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<u>Memorandum</u>

<u>Subject:</u> PJM Capacity Market Short-term Enduring Fixes on MOPR and Over-Procurement

<u>From:</u> Paul M. Sotkiewicz, Ph.D.

<u>To:</u> PJM Capacity Market Workshop Session 3

<u>CC:</u>

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<u>Disclaimer:</u> The views expressed here are my own and do not necessarily reflect the views of clients of E-Cubed Policy Associates, LLC. These views are based on my own experience as a member of FERC Staff putting evaluating and suggesting changes to the ISO/RTO markets, as the former Chief Economist at PJM, and as a consultant working on these issues for clients in PJM, Alberta Electric System Operator Market, NYISO, and ISO-NE.

MOPR and Market Power Mitigation

The best way to address MOPR is viewing it as a buyer-side market power mitigation mechanism that is the flip side to supplier market power. Supplier market power has two screens in RPM: 1) HHI and 2) Three Pivotal Supplier (TPS). Almost no suppliers pass these tests. Suppliers are subject to market seller offer caps.

For MOPR, I propose the following screen as shown in the flow chart below with the following conditions:

1) Define what it means to "serve load" through non-bypassable charges: Does the supply serving load mean that the resources are 1) owned or under contract to a load serving entity (LSE) **<u>and</u>** receives revenue from non-bypassable charges; or 2) received revenue from load based on non-bypassable charges to all load in a zone, LDA, or utility service territory?
2) New and existing resources are subject to MOPR just as they are subject to market seller offer caps.
3) Demand Response, Energy Efficiency, and Price Responsive Demand are demand side actions that one expects would lead to lower expenditures and possibly lower prices and is consistent with rational economic behavior.

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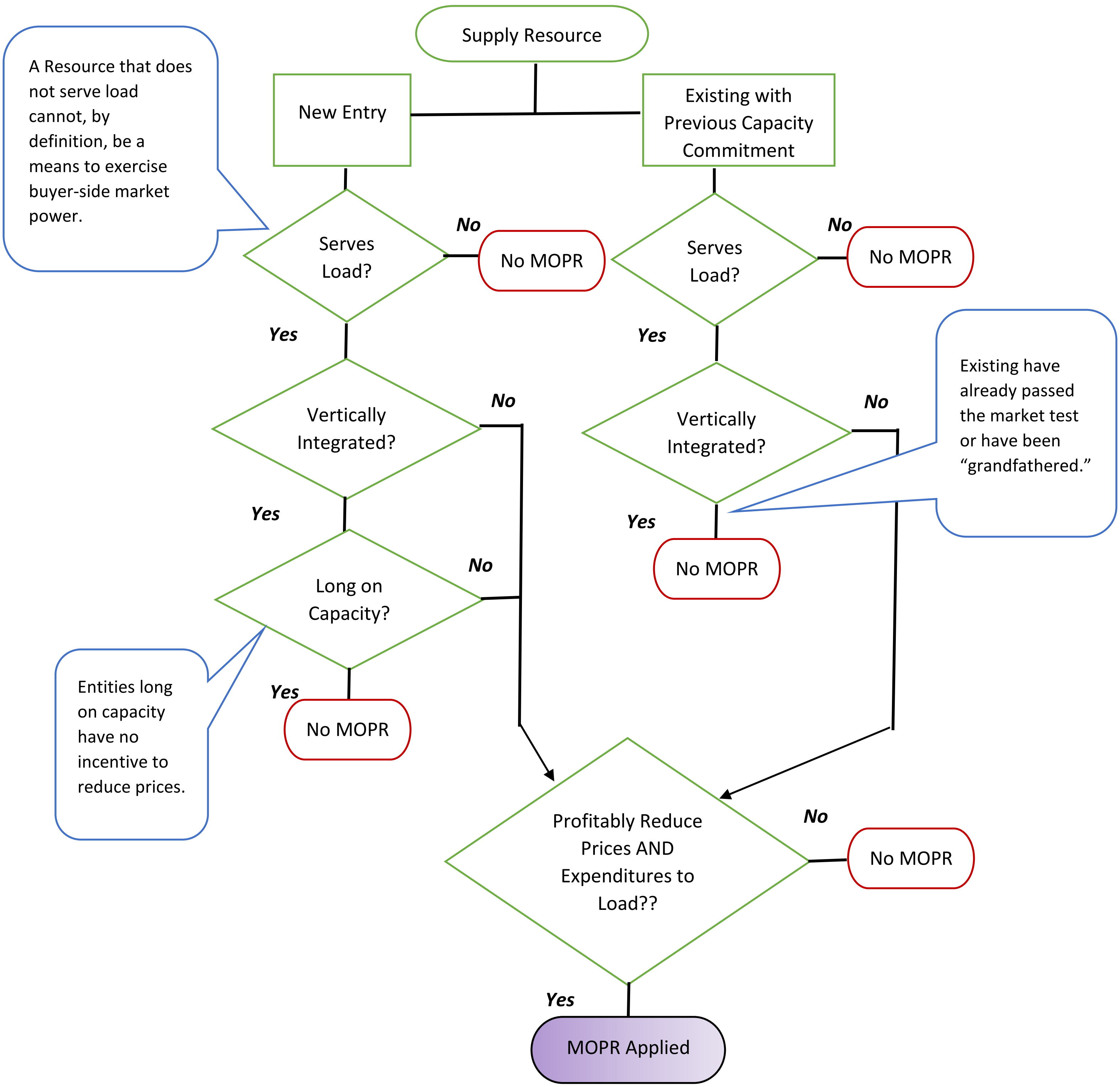

