource that cleared in any RPM Auction relying on such exemption; and suspension of the Capacity Market Seller's exemption for that resource for future RPM Auctions.

iii) Prior to any automatic revocation or submission to FERC, the Office of the Interconnection and/or the Market Monitoring Unit shall notify the affected Capacity Market Seller and, to the extent practicable, provide the Capacity Market Seller an opportunity to explain the alleged misrepresentation or omission. Any filing to FERC under this provision shall seek fast track treatment and neither the name nor any identifying characteristics of the Capacity Market Seller or the resource shall be publicly revealed, but otherwise the filing shall be public. The Capacity Market Seller may apply for a new exemption for that resource for subsequent auctions, including auctions held during the pendency of the FERC proceeding. In the event that the Capacity Market Seller is cleared by FERC from such allegations of misrepresentations or omissions then the exemption shall be restored to the extent and in the manner permitted by FERC. The remedies required by this subsection (h)(10) to be requested in any filing to FERC shall not be exclusive of any other remedies or penalties that may be pursued against the Capacity Market Seller.

# **Attachment B-1**

**BEFORE THE PUBLIC UTILITIES COMMISSION OF OHIO**

In the Matter of the Application Seeking ) Approval of Ohio Power Company's Proposal to ) Enter into an Affiliate Power Purchase ) Agreement for Inclusion in the Power Purchase ) Agreement Rider. ) )	Case No. 14-1693-EL-RDR
In the Matter of the Application of Ohio Power ) Company for Approval of Certain Accounting ) Authority )	Case No. 14-1694-EL-AAM

**FIRST SUPPLEMENTAL TESTIMONY OF JOSEPH E. BOWRING  
ON BEHALF OF THE INDEPENDENT MARKET MONITOR FOR PJM**

1 Q PLEASE STATE YOUR NAME AND POSITION.

2 A My name is Joseph E. Bowring. I am the Market Monitor for PJM. I am the President of  
3 Monitoring Analytics, LLC. Monitoring Analytics serves as the Independent Market  
4 Monitor for PJM, also known as the Market Monitoring Unit. Since March 8, 1999, I have  
5 been responsible for all the market monitoring activities of PJM, first as the head of the  
6 internal PJM Market Monitoring Unit and, since August 1, 2008, as President of  
7 Monitoring Analytics. The market monitoring activities of PJM are defined in the PJM  
8 Market Monitoring Plan, Attachment M and Attachment M-Appendix to PJM Open  
9 Access Transmission Tariff.

10 Q ARE YOU THE SAME JOSEPH BOWRING WHO PREVIOUSLY PROVIDED  
11 TESTIMONY IN THIS PROCEEDING?

12 A Yes. I provided Direct Testimony on September 11, 2015.

13 Q WHAT IS THE PURPOSE OF YOUR SUPPLEMENTAL TESTIMONY IN THIS  
14 PROCEEDING?

15 A The purpose of my testimony is to oppose the Joint Stipulation and Recommendation  
16 filed in this proceeding on December 14, 2015 (December 14<sup>th</sup> Stipulation). The  
17 December 14<sup>th</sup> Stipulation modifies the AEP proposal in this proceeding that was the  
18 basis for my prior testimony. Ohio Power Company (AEP) is requesting Commission  
19 approval of its new affiliate power purchase agreement (PPA) between AEP and AEP  
20 Generation Resources, Inc. (AEPGR) for inclusion in the PPA Rider and approval for

1 including the responsibility for AEP's partial ownership of the Ohio Valley Electric  
2 Corporation ("OVEC") plants in the PPA Rider. The purpose of my testimony is to  
3 explain why the terms and conditions included in the December 14<sup>th</sup> Stipulation  
4 modifying the initially filed PPA are not cause for any change to my prior testimony that  
5 inclusion of these costs in the proposed PPA would constitute a subsidy which is  
6 inconsistent with competition in the PJM wholesale power market.

7 **Q PLEASE BRIEFLY SUMMARIZE THE SALIENT FEATURES OF THE PROPOSED**  
8 **PPA RIDER AS MODIFIED BY THE DECEMBER 14<sup>TH</sup> STIPULATION.**

9 **A** The proposed PPA Rider would transfer, from AEP (AEPGR) to the ratepayers of AEP  
10 on a non bypassable basis, all responsibility for paying to AEP all costs associated with  
11 the PPA Units through May 31, 2024 (approximately eight and a half years) with the  
12 option to extend or modify the PPA Rider. The initial filing would have covered the  
13 entire period through the retirement dates of each and any post-retirement period for  
14 each, including paying retirement costs and any residual value. The PPA units are coal-  
15 fired units: Cardinal Plant Unit 1; Conesville Plant Units 5 and 6, which are 100 percent  
16 owned by AEPGR; and the AEPGR share of Conesville Plant 4; Stuart Plant Units 1 – 4;  
17 and Zimmer Plant Unit 1. In addition, the proposed PPA Rider would transfer, from  
18 AEP (AEPGR) to the ratepayers of AEP, all responsibility for paying for AEP's share of  
19 the two generating plants owned and operated by the Ohio Valley Electric Corporation  
20 ("OVEC"). The OVEC plants are the Kyger Creek Plant in Cheshire, Ohio and the Clifty  
21 Creek Plant in Madison, Indiana.

22 Under the proposed PPA Rider, AEP would offer the energy, ancillary services and  
23 capacity from the assets into the PJM markets. The proposed PPA Rider would credit the  
24 market revenues against the costs and charge the net costs to the ratepayers of the  
25 Company.

26 The proposed PPA Rider would also include a reduced rate of return on equity and the  
27 provision for a modest amount of potential credits during the last four years of the PPA  
28 Rider.

