UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

Calpine Corporation, Dynegy Inc.,	)	
Eastern Generation, LLC, Homer City	)	
Generation, L.P., NRG Power Marketing	)	
LLC, GenOn Energy Management, LLC,	)	
Carroll County Energy LLC,	)	**Docket No. EL16-49-000**
C.P. Crane LLC, Essential Power, LLC,	)	
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	)	
v.	)	
PJM Interconnection, L.L.C.	)	
PJM Interconnection, L.L.C.	)	**Docket Nos. ER18-1314-000, -001**
PJM Interconnection, L.L.C.	)	**Docket No. EL18-178-000**
	)	**(Consolidated)**

LIMITED ANSWER OF
PJM INTERCONNECTION, L.L.C.

PJM Interconnection, L.L.C. ("PJM"), pursuant to Rule 213 of the Federal Energy

Regulatory Commission's ("FERC" or "Commission") rules, 18 C.F.R. § 385.213,

hereby provides this Limited Answer[1] to address a few points that parties raised for the

first time in their reply submissions in this proceeding.

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[1]   PJM seeks leave to submit this limited answer to assist the Commission's decision-making process and clarify the issues. The Commission regularly allows answers in such cases. *See, e.g.*, *PJM Interconnection, L.L.C.*, 139 FERC ¶ 61,165, at P 24 (2012) (accepting answers to a protest because "they have provided information that assisted [the Commission] in [its] decision-making process"); *PJM Interconnection, L.L.C.*, 104 FERC ¶ 61,031, at P 10 (2003) (accepting answer because "it will not delay the proceeding, will assist the Commission in understanding the issues raised, and will [e]nsure a complete record upon which the Commission may act").

I.   **LIMITED ANSWER**

   A.   **Any Seller Can Avoid PJM's Proposed Minimum Offer Price Rule ("MOPR") Floor Offer Price Default Values by Showing Its Resource-Specific Net Costs, Making Claims as to the Impact of Those Values Inaccurate and Misplaced.**

In its October 2 Submittal,[2] PJM proposed default MOPR Floor Offer Price values for new and existing resources. As a threshold issue, the proposed MOPR will apply only to those resources with an Unforced Capacity ("UCAP") of 20 megawatts ("MW") or greater.[3] For those resources of a material size and entitled to a Material Subsidy, the seller may elect to submit an offer based on (1) the default MOPR floor values, or (2) a resource-specific floor price value. Sellers are free to use those default values regardless of their actual costs. Claims that the default values will harm particular unit types because the default values are too high ignores the role of defaults—namely to ease the administrative burden on unit owners who wish to avoid having to utilize PJM's resource-specific review process. Importantly, _no seller is required to use default values_: any seller can choose instead to pursue PJM's proposed option of a resource-specific floor price determination. Availability of the resource-specific option means that the default values, by definition, cannot preclude any resources from offering at their actual demonstrated net cost level, rendering protests in this area wide of the mark.[4]

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[2]   Initial Submission of PJM Interconnection, L.L.C., Docket Nos. EL16-49-000, et al. (Oct. 2, 2018) ("October 2 Submittal").

[3]   Thus, as a practical matter, the proposed MOPR will not apply to most renewable energy resources, given that their unforced capacity value is typically discounted to a substantial degree by the low capacity factor of such resources. *See* Class Average Capacity Factors, Wind and Solar Resources, PJM Interconnection, L.L.C. (June 1, 2017), https://www.pjm.com/-/media/planning/res-adeq/class-average-wind-capacity-factors.ashx?la=en.

[4]   The Commission has long recognized the benefit of resource-specific offers, holding that "resources that have lower competitive costs than the default offer

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Given that each Capacity Market Seller has the option to prove its resource's net costs warrant a floor price below PJM's default values, PJM's proposed default values reasonably include a number of conservative, verifiable assumptions to ensure the default values are not *under*stated. Understated default values would increase the opportunity for subsidized higher-cost resources to offer below their actual costs and thus defeat the very purpose of the proposed MOPR mitigation to address state subsidies. The default values are intended to be just that—a reasonable default offer for sellers who, for whatever reason, choose not to invoke PJM's unit-specific review process.

Clean Energy Industries ("CEI") (among others) complains that the safe-harbor, default values should be set lower,[5] and suggests a number of changes to the assumptions used to derive the defaults.[6] CEI implies that the resource-specific process is not a viable option because it is too "intensive" and "burdensome."[7] However, the resource-specific

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floor . . . [should] have the opportunity to demonstrate their competitive entry costs." *PJM Interconnection, L.L.C.*, 143 FERC ¶ 61,090, at P 141 (2013). *See also PJM Interconnection, L.L.C.*, 135 FERC ¶ 61,022, at P 68 (2011) ("While we agree that estimating project costs is a complex process and that the PJM-determined estimates are, like all estimates, imperfect, the MOPR allows for unit-specific determinations of costs for entities whose costs differ from PJM's net asset class CONE estimates. We find that this process reasonably accounts for the natural variations in costs that resources encounter.").

