

US Electric Utilities & IPPs

Taking a Load Off at PJM

Equities

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Proposed load forecasting methodology shifts could reduce load by 5 GWs

In response to several years of overly "optimistic" (high) forecasts of future electric load used in determining capacity costs, PJM's Load Analysis Subcommittee has been working out improvements to the load forecast methodology to enhance its accuracy. Work is expected to continue through the end of the year with an eye toward incorporating the new forecast methods in the Jan 2016 fifteen-year load projection. While the work remains incomplete, preliminary indications from subcommittee presentation materials and member comments indicate the possibility of reducing as much as ~5 GWs of load currently in the 2015 fifteen-year forecast. Our modelling of supply and demand for the anticipated Base Residual Capacity Auction (BRA) indicates a sensitivity of ~\$40/MW-day to this level of reduced load, potentially offsetting much of the uplift created by the Capacity Performance (CP) scheme. We reiterate our caution once more that the process remains in proposal form – and could yet evolve.

Energy efficiency (EE) factors responsible for the bulk of the total reduction

The current 2015 load forecast includes a projection in 2018 of 161 GW for RTO. This forecast already includes a placeholder binary statistical correction term that reduces it just over 1.1% (about 1.8 GW already baked in). Preliminarily, new corrections for energy efficiency could reduce the forecast by another 4.1% (about 6.4 GW), although we estimate this could be mitigated by extracting at least ~1.7 GW of supply-side EE in the capacity market (could be more); exact details here remain a bit unclear. Addt'l. statistical factors for weather and newly detected levels of autocorrelation have the potential to subtract another 0.7% (about 1.1 GW). PJM is also considering moving to a 20-yr weather data set vs the current 40-yr set. Warmer weather in recent decades could work to offset these changes and *increase* the load forecast by 1%-2% (~2.4 GW). Lastly, a new forecast to reflect rapid distributed solar growth and reduction to load forecast by -1.5 GW (ore more); this too remains in some flux. In total, we estimate that there is potential for as much as ~5 GW of net load reduction in the 2016 forecast beyond the amount already included in the 2015 forecast.

Extracting capacity market EE offsets some of the negative impact to load

Before the new forecast is ready, PJM intends to avoid "double counting" measurable programmatic industrial/commercial/wholesale EE on both the supply and demand sides of the BRA pricing curve. This entails identifying and extracting a projection for this type of explicitly planned EE that will collect capacity revenue from the remaining unmeasurable impacts of general efficiency improvements at the residential and small commercial level (appliances/equipment) that have typically been considered a form of load reduction.

But distributed solar is not yet in the forecast and could reduce load

The Jan 2015 load forecast does not yet include an explicit reduction for distributed solar, although it is presumably embedded implicitly in the 2015 baseline. PJM is working on measurement and forecast methodologies to explicitly include this impact going forward. We estimate this could have a -1.5 GW impact, which is part of our overall -5 GW net impact; PJM's projections appear to us to be highly volatile for 2019.

Joint Consumer Complaint at FERC seeks immediate implementation

In late June, a Section 206 complaint was filed with FERC seeking to force PJM to finish and implement the new enhanced (lower) forecast in time to be used in the upcoming BRA for 2018/19 to be held in August, as well as the Capacity Performance Transition Auctions this summer. Given the complexity of remaining tasks, especially the forecasting of future programmatic EE, we are sceptical that FERC will agree to force the use of an incomplete analysis. The complainants include a mix of industrial groups, the Sierra Club, and various regulatory commissions on behalf of end-use consumers.

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Identifying the impacts – a work in progress

In the table below, we illustrate the preliminary analysis of PJM's Load Analysis Subcommittee as of its [July 9th presentation](#) to the PJM Planning Committee. While the presentation highlights a -5.9% total potential impact to the forecast from the various corrective factors, this includes about -1.1% that is already baked into the most current Jan 2015 load forecast in the form of a placeholder binary statistical correction. The incremental impact to the Jan 2016 forecast is thus -4.8%, or about -7,600 MW from the Jan 2015 load forecast for 161 GW in 2018.

From this, we also show several additional adjustment factors being considered. These include an additional reduction to account for an effective incremental -1.5 GW of distributed solar from 2015-2018 (see below for details). As an offset, PJM is studying the use of a 20-year historical weather data set rather than the current 40-year set. It is our understanding that such a change would likely increase the load forecast by 1%-2% as a result of warmer temperatures in recent years.