29 The December 14<sup>th</sup> Stipulation does not fundamentally change the nature or purpose of  
30 the PPA Rider which is to shift costs and risks from shareholders to customers, to  
31 remove the incentives to make competitive offers in the PJM Capacity Market and to  
32 provide incentives to make offers below the competitive level in the PJM Capacity  
33 Market.

34 **Q DOES AEP BELIEVE THAT AEPGR'S PLANTS ARE A GOOD INVESTMENT?**

1 A No. AEP does not believe that the units are profitable and does not appear to believe  
2 that current and expected market conditions will make the units profitable.

3 As stated by witness Vegas (P 7) in the initial filing: “Unfortunately for Ohio’s  
4 generating assets, these market reforms could come too late to keep assets from retiring  
5 prematurely.” Witness Vegas also stated (P16): “The PPA Units are now on the  
6 economic ‘bubble,’ where low short-term capacity and energy market prices have  
7 increased the risk of premature retirement.” Witness Vegas (P14) stated that market  
8 conditions mean a greater risk of unit retirements and the likely sale of these assets by  
9 AEP. Witness Thomas stated (P11) in the initial filing: “The Affiliated PPA units are on  
10 the economic ‘bubble,’ meaning the market conditions, as described by Company  
11 witness Pearce, are not providing the necessary economic signals for incremental  
12 investment in these units.”

13 The purpose of the PPA Rider is to transfer the costs and market risks associated with  
14 the PPA Rider Units from AEP’s shareholders to AEP’s ratepayers. AEP has not  
15 demonstrated and cannot demonstrate why customers should bear these costs and take  
16 these risks, if a well informed generation owner is not willing to do so.

17 Nothing in the December 14<sup>th</sup> Stipulation or the supporting testimony of witness Allen  
18 indicates that AEP has changed its view of these assets. Witness Allen (P15) states that  
19 the December 14<sup>th</sup> Stipulation will result in an increase in residential customer rates.

20 The fact that AEP is proposing to transfer the costs, the risks and the asserted net  
21 benefits of these units from shareholders to customers is evidence that AEP does not  
22 believe that the units are profitable and does not appear to believe that current and  
23 expected market conditions will make the units profitable.

24 Q **WHAT ARE THE IMPLICATIONS OF PJM’S CHANGES TO THE DESIGN OF THE  
25 CAPACITY MARKET FOR THE PROPOSED PPA RIDER?**

26 A On December 12, 2014, PJM filed a proposal to significantly change the design of the  
27 PJM Capacity Market. The Capacity Performance proposal was approved by FERC by  
28 effective April 1, 2015. (*PJM Interconnection, L.L.C., et al.*, 151 FERC ¶ 61,208 (June 9,  
29 2015).

30 PJM has run a Base Residual Auction for Delivery Year 2018/2019, a Transition Auction  
31 for Delivery Year 2016/2017 and a Transition Auction for Delivery Year 2017/2018 under  
32 the Capacity Performance design. The result was a significant increase in capacity prices

1 for all capacity resources in PJM and particularly for capacity resources in the western  
2 part of PJM, including Ohio.

3 One of the most significant elements of the new capacity market design is to increase the  
4 performance incentives for capacity resources. If units do not perform as required, units  
5 will pay substantial penalties. Those penalties can exceed total capacity market revenue  
6 for a generating unit. Those penalties would be paid to units that did perform when  
7 called, as bonus payments. AEP has not explicitly addressed these issues. But PJM's  
8 filing raises issues relevant to AEP's proposed PPA Rider. If AEP's proposal remains  
9 internally consistent, I would expect that the proposed PPA Rider would require  
10 ratepayers to pay any performance penalties associated with the assets included in the  
11 PPA Rider. I would also expect that AEP would retain any performance payments at  
12 other AEP units, not included in the PPA Rider, even if paid for in part by these  
13 ratepayer penalties.

14 This highlights the incentive issues that arise when the responsibility for operating  
15 plants and the financial consequences of that operation are separated, as would occur  
16 under the proposed PPA Rider. When the penalties are paid by customers, shareholders  
17 and management do not have the same incentives to manage the performance of the  
18 units for which customers bear the risk as they do at units for which shareholders bear  
19 the risk. This is another reason to reject the PPA Rider as inconsistent with competitive  
20 outcomes in the PJM wholesale power market.

21 **Q IS THE PROPOSED PPA RIDER, AS MODIFIED IN THE DECEMBER 14<sup>TH</sup>**  
22 **STIPULATION, CONSISTENT WITH COMPETITION IN THE PJM WHOLESALE**  
23 **POWER MARKET?**

24 **A** No. The proposed PPA Rider is not consistent with competition in the PJM wholesale  
25 power market. The proposed PPA Rider would constitute a subsidy analogous to the  
26 subsidies previously proposed in New Jersey and Maryland, both of which were found  
27 to be inconsistent with competition in the wholesale power markets.<sup>1</sup>

28 The proposed PPA Rider would shift responsibility from AEP for all costs associated  
29 with the PPA assets to the ratepayers of the company. AEP is requesting that the plants  
30 and the contracts be returned to a version of the cost of service regulation regime that  
31 predated the introduction of competitive wholesale power markets.

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<sup>1</sup> See PPL EnergyPlus, LLC, et al. v. Nazarian, et al., slip op. no. 13-2419 (4<sup>th</sup> Cir. June 2, 2014); PPL EnergyPlus, LLC, et al. v. Solomon, et al., slip op. no. 13-4330 (3<sup>rd</sup> Cir. March 27, 2014).