[5] Reply Comments of the Clean Energy Industries on the Application of the Minimum Offer Price Rule, Docket Nos. EL16-49-000, et al., at 16-17 (Nov. 6, 2018) ("CEI Reply"); *see also* Reply Comments of Clean Energy Advocates Separately Addressing the Scope of the Expanded Minimum Offer Pricing Rule, Docket Nos. ER18-1314-000, et al., at 14-15 (Nov. 6, 2018); Reply Comments of Joint Consumer Advocates, Docket Nos. EL18-178-000, et al., at 9 (Nov. 6, 2018).

[6] CEI Reply at 16-29. As PJM explains below, each assumption, while conservative, is reasonable and consistent with PJM's current practice. Thus, contrary to the CEI Reply (at 18), the default values are not "unrepresentatively high."

[7] *Id.* at 17, 18.

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process is not a barrier to entry, because any new project will know its capital costs and likely will have utilized similar going-forward economic modelling to make its market entry decision.

In fact, coupled with the 20 MW materiality threshold, the only renewable resources required to submit non-zero offers[8] likely will be new solar and wind resources with relatively large nameplate capacity. To the extent the sellers of these resources have costs below the default MOPR values, they can use the resource-specific option.

B. CEI's Suggested Changes to the Assumptions Underlying the Default MOPR Values for New Resources Are (with One Minor Exception) Without Merit.

CEI raises a number of suggested changes to the determination of the default minimum prices for new resources as well as resources re-entering the market following a carve out. PJM agrees with one of CEI's suggestions; the rest are without merit.

Specifically, PJM agrees with CEI that the default values should include an offset for ancillary services market revenues.[9] While such revenues are relatively small compared to energy market revenues and will have a small impact on the default values, PJM is willing to update its proposed values in a compliance filing to account for expected revenues from the ancillary services market.

Below, PJM explains why the Commission should dismiss CEI's other complaints.

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[8]   PJM reasonably estimates that the default competitive offer for existing wind and solar resources is zero, because such resources' expected energy revenues exceed their estimated avoidable costs of committing as capacity. *See* October 2 Submittal at 46; Keech Aff. ¶¶ 27-28.

[9]   CEI Reply at 20.

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1.   *CEI's Challenge to Use of the Lowest Zonal Energy Market Revenue Offset Is Without Merit.*

CEI asserts that PJM's proposed use of the lowest applicable zonal energy revenue estimate to offset estimated costs is unreasonable,[10] but their argument is not persuasive.

PJM proposes use of the lowest zonal energy market revenue in PJM, because there is significant variation in energy revenues for each resource type from zone to zone and year to year. As the purpose of the MOPR floor price is to protect the market from price suppression, the conservative safe harbor, default option—which will provide the greatest protection—is the lowest zonal value.[11] Using a higher value may allow the default values to reflect energy market revenues that are relatively overstated.

However, Capacity Market Sellers are not stuck; they may elect the resource-specific option and use energy market revenues for the zone where the resource is located. As Mr. Keech explained, "[t]he lowest zonal value is an appropriate value to utilize in developing a single estimated E&AS revenue value for each planned resource type across the entire PJM Region given the existence of an alternative, resource-specific MOPR Price option."[12]

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[10]   *Id.* at 18.

[11]   In response to the Union of Concerned Scientists' ("UCS") concern, Comments of the Union of Concerned Scientists, Docket Nos. EL16-49-000, et al., at 9 (Nov. 5, 2018) ("UCS Reply"), regarding the basis for PJM's energy market revenue estimates, PJM used the lowest zonal value for each resource type for the period from 2015 to 2017 as reported in the Independent Market Monitor for PJM's ("IMM") 2017 State of the Market Report, which is available at: http://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2017.sht ml.

[12]   Keech Aff. ¶ 21.

2.   *Attempts to Undermine Standardized Financial Inputs for All Resource Types Fail.*

CEI contends that PJM's use across all resource types of standardized financial inputs, like carrying charge and economic life, is "improper" for renewable resources, because such inputs were developed for natural gas-fired resources.[13] CEI also argues that the federal tax credits available to renewable resources should be considered.[14]

Consistent with the current Tariff,[15] PJM proposes here[16] for its default MOPR Floor Offer Price values the same basic financial assumptions, e.g., nominal levelization, 20-year economic life, and cost of capital, that were determined this year for PJM in a comprehensive study of the cost of new entry by a merchant gas-fired generator that is solely dependent on PJM market revenues.[17] These are reasonable financial assumptions for a default determination of competitive entry by other resource types that share (with gas-fired plants) dependence on capacity market revenues. PJM has one capacity market in which resources of different types compete against each other. As a result, using the same parameters as those in the Commission-approved cost of new entry determination is

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[13]   CEI Reply at 20-22.

