UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION


MOTION FOR LEAVE TO ANSWER AND ANSWER OF
PJM INTERCONNECTION, L.L.C.

Pursuant to Rules 212 and 213 of the Federal Energy Regulatory Commission’s ("Commission") Rules of Practice and Procedure,\(^1\) PJM Interconnection, L.L.C. ("PJM") respectfully submits this Motion for Leave to Answer and Answer to several comments and protests regarding PJM’s August 5 Compliance Filing\(^2\) submitted in response to the Commission’s May 21 Order.\(^3\)

I. MOTION FOR LEAVE TO ANSWER

Although an answer to a protest is not a matter of right under the Commission’s regulations,\(^4\) the Commission routinely permits such answers when the answer provides useful and relevant information that will assist the Commission in its decision-making process,\(^5\) corrects


\(^{3}\) *PJM Interconnection, L.L.C.*, 171 FERC ¶ 61,153 (2020) ("May 21 Order").

\(^{4}\) 18 C.F.R. § 385.213(a)(2).

factual inaccuracies and clarifies the issues, and assures a complete record in the proceeding, provides information helpful to the disposition of an issue, or permits the issues to be narrowed.

This answer satisfies this criteria, and accordingly PJM respectfully requests that the Commission grant leave and accept this answer.

II. ANSWER

As a preliminary matter, PJM notes that the August 5 Compliance Filing is the product of a careful and thoughtful process in developing a methodology to estimate the projected net Energy and Ancillary Services offset (“E&AS Offset”). This process included multiple stakeholder discussions with many stakeholder suggestions being incorporated in the proposed methodology. As such, PJM maintains that the August 5 Compliance Filing, along with the minor tweaks described herein, represents a just and reasonable approach in meeting the Commission’s directive from the May 21 Order. PJM acknowledges that there may be alternative methods to estimate the projected E&AS Offset that may also be just and reasonable, but submits that other potential approaches be reviewed as part of the next quadrennial review, which commences in the Spring of 2021. This will allow sufficient time to consider such alternative approaches with the benefit of

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8 See, e.g., CNG Transmission Corp., 89 FERC ¶ 61,100, 61,287, n.11 (1999).
10 For the purpose of this filing, capitalized terms not defined herein shall have the meaning as contained in the Open Access Transmission Tariff, Reliability Assurance Agreement, and the Amended and Restated Operating Agreement of PJM Interconnection, L.L.C.
11 See Tariff, Attachment DD, section 5.10(a)(vi)(D) (“Beginning with the Delivery Year that commences June 1, 2018, and continuing no later than for every fourth Delivery Year thereafter, the Office of the Interconnection shall review the methodology set forth in this Attachment for determining the Net Energy and Ancillary Services Revenue Offset for the PJM Region and for each Zone.”). In any event, because PJM’s forward-looking E&AS Offset methodology was submitted pursuant to a section 206 compliance obligation, if it is just and reasonable, the Commission will prefer it over any alternatives. This is true regardless of whether any competing proposal also is just
experience with the current E&AS Offset, while avoiding any further delay of the upcoming Base Residual Auctions (“BRAs”). Moreover, such an approach would be consistent with the Commission’s recent decision to adopt default gross cost of new entry values for use in determining default floor prices associated with the Minimum Offer Price Rule (“MOPR”) and allow them to be reviewed as part of the quadrennial review process.

Notwithstanding the foregoing, to the extent the Commission believes that modifications to the August 5 Compliance Filing are necessary to meet the more limited question of whether the proposal is in compliance with the May 21 Order, the Commission should provide clear and specific guidance on any potential subsequent compliance requirement. This will allow PJM to expeditiously file compliance without the need to develop an alternative approach and re-engage in additional stakeholder discussions that would further delay an already significantly delayed auction to procure capacity for the 2022/2023 Delivery Year. In other words, PJM requests that any such subsequent compliance requirement provide specific directives and accompanying tariff

See, e.g., PJM Interconnection, L.L.C., 117 FERC ¶ 61,331 at P 85 (2006) (“[W]hen choosing between competing just and reasonable options, the Commission has previously stated that it will accept the proposal of a utility if it is just and reasonable, rather than other competing just and reasonable proposals); Kern River Gas Transmission Co., Opinion No. 486-E, 136 FERC ¶ 61,045, at PP 39-41 (2011) (“If a pipeline’s proposed remedy in a NGA section 5 proceeding is found to be just and reasonable, it is clear … that the Commission will accept that just and reasonable proposal even in the presence of just and reasonable submissions by other parties to the proceeding. To this extent precedent reveals that the pipeline’s proposal is granted a preference.”); ANR Pipeline Co., 109 FERC ¶ 61,138 at P 28, order on reh’g, 110 FERC ¶ 61,069 at P 49, order on reh’g, 111 FERC ¶ 61,113, at P 19 (2005)(“To the extent ANR’s proposed remedy is just and reasonable, the Commission will approve that remedy, even though other just and reasonable remedies might exist.”).

12 PJM acknowledges the Public Interest and Customer Organizations’ position that certain components of the E&AS Offset proposal be further evaluated and revised in a subsequent compliance filing by January 31, 2021. See PJM Interconnection, L.L.C., Public Interest and Customer Organizations’ Partial Protest of and Comments on PJM’s Compliance Filing Regarding Energy and Ancillary Service Offset, Docket No. EL19-58-002 (Sept. 2, 2020). Such alternative approaches would require time sufficient for stakeholders to adequately discuss and consider. As such, it is unrealistic that an alternative approach could be developed and submitted by January 31, 2021, and for the Commission to review and accept such alternative prior to the conduct of the delayed BRAs. Accordingly, PJM proposes to continue to review its E&AS Offset approach with stakeholders and, if appropriate, submit proposed changes for the Commission’s consideration as part of the next quadrennial review.

13 See Calpine Corp. v. PJM Interconnection, L.L.C., 169 FERC ¶ 61,239, at P 143 (2019) (“We also adopt PJM’s proposal to update the values annually and as part of PJM’s quadrennial review of its demand curve and CONE values.”).
language so that PJM’s compliance obligation can be met without further delaying the upcoming BRA.