Important questions and answers:

1) Why would renewables pass this screen?
    a. Renewables can get paid for renewable energy credits (RECs) that are subject to competitive market forces where the price of RECS can change based on the volume of renewable energy available, and within PJM, renewable resources can sell RECs to LSEs in different states in most cases.
    b. In states with retail choice, competitive LSEs may not pay the same price for RECs as the incumbent default supplier…the cost can effectively be bypassed in whole or at least in part in those states.
2) What is the key economic screen?
    a. The check is to examine what happens if the resources that would be subject to MOPR would be able to put in an above market cost resource into the market and reduce prices in the LDA for the load being served by more than the extra costs for the resource paid for by the load.
    b. For example, take a vertically integrated LSE with 5,000 MW of peak load and only 4,000 MW of capacity but proposes another 1,000 MW of capacity to serve its load.
        i. If the LDA price decreases by $10/MW-day from $140/MW-day to $130/MW-day, the cost to serve the load decreases from $700,000/day to $650,000/day for a savings of by $50,000/day.
        ii. But the net cost of new resource is $190/MW-day. The total expenditures to the 5,000 MW load are now $710,000 which is above the cost if they had not built the resource and just bought from the market.
        iii. This is not a successful exercise of buyer-side market power and thus the resource would not be subject to MOPR.
    c. However, the same vertically integrated LSE with 5,000 MW of peak load and only 4,000 MW of capacity but proposes another 1,000 MW of capacity to serve its load.
        i. If the LDA price decreases by $10/MW-day from $140/MW-day to $130/MW-day, the cost to serve the load decreases from $700,000/day to $650,000/day for a savings of by $50,000/day.
        ii. But the cost of resource is $150/MW-day. above the new clearing price for an extra cost of $60,000/day. The total expenditures to the 5,000 MW load are now $670,000 which is below the cost if they had

        not built the resource and just bought from the market, yet the price of the resources is above market costs.
        iii. This is a successful exercise of buyer-side market power and thus the resource would be subject to MOPR.
    d. The smaller is the LSE relative to the LDA, the harder it is to exercise buyer-side market power.

3) What LDA applies to the screen?
    a. The largest LDA in which load is being served. For example, vertically integrated utilities such as ODEC, EKPC, and Buckeye are cooperatives and AMP is a muni that serve load in RTO, and thus the impact would be based on prices in RTO. Mon Power and Dominion are in RTO as well.
4) What would the disposition of nuclear units in Illinois and New Jersey receiving ZEC payments?
    a. These resources would be serving load by the definition above given that they are collecting non-bypassable charges. The ZECs are pre-determined rates and not subject to any competitive pressures like RECs are.
    b. They are also in small LDAs relative to the load being served and to the amount of capacity considered to be serving load through non-bypassable charges.
    c. If they pass the economic screen, this means that the resources did not need the money.
    d. If they do not pass the screen, then these units are out of market and should retire. Yet there is also ample evidence showing that these resources are not in need of ZECs to remain in the market so MOPR would likely not have any impact.

Reducing Over-Procurement

Over time the load forecast error in PJM has been on the Order of as high as 15,000 MW to as low as 5,000 MW from the three year forward BRA to the actual realized weather-normalized peaks as shown by Jim Wilson in his paper for NRDC and Sierra Club 1 year ago.

