MOPR Proposal: Explicit Screens and Tests for Buyer-Side Market Power

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Introduction

- This proposal is being sponsored by Elwood Energy, LLC (J-Power USA Ltd.)
  - At this point there are no other official endorsements, but discussion with a wide variety of members has been ongoing and a list of endorsements will be provided for the CIFP Meeting on June 30.
- The purpose of this proposal is to provide an explicit buyer-side market power test that is analytically practical and can be replicated.
- This proposal avoids pitfalls of other proposals:
  - Avoids protracted litigation at FERC and beyond.
  - Minimizes IMM and PJM discretion.
  - Does not rely on “legal arguments” regarding “tethering” or “permissibility of subsidies.”
  - Ensure against true buyer-side market power abuses without attempting to divine intent.
  - Mitigates buyer-side market power *ex-ante* rather than waiting for FERC to makes such a determination long after a BRA has been run.

Executive Summary: Application and Initial Screens

- Application:
  - All new resources with an ISA executed after December 19, 2019, consistent with the FERC Order
  - Existing resources that have been announced as being uneconomic by their owner/operators and seeking or receiving subsidies to remain in commercial operation
  - Age, technology, fuel, size neutral
- Defines a set initial screens to eliminate resources that have no incentive to exercise buyer-side market power from further examination
  - Merchant resources
  - LSEs that are "net long"
  - New resources that may have PPAs for energy or RECs, but not capacity delivery

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Executive Summary: Buyer-Side Market Power Test

- Buyer-side Market Power in RPM:
  - Ability for an LSE or group of LSEs to successfully insert an uneconomic resources into the market to reduce overall capacity market expenditures from capacity market purchases and self-supplied/contracted/payment obligations relative to purchasing the original net short position from the RPM Capacity Market
  - Smaller the LDA, the easier it is to exercise buyer-side market power
  - The larger the net short position, the easier it is to exercise buyer-side market power
  - ***Ex-ante*** test that is transparent and can be replicated
- It is only about ***incentive and ability*** and ***not intent***
  - Consistent with the application of supplier market power tests which only examine ability and not intent such as HHI and TPS
  - Does not depend upon state policy and thus requires no examination about "permissible subsidies"

Initial Screens: Eliminating Resources with No Incentive or Ability to Exercise Buyer-side Market Power

1. Subject to MOPR → 1. All New Resources and Existing Resources Announced as Uneconomic and Receiving Revenues thru Non-bypassable Charges to Load

2. Merchant? → 2. New merchant eliminated from further examination

3. LSE that is net long? → 3. New resources owned/contracted by Net Long LSEs eliminated from further examination

4. "Arms length" PPA for energy, and/or RECs but not capacity? → 4. Resources with PPA for RECs and/or Energy-only eliminated from further examination

5. Remaining Resources Subject to the Market Power Test → **5. Existing Resources announced as uneconomic with non-bypassable revenues outside of PJM and resources owned or contracted by Net Short LSEs**

Rationale for Initial Screens to Eliminate Resources from Further Examination-1

1. Check on all possible resources that could be used to exercise buyer-side market power
2. Resources that are merchant have no contractual ties to load and have no incentive to reduce prices.
   a) These resources would be subject to supplier market power tests. Incentives to raise prices
3. Net Long LSEs have no incentive to reduce market prices as they would want to sell the excess to reduce costs or increase profits.
4. "Arms length" PPAs for energy and/or RECs alone do not affect the capacity market and effectively look like merchant resources from an incentive perspective

Rationale for Initial Screens to Eliminate Resources from Further Examination-2

- Why are RECs not an exercise of buyer-side market power?
  - REC prices are determined by the supply-demand balance and ability to earn other revenues.
  - While LSEs must hold RECs to satisfy their state-mandated obligations, they have many options outside the state or LDA to purchases RECs at the lowest possible cost
  - Even RFPs for RECs, if prices competitively determined, the same logic applies
  - The competitive process means that RECs are not non-bypassable charges in the sense of having a fixed, exogenously determined price determined administratively.
- Why are arms length PPAs (absent a capacity obligation) not exercises of buyer-side market power?
  - The parties in question have agreed to a price that is mutually beneficial given that they could go to the energy or REC markets to buy spot.
  - No links to providing capacity
  - Also applies to PPAs with non-LSEs for capacity as a financial hedge for both parties.

Rationale for Further Examination: Incentives Do Not Imply an Ability to Exercise Buyer-side Market Power

1. Regardless of intent, net short LSEs that own through self-build or have contractual obligations to new resources, have an incentive to enjoy lower capacity prices.
2. Politically, lower capacity prices are often more desirable than higher capacity prices. Non-bypassable charges to otherwise uneconomic existing resources create the ability to exercise buyer-side market power regardless of intent
   a) This is no different than suppliers who take outages due to maintenance or equipment failure, or choose to retire resources, have no intent to exercise supplier market power yet, are screened and/or mitigated for it anyway.