A. PJM Agrees That Nuclear Refueling Outages May Result in Significant Annual Variations.

In August 5 Compliance Filing, PJM proposed to use a nuclear resource’s “anticipated refueling schedule” when determining availability for purposes of estimating its net E&AS Offset. Upon review of comments to this proposed approach, PJM agrees that using the anticipated refueling schedule for nuclear resources for a given year may result in significant variations year-over-year given that such outages generally do not occur annually while the duration of a nuclear outage is relatively longer than outages for other resource types. As a result, PJM agrees that a methodology that uses an average equivalent availability factor of all PJM nuclear resources can better represent a nuclear resource’s refueling outage and avoid yearly variations. Notably, the approach to use a class average equivalent availability factor for nuclear facilities is also supported by the Independent Market Monitor for PJM (“Market Monitor”). Accordingly, PJM is amendable to revising the proposed approach for determining the default E&AS Offset for nuclear resources in a subsequent compliance using the method described in PSEG’s comments. Any Capacity Market Sellers that wish to use an alternative approach would need to request a resource-specific exception.

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B. PJM Agrees that the Use of Hub-to-Node FTR Auction Values Is A Reasonable Means to Estimate the Basis Differential for Projecting Forward Prices of Existing Resources that Seek a Resource-Specific E&AS Offset.

In the August 5 Compliance Filing, PJM proposed to use long-term Financial Transmission Rights ("FTRs") auction results as a component in the calculation of forward monthly peak and off-peak prices for each Zone, by applying as the basis differential the difference between long-term FTR prices at the relevant liquid hub and the Zone.\(^{18}\) These Zonal prices will be used to determine default Net E&AS Offsets. To determine the resource-specific E&AS Offset for an existing resource, PJM proposed to determine the basis differential by considering both: (1) the difference between the long-term FTR price at the relevant liquid hub and the Zone, and (2) the difference between the historical LMP for each hour at the Zone and generation bus.\(^{19}\)

Exelon argues that PJM’s proposed “two-step locational adjustments (hub to Zone and then Zone to bus) to derive unit-specific forward energy revenue for existing resources” should be replaced with a resource-specific approach that uses the FTR auction results for “the congestion differential between the hub and the [generation] bus.”\(^{20}\) PJM agrees that such a one-step approach would “increase measurement precision by eliminating the zonal adjustment step in between estimating the forward liquid hub price and the unit-specific nodal prices.”\(^{21}\) Accordingly, while PJM’s approach of discretely relying on FTR auction data for the first step and using historical LMP differences for the second step is reasonable for determining the default E&AS Offsets,\(^{22}\) Exelon’s one-step proposal of long-term FTR auction hub-to-bus values to estimate the basis

\(^{18}\) August 5 Compliance Filing at 16-17; id., Attachment A, proposed Tariff, Attachment DD, section 5.10(a)(v-1)(C)(3).

\(^{19}\) id., Attachment A, proposed Tariff, Attachment DD, section 5.10(a)(v-1)(C)(3)(6).

\(^{20}\) Exelon Protest at 15.

\(^{21}\) Exelon Protest at 17.

\(^{22}\) See August 5 Compliance Filing at pp. 15-18.
differentials for projecting forward prices of existing units is also reasonable. Thus, PJM would be willing to implement such an approach for determining the default E&AS Offsets on compliance, if directed by the Commission.

C. Contrary to the Independent Market Monitor for PJM, Long-term FTR Auction Prices are a Reasonable Component of a Forward-looking E&AS Offset.

The Market Monitor opposes PJM’s proposal to rely on forward expectations, as expressed through long-term FTR auction results, to estimate Zonal and generation bus basis differentials from the liquid hub in determining future energy prices, and proposes to instead to “shape the forward energy prices [at PJM Western Hub] using only historical LMPs.”23 The Market Monitor’s primary objection is that there is timing mismatch between the applicable Delivery Year and the long-term FTR auction subject year.24 The Commission should reject the Market Monitor’s proposed change for the reasons explained below.

In developing the proposed forward-looking E&AS Offset methodology, PJM endeavored to employ, to the extent reasonable, forward-looking components as well as approaches employed by Capacity Market Sellers. In this regard, PJM recognizes the timing mismatch25 but finds that any detriment is well outweighed by the facts that: (1) long-term FTR auction results reflect the market’s expectation of future conditions; and (2) it is “standard practice” for market participants to rely on the “differences in congestion prices between each zone and the hub, from the latest

23 Market Monitor Comments at pp. 10-11.
24 Market Monitor Comments at 11-12.
25 The Market Monitor contends that the timing mismatch is two years, Market Monitor Comments at 12, not one year as Brattle recognized. See Brattle Aug. 5 Aff. ¶ 17. The difference appears to be due to the Market Monitor’s implicit assertion that only the prices determined in the fifth and final round of a long-term FTR auction for a given year are useful. However, prices need not be set in stone for them to reflect participants’ expectations. Indeed, the FTR prices at the time closest to the capacity auction are appropriate to use even if they are not final as they represent current expectations of future congestion.
long-term FTR auction.” 26 PJM’s approach is thus consistent with the Commission’s directives in the May 21 Order.27

In contrast, the Market Monitor’s alternative of looking backward at historical LMPs inherently exacerbates the timing mismatch; does not reflect the market’s expectation of future conditions; and would unnecessarily make this component of the forward-looking analysis to be backward-looking. The timing mismatch between long-term FTR auction data and the applicable Delivery Year is one to two years, while the mismatch in using historical data is no less than three years (given that the Delivery Year generally is three years in the future) and would extend to six years if three years’ of historical data are used. In addition, the Market Monitor does not provide any analysis to support its argument that historical LMPs yield more accurate basis differential than long-term FTR auction data. As Brattle explained, although “[l]ong-term FTRs of course do not accurately predict the realized congestion in the delivery year due to the uncertainty of the market conditions . . . FTR prices do incorporate trends . . . . [Therefore, u]sing FTR prices to forecast basis differentials incorporates such shifts sooner than using trailing historical prices to forecast [basis differentials].” 28

D. Contrary to the Market Monitor Assertion, the Forward Fuel and Electricity Prices Cannot be Retrieved 134 Days Prior to the Base Residual Auction.

In determining forward fuel and electricity prices, PJM proposed to retrieve forward pricing data for each month of the future Delivery Year, and average the daily settlement data reported over a 30-day period. Such data would be retrieved 180 days prior to the start of each

26 August 5 Compliance Filing, Brattle Affidavit at P 17; see August 5 Compliance Filing at pp. 16-17.

27 See May 21 Order at P 320.

28 August 5 Compliance Filing, Brattle Aff. ¶ 55 (citing example of regional price shifts from Marcellus shale gas production).
BRA to provide PJM with time to calculate the E&AS Offsets for the reference resources prior to having to post the preliminary default MOPR Floor Offer Prices at 150 days prior to the auction.