[14]   *Id.* at 21.

[15]   *See* PJM Open Access Transmission Tariff ("Tariff"), Attachment DD, section 5.14(h)(1) (providing that the MOPR floor prices "shall be asset-class estimates of competitive, cost-based nominal levelized Cost of New Entry. . . . consistent with the methodology used to determine the Cost of New Entry set forth in Section 5.10(a)(iv)(A) of this Attachment.").

[16]   *See* October 2 Submittal, proposed pro forma Tariff, Attachment DD, section 5.14(h)(iv)(B)(2).

[17]   *See* Keech Aff. ¶¶ 19-20 (citing *PJM Cost of New Entry - Combustion Turbines and Combined-Cycle Plants with June 1, 2022 Online Date,* https://www.pjm.com/~/media/committees-groups/committees/mic/20180425-special/20180425-pjm-2018-cost-of-new-entry-study.ashx). *See also PJM Interconnection, L.L.C.,* 135 FERC ¶ 61,022, at P 50 (discussing 20-year economic life).

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reasonable to ensure that resources competing against each other are being analyzed in a comparable fashion. Consistent with this approach, the Commission has recognized that standardized inputs are a simplifying tool appropriate for determining floor prices.[18]

As to economic life, 20 years is a reasonable assumption. While some resources may anticipate a longer useful life, recent experience with significant changes in the relative competitiveness of various resource types in wholesale markets highlights the risk to a developer of relying on 20 years of market revenue to fully recover its plant costs. Accordingly, suggestions for an even longer cost recovery period seem overly optimistic, particularly for use in a default offer value.

Last, contrary to CEI, the competitive costs for renewables should not be based on a subsidy in the form of tax credits. That would be contrary to the purpose of the MOPR.

> 3.   *Contrary to Challengers, PJM Did Not Simply Assume One Energy Market Revenue Estimate for Onshore and Offshore Wind; Rather, a Common Value Happened to Result from Use of Differing Sets of Assumptions.*

CEI and the UCS question PJM's use of identical energy market revenue offsets for onshore wind and offshore wind.[19] However, this was not by design. In developing these values, PJM used differing capacity factors of 26% of nameplate capacity for offshore wind and 14.7% for onshore wind.[20] Due to lack of data for offshore wind (there

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[18]   *See PJM Interconnection, L.L.C.*, 143 FERC ¶ 61,090, at P 144 ("We encourage PJM and its stakeholders to consider, for example, whether the unit-specific review process would be more effective if PJM requires the use of common modeling assumptions for establishing unit-specific offer floors while, at the same time, allowing sellers to provide support for objective, individual cost advantages.").

[19]   CEI Reply at 22; UCS Reply at 9.

[20]   *See* Class Average Capacity Factors, Wind and Solar Resources, PJM Interconnection, L.L.C., https://www.pjm.com/-/media/planning/res-adeq/class-

is none in PJM), PJM estimated the energy revenue offset for offshore wind by multiplying the energy revenue offset for onshore wind as follows: $63,327/MW-year by offshore/onshore capacity factor ratio of 26%/14.7% or 1.77, or stated another way: $63,327 * 1.77 = $112,007/MW-year.[21] Then, PJM converted the energy revenue offset from $/MW-year (nameplate MW basis) to $/MW-day (UCAP MW basis). The resulting values are, for onshore wind $63,327/(365*0.147) = $1180/MW-day and for offshore wind $112,007/(365*0.26) = $1180/MW-day. Both values turn out to be the same. Thus, while PJM did assume a higher energy revenue offset for offshore wind, the energy market revenue offset per UCAP MW basis ended up being identical to onshore wind because the offshore wind capacity factor relative to onshore wind is higher by the same ratio used to estimate the energy revenue offset. Actual data from offshore wind will be necessary to refine the energy revenue offset estimate for that resource class.

     C.   **Protestors' Suggested Departures from the Method the Commission Has Long Accepted to Determine Avoidable Costs for New Entry Are Beyond the Scope of this Proceeding and Not Reasonable.**

Since its inception, PJM's MOPR has determined competitive offers for new resources based on such resources' net cost of new entry. The Commission has consistently approved this approach, and has repeatedly held that a resource subject to

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average-wind-capacity-factors.ashx?la=en. PJM based the 26% offshore capacity factor on projects that are in PJM's interconnection queue.

[21]   As explained, PJM used the lowest zonal energy revenue value estimated for onshore wind. *See* section I.B.1 above and Keech Aff. ¶ 21. The onshore wind energy revenue offset $63,327/MW-year in the above calculation was the Penelec value taken from Table 7-19 in 2017 State of the Market Report.

