**UNITED STATES OF AMERICA**
**BEFORE THE**
**FEDERAL ENERGY REGULATORY COMMISSION**

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

**BRIEF OF THE INDEPENDENT MARKET MONITOR FOR PJM**

Monitoring Analytics, LLC, acting in its capacity as the Independent Market Monitor for PJM Interconnection, L.L.C.[1] ("PJM") ("Market Monitor"), submits this reply brief, pursuant to the order issued in this proceeding establishing a paper hearing process on

[1] Capitalized terms used herein and not otherwise defined have the meaning used in the PJM Open Access Transmission Tariff ("OATT"), the PJM Operating Agreement ("OA") or the PJM Reliability Assurance Agreement ("RAA").

June 29, 2018 ("June 29th Order")[2] and in response to certain of the briefs filed in this matter on or about October 2, 2018.

## I. COMMENTS

The Sustainable Market Rule ("SMR") is simple, based in economic logic and does not require complex rule changes to implement. The SMR would provide a straightforward way to harmonize federal and state approaches to the provision of energy, while respecting the distinction between federal and state authority.

Under the SMR, all nonmarket resources may participate in the energy market without limits. But to ensure the reliable operation of the energy market, the capacity market needs to be the balancing mechanism for required market resources to provide the appropriate incentives for entry and exit. This balancing function requires that all capacity resources offer at competitive levels.

If resources offer at competitive levels and clear the capacity market, the resources are paid the market clearing price. If resources do not clear the capacity market, the resources are not paid for capacity. Any nonmarket revenues required to meet the public policy goals associated with these resources would be provided outside the market in whatever manner the supporters of those resources choose.

The SMR addresses the issues raised by other parties and is the most clear, simple, easy to implement and effective approach to the identified issues.

### A. Basic Elements of SMR

#### 1. SMR Market Design

The SMR design is simple. All capacity has a must offer requirement. All MW required for reliability are included in the capacity market demand curve (VRR curve). All cleared resources are paid the capacity market clearing price. The SMR could be

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[2] PJM Interconnection, L.L.C., 163 FERC ¶ 61,236.

implemented fully in the next Base Residual Auction and would not require a transition mechanism.

### 2. Definition of Competitive Offer

All resources with a must offer requirement or that wish to sell capacity are required to make competitive offers in the capacity market.

Competitive offers in the capacity market for resources with nonmarket revenues are defined to be greater than or equal to net going forward costs ("ACR"), and less than the offer cap. Gross ACR uses unit specific facts, or technology defaults, and net ACR, in addition, uses unit specific forward looking market net energy revenue.[3] Nonmarket revenue is not part of the net ACR calculation. Competitive offers for resources with only market revenues are defined to be offers less than or equal to the offer cap. The currently defined capacity market default market seller offer cap in the PJM tariff, Net CONE times the average balancing ratio (B), significantly overstates the competitive offers of resources in the PJM Capacity Market, given the discrepancies in the assumptions for inputs used to derive the Net CONE times B offer cap compared to accurate estimates for inputs based on recent history. The Market Monitor has explained the issues in detail in the IMM report on the most recent Base Residual Auction ("BRA").[4] Given the updated estimates for the expected number of Performance Assessment Intervals ("PAIs"), and given the definition of the nonperformance charge rate as Net CONE divided by 30 hours, the updated competitive offer for resources in the PJM market is their net ACR, adjusted with any expected nonperformance charges or bonuses.

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[3] The definition of avoidable costs and fixed costs is objective and the definition is not at the discretion of the unit owner.

[4] See "Analysis of the 2021/2022 RPM Base Residual Auction - Revised," <http://www.monitoringanalytics.com/reports/Reports/2018/IMM_Analysis_of_the_20212022_RPM_BRA_Revised_20180824.pdf> > (August 24, 2018) at p. 43 and Attachment B.

Attempts to distinguish between the definitions of competitive offers of new entrants and the competitive offers of existing resources are a mistake. A competitive offer is a competitive offer, regardless of whether the resource is new or existing. A competitive offer in the capacity market is the marginal cost of capacity, or net ACR, regardless of whether the resource is planned or existing. ACR includes incremental capital expenditures, termed APIR.

The Market Monitor has interacted with many market participants and developers proposing to offer new units in the PJM capacity market over more than ten years. In general, developers do not want to offer at net CONE because it implies a significant chance of not clearing.

As a matter of economic logic and observed behavior, developers plan to build resources that will have an economic life of at least 20 years and expect to achieve full cost recovery and a target rate of return over that period. These goals are not met by offering at net CONE. Developers expect to earn their returns from inframarginal revenues in the energy and capacity markets as a result of the greater efficiency of the new units. The way to maximize profits is to make a competitive offer in the energy and capacity markets. In the same way that a competitive offer in the energy market for a new unit is short run marginal cost and not net CONE, a competitive offer in the capacity market is the marginal cost of capacity, net ACR, and not net CONE.

