



# Return of the RTO: Auction Results Portend Recovery

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## Executive Summary

The doubling of RTO capacity prices indicates that market reforms are helping to improve the market through the elimination of inappropriate preferences for demand response (DR) and imports. The price movement is partially driven by other market dynamics including expanded internal transmission capabilities, the tightening MISO supply/demand balance, and tightening environmental regulations. ICF expects capacity prices will follow a general upward trend in future auctions, but the extent and rate of the increase (and volatility around the generally increasing trend) is more difficult to predict.

Despite this meaningful price recovery for the region, capacity prices remain far below PJM's net CONE (the theoretical market equilibrium) for new resources. Although we do not believe full CONE will be reached, we do believe higher prices would result from a fuller implementation of market reforms. Further, although recovery of the RTO prices provides financial relief for some portion of the existing generation portfolio, it remains to be seen whether this recovery will be sufficient to cover the high fixed costs of some existing resources in the region on a sustained basis.

The significant addition of new gas-fired power plants indicates that the market, at the clearing price levels, is continuing to attract new entrants in the generation space. However, the majority of the new resources are gas-fired combined cycles that are likely to rely on interruptible gas service and likely not to have on-site back-up fuel. Significant additions of such capacity may add to the stress on the natural gas markets in the eastern PJM delivery zones during colder than normal winter conditions.

The results of the latest auction indicate that approximately 1.1 GW of units have cancelled or postponed retirement and nearly 1 GW were reactivated.<sup>1</sup> This change of heart may have been influenced by the polar vortex and associated higher energy prices. In contrast to these additions, several large baseload facilities did not clear at the higher RTO pricing levels this year. Prices are still well below CONE, and coupled with expected new environmental regulations (performance standards for existing resource), could prompt another round of retirements.

DR declined significantly and there is still room to go. There was a shift in DR resources toward more annual and extended summer DR products to provide more reliable capacity and year-round flexibility. The large amount of remaining DR indicates a potential for higher prices if additional reforms are implemented. And last week's U.S. Court of Appeals decision removing FERC jurisdiction over DR may have substantial consequences over the next few years.

Importantly, the results of this auction are an indication that some significant issues recently identified by the Independent Market Monitor in PJM's market construct, have begun to be addressed.<sup>2</sup>

<sup>1</sup> Reactivated resources are counted as new generating resources and are subject to mitigation rules.

<sup>2</sup> In particular, the IMM identified the need for demand response to act as a full substitute for generation in its recent report, "Analysis of the 2016/2017 RPM Base Residual Auction," The Independent Market Monitor for PJM, April 18, 2014.



## Capacity Prices Begin Recovery

The 2017–2018 reliability pricing model (RPM) base residual auction (BRA) cleared results indicate significant capacity price recovery in the “RTO”<sup>3</sup> zone of PJM. Compared to previous auctions, the RTO capacity price increased by approximately 100 percent or \$60/MW-day. Contrary to the previous auction where MAAC and ATSI cleared at premiums of \$60/MW-day and \$55/MW-day over RTO respectively, prices for annual resources converged across all PJM local deliverability areas (LDAs), with the exception of the PSEG LDA. Because of unresolved transmission constraints in the PSEG LDA, capacity prices remain higher than RTO prices by \$95/MW-day, as shown in Exhibit 1. Capacity price for the limited DR product was lower by approximately \$15/MW-day than for annual resources in RTO and PSEG and even lower (by \$80/MW-day) in PPL.