MOPR is reasonably subject to an offer floor based on its entry costs until the resource shows it is needed by the market at a price based on such costs.[22]

The IMM and other parties now suggest major departures from this precedent, suggesting three alternative approaches for both new and existing resources: (1) the net avoidable cost rate approach advanced by the IMM[23] and, by CEI;[24] (2) the "Depreciated MOPR" approach;[25] and (3) the Levelized Cost of Energy ("LCOE") approach.[26]

At the outset, the Commission instituted this section 206 proceeding to address the impact of state subsidies on capacity prices determined in PJM's capacity auctions.[27] Some parties evidently seek to bootstrap that finding to mount a broad challenge to the determination of competitive costs for purposes of mitigation in general. These challenges to Commission-accepted determination of new entry floor prices are beyond the scope of this proceeding.

As to the merits, the IMM and other parties seek, for the first time, a change in the Commission's long-standing approach to determining competitive offers for new resources. The Commission has "reject[ed] . . . challeng[es] [to] PJM's use of Net [Cost

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[22]   *See, e.g.*, *PJM Interconnection, L.L.C.*, 135 FERC ¶ 61,022, at PP 172-76; *PJM Interconnection, L.L.C.*, 137 FERC ¶ 61,145, at PP 122-33 (2011); *see also* Tariff, Attachment DD, section 5.14(h)(4)(i) (applying MOPR until the resource clears an auction).

[23]   Brief of the Independent Market Monitor for PJM, Docket Nos. EL16-49-000, et al., at 9-18 (Oct. 2, 2018) ("IMM"); Brief of the Independent Market Monitor for PJM, Docket Nos. EL16-49-000, et al., at 2-7 (Nov. 6, 2018) ("IMM Reply"); at CEI Reply at 24-25.

[24]   CEI Reply at 24-25.

[25]   CEI Reply at 25-28.

[26]   *Id.* at 28-29.

[27]   *Calpine Corp. v. PJM Interconnection, L.L.C.*, 163 FERC ¶ 61,236, at PP 149-56 (2018) ("June 29 Order").

of New Energy] as the benchmark for MOPR mitigation"[28] and found "just and

reasonable [an] administrative method for calculating the MOPR reference values

consistent with the existing [Variable Resource Requirements] Curve guidelines."[29]

Thus, "the MOPR offer floor should apply to each new resource in the base residual

auction and each incremental auction until the resource demonstrates that its capacity is

needed by the market *at a price near its full entry cost*—by clearing one of the PJM

capacity auctions (base residual or incremental) at an offer price near its full cost of

entry."[30] By requiring new resources to offer near their full entry costs until the resource

clears a capacity auction, the initial capital investment to build a new resource is not

simply treated as "sunk cost" and disregarded. Put another way, all of a resource's costs

are deemed to be avoidable until the resource clears the market.[31] After it clears the

market (demonstrating market need at its new entry costs), the resource's competitive

costs are reasonably measured as those it can avoid by not committing as capacity for the

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[28]   *PJM Interconnection, L.L.C.*, 135 FERC ¶ 61,022, at P 69.

[29]   *PJM Interconnection, L.L.C.*, 137 FERC ¶ 61,145, at P 25.

[30]   *PJM Interconnection, L.L.C.*, 135 FERC ¶ 61,022, at P 176 (emphasis added).
        The current MOPR implements this holding. *See* Tariff, Attachment DD, section
        5.14(h)(1) ("the Net Asset Class Costs of New Entry shall be asset-class estimates
        of competitive, cost-based nominal levelized Cost of New Entry, net of energy
        and ancillary service revenues. Determination of the gross Cost of New Entry
        component of the Net Asset Class Cost of New Entry shall be consistent with the
        methodology used to determine the Cost of New Entry set forth in Section
        5.10(a)(iv)(A) of this Attachment.").

[31]   *See* Reply Submission of PJM Interconnection, L.L.C., Docket Nos. EL16-49-
        000, et al., at 17-18 (Nov. 6, 2018) ("PJM Reply Submittal") (citing 153 FERC
        ¶ 61,066, at P 81 (2015)).

delivery year at issue.[32] The record in this proceeding does not justify abandoning this

long-established approach.[33]

Under the IMM's net avoidable cost rate approach, which declines to consider a

resource's construction costs, subsidized new entry could easily circumvent the MOPR

rules by accepting subsidies supporting the construction costs of a new high-cost resource

and significantly expending capital costs upfront before offering the resource into the

market. Once the seller has sunk enough costs in the resource for it to appear

"competitive" under the IMM's approach, the resource could offer and clear at a level

below the resource's actual cost of entry, thereby evading the price suppression

mitigation of the MOPR even though the resource would never have cleared on the basis

of the actual cost of the facility.[34] This result clearly would undermine the purpose of the

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[32]   *See PJM Interconnection, L.L.C.*, 153 FERC ¶ 61,066, at P 77 (2015) ("The one
year application of the MOPR therefore permits a resource to submit a
competitive offer price [in subsequent auctions] reflecting its going forward costs
and excluding construction costs incurred after the resource has cleared.").