1 The proposed PPA Rider would require that the ratepayers of AEP subsidize the costs of  
2 the plants to the benefit of AEP. The logical offer price for these resources in the PJM  
3 Capacity Market, under these conditions, would be zero. A zero offer would be rational  
4 because this would maximize the revenue offset to the customers who would be  
5 required to pay 100 percent of the costs of this capacity and bear all of the performance  
6 risks. Offers at or near zero would have an anti-competitive, price suppressive effect on  
7 the PJM Capacity Market as would any offers at less than the competitive offer level.  
8 The proposed PPA Rider would create strong incentives for AEP to offer this capacity as  
9 less than the competitive offer level.

10 This type of subsidy is inconsistent with competition in the wholesale power markets  
11 because of its price suppressive effects. Such effects would make it difficult or  
12 impossible for generating units without subsidies to compete in the market. Competition  
13 depends on units making competitive offers that reflect their costs and the risk of paying  
14 penalties and/or receiving benefits (e.g. the offer cap for Capacity Performance  
15 resources) and on recovering revenues only from the markets and not from subsidies.  
16 Such subsidies would negatively affect the incentives to build new generation in Ohio  
17 and elsewhere in PJM and if adopted by others would likely result in a situation where  
18 only subsidized units would ever be built.

19 **Q HOW DOES COMPETITION IN THE PJM WHOLESALE POWER MARKET WORK?**

20 **A** It is essential that any approach to the PJM markets and the PJM Capacity Market  
21 incorporate a consistent view of how the preferred market design is expected to work to  
22 provide competitive results in a sustainable market design over the long run. A  
23 sustainable market design means a market design that results in appropriate incentives  
24 to retire units and to invest in new units over time such that reliability is ensured as a  
25 result of the functioning of the market. There are at least two broad paradigms that  
26 could result in such an outcome. The market paradigm includes a full set of markets,  
27 most importantly the energy market and capacity market, which together ensure that  
28 there are adequate revenues to incent new generation when it is needed and to incent  
29 retirement of units when appropriate. This approach will result in long term reliability  
30 at the lowest possible cost.

31 The quasi-market paradigm includes an energy market based on LMP but addresses the  
32 need for investment incentives via the long-term contract model or the cost of service  
33 model. In the quasi-market paradigm, competition to build capacity is limited and does  
34 not include the entire PJM footprint. In the quasi-market paradigm, customers absorb  
35 the risks associated with investment in and ownership of generation assets through



1 guaranteed payments under either guaranteed long term contracts or the cost of service  
2 approach. In the quasi-market paradigm there is no market clearing pricing to incent  
3 investment in existing units or new units. In the quasi-market paradigm there is no  
4 incentive for entities without cost of service treatment to enter and thus competition is  
5 effectively eliminated.

6 I believe that the market paradigm is the preferred alternative for providing reliable  
7 wholesale power at the lowest possible cost and that AEP's proposal is not consistent  
8 with the market paradigm. While it is true that there are other exceptions to the market  
9 paradigm within PJM, that is not a reason to remove units from the market and further  
10 extend the non-market paradigm. The adoption of the non-market paradigm here would  
11 move the PJM market farther from a market paradigm and create real risk to the market  
12 paradigm. Whatever the decision, it is essential at a minimum that the choices about  
13 incentives and regulatory approaches be made with an explicit understanding of the  
14 short run and long run implications of these choices for the design of wholesale power  
15 markets and the interaction between wholesale power markets and retail markets.

16 **Q HOW SHOULD THE PJM MARKET RULES BE MODIFIED TO ADDRESS THE**  
17 **PROPOSED SUBSIDIES?**

18 **A** PJM rules currently include a Minimum Offer Price Rule (MOPR) designed to address  
19 the impact on competitive markets of subsidies to most new gas-fired generating units  
20 by requiring that such new units with subsidies offer at a level no lower than the cost of  
21 new entry. The actions of AEP in requesting approval for this PPA highlight the fact that  
22 the MOPR needs to be expanded to address all cases where subsidies create an incentive  
23 to offer capacity into the PJM Capacity Market at less than an unsubsidized, competitive  
24 offer. This would include offers from all new and existing units that receive subsidies.

25 **Q WHAT WOULD BE THE IMPACT ON THIS PPA IF THE MOPR RULE WERE**  
26 **EXPANDED?**

27 **A** If the MOPR were expanded to include all new or existing units receiving subsidies, it  
28 would require AEP to make competitive offers in the PJM Capacity Market rather than  
29 offering at levels below the competitive offer level including offers at or close to zero. If  
30 AEP were required to offer the units at the competitive level and the units do not clear in  
31 the capacity market as a result of a competitive offer, there would be no market  
32 revenues and customers would receive no offset to the costs they would be required to  
33 pay under the PPA Rider.

1 In addition to the other costs and risks, the proposed AEP PPA Rider would shift this  
2 significant regulatory risk of an improved MOPR from shareholders to customers.

3 Q **PLEASE SUMMARIZE YOUR RECOMMENDATION.**

4 A The proposed PPA Rider would constitute a subsidy which provides incentives for non-  
5 competitive offers and is inconsistent with competition in the PJM wholesale power  
6 markets. The proposed PPA Rider should be rejected for that reason.

7 Q **DOES THIS COMPLETE YOUR DIRECT TESTIMONY?**

8 A Yes.

**CERTIFICATE OF SERVICE**

I hereby certify that a true copy of the foregoing Direct Testimony of Joseph E. Bowring on Behalf of Monitoring Analytics, LLC, was served via electronic transmission to the persons listed below on this 28th day of December, 2015.