Finally, PJM is conducting an analysis of energy efficiency impacts with an eye toward extracting EE planned to be entered into capacity auctions from the EE reductions to be applied to the load forecast. This is necessary to avoid double counting EE on both sides of the supply and demand curves. The type of EE to remain as a negative load forecast factor is tied more to general equipment/appliance upgrading that is heavily residential/small commercial and is also typically not subject to direct measurement; PJM's proposal would adopt the same approach employed by EIA in its own assessment of this underlying improvement in the capital base. While this could be a significant offset to the -4.0% (-6.4 GW) of total EE identified in PJM's preliminary load forecast analysis, we note that 1.3 GW of EE cleared the 2017/18 BRA in RTO.

In the table below, we add this load back plus an additional 400 MW as an example of what the subcommittee may choose to exempt from the load forecast because it is already part of the supply/demand curve on the supply side. We caution that PJM may ultimately judge that a higher offset may be more appropriate.

With nearly 75% of its assets concentrated in PJM, we believe TLN is the most sensitive to changes.

We caution that PJM may ultimately judge that a higher EE offset may be more appropriate, mitigating the load reduction further.

Figure 1: Incremental Impacts to 2018 RTO Load Forecast in the Jan 2016 report

2018 RTO Load Forecast as of Jan 2015 report (MW)		161,128
Items identified in June 9th Planning Committee Presentation		
New weather specification	-1.2%	(1,900)
Autocorrelation AR (1) correction	-0.7%	(1,100)
Equipment saturation/Efficiency variables	-4.0%	(6,400)
Total	-5.9%	
Placeholder binary stat correction already baked into 2015 forecast	1.1%	1,800
Incremental total vs 2015 load forecast	-4.8%	
Additional factors being considered:		
Forecast of incremental distributed solar	-0.9%	(1,500)
Shorten historical weather from 40 years to 20 years **	1.5%	2,400
Extract EE that cleared 2017/18 BRA ***	0.8%	1,300
Extract incremental EE to clear 2018/19 BRA ***	0.2%	400
Total potential net impact vs 2015 forecast	-3.2%	(5,000)
* All impacts are still preliminary pending a final report from PJM ** UBS estimates impact on forecast from the impact of warmer weather in recent decades *** PJM is still working on a forecast methodology for capacity market EE; we've simply taken the EE that cleared in last year's 2017/18 BRA as an example of what could be subtracted.		

Source: PJM Interconnection LLC, UBS estimates

Distributed solar also reduces forecast

The impact of distributed solar is not yet being explicitly factored into PJM's load forecasts. Nevertheless, the current level of installed distributed solar capacity (ICAP), estimated by PJM to be about 2,000 MW in 2015, is presumably an implicit part of the 2015 load forecast. Using 2015 actual load as a base, the task ahead for PJM is to determine a forecasting methodology for incremental distributed solar in order to explicitly factor in the resulting load reduction in future load forecasts to enhance their accuracy. PJM's own forecast for distributed solar in 2018 is approximately 4,500 MW (a 31% CAGR). In the table below, we apply a 60% capacity factor to the incremental 2,500 MW to account for the expected impact of ICAP on load for the fact that daily solar peak generation is not actually coincident with peak load. Our final estimate is applied in Figure 1 above to illustrate a net -5 GW reduction in load for the Jan 2016 forecast.

Assumptions for distributed solar appear exceptionally uncertain, with methodology on reflecting this implicit demand reduction unclear

Figure 2: Forecast of incremental distributed solar in PJM RTO, 2015A-2018E

Forecast of incremental distributed solar	
2015A Installed distributed solar capacity (ICAP)	2,000
2018 PJM forecast RTO distributed solar	4,500
PJM forecast RTO 3-yr dist solar CAGR	31%
2015A-2018E incremental dist solar	2,500
% of ICAP coincident with peak load	60%
2018E load reduction from distributed solar vs 2015 load forecast	1,500

Source: UBS estimates, PJM Interconnection, LLC

Beyond distributed solar, we note some desire to address wider adoption of behind-the-meter generation in the forecast load.