**Exhibit 1. PJM RPM BRA Annual Resource Clearing Prices (UCAP \$/MS-day)**

	RTO	MAAC	EMAAC	SWMAAC	PS	PS North	ATSI
2014/2015	126	137	136	136	136	225	N/A
2015/2016	136	167	167	167	167	167	357
2016/2017	59	119	119	119	219	219	114
2017/2018	120	120	120	120	215	215	120

Source: Source: PJM<sup>4</sup>

Going into the auction, there were signals that the RTO prices would likely clear at levels higher than the prior capacity auction. Two of the signals for higher capacity prices were (i) the change in the participation rules and the implementation of limits on limited and extended summer DR products and (ii) limits on external generation resource than can participate in PJM auctions (import limits). Additionally, net CONE values that determine the shape of the demand curve and clearing prices were increased by 6 percent for RTO and by as much as 31 percent for some LDAs. Conversely, the 14 GW of new generating resources granted exemptions from minimum offer price rule (MOPR) as competitive entry or self-supply were signaling downward pressure. This in turn reflected the large quantity of potential new gas fired supply and the ability of these generators to bid aggressively.

### Key Outcomes

- **Imports declined.** A total of 4.5 GW of import resources cleared in this auction. This represents a 40 percent or 3 GW decrease in the total amount of imports that cleared in the 2016–2017 auction. On March 3, 2014, FERC imposed limits from zones outside PJM and set the maximum (simultaneous) import level for the 2017–2018 auction to 6.5 GW.<sup>5</sup>
- **DR declined.** The total amount of DR that cleared in the 2017–2018 auction was 11 GW, representing a 1.5 GW decrease from the 2016–2017 level (see Exhibit 2). The decrease is

<sup>3</sup> RTO is Regional Transmission Organization. PJM is an RTO. However, the western portion of PJM is a subzone for capacity market purposes and is referred to as the RTO zone.

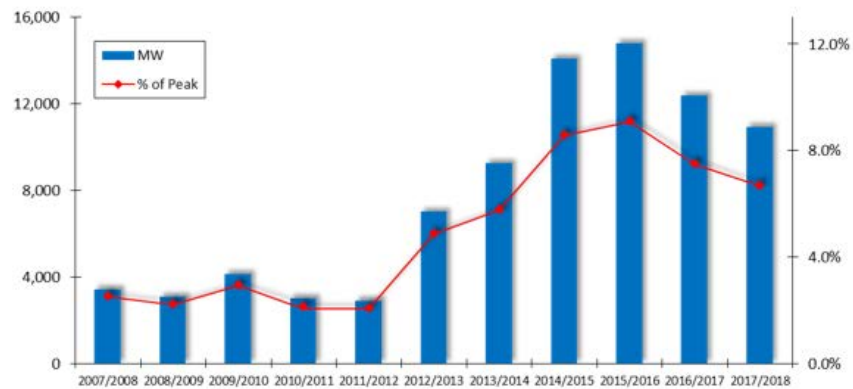
<sup>4</sup> <http://www.pjm.com/~media/documents/reports/20140109-january-2014-cold-weather-peaks-and-generator-outages.ashx>  
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<sup>5</sup> FERC instituted many new import limits; the one identified is from the west—i.e., MISO. The stated goal was to reserve capacity for emergency imports known as the capacity benefit marking. The alternative was to raise the target reserve margin.



the result of recent FERC orders. On January 30, 2014, FERC ordered correction of unintentional errors that favored DR.<sup>6</sup> In addition, on March 3, 2014, FERC instituted an attestation requirement by officers, making explicit the intent to offer physically controlled load identified in qualification filings. Both of these orders effectively decreased the implicit preference for DR, potentially triggered in part as a response to the polar vortex (because nearly all DR resources are summer only, with a 60-hour call limit). These results do not reflect in any way the announcement last week that a federal court has ruled that DR in the energy markets is a state, not a federal, jurisdictional issue. Although not directly addressing the capacity markets, there is the unexpected and difficult to assess possibility that DR capacity in general cannot be FERC jurisdictional and will not be able to participate in future auctions.