/s/ Jeffrey W. Mayes

Jeffrey W. Mayes

General Counsel

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**Exhibit No. 1**

BEFORE THE PUBLIC UTILITIES COMMISSION OF OHIO

In the Matter of the Application Seeking	)	Case No. 14-1693-EL-RDR
Approval of Ohio Power Company's Proposal to	)	
Enter into an Affiliate Power Purchase	)	
Agreement for Inclusion in the Power Purchase	)	
Agreement Rider.	)	
	)	
In the Matter of the Application of Ohio Power	)	Case No. 14-1694-EL-AAM
Company for Approval of Certain Accounting	)	
Authority	)	

**CERTIFICATION**

I, JOSEPH E. BOWRING, being duly sworn, depose and state that the testimony to which this certification is attached was prepared by me, acting in my capacity as the Market Monitor, and that the statements contained therein are true and correct to the best of my knowledge and belief.

This certification is made under the penalty of perjury.



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Joseph E. Bowring

## **Attachment B-2**

BEFORE THE PUBLIC UTILITIES COMMISSION OF OHIO

In the Matter of the Application of Ohio Edison )  
Company, The Cleveland Electric Illuminating ) Case No. 14-1297-EL-SSO  
Company, and The Toledo Edison Company for )  
Authority to Provide a Standard Service Offer )  
Pursuant to R.C. § 4928.143 in the Form of an )  
Electric Security Plan. )  
)

FIRST SUPPLEMENTAL TESTIMONY OF JOSEPH E. BOWRING  
ON BEHALF OF THE INDEPENDENT MARKET MONITOR FOR PJM

1 Q PLEASE STATE YOUR NAME AND POSITION.

2 A My name is Joseph E. Bowring. I am the Market Monitor for PJM. I am the President of  
3 Monitoring Analytics, LLC. Monitoring Analytics serves as the Independent Market  
4 Monitor for PJM, also known as the Market Monitoring Unit. Since March 8, 1999, I have  
5 been responsible for all the market monitoring activities of PJM, first as the head of the  
6 internal PJM Market Monitoring Unit and, since August 1, 2008, as President of  
7 Monitoring Analytics. The market monitoring activities of PJM are defined in the PJM  
8 Market Monitoring Plan, Attachment M and Attachment M-Appendix to the PJM Open  
9 Access Transmission Tariff.

10 Q ARE YOU THE SAME JOSEPH BOWRING WHO PREVIOUSLY PROVIDED  
11 TESTIMONY IN THIS PROCEEDING?

12 A Yes. I provided Direct Testimony on December 22, 2014.

13 Q WHAT IS THE PURPOSE OF YOUR SUPPLEMENTAL TESTIMONY IN THIS  
14 PROCEEDING?

15 A The purpose of my testimony is to oppose the Third Supplemental Stipulation and  
16 Recommendation filed in this proceeding on December 1, 2015 (December 1<sup>st</sup>  
17 Stipulation). The December 1<sup>st</sup> Stipulation modifies the FirstEnergy proposal in this  
18 proceeding that was the basis for my prior testimony. Ohio Edison Company ("Ohio  
19 Edison"), The Cleveland Electric Illuminating Company ("CEI") and The Toledo Edison  
20 Company ("Toledo Edison") (the "Companies" or "FirstEnergy") are requesting



1 Commission approval of their fourth electric security plan (“ESP IV”). ESP IV includes  
2 the Retail Rate Stability Rider (“Rider RRS”).

3 The purpose of my testimony is to explain why the terms and conditions included in the  
4 December 1<sup>st</sup> Stipulation modifying the Rider RRS would constitute a subsidy which is  
5 inconsistent with competition in the PJM wholesale power market. The modifications to  
6 the terms of the proposed Rider RRS do not change the conclusions from my direct  
7 testimony.

8 **Q PLEASE BRIEFLY SUMMARIZE THE SALIENT FEATURES OF PROPOSED RIDER**  
9 **RRS AS MODIFIED BY THE DECEMBER 1<sup>ST</sup> STIPULATION**

10 **A** The proposed Rider RRS would transfer from FirstEnergy to the ratepayers of  
11 FirstEnergy on a non bypassable basis, all responsibility for paying to FirstEnergy all the  
12 historic and future costs associated with the RRS assets through May 31, 2024 (eight year  
13 term). The RRS assets are the Davis-Besse Nuclear Power Station (“Davis-Besse”) and  
14 the W.H. Sammis Plant (“Sammis”) (the “Plants”) and FirstEnergy’s share of the output  
15 of the Kyger Creek Plant in Cheshire, Ohio and the Clifty Creek Plant in Madison,  
16 Indiana, which are owned and operated by Ohio Valley Electric Corporation (“OVEC”).  
17 The costs would include what witness Mikkelsen refers to as Legacy Costs which are all  
18 historical costs incurred at these plants and under these contracts, prior to the proposed  
19 transfer of all cost responsibility to ratepayers under the proposed Rider RRS.

20 Under the proposed Rider RRS, FirstEnergy would offer the energy, ancillary services  
21 and capacity from the assets into the PJM markets. The proposed Rider RRS would  
22 credit the market revenues against the costs of the assets and charge the net costs to the  
23 ratepayers of the Company.

24 The proposed Rider RRS would also provide for a modest amount of potential credits  
25 during the last four years of the Rider RRS.

26 The December 1<sup>st</sup> Stipulation does not fundamentally change the nature or purpose of  
27 the proposed Rider RRS which is to shift costs and risks from shareholders to customers,  
28 to remove FirstEnergy’s incentives to make competitive offers in the PJM Capacity  
29 Market and to provide FirstEnergy incentives to make offers below the competitive level  
30 in the PJM Capacity Market.

31 **Q DOES FIRSTENERGY BELIEVE THAT THE PLANTS ARE A GOOD**  
32 **INVESTMENT?**

33 **A** No. FirstEnergy does not believe that the units are profitable and does not believe that  
34 current and expected market conditions will make the units profitable.