Incentives do not imply ability! Hence the reason for the Buyer-side Market Power Test!

Simple Examples of the Buyer-Side Market Power Mitigation Screen in Concept

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Buyer-side Market Power Test: Simple Example No Ability to Exercise Buyer-side Market Power

LSE 1000 MW UCAP Net Short Position

1. LSE does not build. or contract and the RPM clearing price is $140/MW-day
2. For the net short position of 1000 MW UCAP, the LSE pays ($140/MW-day) x (1000 MW) = $140,000/day
3. The rest of the load obligation is settled at the cost of the resources already serving the load.

LSE Self-build or Contracts for 500 MW of UCAP at $250/MW-day

1. LSE puts this into the auction as inframarginal (or zero) and the RPM clearing price is $130/MW-day.
2. For the remaining 500 MW UCAP net short position the LSE pays ($130/MW-day) x (500 MW) = $65,000/day.
3. LSE also pays for the other 500 MW at $250/MW-day for a total of $125,000/day
4. Total is $125,000 + $65,000 = $190,000/day ($50,000 increase)

Since the total load expenditures for capacity exceed the expenditures absent the new build there is no exercise of buyer-side market power and thus *NO MOPR Floor Price is applied.*

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Buyer-side Market Power Test: Simple Example with Ability to Exercise Buyer-side Market Power…Think Small LDA

LSE 1000 MW UCAP Net Short Position

1. LSE does not build. or contract and the RPM clearing price is $140/MW-day
2. For the net short position of 1000 MW UCAP, the LSE pays ($140/MW-day) x (1000 MW) = $140,000/day
3. The rest of the load obligation is settled at the cost of the resources already serving the load.

LSE Self-build or Contracts for 500 MW of UCAP at $250/MW-day

1. LSE puts this into the auction as inframarginal (or zero) and the RPM clearing price is $25/MW-day.
2. For the remaining 500 MW UCAP net short position the LSE pays ($25/MW-day) x (500 MW) = $12,500/day.
3. LSE also pays for the other 500 MW at $250/MW-day for a total of $125,000/day
4. Total is $125,000 + $12,500 = $137,500/day ($2,500/day savings)

Since the total load expenditures for capacity *are below* the expenditures absent the new build there is an exercise of buyer-side market power and a *MOPR Floor Price is applied.*

Buyer-side Market Power Test: Simple Example with Ability to Exercise Buyer-side Market Power…Think Large Net Load Position

LSE 10000 MW UCAP Net Short Position

1. LSE does not build. or contract and the RPM clearing price is \$140/MW-day
2. For the net short position of 1000 MW UCAP, the LSE pays (\$140/MW-day) x (10000 MW) = \$1,400,000/day
3. The rest of the load obligation is settled at the cost of the resources already serving the load.

LSE Self-build or Contracts for 500 MW of UCAP at \$250/MW-day

1. LSE puts this into the auction as inframarginal (or zero) and the RPM clearing price is \$130/MW-day.
2. For the remaining 500 MW UCAP net short position the LSE pays (\$130/MW-day) x (9500 MW) = \$1,235,000/day.
3. LSE also pays for the other 500 MW at \$250/MW-day for a total of \$125,000/day
4. Total is \$1,235,000 + \$125,000 = \$1,360,000/day (savings of \$40,000/day)

Since the total load expenditures for capacity *are below* the expenditures absent the new build there is an exercise of buyer-side market power and a *MOPR Floor Price is applied.*

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Requirements to Apply a Buyer-side Market Power Mitigation Screen

1. "Derived Supply Curves" from PJM simulations in RTO. These can be derived from scenario analysis from past BRAs and would also require PJM develop other scenarios to determine derived supply curves in constrained LDAs.
2. For Constrained LDAs, the ability to simulate market outcomes.
3. Updated demand curve (VRR Curve) for the upcoming BRA
4. Each net short LSE or combined loads with non-bypassable charges to covered the costs of screened resources can be added into the derived supply curves to determine the impact on prices of adding resources to the market
5. Assumptions regarding retirements and new entry:
   a) Assume no other new entry
   b) Assume resources slated to retire where not committed in the previous BRA and this do not need to be considered in the derived supply curve.
6. Default CONE values for new resources (these are already available), plus estimates of EAS offsets.

Detailed Buyer-Side Market Power Mitigation Screen: RTO First Screen

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Which LDA Should Be Applied?