**Exhibit 2. PJM Demand Response in MWs and as Percentage of Peak**



Source: PJM ISO; ICF

- **PJM-wide total generation resources declined.** Compared to the previous auction, approximately 1 GW less total generation and 1.4 GW less DR cleared in this auction. This represents a 1.4 percent decrease in the PJM-wide reserve margin, from 21.4 percent to 19.7 percent. Higher prices result in fewer resources due to the downward sloping demand curve. This is because procurement levels are not fixed, but decrease when prices are higher. This is an issue that warrants review in light of the reliability issues raised during the polar vortex.
- **Fewer existing generation resources cleared.** Although 6.3 GW unforced capacity (UCAP) of new resources (new generating resource and uprates) cleared the auction, there was a decrease of 9.8 GW of generation resources that cleared the prior auction.<sup>7</sup> This may include Exelon’s nuclear generation in Illinois as well as coal capacity subject to state environmental regulations.

<sup>6</sup> After meeting 90 percent of the reliability requirements from annual resources the PJM auction clearing algorithm was giving equal preference on generating resources and DR productions. With this order (ER14-504), FERC maintains the 90 percent requirement from annual resources but limits the amount of limited and extended summer DR products that can clear in the auction. Limited DR is capped at the constrained level (2,322 MW).

<sup>7</sup> This decrease represents generators that bid high and did not clear the auction, generators that plan to retire, and planned generators that cleared the previous auction but did not participate in the most recent auction (as the development projects have been cancelled or postponed).



- **Convergence of RTO and MAAC price results.** As a result of the capacity emergency import limits (CETL) for MAAC being increased before the auction (by approximately 800 MW) and MAAC needing less imports due to additional new generation, the import limits are no longer binding between RTO and MAAC, thereby resulting in price convergence.

## Significant Number of Power Plant Additions

New projects that cleared the auction are considered confidential information and are not reported by PJM ISO. However, all the gas-fired combined cycles cleared in the eastern parts of PJM, which have experienced higher capacity prices historically and have areas with the lowest reported gas prices. Interestingly, the plants all cleared in market areas that experienced shortages of interruptible gas delivery service in the winter of 2013–2014. We also note that of the 6 GW that cleared, approximately 5 GW is new gas-fired capacity, and just under 1 GW is reactivated capacity.

The auction report indicates that 1.7 GW (UCAP) of new generating projects in EMAAC cleared the auction. New generating projects in EMAAC almost certainly include Old Dominion’s 1,000 MW Wildcat Point project clearing as self-supply and either Rockland’s 500 MW BL England redevelopment project, or NRG’s 600 MW Old Bridge project.

PJM’s auction report also indicates that 2.7 GW of new generation is located in MAAC, excluding EMAAC (i.e., PPL, PENELEC, METED, and SWMAAC). There are at least eight projects in advanced development in these regions including:

- SWMAAC: Genesis’ 700 MW Key’s Energy; Panda’s 900 MW Mattawoman; CPV’s 700 MW St. Charles; and Constellation’s 120 MW Perryman 6 expansion.
- Rest of MAAC: Panda’s Patriot 800 MW; EmberClear’s 600 MW Good Spring; Tenaska’s 1000 MW Lebanon Valley; and the 900 MW Berks Hollow.

It is difficult to guess which of the above units cleared, but based on development/permitting status, potential candidates include Panda’s Patriot project, the Perryman 6 expansion and Tenaska’s Lebanon Valley.

For RTO, PJM ISO reports 1.5 GW of new projects cleared the auction. Given that all new cleared projects are located downstream of west-to-east transmission constraints and based on development/permitting status and cost of the approximately seven projects in advanced development (Stonewall; Rolling Hills; Oregon; Carroll County; CPV Smyth; Westmoreland; Beech Hollow), the more likely candidates to have cleared include Panda’s 800 MW Stonewall project and Tenaska’s 600 MW Rolling Hills project.