[33]   The UCS commented that PJM did not provide the same level of detail underlying
its cost of new entry estimates for each resource type as PJM does for the Cost of
New Entry ("CONE") estimate used to shape the Variable Resource Requirement
curve. Comments of the Union of Concerned Scientists, Docket Nos. EL16-49-
000, et al., UCS Reply at 8. Given the limited import of default MOPR floor
prices, PJM could not justify putting forth the effort needed to develop technology
and location specific engineering estimates for each resource type similar to the
approximately 90-page 2018 CONE Study PJM submitted in Docket No. ER19-
105-000 (Exhibit No. 2 to Attachment E). The resource-specific option typically
would rely on location-specific information.

[34]   The IMM argues that requiring subsidized new resources to offer in based on their
actual cost of new entry would "define a competitive offer so as to exclude some
offers" from the capacity market. IMM Reply at 5. The IMM misses the point.
The purpose of mitigating an offer price to reflect a resource's costs is to ensure
competitive auction results. The IMM's proposal does not ensure a competitive
result because it would allow new subsidized resources to evade the MOPR.
However, excluding the resource entirely would also potentially preclude a
competitive result because it's possible a resource could clear on the basis of its
new entry costs.

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MOPR, and for this reason, the Commission approved applying the MOPR until the resource clears the market.[35]   Accordingly, the Commission should reject the newly-proffered approach of disregarding all capital costs of a new resource.

The Commission likewise should reject the proposed Depreciated MOPR approach, which would require abandoning the nominal levelization that the Commission has long found "reasonable for mitigation under the MOPR and . . . appropriate for the objectives of [PJM's Capacity Market]."[36]   The nominal levelization method assumes that net revenues will be constant in nominal terms over the 20-year life of the resource, which is "consistent with the mortgage-like cash stream associated with project finance."[37]   By contrast, the proposed Depreciated MOPR would drop the net cost of new entry significantly over just the first four years a resource is in service, which is inherently inconsistent with a levelized approach.

The proffered LCOE approach also is inappropriate for developing a MOPR Floor Offer Price.[38]   LCOE is the result of dividing a resource's annual capital and operating costs by the annual energy it produces. Accordingly, while LCOE arguably is useful for providing an economic comparison of *energy production* by different technologies, for the same basic capital and operating costs LCOE cannot produce a significantly lower

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[35]   *See PJM Interconnection, L.L.C.*, 137 FERC, ¶ 61,145, at P 125 (2011) ("PJM voluntarily filed to eliminate its existing tariff because it contained a loophole: it applied [the MOPR] only once, for the first delivery year in which the resource could be offered, so that a resource by sitting out one auction, could depress prices in a second auction without mitigation. The Commission agreed with PJM that its existing tariff was unjust and unreasonable.").

[36]   *PJM Interconnection, L.L.C.*, 135 FERC ¶ 61,022, at P 51 (2011); *see also id.* at PP 43, 49-51 (finding the nominal levelized approach just and reasonable).

[37]   *PJM Interconnection, L.L.C.*, 135 FERC ¶ 61,022, at P 51.

[38]   CEI Reply at 28-29.

Net CONE as the basis for a resource's competitive cost of committing as *capacity*. In any event, it is not clear how CEI calculated $12/MW-day for a new solar photovoltaic resource, while PJM's $387/MW-day value is supported by publicly available data from the National Renewable Energy Laboratory.[39]

Both on the merits and on the fact that these issues are simply beyond the scope of the issues here, these arguments should be rejected.

> **D.   The Illinois Attorney General's Complaints About the Reliability Pricing Model's ("RPM") Auction Clearing Rules Do Not Detract from the June 29 Order's Findings on the Need for MOPR Reform, and Are Outside the Scope of the Paper Hearing.**

The Illinois Attorney General ("AG") contends that, entirely apart from the section 206 findings in the June 29 Order concerning MOPR and state options to commit subsidized uneconomic resources as wholesale capacity, other aspects of the RPM auction clearing method "will distort and drive up the final capacity price, resulting in unjust and unreasonable prices."[40] The Illinois AG argues that because of this alleged deficiency in market rules not otherwise at issue in this case, "the imposition of a minimum offer price will have no effect on capacity prices (up or down) that are already substantially in excess of a competitive level."[41] The Illinois AG's affiant Mr. Robert McCullough elaborates on these objections to RPM's auction clearing rule, making clear that the Illinois AG's objection is focused on the rule governing clearing of marginal offers.[42]

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[39]   *See* Keech Aff. ¶¶ 18-21.

[40]   Responsive Brief of the People of the State of Illinois, Docket Nos. EL16-49-000, et al., at 10 (Nov. 6, 2018).

[41]   *Id.* at 12.

[42]   *Id.* at Attachment A ("McCullough Aff.").