- For vertically integrated LSEs with resources and loads dispersed throughout the RTO across multiple LDAs, the RTO-wide demand will be used.
  - Larger T&D municipal entities providing generation to its members
  - Larger T&D Cooperatives providing generation to its members
- For Vertically Integrated LSEs that with resources and load all within the same LDA, the relevant LDA
- For Load facing a non-bypassable charge in retail choice states in which all load, regardless of LDA. For constrained LDAs and retail choices states in which load is split over multiple LDAs, market simulations are required for accuracy.
  - In the same manner as the scenario analysis already done by PJM post-BRA.
  - MD, OH, DE, PA are retail choice states with multiple LDAs that are modeled and often constrained.

Simple First Cut Test: Using the 2022/2023 Demand and Known Market Outcome

- Rather than using a derived supply curve, a simple test is to simply “assume a vertical supply curve” and insert the added supply quantity as s shift in the vertical supply to the right as a “worst case” scenario for the exercise of buyer-side market power.
- Also assume the default Net CONE for a resource
- In reality, the price impact will be much lower as the supply curve is not vertical, but the supply is much “flatter” around the market clearing quantity and price.

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Simple First Cut Test: Using the 2022/2023 Demand and Known Market Outcome: RTO and 500 MW UCAP New Entry Combined Cycle

- Net CONE for CONE Area 3: $208.42/MW-day
- RTO Clearing Price: $50.00/MW-day
- Cleared quantity (MW UCAP): 144,477.3
- 2000 MW UCAP Net Short
- Impact of 500 MW of supply as a vertical supply and clearing:
  - Slope of this section of demand is -$0.02867/MW
  - 500 MW x (-$0.02867) = -$14.335/MW-day
- Before added supply:
  - 2000 MW UCAP x $50.00/MW-day = 100,000/day
- After added supply:
  - [1500 MW UCAP x $35.665/MW-day] + [500 x $208.42/MW-day] = $157,707.5/day

No Buyer-side Market Power Exercised! Expenditures Went Up!

Simple First Cut Test: Using the 2022/2023 Demand and Known Market Outcome: Larger Net Short, RTO and 500 MW UCAP New Entry Combined Cycle

- Net CONE for CONE Area 3: $208.42/MW-day
- RTO Clearing Price: $50.00/MW-day
- Cleared quantity (MW UCAP): 144,477.3
- <u>*8000 MW UCAP Net Short*</u>
- Impact of 500 MW of supply as a vertical supply and clearing:
  - Slope of this section of demand is -$0.02867/MW
  - 500 MW x (-$0.02867) = -$14.335/MW-day which implies a new price of $35.665/MW-day
- Before added supply:
  - <u>*8000 MW UCAP x $50.00/MW-day = 400,000/day*</u>
- After added supply:
  - [7500 MW UCAP x $35.665/MW-day] + [500 x $208.42/MW-day] = $371,697.50/day

Possible Buyer-side Market Power Exercise! Next Check is Derived Supply in RTO

Detailed Buyer-Side Market Power Mitigation Screen with Derived Supply: Final Screen in RTO

Using the 2022/2023 Demand and Known Market Outcome: Larger Net Short, RTO and 500 MW UCAP New Entry Combined Cycle and Derived Supply

- Net CONE for CONE Area 3: $208.42/MW-day
- RTO Clearing Price: $50.00/MW-day
- Cleared quantity (MW UCAP): 144,477.3
- *8000 MW UCAP Net Short*
- Derived supply slope from the 2021/2022 BRA in RTO for adding 3000 MW of supply is $0.007404/MW
- New RTO Clearing Price: $48.5412
- Before added supply:
  - *8000 MW UCAP x $50.00/MW-day = 400,000/day*
- After 500 MW added supply:
  - [7500 MW UCAP x $48.5412/MW-day] + [500 x $208.42/MW-day] = $468,269/day

No Buyer-side Market Power Exercise! The supply curve is relatively more elastic than demand and expenditures increase

Using the 2022/2023 Demand and Known Market Outcome: Larger Net Short, RTO and 1000 MW UCAP New Entry Combined Cycle and Derived Supply

- Net CONE for CONE Area 3: $208.42/MW-day
- RTO Clearing Price: $50.00/MW-day
- Cleared quantity (MW UCAP): 144,477.3
- <u>*8000 MW UCAP Net Short*</u>
- Derived supply slope from the 2021/2022 BRA in RTO for adding 3000 MW of supply is $0.007404/MW
- New RTO Clearing Price: $45.59895
- Before added supply:
  - <u>*8000 MW UCAP x $50.00/MW-day = 400,000/day*</u>
- After 1000 MW added supply:
  - [7000 MW UCAP x $45.59895/MW-day] + [1000 x $208.42/MW-day] = $527,612.65/day