## Area of Concern

These new resources competed and displaced existing generating resources that may retire as a result of not clearing in the RPM. A significant concern of PJM, regulators, and load providers is the potential for delay of these new capacity resources. This concern has driven PJM and PJM’s IMM to propose measures that would require guarantees that new generation reflects legitimate projects that are planning to come online and are not speculative bids that could subsequently withdraw. Specifically, PJM ISO and PJM’s IMM proposed measures (EL14-1461) to diminish incentives for sellers to submit speculative supply offers in its capacity market auctions. On May 9, 2014, FERC rejected the proposal and initiated an investigation (EL14-48), and directed commission staff to hold a technical conference to "facilitate development of a just and reasonable solution" to any reliability issues.



## Capacity Prices and CONE Strengthen Bear Argument

The RTO clearing price indicates recovery is still far below the net cost of new entry (CONE), strengthening the skeptical school of thought on the future level of capacity market revenues for generators relative to CONE. The results reinforce the continued potential for a significant number of new generation projects to clear at capacity prices far below what is assumed to be net CONE by PJM. PJM's net CONE is designed to reflect the required bid price for new (CT) generating resources.

The question going forward is whether new generation projects that clear the auction will have significant cost advantages (e.g., brownfield development, repowering, reactivation, etc.) or whether the margins are sufficient to justify \$120/MW-day capacity pricing, which is significantly lower than the PJM's net CONE estimate of \$350/MW-day. The fact the new generation clears at levels below net CONE is not new in this last auction. As shown in the Exhibit 3, since the beginning of PJM BRA auctions, new generating resource have bid below (in many cases, significantly below) Net CONE estimates. We do note, however, that the bulk of the new merchant projects have cleared largely in the last two auctions. Closer investigation of each development project is likely to reveal nuances to any generalization.

### Exhibit 3. Clearing Prices as Percentage of Net CONE

PJM RPM BRA Annual Resource Clearing Prices (UCAP \$/MW-day)

	RTO	MAAC	EMAAC	SWMAAC	PS	PS North	ATSI
2014/2015	126	137	136	136	136	225	N/A
2015/2016	136	167	167	167	167	167	357
2016/2017	59	119	119	119	219	219	114
2017/2018	120	120	120	120	215	215	120

Net CONE (UCAP \$/MW-day)

	RTO	MAAC	EMAAC	SWMAAC	PS	PS North	ATSI
2014/2015	342	242	275	242	275	275	361
2015/2016	321	268	314	268	314	314	358
2016/2017	331	277	330	277	330	330	363
2017/2018	351	313	366	313	366	366	374

Net CONE (UCAP \$/MW-day)

	RTO	MAAC	EMAAC	SWMAAC	PS	PS North	ATSI
2014/2015	37%	57%	49%	56%	49%	82%	—
2015/2016	42%	62%	53%	62%	53%	53%	100%
2016/2017	18%	43%	36%	43%	66%	66%	31%
2017/2018	34%	38%	33%	38%	59%	59%	32%



Despite the positive developments in the PJM auction price results, ICF believes that the bidding behavior of cleared new gas generation may continue to overstate potential energy market revenues for a generic combined cycle project given the volatility in the forwards market and the fact that forwards (especially PJM forwards) have increased significantly recently, in turn likely due to the high energy prices of this past winter. Additionally, the bids of new generators may continue to reflect the potential for arbitrage opportunities associated with the large natural gas price basis differentials across PJM. There is a difference of \$1.1/MMBtu between delivered gas prices in the Western MAAC and Eastern MAAC regions. A key question is whether these arbitrage opportunities will be sustained in the face of potential infrastructure expansion and increasing gas demand.

### About the Authors

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**Maria Scheller**, an expert in long-term planning and forward market modeling, she is experienced in assessing long-term market risks and developing strategies around reducing risks and maintaining operational standards. She has testified on behalf of utilities and their long-term resource planning strategies. She also has supported utilities and independent power producers in reviewing plans for development of generation and other resource options for financial soundness under an expected range of conditions. Ms. Scheller has provided due diligence support to individual asset owners and companies holding portfolios of diverse assets and has supported resource procurement exercises for load-serving entities.

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