PJM's approved, current effective Tariff, Attachment DD, section 5.12(a), explicitly prescribes, as follows, the key market clearing rules to which Mr. McCullough and the Illinois AG object:

> The optimization algorithm shall be applied to calculate the overall clearing result to minimize the cost of satisfying the reliability requirements across the PJM Region, regardless of whether the quantity clearing the Base Residual Auction is above or below the applicable target quantity, while respecting all applicable requirements and constraints . . . Where the supply curve formed by the Sell Offers submitted in an auction falls entirely below the Variable Resource Requirement Curve, the auction shall clear at the price-capacity point on the Variable Resource Requirement Curve corresponding to the total Unforced Capacity provided by all such Sell Offers. Where the supply curve consists only of Sell Offers located entirely below the Variable Resource Requirement Curve and Sell Offers located entirely above the Variable Resource Requirement Curve, the auction shall clear at the price-capacity point on the Variable Resource Requirement Curve corresponding to the total Unforced Capacity provided by all Sell Offers located entirely below the Variable Resource Requirement Curve. In determining the lowest-cost overall clearing result that satisfies all applicable constraints and requirements, the optimization may select from among multiple possible alternative clearing results that satisfy such requirements, including, for example (without limitation by such example), accepting a lower-priced Sell Offer that intersects the Variable Resource Requirement Curve and that specifies a minimum capacity block, accepting a higher-priced Sell Offer that intersects the Variable Resource Requirement Curve and that contains no minimum-block limitations, or rejecting both of the above alternatives and clearing the auction at the higher-priced point on the Variable Resource Requirement Curve that corresponds to the Unforced Capacity provided by all Sell Offers located entirely below the Variable Resource Requirement Curve.

Compare McCullough Aff. at ¶¶ 9-13 and 19-26 (describing objections to these same elements of the market-clearing optimization algorithm).

The June 29 Order found under section 206 that PJM's existing MOPR is unjust and unreasonable because it does not sufficiently protect clearing prices from suppression by subsidized, uneconomic offers from existing and new resources.[43] The June 29 Order

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[43]   June 29 Order at PP 150-56.

made no findings at all with respect to the market optimization algorithm prescribed by Tariff, Attachment DD, section 5.12(a), and any issues that the Illinois AG might have with PJM's market clearing algorithms are outside the scope of the proceeding.

In any event, the Illinois AG's suggestion that its objections to the auction clearing algorithm somehow obviate the need to reform MOPR is incorrect. The Commission has long held,[44] and has ample analyses in this proceeding to confirm,[45] that allowing subsidized sellers to submit offers below their resource's net costs unreasonably suppresses auction clearing prices.[46]

E.   The Pennsylvania Public Utility Commission's ("PUC") Suggestion that PJM's Expanded MOPR Will Produce Unreasonably High Clearing Prices is Not Persuasive.

The June 29 Order found that MOPR must be expanded to existing resources, and more resource types. PJM's initial submission in this paper hearing proposed to do exactly that.[47] The Pennsylvania PUC, however, raises concern that expansion of MOPR

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[44]   *See, e.g.*, *Midwest Indep. Transmission Sys. Operator, Inc.*, 139 FERC ¶ 61,199, at P 69 (2012); *ISO New England, Inc.*, 135 FERC ¶ 61,029, at P 170 (2011).

[45]   *See, e.g.*, *PJM Interconnection, L.L.C.*, Docket No. ER18-1314-000, at 24-35, Attachments E & F (Apr. 16, 2018); Motion to Amend, and Amendment to, Complaint and Request for Expedited Action on Amended Complaint of Calpine Corp., Docket No. EL16-49-000 (Jan. 9, 2017); Complaint Requesting Fast Track Processing of Calpine Corp., Docket No. EL16-49-000, at 23-33 & Attachment A (Mar. 21, 2016); Joe Bowring, Devendra Canchi, John Hyatt & Alexandra Salaneck, *Capacity Auction Clearing with Resource Specific FRR*, Monitoring Analytics (Sept. 11, 2018) https://www.pjm.com/-/media/committees-groups/committees/mrc/20180911-special/20180911-imm-sensitivity-analysis.ashx.

[46]   That *other* factors, such as tax law changes and the Tariff's auction clearing optimization rules, *also* affect clearing prices, does not negate the intuitively obvious (and well-supported) conclusion that allowing subsidized resources to submit uneconomic offers will adversely affect the auction clearing price on which competitive, unsubsidized resources depend to help the PJM Region meet resource adequacy goals.

[47]   *See* October 2 Submittal at 36-50.

to existing resources will produce "excessively high costs to consumers," e.g., "applying a MOPR to an existing wind unit that has *not* cleared in a previous BRA would result in a MOPR price of $2,489/MW-Day," and a BRA price at that level if the resource clears.[48] The Pennsylvania PUC suggests that the resulting auction price would be unreasonable.