No Buyer-side Market Power Exercise! The supply curve is relatively more elastic than demand and expenditures increase

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Detailed Buyer-Side Market Power Mitigation Screen with Derived Supply: Initial Screen in Constrained LDAs

Constrained LDAs and Retail Choice

- Most modeled constrained LDAs operate under retail choice and this the LSEs in these areas likely do not have contracts for capacity as the load they serve can easily switch to alternate suppliers
  - MAAC, EMAAC, ATSI, COMED, DEOK (Ohio) and associated sub-LDAs operate under retail choice
- By definition, the net short position in these constrained LDAs is the entire peak load in the LDA
- VRR Curves in constrained LDAs tend to have the that prices are more easily moved with a smaller amount of uneconomic or new supply that could be used to exercise buyer-side market power.
- For Load facing a non-bypassable charge in retail choice states in which all load, regardless of LDA. The largest modeled constrained LDA for which most of load is served

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Using the 2022/2023 Demand and Known Market Outcome: Net Short is Entire Requirement in LDA
3000 MW Nuclear Announced Uneconomic, Vertical Supply

- Net ACR for CONE Area 1 (EMAAC): $120/MW-day (this is not a reflection of true net costs)
- EMAAC Clearing Price: $97.86/MW-day
- Cleared quantity (MW UCAP) plus CETL: 38,506.8 MW
- <u>*35,884 MW UCAP Net Short (entire load in EMAAC)*</u>
- Assume vertical supply
- New EMAAC Clearing Price: Clears with MAAC…assume the MAAC price goes to at $70/MW-day as adding supply to EMAAC also adds supply to MAAC.
- Before added supply:
  - <u>*35,844 MW UCAP x $97.86/MW-day = $3,507,693/day*</u>
- After 3000 MW added supply:
  - [32,844 MW UCAP x $70.00/MW-day] + [3000 x $120/MW-day] = $2,695,080/day

Buyer-side Market Power Exercise! In this example it causes EMMAC to clear with MAAC and expenditures decrease

Using the 2022/2023 Demand and Known Market Outcome: Net Short is Entire Requirement in LDA
1500 MW Nuclear Announced Uneconomic, Vertical Supply

- Net ACR for CONE Area 3 (COMED): $120/MW-day (this is not a reflection of true net costs)
- COMED Clearing Price: $68.96/MW-day
- Cleared quantity (MW UCAP) plus CETL: 26,036.5 MW
- _23,931 MW UCAP Net Short (entire load in COMED)_
- Assume vertical supply
- New COMED Clearing Price: Clears with RTO…assume the RTO stays at $50/MW-day.
- Before added supply:
  - _23,931 MW UCAP x $68.96/MW-day = $1,650,281/day_
- After 1500 MW added supply:
  - [22,431 MW UCAP x $50.00/MW-day] + [3000 x $120/MW-day] = $1,301,550/day

Buyer-side Market Power Exercise! In this example it causes COMED to clear with RTO and expenditures decrease

Using the 2022/2023 Demand and Known Market Outcome: Net Short is Entire Requirement in LDA in EMAAC
1500 MW UCAP Offshore Wind, Vertical Supply

- Net CONE Offshore Wind: $2000/MW-day (this is not a reflection of true net costs)
- EMAAC Clearing Price: $97.86/MW-day
- Cleared quantity (MW UCAP) plus CETL: 68,989 MW
- *35,844 MW UCAP Net Short (entire load in EMAAC)*
- Assume vertical supply
- New EMAAC Clearing Price: Clears with MAAC… assume the MAAC price goes to at $80/MW-day as adding supply to EMAAC also adds supply to MAAC.
- Before added supply:
  - *35,844 MW UCAP x $97.86/MW-day = $ 3,507,693 /day*
- After 1500 MW added supply:
  - [34,344 MW UCAP x $80.00/MW-day] + [1500 x $2000/MW-day] = $5,787,520/day

No Buyer-side Market Power Exercise! In this example the actual Net CONE is so high that expenditures increase substantially in spite of lower clearing price.

Examining Constrained LDAs Requires a Simulation of the Auction to Account for Interactions

- These "simple" tests with constrained LDAs are not even that simple, but these examples provide an idea of how this works
- In contrast the RTO examination is relatively simple to implement.
- To increase transparency, PJM should do more than simply publish the current algorithm on the RPM page but provide updated and more detailed information to allow interested stakeholders to examine the potential for being caught up in the buyer-side market power screen.
- The location of new resources relative to the load paying for these resources also matters, and is not shown in these examples in total
- A technical appendix will be provided for the CIFP Meeting on June 30.

Questions?

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