



# PJM Analysis



CCPPSTF  
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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 (including 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 could potentially have a significant impact on resource economics.
  - Renewable Portfolio Standards
  - Zero Emission Credits
  - Rate Based Cost Recovery (for certain resources)

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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
<b>Solar-New</b>	\$1,578	\$350	\$1,229	\$2490; \$66	NJ, OH RPS
<b>Wind-New</b>	\$4,225	\$1,181	\$3,044	\$277; \$39	NJ, OH RPS
<b>Nuclear-Existing-EPA</b>	\$564	\$458	\$106	\$265	IL ZEC
	\$564	\$374	\$190	\$265	IL ZEC
	\$564	\$682	-\$118	\$265	IL ZEC
<b>Nuclear-Existing-NEI</b>	\$640	\$458	\$182	\$265	IL ZEC
	\$640	\$374	\$266	\$265	IL ZEC
	\$640	\$682	-\$41	\$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. EPA nuclear fixed cost is from EPA data: 2011 costs escalated to 2016 at 2%/year. Range \$350-\$700/MW-day. NEI nuclear fixed cost is from the Nuclear Energy Institute (NEI): 2015 costs escalated to 2016 at 2%/year. A 90% capacity factor is assumed in converting \$/MWh cost to fixed cost. Cost varies depending on whether it is a single unit or multi-unit site.					
** Net energy revenues are from 2016 SoM report for new capacity: PJM value and lowest and highest zonal values are shown.					
*** Potential credits are from KWA #3 Quantification (see CCPSTF Matrix).					

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- Significant credits to resources may result in lower offers from these resources and suppress market clearing prices when the resources receiving the credits are not economic
  - 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**

- 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 using the 2020/2021 BRA scenario analysis results
- The price impact is greater if the uncompetitive sell offers are confined to a smaller constrained sub-region of the RTO as opposed to being distributed evenly throughout the RTO
  - the estimated price impact for the constrained EMAAC LDA is \$4.34/MW -day per each 100 MW of subsidized capacity located in the EMAAC area (using delta of EMAAC RCPs from scenarios 6 & 7 divided by total change in EMAAC supply in these cases of 3,258 MW)
  - The estimated price impact for the RTO Region is \$0.26/MW-day per each 100 MW of subsidized capacity distributed throughout the rest of RTO region (using delta of RTO RCPs from scenarios 2 & 3 divided by total change in RTO supply in these cases of 6,000 MW)