



PJM Analysis



CCPPSTF
July 17, 2017

1. State Actions
2. Revenue Shortfall vs. Credits from State Actions: Example
3. State Actions Impact on Key RPM Components
4. Effect of Low Offer Prices on Clearing Prices

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1. Renewable Portfolio Standards (Credits vary in different States)
2. Emission Tax (Not applicable in PJM)
3. Cap-and-Trade (Penalties for fossil generation in DE and MD)
4. Feed-in Tariff (Not applicable in PJM)
5. Mandated Power Purchase Agreements (Applicable in MI; Difficult to quantify)
6. Zero Emission Credits (e.g. Credits to nuclear generation in IL)
7. Loan Programs (Not applicable in PJM)
8. Grant Programs (Not applicable in PJM)
9. Tax Incentives (Various; small credits)
10. State Takeover (Not applicable in PJM)
11. Rate Based Cost Recovery for Certain Resources (Varying credits to EE and DR)

See CCPPSTF Matrix tab “KWA #2” for details.

1. Potential credits to some resources due to State Actions were quantified. The credits vary widely in value depending on the State. See CCPPSTF Matrix tab KWA #3 Quantification for details. **PJM does not have data to quantify credits due to Rate Based Cost Recovery.**
2. The following three State Actions may have significant impact on resource economics.
 - Renewable Portfolio Standards
 - Zero Emission Credits
 - Rate Based Cost Recovery

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Revenue Shortfall vs. Credits from State Actions: Example

PJM has no data to illustrate credits due to Rate Based Cost Recovery.

	Fixed Cost *	Net Energy Revenue **	Revenue Shortfall	Potential Credit Examples ***	State Action
Solar-New	\$1,578	\$350	\$1,229	\$2490; \$66	NJ, OH RPS
Wind-New	\$4,225	\$1,181	\$3,044	\$277; \$39	NJ, OH RPS
Nuclear-Existing	\$564	\$458	\$106	\$265	IL ZEC

All data converted to \$/MW-day UCAP basis using typical UCAP to nominal capacity ratio.

* Solar and wind fixed costs are from 2016 SoM report; Nuclear fixed costs are from EPA data: 2011 costs escalated to 2016 at 2%/year. Range \$350-\$700/MW-day.

** Net energy revenues are from 2016 SoM report for new capacity; Existing nuclear energy revenues would vary widely (not public information).

*** Potential credits are from KWA #3 Quantification (see CCPPSTF Matrix).

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- Significant credits to resources may result in lower offers from these resources and suppress market clearing prices
 - Detrimental effect to merchant assets wholly dependent on the wholesale market
- Pushes out the economic entrant
 - New, more efficient, resources are kept out of the market by maintaining uneconomic resources

Administrative

- RTO/LDA Reliability Requirement (BTMG may have some impact)
- Net Cost of New Entry (Possible secondary impact of energy market changes; energy market not in scope)
- Sloped VRR Curve

Specific Tariff Requirement

- Market Power Mitigation
- MOPR for new generation

Auction Clearing Constraints

- Locational (transmission related)
- Resource Caps (reliability related)

Delivery Year Performance

Supply

- Resource Diversity (Increase or decrease)
- Offer Prices/Competition *
- Forward Commitment *
- Non-Discriminatory Selection *

Auction Clearing

- Locational Price Signals *
- Revenue Adequacy *
- Centralized Market/Price Transparency *

Delivery Year Load Charges

*** The RPM components that are potentially impacted by State Actions may need a special treatment to minimize the impact.**

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Clearing Price Impact of Uncompetitive Sell Offers

- The clearing price impact of uncompetitive sell offers has been estimated by removing an assumed 2,000 MW quantity of uncompetitive sell offers from the 2020/2021 BRA sell offer curve
 - for this purpose, uncompetitive sell offers are defined as cleared BRA sell offers that would not have otherwise cleared absent some out-of-market subsidy
- The clearing price impact varies significantly depending on the assumed location of the 2,000 MW of uncompetitive sell offers
- If wholly contained in a constrained LDA the size of ComEd or EMAAC (internal LDA capacity requirements in range of 23,000 MW to 28,500 MW), the 2,000 MW of uncompetitive sell offers may impact the affected LDA clearing price by as much as \$130 to \$150/MW-day; with little to no impact on the clearing price of the unconstrained region outside of the impacted LDA
- If distributed throughout larger regions of the PJM system or the entire PJM system, the 2,000 MW of uncompetitive sell offers may impact the clearing price of the larger unconstrained RTO region by as much as \$10/MW-day