The Market Monitor argues that PJM should instead use forward pricing data over a one-week period, instead of a 30-day period, that ends 134 days prior to the start of the BRA.\textsuperscript{29} The use of a 30-day average is intended to prevent potential vulnerability to market manipulation from indexing to a single day. In general, using a fewer number of days results in a smaller sample size of the settlement data and could be more susceptible to market manipulation. Notwithstanding foregoing, PJM would not object to shortening the window to one-week period if the Commission finds a shorter window to be appropriate.

PJM, however, objects to retrieving such data 134 days prior to the conduct of the BRA instead of the proposed 180 days prior to the BRA for two primary reasons. First, the proposed language in Tariff, Attachment DD, section 5.14(h-1)(3)(A) requires PJM to “post, by no later than one hundred fifty (150) days prior to the commencement of the offer period for the relevant RPM Auction, a preliminary estimate for the relevant Delivery Year of the default Minimum Floor Offer Prices.”\textsuperscript{30} In order to accomplish this, PJM will need to obtain data sufficiently in advance of 150 days prior to the BRA so that there is enough time to calculate the forward looking E&AS Offsets. Therefore, it would not be possible to use data from 134 days prior to the BRA for purposes of calculating the E&AS Offset. Second, using data from 134 days prior to the BRA as suggested by the Market Monitor, would only provide two weeks for the calculation and posting of the E&AS Offsets, as well as the Market Participant’s review of such values. The various simulation runs

\textsuperscript{29} Market Monitor Comments at p. 14.

\textsuperscript{30} See Compliance Filing Concerning the Minimum Offer Price Rule, Request for Waiver of RPM Auction Deadlines, and Request for an Extended Comment Period of at Least 35 Days of PJM Interconnection, L.L.C., Docket No. ER18-1314-003 (Mar. 18, 2020). Posting the preliminary default MOPR prices 150 days prior to the BRA is necessary to provide Capacity Market Sellers to evaluate whether to submit a resource-specific exception request and, if necessary, prepare documentation prior to submitting such a request no later than 120 days prior to the BRA.
take several days to complete before the standard E&AS Offset values can be posted. In turn, Capacity Market Sellers also need some time to review and determine whether to seek a resource-specific exception upon reviewing the E&AS Offset values. Further, in the event a Capacity Market Seller decides that it needs to seek a resource-specific MOPR exception request, sufficient time must be afforded for the seller to submit the necessary documentation used to demonstrate the resource-specific values no later than 120 days prior to the BRA.

In short, PJM’s proposal to pull the data 180 days prior to the BRA (30 days prior to the posting of the default Minimum Floor Offer Prices) is reasonable and should not be changed. While PJM does not oppose using forward pricing data over a one-week period, such data must not be obtained less than 180 days prior to the conduct of the BRA.

E. The Inclusion of a Ten Percent Cost Adder for Combustion Turbine Resources Remains Appropriate.

Various parties submitted comments on PJM’s proposal to include a ten percent cost adder for gas-fired Combustion Turbine (“CT”) resources while excluding the ten percent cost adder for other resource types. In particular, certain parties argued that the ten percent cost adder should be broadly applied to all resource types while others contend that the ten percent cost adder should not be applied to any resource type.31

PJM maintains that the application of the ten percent cost adder for CT resources and exclusion of such adder for other resource types is reasonable. As explained in the August 5 Compliance Filing, the inclusion of the ten percent cost adder for CT is appropriate to take into account the additional costs and risks that may be incurred by operating the reference CT in a

manner that fully utilizes its flexibility. These additional costs and risks can include (1) additional fuel procurement costs due to being dispatched in real-time and needing to purchase gas at a premium or (2) the risk of gas imbalancing costs that may occur if the resource is not run in real-time consistent with the gas procured to meet a day-ahead schedule. Such risks of increased costs can exist at any time of the year and are not necessarily limited to only during peak hours or other times of system stress. As a result, the inclusion of a ten percent cost adder for CTs in the definition of Projected E&AS Dispatch ensures the dispatch properly accounts for the resource’s costs when evaluating whether to commit or dispatch the resource.

Moreover, the Reference Resource, a CT, used in the development of the Variable Resource Requirement curve includes a ten percent cost adder. This is appropriate because the Reference Resource is unique in that its net revenues, and ultimately its Net CONE, provides the cornerstone of the Variable Resource Requirement curve used to clear the entire market. As such, it is important that the expected revenues of the Reference Resource consider all reasonable costs that may be incurred to ensure the resulting Net CONE is as accurate as possible and not understated. Omission of certain costs that are difficult to quantify, but are nonetheless real, will have significant market implications. In short, because that the Reference Resource is a CT, it is reasonable that the ten percent cost adder remains applicable and consistent for all CT resources.

In contrast, it would not be appropriate to apply the ten percent cost adder for other resource types, particularly given that the E&AS Offset for other resource types is not used in the development of the Variable Resource Requirement curve, but rather is used for the development

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of the MOPR.33 In constructing MOPR Floor Offer Prices, it is important to set these values based on reasonable minimum offers into the capacity market. Such minimums offers can be constructed by reasonably assuming that resources that are not facing the same costs and risks as the reference CT offer into the energy market at their marginal cost without the ten percent cost adder. Applying the ten percent cost adder for other resource types will result in lower net revenues for such resources and higher MOPR Floor Prices, all other things equal, and could result in over-mitigation via the MOPR. Given that a purpose of the MOPR is to mitigate potential market power, it is important that such floor prices reflect the lower bound of a competitive offer.34

F. PJM’s Proposed Use of Selected Hubs for Forward Prices for Electric and Natural Gas is Appropriate and Provides a Reasonable Estimate of a Projected Energy and Ancillary Service Offset.

As explained in the August 5 Compliance Filing, Brattle’s analysis showed that the PJM Western Hub, AEP Dayton Hub, and Northern Illinois Hub are currently sufficiently liquid 3.5 to 4.5 years forward for PJM to rely on in its forward-looking E&AS analysis.35 Based on this analysis, PJM intends to use electric futures settlements from these three electricity hubs for the forward energy and ancillary services revenues.