The definition of a competitive offer for existing and planned resources is net ACR and not net CONE. Use of higher offers for new resources based on the full cost of entry or net CONE, as proposed by PJM, would constitute a noncompetitive barrier to entry and would create a noncompetitive bias in favor of existing resources and against new resources of all types, including new renewable resources and new gas fired combined cycles.

Use of higher offers for new renewable resources would create an issue because most such artificially higher offers are unlikely to clear in the market and would be categorized as subsidized in many of the proposed approaches. That would mean, under the PJM resource carve out approach for example, new renewable resources 20 MW or

greater would be offered at $0 per MW-day, receive no PJM capacity payments, and final market clearing would require the other convoluted mechanics of that approach including payment of opportunity costs to units with no capacity obligation.

It has been suggested that net CONE must be used in order to ensure that resources with nonmarket revenues do not clear in the first year in which they are offered. It has been suggested that the SMR approach would have permitted the subsidized New Jersey and Maryland combined cycle units to clear.[5] But it is not appropriate to define a competitive offer so as to exclude some offers. In the PJM Capacity Market, the definition of a competitive offer is quite clear and was quite clear prior to the introduction of the capacity performance rules. If the Commission wishes to prevent units with specific characteristics that receive nonmarket revenues from entering the capacity market (e.g. thermal resources that routinely clear competitively in the PJM Capacity Market), that rule should be made explicit.

There should be no minimum size to which market rules apply. Small resources can have large impacts on markets. Market rules are market rules and should apply to all equally. If the rules require competitive behavior, it makes no sense to exempt some market participants from the requirement of competitive behavior, regardless of size.

***a. Default ACRs***

The Market Monitor developed default gross ACR values by resource type. Table 1 shows the proposed default ACR values from the Market Monitor and PJM. The IMM values are gross ACRs. The PJM values are gross ACR values for all technology types except hydro, pumped storage, solar, and offshore wind, which are net ACRs.[6] The IMM

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5 *Hughes v. Talen Energy Marketing, LLC*, 136 S. Ct. 1288, 1298 (2016). See In the Matter of Long-Term Capacity Agreement Pilot Program, New Jersey BPU Docket No. EO11010026 (March 29, 2011). The New Jersey Statute is known as the Long-Term Capacity Agreement Pilot Program or "LCAPP Act."

6 Initial Submission of PJM Interconnection, L.L.C, Docket Nos. EL16-49, ER18-1314-000, -001 and EL18-178, Consolidated (October 2, 2018), p. 46.

values are based on 2017 data for all technology types except onshore and offshore wind, which are based on 2016 data. The PJM values are based on 2011 data escalated eleven years to 2022 using the applicable Bureau of Labor and Statistics ("BLS") Composite Index. The use of 2017 data is reasonable, given that technology costs are generally decreasing and not increasing. The Commission could require an annual process to update gross ACR values. PJM's use of outdated information escalated using a generic inflation factor, without accounting for technology specific trends, is not a reliable guide to current ACR values.

PJM also calculated default net CONE values for new entry floors. These are CONE values and not ACR values. The Market Monitor did not calculate CONE values because they are not relevant to competitive offers. Competitive offers are the same for existing units and new entrants.

**Table 1 Proposed default ACRs**

| | Default Avoidable Cost Rates ($ per MW-Day ICAP) | |
|---|---|---|
| Technology Type | PJM | IMM |
| Coal Fired | $171.00 | $98.58 |
| Combined Cycle | $86.00 | $46.14 |
| Combustion Turbine - Aero Derivative | $57.00 | $32.52 |
| Combustion Turbine - Industrial Frame | $57.00 | $32.52 |
| Diesel | NA | NA |
| Hydro | $0.00 | NA |
| Oil and Gas Steam | NA | NA |
| Pumped Storage | $0.00 | NA |
| Nuclear - Dual | $593.00 | $586.80 |
| Nuclear - Single | $631.00 | $869.76 |
| Solar PV | $0.00 | $12.86 |
| Wind Onshore | $0.00 | $87.65 |
| Wind Offshore | NA | $280.68 |

### 3. Definition of Nonmarket Revenue

The SMR defines nonmarket revenue for a resource as all revenue not received under a tariff regulated by the Commission, i.e. PJM market revenues. The SMR proposed definition of nonmarket revenues is broad and therefore not discriminatory. The definition is based directly on the definition in the PJM tariff prior to the remand order in the NRG

case and adds cost of service regulation. The proposed definition of nonmarket revenues excludes only nonmarket revenues generally available under federal programs.