This concern is misplaced. The likelihood a resource would clear at that price is zero under any supply conditions. Pennsylvania PUC suggests that if the new wind plant fails to clear at that MOPR price, the resulting auction price would be unreasonable.[49] To the contrary, if a high-cost resource cannot clear a competitive auction without a subsidy, that resource *should not* clear, if the auction is to remain competitive. Moreover, the highest price on the VRR Curve, which acts as a cap on the clearing price, is far below that level—$482.36/MW-Day in last year's BRA,[50] for example.[51]

F.   PJM Supports the Need for Clarity Around the Definition of a Material Subsidy that Ultimately Leads to Which Resources are Subject to MOPR and, as such, would be Eligible for the Resource Carve-Out.

Exelon seeks Commission guidance on various aspects of the Resource Carve-Out to ensure clarity and a path forward.[52] PJM supports the need for clarity in this area.

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[48]   Reply Comments of the Pennsylvania Public Utility Commission, Docket Nos. EL16-49-000, et al., at 12-13 (Nov. 6, 2018).

[49]   *Id.* at 12.

[50]   *See 2021-2022 RPM Base Residual Auction Planning Parameters*, PJM Interconnection, L.L.C., Tab B, Column B, Row 20 (May 3, 2018), https://www.pjm.com/-/media/markets-ops/rpm/rpm-auction-info/2021-2022/2021-2022-bra-planning-period-parameters.ashx?la=en.

[51]   In addition, PJM demonstrated that the Extended RCO proposal also would not lead to excessive prices, showing that removing the three nuclear resources likely to receive zero emission credits would only increase clearing prices by about $11/MW-day. *See* PJM Reply Submittal at 27-29 & Attachment A.

[52]   Motion for Leave to Answer and Answer of Exelon Corporation, Docket Nos. EL16-49-000, et al., (Nov. 21, 2018) ("Exelon Answer"). While Exelon

Specifically, there is an apparent need to clarify what type of state directed procurements will constitute a Material Subsidy, triggering application of the MOPR or, in the alternative, eligibility for the Resource Carve-Out.[53]   Returning to PJM's October 2 submittal,[54] and analyzing the scenarios Exelon laid out in its answer,[55] PJM clarifies, as follows, how it would handle state directed procurements such as those hypothesized by Exelon:

In short, any state directed wholesale procurement that includes a Material Subsidy[56] that is also defined as a "Capacity Resource with Actionable Subsidy" (meaning the resource is not exempt under the Self-Supply Exemption or the materiality

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seeks guidance on various subjects concerning the Resource Carve-Out such as who pays for carved out capacity, at what rate should capacity be compensated, and who determines that rate, PJM limits its response here to the question of what constitutes a Material Subsidy. PJM is not repeating here its proposals on Exelon's other issues, as PJM has sufficiently addressed those issues in its prior submissions.

[53]   *See, e.g.*, Exelon Answer at 4-9; Reply Comments of Direct Energy and NextEra Energy Resources, Docket Nos. EL16-49-000, et al., at 7-9, 14-17 (Nov. 6, 2018); Reply Brief of NRG Power Marketing LLC, Docket Nos. EL16-49-000, et al., at 14-17 (Nov. 6, 2018); Reply Brief of the Electric Power Supply Ass'n, Docket Nos. EL16-49-000, et al., at 16-23 (Nov. 6, 2018).

[54]   October 2 Submittal at 19-21; PJM Reply Submittal at 13-14.

[55]   Exelon Answer at 4-9.

[56]   *See* October 2 Submittal, proposed pro forma Tariff, Definition of Material Subsidy ("Material Subsidy" shall mean: (1) material payments, concessions, rebates, or subsidies as a result of any state governmental action connected to the procurement of electricity or other attribute from an existing Capacity Resource, or the construction, development, or operation, (including but not limited to support which has the effect of allowing the unit to clear in any RPM Auction) of a Capacity Resource, or (2) other material support or payments obtained in any state-sponsored or state-mandated processes, connected to the procurement of electricity or other attribute from an existing Capacity Resource, or the construction, development, or operation, (including but not limited to support which has the effect of allowing the unit to clear in any RPM Auction), of the Capacity Resource . . . .").

thresholds),[57] will be subject to MOPR, and thus eligible to elect the Resource Carve Out. To be clear, a subsidy need not be explicitly stated or captured in a distinct rate for it to be considered a Material Subsidy; rather the state-directed procurement itself that includes a non-bypassable charge or any other rate to retail customers imposed by law or regulation, will constitute the subsidy.

This approach is consistent with prior holdings concerning the effect of state-sanctioned subsidies on the wholesale capacity market.[58] In *Hughes v. Talen*, the U.S. Supreme Court found Maryland's program of ensuring a constant revenue stream to certain resources in a contract for differences through a combination of non-bypassable charges on load and PJM market revenues to impermissibly impact PJM's wholesale capacity market.[59] The U.S. Court of Appeals for the Third Circuit likewise found New Jersey's similar program of guaranteeing a generation resource a specific revenue stream via a non-bypassable charge on load unlawful.[60] For its part, the Commission has found non-bypassable charges render retail customers "captive" in states that otherwise allow retail choice, thus negating a key condition for allowing market-based rates for affiliate transactions. [61] Indeed, the June 29 Order found PJM's proposed MOPR-Ex unjust and

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[57] Materiality thresholds include (1) if the resource has an unforced capacity value of less than 20 MWs; (2) if energy production is not the resource's primary purpose but rather a by-product of its business function; or (3) if the subsidy is less than 1% of its expected revenues in PJM's wholesale markets. This also would not apply to a resource that is desgnated in a Fixed Resource Requirement ("FRR") Alternative Entity's FRR Capacity Plan.