The Public Interest and Customers Organizations argue that PJM’s proposed methodology for calculating the projected E&AS Offset is flawed due to a mismatch of energy and fuel prices.36 In particular, they argue that additional electricity hubs should be used to better align with the

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33 In addition, the E&AS Offset is also used in calculating the Market Seller Offer Cap pursuant to Tariff, Attachment DD, section 6.8(d).
34 To the extent a Market Seller seeks to include the ten percent cost adder for purposes of the avoidable cost rate in calculating the Market Seller Offer Cap, such Market Seller may continue to include the adder in a unit-specific review to avoid any potential over-mitigation.
35 August 5 Compliance Filing, Brattle Affidavit at P 51.
natural gas hubs. PJM acknowledges that, to the extent possible, electricity and natural gas prices used in the model are aligned to avoid errors in the forecasted E&AS margins. This is because natural gas prices are one of the primary drivers of electric prices. However, as Brattle explained in PJM’s August 5 Compliance Filing, the use of zonal futures from hubs with limited liquidity make such data “more vulnerable to manipulation, which could cause large distortions in the capacity market parameters and outcomes.”37 As Brattle further explains, the use of data from illiquid PJM hubs “is not a viable option” because it “introduces the potential for manipulation of those zonal prices with relatively small transactions, causing large distortions in the forward markets and in the capacity market parameters and outcomes.”38 In other words, the benefits of aligning the electric hubs with the natural gas hubs are outweighed by the risk of using futures data when such data originates from illiquid hubs. Given that electricity prices in eastern PJM hubs have limited open interest and are inconsistent year over year,39 it would not be appropriate to use such data from the eastern PJM hubs. In this vein, PJM also disputes the Market Monitor’s contention that only futures prices from the PJM Western Hub should be used. Given that sufficient liquidity is also observed in the AEP Dayton and Northern Illinois hubs, it is appropriate to include futures prices from these hubs to better align the electricity and natural gas prices and avoid potential errors in forecasting the E&AS margins.40

The Public Interest and Customers Organizations attempt to brush aside the illiquidity concern by suggesting that PJM and the Market Monitor could simply review the forward prices “with defined quantitative triggers to identify circumstances where the values are suspect and

37 August 5 Compliance Filing, Brattle Affidavit at P 51.
39 Id.
40 Brattle Supplemental Affidavit at P 19.
warrant further review.”\textsuperscript{41} This approach ignores the advantage of relying on futures prices in the first instance, which is that the futures prices incorporate Market Participants’ views of various market factors.\textsuperscript{42} Under the Public Interest and Customers Organizations approach, PJM and the Market Monitor would have to substitute their own views in place of what Market Participants are thinking with respect to valuing futures prices. Such evaluations would inevitably be subjective and, thus, should be avoided.

Aside from these practical considerations, the Public Interest and Customer Organizations’ argument against using the annual forward FTR prices to develop monthly basis differentials is fundamentally flawed. Specifically, as Brattle explains:

the Wilson affidavit compares the basis differentials from PJM Western Hub to PJM Eastern Hub implied by forward prices, to the basis differentials from PJM Western hub to PSEG, based on shaped FTR prices. However, PSEG and PJM Eastern Hub are not equivalent; they represent electrically different locations. Further, it appears that Wilson neglected to include losses in the calculation of the basis from “shaped FTR prices,” even though our recommended approach for forecasting zonal prices includes both an FTR component and a historical losses component.\textsuperscript{43}

After correcting for these aforementioned errors, Brattle shows that the basis differentials using the proposed approach closely aligns with the forward pricing data.\textsuperscript{44} Moreover, as Brattle explains, “[i]t is the delivered price at any given location, not the basis differential, that determines the net energy revenues of a resource.”\textsuperscript{45} Thus, the proposed methodology to use congestion expectations from FTR data is a just and reasonable approach for constructing zonal price forecasts.

\textsuperscript{41} Public Interest and Customer Organizations’ Protest and Comments at p. 19.
\textsuperscript{42} August 5 Compliance Filing, Brattle Affidavit at P 52.
\textsuperscript{43} Brattle Supplemental Affidavit at P 21.
\textsuperscript{44} Brattle Supplemental Affidavit at Figure 2.
\textsuperscript{45} Brattle Supplemental Affidavit at P 22.
For the foregoing reasons, PJM’s proposal of using the most liquid trading hubs (Western, AEP-Dayton, and Northern Illinois hubs), plus market-based information on congestion expectations from FTR data, is more reasonable than the Market Monitor’s proposal to only use a single hub, as well as the Public Interest and Customer Organizations’ proposal to use all available zonal prices.

G. Contrary to the Clean Energy Associations, PJM’s Forward-looking E&AS Offset Methodology Relies on Energy Prices from Liquid Futures Markets.

The Clean Energy Associations argue that PJM’s forward-looking E&AS Offset approach is flawed because it relies on forward looking energy prices that “significantly reduce the E&AS Offset (and raise default MOPR prices) for wind and solar resources.”46 The Clean Energy Associations thus request the Commission to direct PJM to “estimate the impact that the co-optimization between energy and reserve markets will have on energy market prices and then scale the energy prices at the liquid hubs used in the forward-looking methodology according to that estimation.”47 The Commission should reject calls for an artificial prediction of what future energy prices will be when there is price information available from liquid futures markets. Reliance on future prices determined by liquid forward markets ensures that PJM’s approach “will better reflect Market Participants’ expectations about future conditions.”48 Brattle explained that forward market prices “anticipate market conditions at forward contract delivery dates.”49 Because the liquid futures markets on which PJM proposes to rely “determine a settlement price for each

47 Clean Energy Associations Comments at 7-8.
48 August 5 Compliance Filing at 9.
49 August 5 Compliance Filing, Brattle Affidavit at P 42.
contract on each business day,” the market-determined prices have had ample time to consider and internalize the effect on energy market prices of the reserve market changes approved in the May 21 Order.

A forward-looking approach necessarily relies on forward-looking data. Just because the forward prices are not in line with one set of expectations does not mean that they are wrong or should be ignored. As Brattle explained, the incentives on the seller and buyer sides of forward contracts are inherently in tension, keeping each other in check, i.e., if one side “reliably yielded profits, then trading would soon dry up, since the other side of those bets would reliably realize losses.” The liquidity at the identified hubs instills confidence that the forward market “will anticipate market prices at contract delivery dates.” Thus, simply because the Clean Energy Associations predict that energy prices will be higher in the future does not undermine the credibility or reasonableness of PJM’s approach.