Specifically, the proposed definition of nonmarket revenue is:

> Formal or informal agreements or arrangements to seek, recover, accept or receive any (1) material payments, concessions, rebates, or subsidies directly or indirectly from any governmental entity connected to the construction, development, operation, or clearing in any RPM Auction, of the Capacity Resource, that are not received under a tariff regulated by the Commission and administered by PJM, (2) other material support or payments obtained in any state-sponsored or state-mandated processes, connected to the construction, development, operation, or clearing in any RPM Auction, of the Capacity Resource, or (3) revenue attributable to the inclusion of costs of the resource in an LSE's retail rates. Nonmarket revenue shall not include federal government production tax credits, investment tax credits, and similar tax advantages or incentives that are available to generators without regard to the technology, fuel type, or geographic location of the generation.

The purpose of defining nonmarket revenue is to identify resources whose capacity market offers are subject to a floor.

#### *a. Bilateral REC Revenues*

Revenues received by renewable resources from bilateral agreements to sell renewable energy attributes (also referred to as Renewable Energy Credits, or RECs) to LSEs to meet state mandated procurement processes are defined to be nonmarket revenues. However, revenues received by renewable resources from bilateral agreements to sell RECs to individual entities to meet their voluntary individual or corporate renewable energy objectives (voluntary targets) are not considered nonmarket revenues. The Market Monitor recognizes the timing issues raised by Avangrid regarding renewable resource owners not knowing if the RECs generated by their resource will be used for state RPS compliance or

for voluntary targets at the time of the PJM capacity auction.[7] To the extent that net ACR does not restrict competitive offers, the timing issue is not relevant. It is very likely to be not relevant for that reason. If an entity is planning to enter into a commercial bilateral agreement, that should be done prior to the relevant capacity market auction if the entity wants that fact to be considered in a review of offers for that auction.

**4. Existing FRR Design**

The existing FRR approach remains an option for utilities with revenues based on cost of service rates, including both privately and publicly owned (including public power entities and electric cooperatives) utilities. Such utilities have had and continue to have the ability to opt out of the capacity market and provide their own capacity. There is no reason for any special exemptions for such utilities. Revenues from cost of service rates are defined to be nonmarket revenues under the SMR approach.

The Market Monitor agrees with Dominion that the current proceeding provides an opportunity to improve the existing FRR approach. However, the Market Monitor disagrees with Dominion's specific suggestions.

Existing FRR entities currently have the option to select a physical or financial non-performance charge option for FRR resources that may underperform during the delivery year. If the FRR entity opts for the physical nonperformance option, the entity with nonperformance is required to commit additional capacity to the FRR plan for the subsequent delivery year using a defined formula.[8] RPM committed resources do not have such an option, and are subject to financial penalties based on a tariff defined non-performance charge rate. If an RPM committed resource in PJM overperforms during a PAI in which an FRR resource underperforms, the RPM resource would receive no bonus

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[7] *See* "Prepared Initial Testimony of Kevin F Kilgallen on behalf of Avangrid Renewables, LLC", Docket Nos. EL16-49 and EL18-178, (October 2, 2018) at pp. 11 – 15.

[8] *See* PJM, "Manual 18: PJM Capacity Market," at 11.8.9 Physical Non-Performance Assessment, Revision 40 (February 22, 2018).

payments for over performance, either in the current delivery year or in future delivery years. This is because bonus performance payments are paid out from a pool of nonperformance charges collected from underperforming resources. When FRR resources that elect the physical penalty option underperform, they do not pay these financial penalties. The physical penalty option weakens the fundamental incentive system put in place in the Capacity Performance design in PJM. The Market Monitor's position is that FRR underperformance should be subject to the same financial nonperformance charges that an RPM resource would be subject to and that all capacity resources, including FRR resources, should pay penalties when underperforming and receive bonuses when overperforming.

The Market Monitor's position is that a five year term before terminating an FRR election continues to be appropriate. Dominion states that the current five year election period makes it challenging to react in a timely fashion to changes in public policies or business strategies. However, electing the FRR option or opting out of it causes significant changes to the PJM Capacity Market and reducing the term to three years would introduce an additional source of volatility for the competitive resource owners that have been in RPM for the entire period.

The Market Monitor's position is that the sales cap into RPM (either directly or through bilateral capacity sales that could be used for RPM commitments) for FRR entities should be set to zero MW. Dominion's recommendation that the MW cap for FRR LSEs to sell into RPM should be removed when RPM is short would undo the fundamental price signals in the capacity market. There is no way to know in advance of an auction if RPM is short or long of the target installed reserve margin ("IRM"). If RPM is short, market prices should reflect the supply and demand conditions in RPM. Allowing FRR LSEs to sell into RPM when it is short would suppress the market price for all the competitive resources that participate in RPM and that cannot rely on cost of service rates when prices are low.