[58] *See Hughes v. Talen Energy Mktg, LLC*, 136 S.Ct. 1288, 1299 (2016) (clarifying that opinion should not be read to foreclose states from encouraging generation through measures that are "untethered to a generator's wholesale market participation.").

[59] *Id.* at 1297-1299.

[60] *PPL Energyplus, LLC v. Solomon*, 766 F.3d 241, 246 (2014).

unreasonable based, in part, on "its failure to mitigate offers for existing resources that receive subsidies through non-bypassable charges."[62]

PJM recognizes this approach to state-directed procurement programs may over time come to impact many resources. PJM again notes there could come a point when the amount of Carved Out Resources becomes so large that a capacity market for the remaining resources will not remain viable. For this reason, a cap on the amount of megawatts electing the Resource Carve-Out option makes sense. The urgency in establishing the rules around such a cap will be driven in large part on whether the Commission decides to adopt the Extended Resource Carve-Out proposal to correct the price suppressive effects of subsidies on capacity prices.[63] But the essential point here is that States need to make a choice. If a deregulated state seeks to procure large swaths of its own preferred capacity it must accept the need either to re-regulate and engage in self-supply or participate in the FRR Alternative that has been a part of the market for more than a decade since the inception of RPM. No state can reasonably expect market procurement to function effectively alongside extensive out-of-market procurement.

To illustrate the types of state-directed procurements that will result in resources obtaining a Material Subsidy, PJM provides the following non-exhaustive list. A common facet of each listed scenario is that the resources selected will receive an out-of-market payment connected with a state directed procurement accompanied by a subsidy (whether explicitly stated or not) and associated rate recovery from retail load:

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[61]   Order No. 697-A at P 198.

[62]   June 29 Order at P 117.

[63]   *See* October 2 Submittal at 6-7; PJM Reply Submittal at 26-27. If an express mechanism to address price suppression is accepted, a greater number of carved out resources can be tolerated while still preserving expectation that the PJM capacity market would result in just and reasonable outcomes.

- State directs procurement of capacity from a specific resource because it does not want that unit to retire;

- State directs procurement of capacity from a specific clean energy resource because it values clean energy. The payment to the resource may or may not include explicit additional payments for the clean energy attributes of the resource;

- State directs procurement of capacity from a specific resource for any other attribute it values. The payment to the resource may or may not include explicit additional payments for the desired attributes of the resource; and

- State directs a request for proposal or an auction to procure resources for one or more attributes. The payment to the winning resource(s) may or may not include explicit additional payments for the desired attributes of the resource.

In each such instance above, retail customers are captive to paying for preferred resources at a wholesale rate higher than what the market would deliver. In each instance above, the Material Subsidy defeats the intended operation of the market. Resources selected in these scenarios will, subject to materiality thresholds, be considered Capacity Resources with Actionable Subsidies and will be subject to the MOPR (at a resource-specific or default floor price) or they can select the Resource Carve Out. It bears repeating,[64] that a resource is eligible for the Resource Carve Out *only* if is subject to MOPR in the first instance.

The above examples illustrate "state directed procurement" scenarios seeking to compensate resources for preferred social or environmental attributes recognized by state policy but not recognized by the PJM capacity market. These procurements will be subject to MOPR and qualify for the Resource Carve Out. Conversely, a voluntary bilateral transaction for capacity and/or other attributes that is not state-directed and/or

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[64]   October 2 Submittal at 14.

that does not result in a non-bypassable charge to consumers would *not* be considered a Material Subsidy and not trigger MOPR (or accordingly the Resource Carve Out).

Finally, as PJM noted in its initial comments,[65] even if a resource qualifies and elects the Resource Carve Out, any rate it may establish pursuant to a state program to receive compensation for a Commission-regulated, wholesale market product (notably, capacity) will be subject to Commission review and must meet Federal Power Act standards, including requirements prohibiting non-discriminatory rates.

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[65]   October 2 Submittal at 60-61.

III.   CONCLUSION

For the foregoing reasons, the Commission should adopt the PJM proposal along with the accompanying pro forma tariff sheets for implementation through a compliance filing in time for the August 2019 Base Residual Auction.

Respectfully submitted,

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December 6, 2018

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 Washington, DC, this 6th day of December 2018.

/s/ Ryan J. Collins
Ryan J. Collins

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