Moreover, in contrast to the Clean Energy Association’s preferred approach, PJM’s approach is consistent with the May 21 Order’s guidance to use “project[ed] valuation methods used by market participants.” Market participants regularly use energy prices determined by

50 August 5 Compliance Filing, Brattle Affidavit at P 46.
51 August 5 Compliance Filing, Brattle Affidavit at P 44.
52 Id.
53 The Clean Energy Associations also allege that PJM’s approach “artificially and unjustly favors natural gas resources” by considering revenues from market-based ancillary services (i.e., Synchronized Reserves and Non-Synchronized Reserves) in their E&AS Offset, but not including revenues from such services in the default MOPR Floor Offer Price for solar and wind resources. Clean Energy Associations at 4-6. However, PJM’s approach merely recognizes inherent operating characteristics of each resource type. Natural gas-fired and storage resource types will, by default, be credited with revenues for Synchronized Reserve, Non-synchronized Reserve, and Regulation revenues, because such resources are dispatchable can provide these reserve products upon request. By contrast, solar and wind resources are ineligible to provide these reserve products, by default, and will only be allowed to offer them upon receiving resource-specific approval. See July 6 Compliance filing at 3-6. Thus, to the extent a solar or wind resource anticipates receiving revenues from market-based ancillary services in a respective Delivery Year, it may submit a request for a resource-specific MOPR exception.
54 May 21 Order at P 320.
liquid futures markets over an artificial estimation of future energy prices. Indeed, Brattle explained that they rely on market-based forward prices “in commercial application.”

**H. Contrary to the Market Monitor’s Assertion, Major Maintenance Costs Should be Included in a Resource’s Cost-Based Energy Offer.**

The Market Monitor continues to assert that major maintenance costs should not be included in a resource’s operating costs because such costs are not short run marginal costs. However, as the Commission has determined, major maintenance costs are short run costs of electric production and appropriately included in a resource’s cost-based energy offer. Thus, PJM’s proposed inclusion of major maintenance costs in a resource’s energy offer is consistent with the Commission’s precedent and existing tariff rules.

Further, contrary to the Market Monitor’s claim, PJM’s August 5 Compliance Filing justifiably split major maintenance between start costs and incremental costs. In particular, PJM’s proposed approach is reasonable given that both starts and run hours cause wear-and-tear that accelerates the need for major maintenance. In particular, long-term service agreements for major maintenance with original equipment manufacturers demonstrate that such costs are appropriately split between starts and run hours. Moreover, as explained in the August 5 Compliance Filing, Brattle’s “analysis indicates that splitting the major maintenance costs 50/50 between starts and run hours . . . produce[s] more reasonable dispatch simulation results that fall between the CT running with excessive starts (under a pure hours-based approach) or excessive

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55 August 5 Compliance Filing, Brattle Affidavit at P 37.
56 Market Monitor Comments at p. 22.
57 *PJM Interconnection, L.L.C.*, 167 FERC ¶ 61,030 at P 42.
58 See Operating Agreement, Schedule 2.
59 August 5 Compliance Filing at 34-36.
60 August 5 Compliance Filing, Brattle Affidavit at P 72.
run hours (under a pure starts-based approach).”61 Therefore, splitting costs associated with major maintenance between start costs and incremental costs is appropriate and justified.

I. Contrary to the Market Monitor’s Assertion, Futures Prices Posted By the Intercontinental Exchange are a Reasonable Component of a Forward-looking E&AS Offset Methodology.

The Market Monitor objects to using prices posted by the Intercontinental Exchange (“ICE”) and recommends the use of price data from Platts.62 The Market Monitor’s main objection to ICE pricing data appears to be that PJM Manual 15 uses Platts’ forward curves as part of the “Cost Development Guidelines” and the August 5 Compliance Filing “does not discuss the reasons for its choice of ICE data over Platts’ data.”63

As Brattle explains in the attached affidavit, ICE pricing data is “more straightforward and transparent” than Platts.64 “ICE data offers much transparency as it, like other futures exchanges, make settlement prices for recent trading days publicly available,” whereas “Platts data are available only to subscribers.”65 In addition, Platts’ prices actually use ICE pricing data as the starting point for its determination of forward price curves and, therefore, both rely on the same underlying data sets.66 This is the reason for Brattle’s conclusion that “Platts-reported forward prices and ICE futures settlement prices are virtually identical for the relevant delivery points and

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61 August 5 Compliance Filing, Brattle Affidavit at P 73.
62 Market Monitor Comments at 4.
63 Id.
64 Brattle Supplemental Affidavit at P 9.
65 Id.
Based on the foregoing, PJM’s proposed use of ICE pricing data, instead of Platts, in the E&AS Offset methodology is reasonable.


Several parties commented on the level of Regulation revenues, arguing that the combustion turbine (“CT”) Reference Resource (which is used to set the VRR Curve) has “an artificially high and significant level of regulation revenues.” Commenters request that PJM “adjust the pricing curve for Regulation” or remove regulation revenues altogether “to better reflect realistic market outcomes.” However, PJM’s approach is reasonable, as it is grounded in the physical operating characteristics and costs of the Reference Resource CT and the estimated future Regulation prices.

Because the E&AS Offset for the Reference Resource CT is designed to reflect the revenues such a resource is likely to earn from providing energy and ancillary services, it is reasonable to assume that a new CT resource would earn revenues from each product it is capable of providing, including Regulation. Thus, PJM reasonably assumed the Reference Resource CT would earn Regulation revenues and should not exclude such revenues from the Reference Resource.

There are three factors for determining Regulation revenues: offer price, regulation clearing price and megawatt quantity. As PJM explained in the August 5 Compliance Filing, the Regulation clearing prices have historically been highly correlated with energy prices. Therefore, it is appropriate to scale historical Regulation prices by the percent change in future energy

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67 Brattle Supplemental Affidavit at P 8.
68 Market Monitor Comments at 24; see also Exelon at 4; P3 at 6; PSEG at 8-10.
69 Exelon at 4
70 PSEG at 1-2.
prices.\textsuperscript{71} PJM explained that it “will use the Western pricing hub in PJM as the ‘appropriate price point’ to perform the comparison between historical and forward energy prices.”\textsuperscript{72} PJM also reviewed how CT resources actually participated in the Regulation market, and found that participating CT resources offered up to 90\% of their dispatchable range into the Regulation market. Therefore, there is no compelling reason to support derating the regulation capability of the reference resource. To determine the regulation offer price of the Reference Resource, PJM strictly followed the guidelines set forth in PJM Manual 15 in incorporating the characteristics of the Reference Resource.\textsuperscript{73} Additionally, PJM set the Margin Adder, an adder onto the cost-based regulation of up to $12.00/MWh, equal to $0.00/MWh as there were not additional costs that PJM believed needed to be quantified in the regulation offer.