1 As stated by witness Moul (at 2 ll. 17–18) in the initial filing: “The economic viability of  
2 the Plants is in doubt. Market-based revenues for energy and capacity have been at  
3 historic lows and are insufficient to permit FES to continue operating the Plants and to  
4 make the necessary investments.” Witness Moul also stated (at 3 ll. 5–6): “Markets have  
5 not, and are not, providing sufficient revenues to ensure continued operation of the  
6 Plants.”

7 Nothing in the December 1<sup>st</sup> Stipulation or the supporting testimony of witness  
8 Mikkelsen indicates that FirstEnergy has changed its view of these assets.

9 Nonetheless, FirstEnergy wants to shift the costs and risks of these resources to  
10 ratepayers. The purpose of the proposed Rider RRS is to transfer the costs and market  
11 risks associated with the Rider RRS assets from FirstEnergy’s shareholders to  
12 FirstEnergy’s ratepayers. FirstEnergy has not demonstrated and cannot demonstrate  
13 why customers should bear these costs and take these risks, if a well informed  
14 generation owner is not willing to do so.

15 The fact that FirstEnergy is proposing to transfer the costs, the risks and the asserted net  
16 benefits of these units from shareholders to customers is evidence that FirstEnergy does  
17 not believe that the units are profitable and does not appear to believe that current and  
18 expected market conditions will make the units profitable.

19 **Q WHAT ARE THE IMPLICATIONS OF PJM’S CHANGES TO THE DESIGN OF THE**  
20 **CAPACITY MARKET FOR THE PROPOSED RIDER RRS AS MODIFIED BY THE**  
21 **DECEMBER 1<sup>ST</sup> STIPULATION?**

22 **A** On December 12, 2014, PJM filed a proposal to significantly change the design of the  
23 PJM Capacity Market. Following the submission of my direct testimony in this case, the  
24 Capacity Performance proposal was approved by FERC effective April 1, 2015. (*PJM*  
25 *Interconnection, L.L.C., et al.*, 151 FERC ¶ 61,208 (June 9, 2015).

26 PJM has run a Base Residual Auction for Delivery Year 2018/2019, a Transition Auction  
27 for Delivery Year 2016/2017 and a Transition Auction for Delivery Year 2017/2018 under  
28 the Capacity Performance design. The result was a significant increase in capacity prices  
29 for all capacity resources in PJM and particularly for capacity resources in the western  
30 part of PJM, including Ohio.

31 One of the most significant elements of the new capacity market design is an increase to  
32 the performance incentives for capacity resources. If units do not perform as required,  
33 units will pay substantial penalties. Those penalties can exceed total capacity market

1 revenue for a generating unit. Those penalties would be paid to units that did perform  
2 when called, as bonus payments. FirstEnergy has not explicitly addressed these issues.

3 But the new PJM capacity market rules raise issues relevant to FirstEnergy's proposed  
4 Rider RRS. If FirstEnergy's proposal remains internally consistent, I would expect that  
5 the proposed Rider RRS would require ratepayers to pay any performance penalties  
6 associated with the assets included in the Rider RRS. I would also expect that  
7 FirstEnergy would retain any performance payments at other FirstEnergy units, not  
8 included in the Rider RRS, even if paid for in part by these ratepayer penalty payments.

9 This highlights the incentive issues that arise when the responsibility for operating  
10 plants and the financial consequences of that operation are separated, as would occur  
11 under the proposed Rider RRS. When the penalties are paid by customers, the  
12 performance risk is borne by customer. Shareholders and management do not have the  
13 same incentives to manage the performance of the units for which customers bear the  
14 risk as they do to manage the performance of the units for which shareholders bear the  
15 risk. This attenuation of the capacity market performance incentives is another reason to  
16 reject the Rider RRS as inconsistent with competitive outcomes in the PJM wholesale  
17 power market.

18 **Q IS THE PROPOSED RIDER RRS, AS MODIFIED IN THE DECEMBER 1<sup>ST</sup>**  
19 **STIPULATION, CONSISTENT WITH COMPETITION IN THE PJM WHOLESALE**  
20 **POWER MARKET?**

21 **A** No. The proposed Rider RRS, as modified in the December 1<sup>st</sup> Stipulation, is not  
22 consistent with competition in the PJM wholesale power market. The proposed Rider  
23 RRS would constitute a subsidy analogous to the subsidies proposed in New Jersey and  
24 Maryland, both of which were found to be inconsistent with competition in the  
25 wholesale power markets.<sup>1</sup>

26 The proposed Rider RRS would shift responsibility from FirstEnergy, for all historical  
27 and future costs associated with the Rider RRS assets for the term of the Rider RRS, to  
28 the ratepayers of the Companies. The Companies are requesting that the plants and the  
29 contracts be returned to a version of the cost of service regulation regime that predated  
30 the introduction of competitive wholesale power markets.

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<sup>1</sup> See PPL EnergyPlus, LLC, et al. v. Nazarian, et al., slip op. no. 13-2419 (4<sup>th</sup> Cir. June 2, 2014); PPL EnergyPlus, LLC, et al. v. Solomon, et al., slip op. no. 13-4330 (3<sup>rd</sup> Cir. March 27, 2014) .

1 The proposed Rider RRS would require that the ratepayers of the Companies subsidize  
2 the costs of the plants and the contracts to the benefit of the Companies. The logical offer  
3 price for these resources in the PJM Capacity Market, under these conditions, would be  
4 zero. A zero offer would be rational because this would maximize the revenue offset to  
5 the customers who would be required to pay 100 percent of the costs of this capacity and  
6 bear all of the performance risks. Offers at or near zero would have an anti-competitive,  
7 price suppressive effect on the PJM Capacity Market as would any offers at less than the  
8 competitive offer level. The proposed Rider RRS would create strong incentives for  
9 FirstEnergy to offer this capacity at less than the competitive offer level.