The Market Monitor also disagrees with Dominion's recommendation to allow merchant assets of an affiliate of a company with nonmarket revenues to be removed from

the FRR plan. FRR status should apply to the parent company and all affiliates. It is difficult to demonstrate all the subtle and less subtle ways in which nonmarket revenues affect the costs of affiliates but there are clearly multiple effects.

The Market Monitor also disagrees with the PJM Power Providers' ("P3") suggestion that FRR entities should be required to procure the same level of reliability as procured by PJM in the capacity market.[9] The target IRM, by definition, is the minimum supply of resources needed to meet the one in ten reliability target of the PJM system. The fact that PJM has a history of over procurement due to its own issues with upward biased peak load forecasts or the rules regarding inflexible sell offers, should not subject FRR entities to over procure at an additional cost to their customers. Such a change to the PJM capacity market rules would propagate an economically inefficient outcome to FRR entities. Coupled with the other requirements for FRR entities, including the modifications proposed by the Market Monitor, the FRR rules isolate the decisions of the FRR entity sufficiently to make the P3 suggestion unnecessary and inappropriate.

**B. Impacts of SMR Market Design**

The expected impact of the SMR design on the offers and clearing of renewable resources would be from zero to insignificant. The competitive offers of renewables, based on the net ACR of current technologies, are likely to clear in the capacity market.

The expected impact of the SMR design on the offers and clearing of nuclear plants would be from zero to insignificant. The competitive offers of nuclear plants, based on net ACR, are likely to clear in the capacity market.

The expected impact of the SMR design on the offers and clearing of cost of service resources would be from zero to insignificant. The competitive offers of these resources, based on net ACR, are likely to clear in the capacity market. In addition, cost of service

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9 *See* "Affidavit of Roy J. Shanker, Ph.D., on behalf of the PJM Power Providers Group", Docket No. EL16-49 (October 2, 2018), at P. 43 – 44.

resources have the option of using the existing FRR rules, which would retain their existing status.

Allowing competitive renewable offers, competitive nuclear offers and competitive cost of service offers to clear in the market would have essentially the same impact as carving out such resources using a resource specific FRR but without the need for complex federal and state rules.

The Commission has observed and accepted (at P 159) that "some ratepayers may be obligated to pay for capacity both through the state programs providing out-of-market support and through the capacity market."

In the SMR approach, market and nonmarket resources that do not clear the capacity market based on their competitive offers are not paid a capacity price, do not contribute to meeting PJM's reliability requirements, and are not given any special treatment in the wholesale power market. Any revenues required to sustain such resources would come from the energy and ancillary services markets and from nonmarket sources. Nonmarket resources that do not clear the capacity market would be eligible to receive bonus payments under the capacity performance design for performance during performance assessment intervals, similar to energy only resources.

**C. Carbon Price**

Although not directly the subject of this proceeding, the implementation of a carbon price by the states would obviate the need to address many of the issues raised in this proceeding. To the extent that nonmarket revenues are about reducing carbon output, a carbon price would be much more efficient than a patchwork of noncoordinated state policies with a wide range of implied carbon prices and requirements and import limits.

PJM markets provide a flexible mechanism for incorporating the costs of environmental controls and meeting environmental requirements in a cost effective manner. Costs for environmental controls are part of offers for capacity resources in the PJM Capacity Market. The costs of emissions credits are included in energy offers. PJM markets also provide a flexible mechanism that incorporates renewable resources and the

impacts of renewable energy credit markets, and ensure that renewable resources have access to a broad market. PJM markets provide efficient price signals that permit valuation of resources with very different characteristics when they provide the same product.

PJM markets could also provide a flexible mechanism to limit carbon output, for example by incorporating a consistent carbon price in unit offers which would be reflected in PJM's economic dispatch. If there is a social decision to limit carbon output, a consistent carbon price would be the most efficient way to implement that decision. It would also be an alternative to specific subsidies to individual nuclear power plants and to the current wide range of implied carbon prices embedded in RPS programs and instead provide a market signal to which any resource could respond. The imposition of specific and prescriptive environmental dispatch rules would, in contrast, pose a threat to economic dispatch and efficient markets and create very difficult market power monitoring and mitigation issues. The provision of subsidies to individual units creates a discriminatory regime that is not consistent with competition. The use of inconsistent implied carbon prices by state is also inconsistent with an efficient market and inconsistent with the least cost approach to meeting state environmental goals.

## II. CONCLUSION

The Market Monitor respectfully requests that the Commission afford due consideration to these comments on brief as the Commission resolves the issues in this proceeding.

Respectfully submitted,

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Dated: November 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 Eagleville, Pennsylvania,
this 6th day of November, 2018.

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