To estimate Regulation revenues for CTs, PJM ran the Projected EAS Dispatch model with the Reference Resource CT and the estimated future Regulation prices. The Projected EAS Dispatch co-optimizes energy and ancillary services, similar to PJM’s existing Day-ahead and Real-time Energy Markets. PJM does not propose to subjectively limit the resource’s offered MW amount or price for any product. Rather, PJM assumed the resource’s offers would be based on its costs and physical operating characteristics. Thus, the Regulation revenues estimated for the Reference Resource CT are merely a function of the resource’s physical operating characteristics and costs.

PJM recognizes that commenters raise a valid point that Regulation prices may decrease as additional Regulation is assigned to the Reference Resource CT in the dispatch model given the

\textsuperscript{71} August 5 Compliance Filing at p. 25; see also Brattle Aug. 5 Affidavit at P 59.
\textsuperscript{72} August 5 Compliance Filing at p. 26.
\textsuperscript{73} PJM Manual 15: Cost Development Guidelines, Rev. 36 (Sept. 1, 2020) https://www.pjm.com/~/media/documents/manuals/m15.ashx
reference CT’s significant regulation capability. However, as explained by Brattle, “[a]ccounting for the impact of the reference unit on regulation prices would depart from the rest of the E&AS estimation methodology that takes energy and ancillary services prices as given.” Further, estimating the impact on regulation prices “would require a complicated, non-standard, and probably controversial modeling analysis—even more so if trying to optimize the amounts and prices of regulation offered by the CT, given its impact on the price.” Moreover, even assuming, arguendo, that the Regulation revenues are overstated, Regulation revenues do not represent a significant impact on the Net CONE values, as further explained below. Accordingly, rather than further tweaking or removing Regulation revenues altogether, the Regulation revenues are reasonably considered in the August 5 Compliance Filing because any potential overestimation of projected Regulation revenues will result in a de minimis impact on Net CONE.

A fundamental assumption of the Projected EAS Dispatch model is that prices are a given (i.e., do not react to market forces within the model) and PJM is dispatching resources based on those locked forward prices. To determine the impact on net revenues and ultimately the Zonal Net CONEs for the Reference Resource, PJM re-ran its Projected EAS Dispatch model and removed the ability for the Reference Resource to regulate. The result of this analysis, compared with the indicative values filed in the August 19 information filing,\(^7\) shows that regulation revenues do not significantly impact overall net revenues and, ultimately, Net CONEs.

In particular, Table 1 shows the difference between the indicative values for the Zonal Net CONEs for the Reference Resource, including regulation revenues and those without it. In summary, the Zonal Net CONE values for the Reference Resource increase by an average of 3.96% with a range of 2.00% to 6.00%. It is also important to note that when the regulation capability of the Reference Resource is removed, those MWs formerly providing regulation can now provide energy and so the revenues lost from regulation are partly made up in the energy market. These off-setting energy revenues further moderate the impact of the lost regulation revenues so that the net effect is small. The implication of this analysis is that even if another methodology is somehow developed to further refine the price and optimal quantity of regulation, the impact on Net CONE would result in only a fraction of the average 3.97% increase.\(^{75}\) “Such a small effect is within the noise of so many other simplifications inherent in estimating Net CONE (i.e., the capacity price

\(^{75}\) Brattle Supplemental Affidavit at P 28.
an investor would need to enter the market), some of which may increase the value and others that
decrease it.”76

Based on this additional analysis, PJM maintains that the method submitted in the August 5 Compliance Filing to calculate regulation revenues is just and reasonable. Further, as Brattle explains, “[g]iven the complications of making [additional] refinements for such a small difference, the simpler approach filed in PJM’s August 5th compliance filing is a reasonable way to account for the flexible reference CT’s ability to sell regulation.”77 Notwithstanding the foregoing, PJM commits to continue evaluating Regulation modeling for the Reference Resource CT in the next quadrennial review, if not sooner, and consider alternative approaches that may further refine Regulation prices.

K. Forward Looking Net Revenues Continue to Include Bilateral Revenues.

The Market Monitor states that bilateral revenues can be a critical source of revenues and forward looking net revenues should continue to include such revenues.78 PJM confirms that bilateral revenues are to be included in net revenues under the Tariff that was proposed in the August 5 Compliance Filing. Specifically, the proposed language in Tariff, Attachment DD, section 5.14(h-1)(2)(B)(ii), which is incorporated in Tariff, Attachment DD, section 6.8(d-1) includes “any unit-specific bilateral contract.”

The ability to include revenues from bilateral contract extends to any Market Seller that requests a resource-specific E&AS Offset value. In particular, the proposed language in Tariff, Attachment DD, section 5.14(h-1)(2)(B)(ii) on this point explicitly states that the same approach is used for the unit-specific process “as outlined above.”

76 Brattle Supplemental Affidavit at P 28.
77 Brattle Supplemental Affidavit at P 29.
78 Market Monitor Comments at p. 5.
III. CONCLUSION

PJM respectfully requests that the Commission accept this answer and the August 5 Compliance Filing with the proposed modifications described herein.

Respectfully submitted,

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Dated: September 17, 2020
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 Audubon, PA, this 17th day of September 2020.

/s/ Chen Lu
Attachment A

SUPPLEMENTAL AFFIDAVIT OF
SAMUEL A. NEWELL AND JAMES A. READ JR.
ON BEHALF OF PJM INTERCONNECTION, L.L.C.
(Brattle Supplemental Affidavit)
UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

SUPPLEMENTAL AFFIDAVIT OF
SAMUEL A. NEWELL AND JAMES A. READ JR.
ON BEHALF OF PJM INTERCONNECTION, L.L.C.

I. INTRODUCTION AND SCOPE OF THIS TESTIMONY

1. Our names are Samuel A. Newell and James A. Read Jr, and we are employed by The Brattle Group (“Brattle”) as Principals. We previously provided testimony to support the PJM filing in compliance with the May 21 Order concerning the use of forward-looking data to estimate energy and ancillary services revenues for the purposes of determining capacity market parameters.1 In this response affidavit, we address five issues raised in comments and protests to that filing:

2. The Independent Market Monitor for the PJM Interconnection, L.L.C. (“IMM”) asserts that PJM should use forward prices reported by Platts rather than futures settlement prices determined by Intercontinental Exchange (“ICE”). We explain why we recommended that PJM use ICE futures settlement prices.