10 This type of subsidy is inconsistent with competition in the wholesale power markets  
11 because of its price suppressive effects. Such effects would make it difficult or  
12 impossible for generating units without subsidies to compete in the market. Competition  
13 depends on units making competitive offers that reflect their costs and the risk of paying  
14 penalties and/or receiving benefits (e.g. the offer cap for Capacity Performance  
15 resources) and on recovering revenues only from the markets and not from subsidies.  
16 Such subsidies would negatively affect the incentives to build new generation in Ohio  
17 and elsewhere in PJM and if adopted by others would likely result in a situation where  
18 only subsidized units would ever be built.

19 **Q HOW DOES COMPETITION IN THE PJM WHOLESALE POWER MARKET WORK?**

20 **A** It is essential that any approach to the PJM markets and the PJM Capacity Market  
21 incorporate a consistent view of how the preferred market design is expected to work to  
22 provide competitive results in a sustainable market design over the long run. A  
23 sustainable market design means a market design that results in appropriate incentives  
24 to retire units and to invest in new units over time such that reliability is ensured as a  
25 result of the functioning of the market. There are at least two broad paradigms that  
26 could result in such an outcome. The market paradigm includes a full set of markets,  
27 most importantly the energy market and capacity market, which together ensure that  
28 there are adequate revenues to incent new generation when it is needed and to incent  
29 retirement of units when appropriate. This approach will result in long term reliability  
30 at the lowest possible cost.

31 The quasi-market paradigm includes an energy market based on LMP in the energy  
32 market but addresses the need for investment incentives via the long-term contract  
33 model or the cost of service model. In the quasi-market paradigm, competition to build  
34 capacity is limited and does not include the entire PJM footprint. In the quasi-market  
35 paradigm, customers absorb the risks associated with new investment through  
36 guaranteed payments under either guaranteed long term contracts or the cost of service

1 approach. In the quasi-market paradigm there is no market clearing pricing to incent  
2 investment in existing units or new units. In the quasi-market paradigm there is no  
3 incentive for entities without cost of service treatment to enter and thus competition is  
4 effectively eliminated. Without competition, market incentives to provide capacity at the  
5 lowest possible cost are eliminated.

6 I believe that the market paradigm is the preferred alternative and that FirstEnergy's  
7 proposal is not consistent with the market paradigm. While it is true that there are other  
8 exceptions to the market paradigm within PJM, that is not a reason to remove units from  
9 the market and further extend the non-market paradigm. The adoption of the non-  
10 market paradigm in this case would move the PJM market farther from a market  
11 paradigm and create real risk to the market paradigm.

12 Whatever the decision, it is essential at a minimum that the choices about incentives and  
13 regulatory approaches be made with an explicit understanding of the short run and long  
14 run implications of these choices for the design of wholesale power markets and the  
15 interaction between wholesale power markets and retail markets. The market paradigm  
16 creates competitive incentives for all participants and creates a market in which  
17 competitors can build new capacity. The quasi-market paradigm eliminates those  
18 incentives, creates an advantage for the incumbent regulated utility and creates a  
19 disadvantage for competition from new entrants to the market.

20 **Q HOW SHOULD THE PJM MARKET RULES BE MODIFIED TO ADDRESS THE**  
21 **PROPOSED SUBSIDIES?**

22 **A** PJM rules currently include a Minimum Offer Price Rule (MOPR) designed to address  
23 the impact on competitive markets of subsidies to most new gas-fired generating units  
24 by requiring that such new units with subsidies offer at a level no lower than the cost of  
25 new entry. The actions of FirstEnergy in requesting approval for this Rider RRS  
26 highlight the fact that the MOPR needs to be expanded to address all cases where  
27 subsidies create an incentive to offer capacity into the PJM Capacity Market at less than  
28 an unsubsidized, competitive offer. This would include offers from all new and existing  
29 units that receive subsidies.

30 **Q WHAT WOULD BE THE IMPACT ON THIS RIDER RRS IF THE MOPR RULE**  
31 **WERE EXPANDED?**

32 **A** If the MOPR were expanded to include all new or existing units receiving subsidies, it  
33 would require FirstEnergy to make competitive offers in the PJM Capacity Market rather  
34 than offering at levels below the competitive offer level including offers at or close to  
35 zero. If FirstEnergy were required to offer the units at the competitive level and the units

1 do not clear in the capacity market as a result of a competitive offer, there would be no  
2 market revenues and customers would receive no offset to the costs they would be  
3 required to pay under the Rider RRS.

4 In addition to the other costs and risks, the proposed FirstEnergy Rider RRS would shift  
5 this significant regulatory risk of an improved MOPR from shareholders to customers.

6 Q **PLEASE SUMMARIZE YOUR RECOMMENDATION.**

7 A The proposed Rider RRS would constitute a subsidy which provides incentives for non-  
8 competitive offers and is inconsistent with competition in the PJM wholesale power  
9 markets. The proposed Rider RRS should be rejected for that reason.

10 Q **DOES THIS COMPLETE YOUR SUPPLEMENTAL TESTIMONY?**

11 A Yes.

CERTIFICATE OF SERVICE

I hereby certify that a true copy of the foregoing First Supplemental Testimony of Joseph E. Bowring on Behalf of Monitoring Analytics, LLC, was served via electronic transmission to the persons listed below on this 30<sup>th</sup> day of December 2015.

/s/ Jeffrey W. Mayes

Jeffrey W. Mayes

General Counsel

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# **Attachment C**



Monitoring  
Analytics

# **Attachment C: Competitive offer for a Capacity Performance resource in PJM**

The Independent Market Monitor for PJM

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This document describes the mathematics of the calculation of a competitive capacity performance resource offer in PJM.