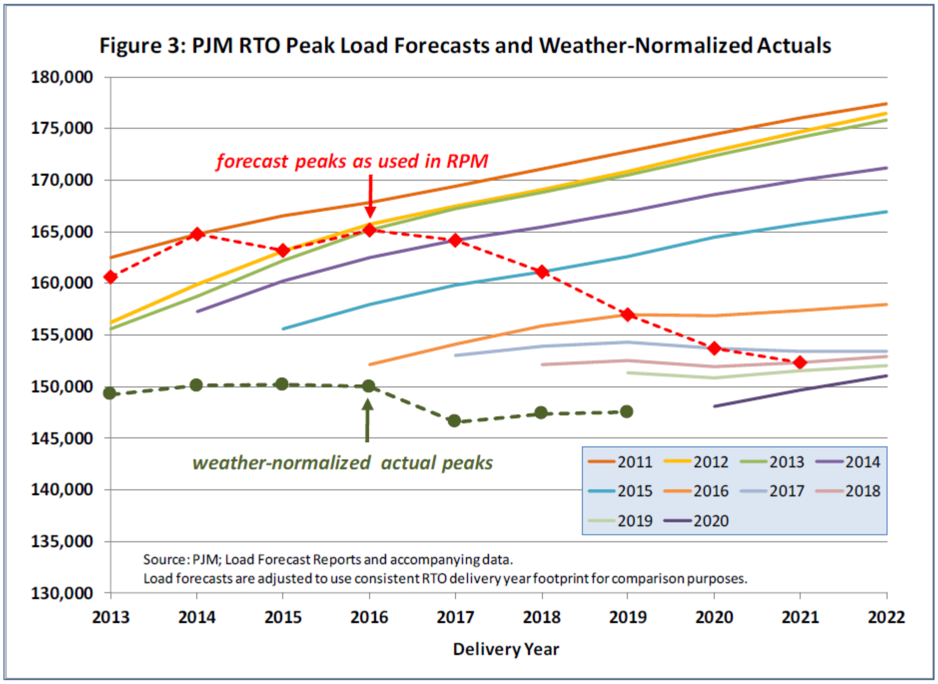

Figure 3: PJM RTO Peak Load Forecasts and Weather-Normalized Actuals

The implication of this is that old, inefficient, and higher emitting resources are being retained by the PJM RPM Capacity Market when they otherwise are not needed by the system. This can be seen by the actual reserve margins going into each delivery year as shown by Wilson's paper.

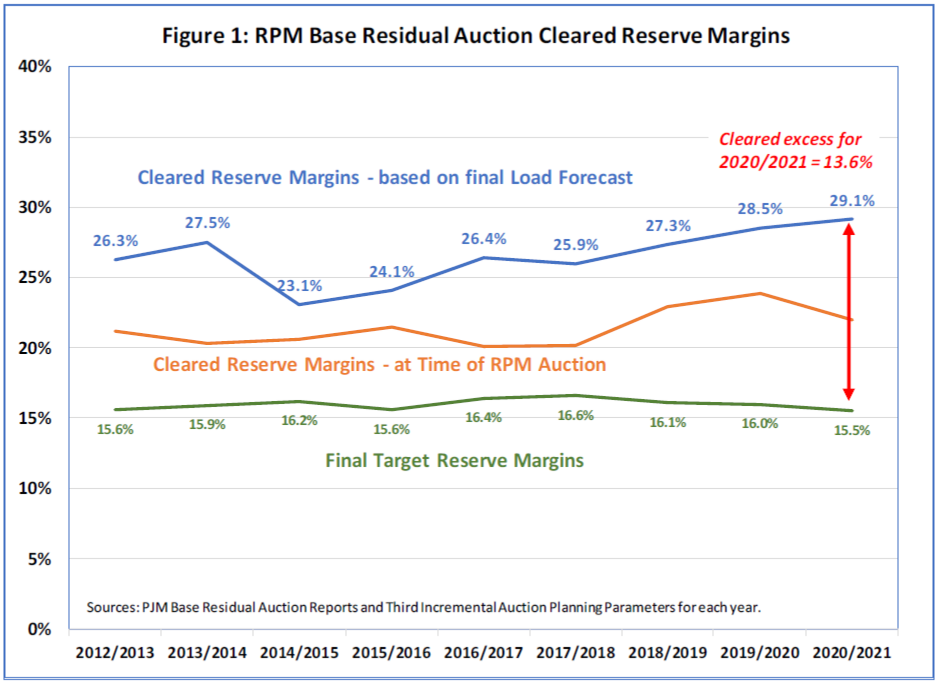

Figure 1: RPM Base Residual Auction Cleared Reserve Margins

Proposed Solution

- **In the 3 year forward BRA, use the moving three-year average of weather normalized peak load as the target for the installed reserve margin and then only procure 90% of that installed reserve margin three years forward in the BRA.**
- **For the first two IAs procure 3.33% of the remaining capacity not procured in the BRA. In the third IA, procure the last 3.33% adjusted for the most up to date load forecast going into the Delivery Year.**
- **Because demand is being reduced by 10% from the expected need, the generator must offer requirement should symmetrically be reduced by 10% otherwise the reduced demand has the same effect as buyer-side market power.**

Advantages of Proposed Solution

1) Signals retirement to older, higher cost, less efficient and higher emitting resources that have otherwise been retained to date.
2) Shifts more revenue into the energy market placing a premium on being low cost over the entire year.
3) Solves the “load forecast arbitrage problem” in that resources cannot take the chance on clearing in the BRA and hoping to buy out in an Incremental Auction at a lower price.

a. IAs will clear at prices at least as high as the BRA and likely higher is the forecast is higher.
b. Will change the offer behavior and some resources more cautious of offering and clearing three years ahead.

4) Easy to transition to now since the 22/23 BRA will be using a 1 year ahead load forecast and 23/24 BRA which will have preliminary load forecast about 2 years out.
5) Works well with PJM implementation of the new ORDC and reserve market construct.