3. The IMM also argues not to use forward prices for any hubs other than PJM Western Hub since it is most liquid. We address the advantages of using Western Hub plus the Northern Illinois (“NI”) and AEP Dayton (“AEP/DAY”) hubs.

4. Mr. James Wilson’s affidavit (“Wilson Affidavit”) criticizes the monthly shape applied to annual forward congestion differentials derived from long-term FTR prices, claiming that it is misaligned with forward gas prices and creates artificial spark spreads.2 We show that any misalignment is smaller than Mr. Wilson suggests and that our recommended approach is reasonable. We explain why his alternative suggestion to instead rely directly on monthly forward prices is not reasonable for hubs that are thinly traded and vulnerable to manipulation.


5. Mr. Wilson further criticizes our recommendation to scale certain ancillary services ("AS") prices linearly with changes in energy prices, claiming that the relationship is not linear but he does not offer any solution. We explain why the linear approximation is reasonable.

6. Several protesters argued that PJM’s simulated regulation revenues for the reference CT were too high because the simulated quantity it provided exceeded what existing CTs typically provide and because the projected regulation price did not account for depressive effects of such a large unit entering the market; some protesters argue to assume no regulation revenues. We explain how the reference CT is particularly good at providing regulation, and that attempting to adjust the market price would introduce complexity and have very limited impact on the result.

II. RESPONSE TO CRITIQUES

Source of Forward Prices

7. In our August 5th affidavit we recommended that PJM use settlement prices for ICE futures contracts in its new, forward-looking E&AS procedures. Our recommendation was based the fact that there is considerably more open interest in relevant ICE-listed electricity futures contracts than there is in the corresponding CME Group ("CME")-listed contracts. Platts, in contrast to ICE and CME, is not a marketplace. It is a proprietary information service that, among other things, constructs estimates of forward prices for electricity and natural gas.

8. According to the Platts methodology document, ICE price data are the primary ingredients in its reported forward prices. The Platts methodology document says that Platts uses other information (historical spot market, forward market, and ICE futures) to “shape” prices for multiple-month transactions on ICE, but Platts-reported forward prices and ICE futures settlement prices are virtually identical for the relevant delivery points and delivery months, as shown in Figure 1. Evidently Platts has not chosen to substitute a materially different estimate of forward prices.

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5 Id.
for the results of the ICE marketplace—at least not for the delivery points and delivery dates that are relevant to this proceeding.6

Figure 1: Comparison of ICE and Platts Forward Prices, PJM Western Hub Day-Ahead On and Off Peak

9. Furthermore, ICE data offers much transparency as it, like other futures exchanges, make settlement prices for recent trading days publicly available. In contrast, Platts data are available only to subscribers. Thus, the direct use of ICE futures settlement prices is more straightforward and transparent.

10. ICE lists peak and off-peak futures contracts for as many as 110 or more consecutive one-month contract periods. Like other futures exchanges, ICE is required to determine a settlement price each trading day for each contract it lists. Settlement prices are used to mark contracts to market and calculate variation margin. This means that money changes hands daily on the basis of settlement prices; they are not merely opinions of an information service.

11. ICE is not required to disclose in detail how it determines settlement prices and, like other futures exchanges, has considerable discretion in determining settlement prices for contracts that did not trade or traded infrequently on any given day. If ICE settlement prices were thought to be unreasonable, that would tend to discourage market participants from using the ICE platform for trading. ICE,

6 Id.
therefore, has incentives to use reasonable procedures in its determination of futures settlement prices.

12. We want to point out that Platts too does not disclose in detail the procedures by which it takes ICE market data and combines it with historical spot and futures market data to arrive at its reported forward electricity prices.

Selection of Pricing Hubs

13. Our objective in designing the proposed methodology was to use the best available market-based data reflecting market expectations of future market conditions, aligned with the Commission order.

14. The IMM contends that “[i]n particular, the August 5th Filing’s use of multiple trading hubs for futures prices adds unnecessary complexity and has no articulated basis. […] There is no reason to use multiple hubs for forward prices. The August 5th Filing presents no good analytical reason for their proposal to use multiple hubs. PJM should use the most liquid PJM trading hub, Western Hub.”

15. However, the IMM’s proposed approach does not make best use of available data reflecting market expectations. In particular, it ignores any market views of changing basis between trading hubs and from trading hubs to zones. For example, if the historical basis for a given calendar month between PJM Western Hub and a given zone were $5/MWh, the IMM’s approach would assume that differential persisted into the future. Instead, our methodology allows PJM to improve the zonal forecasted price by incorporating market participants’ views, expressed through forward prices, that the future expected basis may be higher or lower than it was historically.

16. While prices at other PJM hubs are informed by those at highly-liquid PJM Western Hub, they do not express the same thing. Any difference reflects forward views on basis differentials, which could be the same or different from historical basis differentials. Using forward-looking basis differentials, with information from multiple hubs (and augmented by expectations of congestion implied by FTR prices to inform differentials to smaller hubs) ensures that the forecasted zonal electricity prices reflect market expectations and are consistent with forward-looking zonal gas prices. The importance of this was explained in our earlier affidavit.

Use of Historical Monthly Congestion Patterns to Shape FTRs

17. The Wilson Affidavit argues for directly using zonal forwards prices instead of constructing zonal price forecasts using prices at trading hubs plus FTRs plus historical losses.

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7 IMM Comments at p. 8.
18. While we agree that using these data could incorporate market-based expectations of changing congestion patterns and zonal basis differentials, in practice it is not a viable option. The liquidity of monthly forward prices at each PJM zone is too low, as we illustrated in Figure 1 of our original affidavit. This introduces the potential for manipulation of those zonal prices with relatively small transactions, causing large distortions in the forward markets and in the capacity market parameters and outcomes.

19. Further supporting our rejection of the zonal forward prices, in comments to our August 5 affidavit, the IMM argues against using any forward pricing data outside of that from PJM Western Hub, stating that “[t]he design goal should be to use the most liquid hub as that is most reflective of market fundamentals and is the least likely to be subject to manipulation.” The IMM deems even the two other liquid hubs we proposed, AEP/Day and NI Hubs, to be insufficiently liquid. While we disagree with this assertion because of the relatively high liquidity at those hubs, we note that open interest in all other zonal futures products are at least an order of magnitude less liquid than those. Thus, concerns of manipulation of those zonal forwards prices become more substantial.

20. We view our proposal of using the most liquid trading hubs, plus market-based information on congestion expectations from FTR data, as more reasonable than the IMM’s proposal to only use a single hub and Mr. Wilson’s proposal to use all available zonal prices.