## **Definitions**

$R^c$  – net revenue for a resource with a capacity commitment

$R^{nc}$  – net revenue for a resource without a capacity commitment that sells energy and ancillary services

$A_i = (MWh_i/UCAP)$ , availability during performance assessment hour  $i$

$\bar{A}$  - average availability across all performance assessment hours defined as  $\sum_{i=1}^H MWh_i / (H \times UCAP)$

$B_i$  – balancing ratio during performance assessment hour  $i$ , ratio of total load and reserve requirement during the hour to total committed UCAP.

$\bar{B}$  – average balancing ratio across all performance assessment hours in a delivery year

$H$  – Expected value of total number of performance assessment hours in a delivery year

$CPBR_i$  – capacity performance bonus rate for hour  $i$  in (\$ per MWh), varies by hour

$CPBR$  = average capacity performance bonus rate over all performance assessment hours in a delivery year, calculated as  $\sum_{i=1}^H (CPBR_i \times A_i) / (H \times \bar{A})$

$PPR$  – non-performance charge rate (\$ per MWh; Net CONE in \$ per ICAP MW-year divided by 30, fixed for the delivery year for a particular Net CONE area)

$ACR$  – Net ACR (net going forward costs) for the resource on a per MW UCAP basis, not including any risk premium.

$p$  – Offer price in RPM on a \$ per MW-year UCAP basis

## **Competitive Offer for an underperforming resource**

If a resource is expected to underperform i.e., when expected  $A_i < B_i$  for all PAH:

The net revenue for a resource that has a capacity commitment,  $R^c$ , is calculated as:

$$R^c = UCAP \times [p + PPR \times H \times (\bar{A} - \bar{B})] - UCAP \times ACR \quad (1)$$

This can be summarized as the MW of capacity multiplied by the capacity clearing price net of performance penalties less the annual avoidable costs of operating the unit.

The net revenue for that same resource that does not have a capacity commitment but participates in the energy and ancillary services markets and earns capacity bonus performance payments,  $R^{nc}$ , is calculated as:

$$R^{nc} = UCAP \times \left[ \sum_{i=1}^H (CPBR_i \times A_i) \right] - UCAP \times ACR \quad (2)$$

This can be summarized as the MW of capacity multiplied by the bonus payments less the annual avoidable costs of operating the unit.

In equation (2) since the resource does not have a capacity performance obligation, the resource earns capacity bonus performance payments for all of its energy and reserves during performance assessment hours.

### Low ACR case

If  $R^{nc} \geq 0$ , a resource is expected to make enough revenues to cover net going forward costs without a capacity commitment and has the opportunity to be profitable as an energy only resource in the CP design.

$$if \ ACR \leq \sum_{i=1}^H (CPBR_i \times A_i)$$

$$or \ ACR \leq CPBR \times H \times \bar{A}$$

In order for such a resource to have an incentive to take on the obligation to be a capacity resource under the CP design, the expected revenue with the capacity performance obligation must be greater than or equal to the expected revenue as an energy only resource, or  $R^c \geq R^{nc}$ .

Taking on a capacity obligation is profitable and competitive if:  $R^c - R^{nc} \geq 0$ .  $R^c$  and  $R^{nc}$  are defined in equation (1) and equation (2).

Thus, the competitive offer and therefore the expected equilibrium clearing price in RPM equals a value of  $p$  such that equation (1) minus equation (2) is greater than or equal to zero:

$$p \geq \left[ \sum_{i=1}^H CPBR_i \times (A_i) \right] - PPR \times H \times (\bar{A} - \bar{B})$$

$$or, \quad p \geq PPR \times H \times \bar{B} + \left[ \sum_{i=1}^H CPBR_i \times (A_i) \right] - PPR \times H \times \bar{A}$$

Using the weighted average capacity performance bonus rate,

$$p \geq PPR \times H \times \bar{B} + CPBR \times H \times \bar{A} - PPR \times H \times \bar{A}$$

Therefore the competitive offer is:  $p = CPBR \times H \times \bar{A} + PPR \times H \times (\bar{B} - \bar{A})$  (3)

Equation (3) is the competitive offer formula for a low ACR resource with  $A_i < B_i$  for all PAH. The competitive offer for a low ACR resource equals the expected bonus payments less the expected non-performance charges.

Using PJM's formula for PPR as Net CONE divided by 30, the competitive offer is:

$$p = CPBR \times H \times \bar{A} + \left( \frac{Net\ CONE}{30} \right) \times H \times (\bar{B} - \bar{A}) \quad (4)$$

If (i) the capacity performance bonus rate is assumed to be equal to the capacity non-performance charge rate and, (ii) the number of expected performance hours is expected to be 30, this is identical to:

$$p = Net\ CONE \times \bar{B} \quad (5)$$

These are the assumptions made in the PJM filing and result in the definition of the competitive offer cap in the PJM filing.

In fact, the actual capacity performance bonus rate (CPBR) will depend on the level of non-performance charges collected from underperforming resources during each performance assessment hour. The maximum value of CPBR is the non-performance charge rate, PPR, which occurs when no resource is exempted for under performance for any reason. If resources are exempted for under performance, the CPBR would decrease and the competitive offer would decrease because the value of being an energy only resource and relying solely on bonus payments would decrease as the value of the bonus payments decreases.

## High ACR case

If  $R^{nc} < 0$ , a resource is not expected to make enough revenues to cover net going forward costs without a capacity payment.

$$if\ ACR > \left[ \sum_{i=1}^H (CPBR_i \times A_i) \right]$$

$$or\ ACR > CPBR \times H \times \bar{A}$$

In order for such a resource to have an incentive to take on the obligation to be a capacity resource under the CP design, the expected revenue from the capacity payment and any bonus payments must be enough to cover all the costs of the unit including ACR and any capacity nonperformance charges. (The definition of an underperforming resource means that  $A_i < B_i$  for all PAH and that the resource is expected to incur net non-performance charges if it has a capacity performance obligation.)