Capacity revenue sensitivities

Our work on the Reliability Pricing Model (RPM) indicates a sensitivity of about \$7.50/MW-day for each 1 GW change in either supply or demand, indicating the possibility for a ~\$40/MW-day negative impact to capacity prices should a -5 GW load reduction be integrated into the Jan 2016 forecast for the 2019/20 BRA next year. We've highlighted the comparative impact of such a reduction below. With nearly 75% of its assets concentrated in PJM, TLN is the most sensitive to changes.

Figure 3: Sensitivities to -\$38/MW-day Reduction in RPM Capacity Pricing

PJM Capacity Market Upside	TLN	DYN	NRG	EXC	FE	PEG
Nameplate Capacity (MW)	11,969	11,940	18,658	22,142	9,477	12,042
EFORd Adj. (MW)	11,271	11,265	17,506	20,794	8,942	11,333
Clearing Price in 2016/17 \$/MW-Day	\$59.37	\$59.37	\$59.37	\$59.37	\$59.37	\$59.37
Clearing Price in 2017/18 \$/MW-Day	\$120	\$120	\$120	\$120	\$120	\$120
\$-40/MW-day Sensitivity (\$M)	(165)	(164)	(256)	(304)	(131)	(165)
Impact to EPS	(\$ 0.83)	N/A	N/A	(\$ 0.23)	(\$ 0.20)	(\$ 0.21)
2017 EPS or EBITDA	\$713	\$1,222	\$2,706	\$ 2.52	\$ 2.23	\$ 2.81
% of total 2017 UBS Estimate	-23.1%	-13.5%	-9.4%	-9.0%	-9.1%	-7.5%

Source: UBS estimates, PJM Interconnection LLC

Load growth rate also likely to be reduced

PJM's preliminary load forecasting analysis indicates that in addition to an expected reduction of load at the base starting year, the improved accounting for EE (and to a much lesser extent, weather trends) could reduce the 10-year load growth forecast to 0.7% from 1.0% under current methodologies.

Joint Consumer Complaint cites adverse financial impact

On June 30, a collection of "Joint Consumer Representatives" filed a complaint with FERC under Rule 206 of the Federal Power Act (EL15-83-000) over PJM's intention to delay the implementation of these proposed new load forecasting methods until the 2016 forecast. The heart of the complaint is that the use of the current 2015 forecast in this summer's auctions essentially results in the over-procurement of "7,000 MW" of capacity in this summer's 2018/19 BRA as well as the planned incremental Capacity Performance transition auctions, costing "\$600M or more" than necessary. PJM will file its response on Monday July 20, with the first CP transition auction merely a week later and the BRA scheduled for mid-August. We note that the complaint suggests to FERC that the BRA and CP transition auctions be delayed to November in the case where PJM is ordered to implement the new reduced load forecast but is nevertheless unable to do so in time for this summer.

As Mr. Ott explained to us, the primary reason for the delay is a need for more time to isolate the impact of EE entered into capacity auctions as supply from the more unmeasurable system EE. Without this in place, the early adoption of the current incomplete load forecast methods could result in a double counting of future EE that collects capacity revenue on both the supply and demand sides of the pricing curve. Despite the complainant's request for "fast-track" processing to implement before this summer's auctions, we think there's little chance for FERC to require the use of a half-baked forecast reduction when the methods being adopted are still in a state of flux and being hotly debated.

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The complainants include the PJM Industrial Customer Coalition, the Sustainable FERC Project/Natural Resources Defense Council, Sierra Club, the New Jersey Board of Public Utilities, the New Jersey Division of Rate Counsel, Maryland Office of People's Counsel, the Office of the People's Counsel for the District of Columbia, the Pennsylvania Office of Consumer Advocate, the Delaware Public Service Commission, the Delaware Division of the Public Advocate, and the West Virginia Consumer Advocate Division.

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Exelon Corp. ^{4, 6a, 6b, 7, 16}	EXC.N	Neutral	N/A	US\$33.59	16 Jul 2015
FirstEnergy Corp. ¹⁶	FE.N	Sell	N/A	US\$34.69	16 Jul 2015
NRG Energy Inc. ¹⁶	NRG.N	Buy	N/A	US\$22.25	16 Jul 2015
Public Service Enterprise Group ¹⁶	PEG.N	Neutral	N/A	US\$41.89	16 Jul 2015
Talen Energy Corp ¹⁶	TLN.N	Sell	N/A	US\$17.49	16 Jul 2015

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