21. Notwithstanding these practical considerations, Mr. Wilson argues that transforming annual forward FTR prices into monthly basis differentials by using historical patterns misaligns with forward expectations, distorting the spark spreads available from burning natural gas at monthly forward prices. However, the evidence Mr. Wilson presents to illustrate misalignment is misleading. First, Figure 2 of the Wilson affidavit compares the basis differentials from PJM Western Hub to PJM Eastern Hub implied by forward prices, to the basis differentials from PJM Western hub to PSEG, based on shaped FTR prices. However, PSEG and PJM Eastern Hub are not equivalent; they represent electrically different locations. Further, it appears that Wilson neglected to include losses in the calculation of the basis from “shaped FTR prices,” even though our recommended approach for forecasting zonal prices includes both an FTR component and a historical losses component. We correct these errors in Figure 2 below. As expected, the basis

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8 See August 5 Filing, Attachment C, at P 51 & Figure 1.
9 IMM Comments at p. 8.
10 IMM Comments at 9.
11 Wilson Affidavit at P 41-42.
differentials using our recommended approach aligns much more closely with the forward pricing data once the errors are corrected.

Figure 2. Corrected Version of Wilson Affidavit Figure 2, Comparing Basis from PSEG to PJM Western Hub, from Three Years of Forward Prices and One Year of FTR Prices and Historical Losses

22. In addition, to the extent that alignment is not perfect, this view that focuses on basis differentials overstates the differences between the approaches. Even in a few months when the difference between the FTR + losses approach and the pure forwards approach is higher (up to ~$6/MWh in February), the discrepancy is smaller relative to the delivered price than Wilson’s Figure 2 would suggest. Figure 3 below illustrates the delivered price derived from a forwards-only approach and from our hub + FTR + losses approach. After all, it is the delivered price at any given location, not the basis differential, that determines the net energy revenues of a resource.
23. Mr. Wilson also criticizes our recommendations regarding forecasting AS prices, specifically focusing on the accuracy of the assumption that AS prices are generally linear with energy prices. If we were relying on this assumption to forecast AS prices when energy prices increase by many multiples, or fall to a small fraction of their historical levels, the importance of perfectly parameterizing the relationship between AS prices and energy prices would be greater. However, we only rely on this assumption to make relatively small adjustments to AS prices, reflecting the relatively modest differences between future energy prices and current energy prices. Thus, even if the relationship were somewhat nonlinear globally, accounting for this fact would have a second-order effect.

24. A more important effect will be the introduction of PJM’s Reserve Pricing Reforms. To account for that discontinuity, we recommended that PJM wait until after the Reforms have been implemented and have manifested themselves in then-historical prices before transition to scaling historical reserve prices to forward energy prices.

Regulation Revenues for the Reference CT

25. PSEG, Exelon, and the IMM argued that PJM’s simulated regulation revenues for the reference CT were too high. They noted that in the simulation the CTs often provide 114 MW, which is more than any existing CTs provide. In addition, they argued that such a large unit participating in a market that is only 525-800 MW...
would likely depress the price, yet PJM’s assumed hourly regulation price did not account for such effects.\textsuperscript{12}

26. The quantity simply reflects the capability of such a large and flexible unit to provide such a valuable service as regulation. The reference CT is a large 367 MW turbine with a high enough ramp rate to use its full dispatchable range (from 140 to 367 MW) to sell 114 MW of regulation. We understand from PJM that several existing CTs similarly provide regulation corresponding to their entire dispatchable range, and they provide fewer MW only because they are smaller units with a smaller dispatchable range.

27. Accounting for the impact of the reference unit on regulation prices would depart from the rest of the E&AS estimation methodology that takes energy and ancillary services prices as given. One could attempt to estimate these effects, but it would require a complicated, non-standard, and probably controversial modeling analysis—even more so if trying to optimize the amounts and prices of regulation offered by the CT, given its impact on the price.

28. Fortunately, such an analysis is unnecessary because any increased precision would be minimal. To bound the possible impact, PJM has conducted dispatch simulations without the CT providing any regulation at all, as compared to its prior analysis with the CT providing the full amount of regulation as a price-taker. The case without providing regulation showed that the CT would generate more energy, resulting in a net reduction in CT Net E&AS revenues of only $9/MW-day on average across all zones (and no higher than $13/MW-day in any of the zones). That amounts to only a 4\% reduction in the average CT’s Net CONE (and 6\% for the maximum) when removing regulation revenues entirely. The implication is that somehow refining the price and optimal quantity of regulation provided by CTs would yield an answer somewhere between the full regulation and no-regulation cases, changing the result by only a fraction of the 4\%. Such a small effect is within the noise of so many other simplifications inherent in estimating Net CONE (i.e., the capacity price an investor would need to enter the market), some of which may increase the value and others that decrease it.

29. Given the complications of making such refinements for such a small difference, the simpler approach filed in PJM’s August 5\textsuperscript{th} compliance filing is a reasonable way to account for the flexible reference CT’s ability to sell regulation.

30. This concludes our affidavit.

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

PJM Interconnection, L.L.C.  Docket Nos. EL19-58
                                      ER19-1486

VERIFICATION

Samuel A. Newell, being first duly sworn, deposes and states that he is the Samuel
A. Newell referred to in the foregoing document entitled “Supplemental Affidavit of
Samuel A. Newell, and James A. Read, Jr. on Behalf of PJM Interconnection, L.L.C.” has
read the same and is familiar with the contents thereof, and that the facts set forth therein
are true and correct to the best of his knowledge, information, and belief.

\[Signature\]

Subscribed and sworn to before me, the undersigned notary public, on 9 16 2020.

\[Signature\]
Notary Public
My Commission expires: 2 17 2023
UNIVERS OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

PJM Interconnection, L.L.C. Docket Nos. EL19-58
) ER19-1486

VERIFICATION

James A. Read, Jr., being first duly sworn, deposes and states that he is the James
A. Read, Jr. referred to in the foregoing document entitled “Supplemental Affidavit of
Samuel A. Newell, and James A. Read, Jr. on Behalf of PJM Interconnection, L.L.C.” has
read the same and is familiar with the contents thereof, and that the facts set forth therein
are true and correct to the best of his knowledge, information, and belief.

[Signature]

Subscribed and sworn to before me, the undersigned notary public, on 9/17/2020.

[Notary Public]

My Commission expires: Feb 17, 2023