If taking on a capacity obligation is to be profitable and competitive:  $R^c \geq 0$ .

From equation (1):

$$UCAP \times [p + PPR \times H \times (\bar{A} - \bar{B})] - UCAP \times ACR \geq 0$$

$$\text{or, } p \geq ACR + PPR \times H \times (\bar{B} - \bar{A})$$

The competitive offer is:

$$p = ACR + PPR \times H \times (\bar{B} - \bar{A}) \quad (6)$$

The competitive offer for a High ACR unit equals avoidable costs plus expected non-performance charges.

Comparing equation (3) (Low ACR unit competitive offer) and equation (6) (High ACR unit competitive offer), there is a common component of  $PPR \times H \times (\bar{B} - \bar{A})$  in both equations. For a unit to be High ACR,  $ACR > CPBR \times H \times \bar{A}$ . Comparing equations (3) and (6) and the assumption for a High ACR unit, the High ACR unit competitive offer from equation (6) is always greater than the Low ACR unit competitive offer from equation (3).

### **Competitive Offer for an overperforming resource**

If a resource is expected to overperform i.e., when expected  $A_i > B_i$  for all PAH:

The total net revenue for a resource that has a capacity commitment,  $R^c$ , is calculated as:

$$R^c = UCAP \times p + UCAP \times \left[ \sum_{i=1}^H CPBR_i \times (A_i - B_i) \right] - UCAP \times ACR \quad (7)$$

This can be summarized as the MW of capacity multiplied by the capacity clearing price plus performance bonuses less the annual avoidable costs of operating the unit.

The total net revenue for that same resource that does not have a capacity commitment but participates in the energy and ancillary services markets and earns capacity bonus performance payments,  $R^{nc}$ , is calculated as:

$$R^{nc} = UCAP \times \left[ \sum_{i=1}^H (CPBR_i \times A_i) \right] - UCAP \times ACR \quad (8)$$

This can be summarized as the MW of capacity multiplied by the bonus payments less the annual avoidable costs of operating the unit.

In equation (8) since the resource does not have a capacity performance obligation, the resource earns capacity bonus performance payments for all of its energy and reserves during performance assessment hours.

## Low ACR case

If  $R^{nc} \geq 0$ , a resource is expected to make enough revenues to cover net going forward costs without a capacity commitment and has the opportunity to be profitable as an energy only resource in the CP design.

$$\text{if } ACR \leq \sum_{i=1}^H (CPBR_i \times A_i)$$

$$\text{or } ACR \leq CPBR \times H \times \bar{A}$$

In order for such a resource to have an incentive to take on the obligation to be a capacity resource under the CP design, the expected revenue with the capacity performance obligation must be greater than or equal to the expected revenue as an energy only resource, or  $R^c \geq R^{nc}$ .

Taking on a capacity obligation is profitable and competitive if:  $R^c - R^{nc} \geq 0$ .  $R^c$  and  $R^{nc}$  are defined in equation (7) and equation (8).

Thus, the competitive offer and therefore the expected equilibrium clearing price in RPM equals a value of  $p$  such that equation (7) minus equation (8) is greater than or equal to zero:

$$p \geq \left[ \sum_{i=1}^H CPBR_i \times (B_i) \right]$$

$$\text{or, } p \geq CPBR \times H \times \bar{B} \quad (9)$$

Equation (9) is the competitive offer formula for a low ACR resource with  $A_i > B_i$  for all PAH.

If (i) the capacity performance bonus rate is assumed to be equal to the capacity non-performance charge rate (Net CONE divided by 30) and, (ii) the number of expected performance hours is expected to be 30, this is identical to:

$$p = \text{Net CONE} \times \bar{B} \quad (10)$$

These are the assumptions made in the PJM filing and result in the definition of the competitive offer cap in the PJM filing.

## High ACR case

If  $R^{nc} < 0$ , a resource is not expected to make enough revenues to cover net going forward costs without a capacity payment.



$$if\ ACR > \left[ \sum_{i=1}^H (CPBR_i \times A_i) \right]$$

$$or\ ACR > CPBR \times H \times \bar{A}$$

In order for such a resource to have an incentive to take on the obligation to be a capacity resource under the CP design, the expected revenue from the capacity payment and any bonus payments must be enough to cover all the costs of the unit including ACR. (The definition of an overperforming resource means that  $A_i > B_i$  for all PAH and that the resource is expected to receive capacity performance bonus revenues.)

If taking on a capacity obligation is to be profitable and competitive:  $R^c \geq 0$ .

From equation (7):

$$UCAP \times p + UCAP \times \left[ \sum_{i=1}^H CPBR_i \times (A_i - B_i) \right] - UCAP \times ACR \geq 0$$

$$or,\quad p \geq ACR + CPBR \times H \times (\bar{B} - \bar{A})$$

The competitive offer is:

$$p = ACR + CPBR \times H \times (\bar{B} - \bar{A}) \tag{11}$$

The competitive offer for a High ACR unit equals avoidable costs net of expected bonus performance revenues.

The assumption that makes a unit High ACR is,  $ACR > CPBR \times H \times \bar{A}$ . Comparing equations (9) and (11) and the assumption for a High ACR unit, the High ACR unit competitive offer from equation (11) is always greater than the Low ACR unit competitive offer from equation (9).

If the capacity performance bonus rate is equal to the capacity non-performance charge rate, the competitive offer for a Low ACR unit is equal to  $PPR \times H \times \bar{B}$  regardless of the performance of the unit and the competitive offer for a High ACR unit is equal to  $ACR + PPR \times H \times (\bar{B} - \bar{A})$  regardless of the performance of the unit.