

Latest Thinking on Capacity Cost Allocation

MADRI Meeting

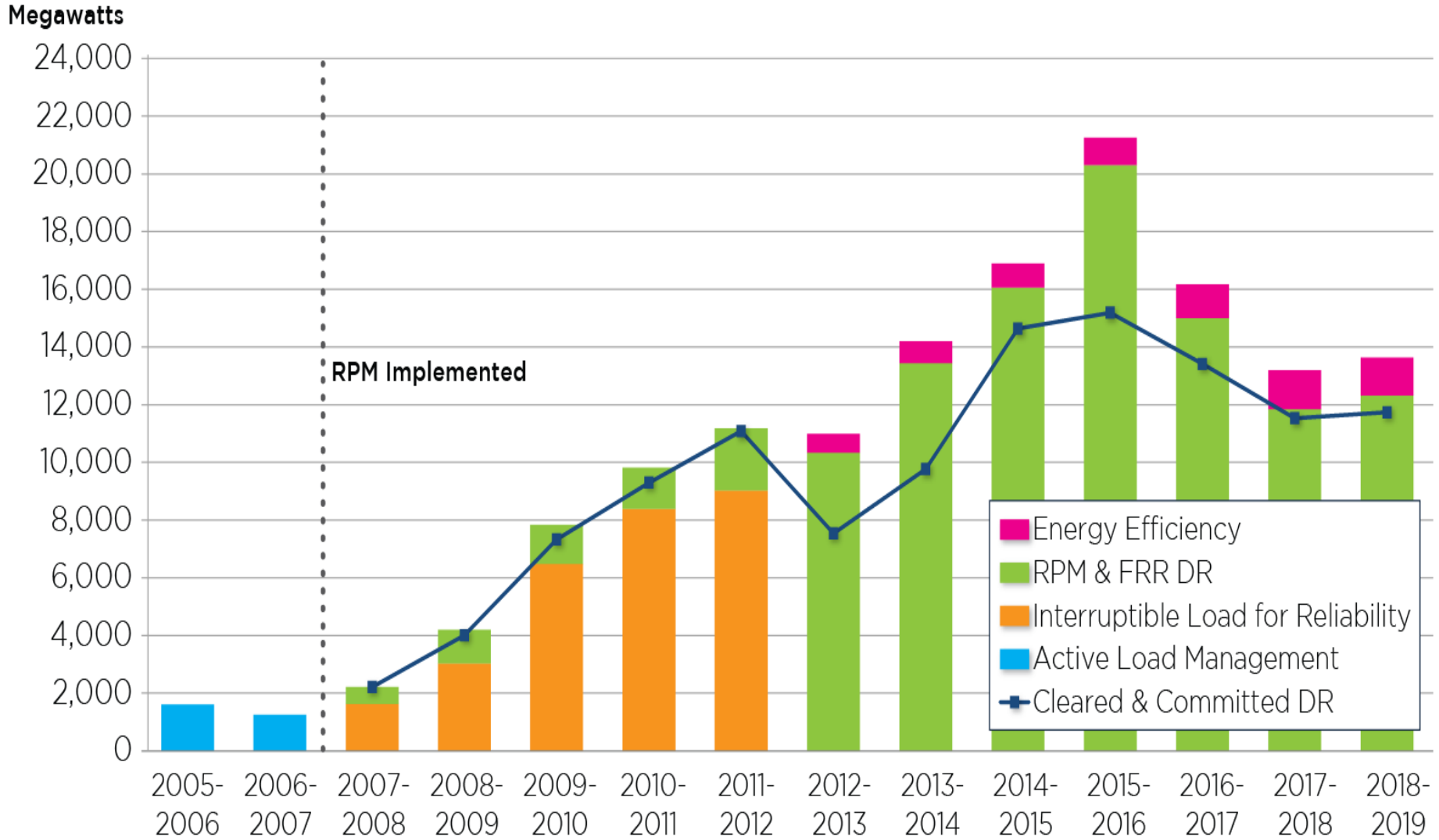
Paul Scheidecker,
Sr. Lead Engineer
December 8, 2015



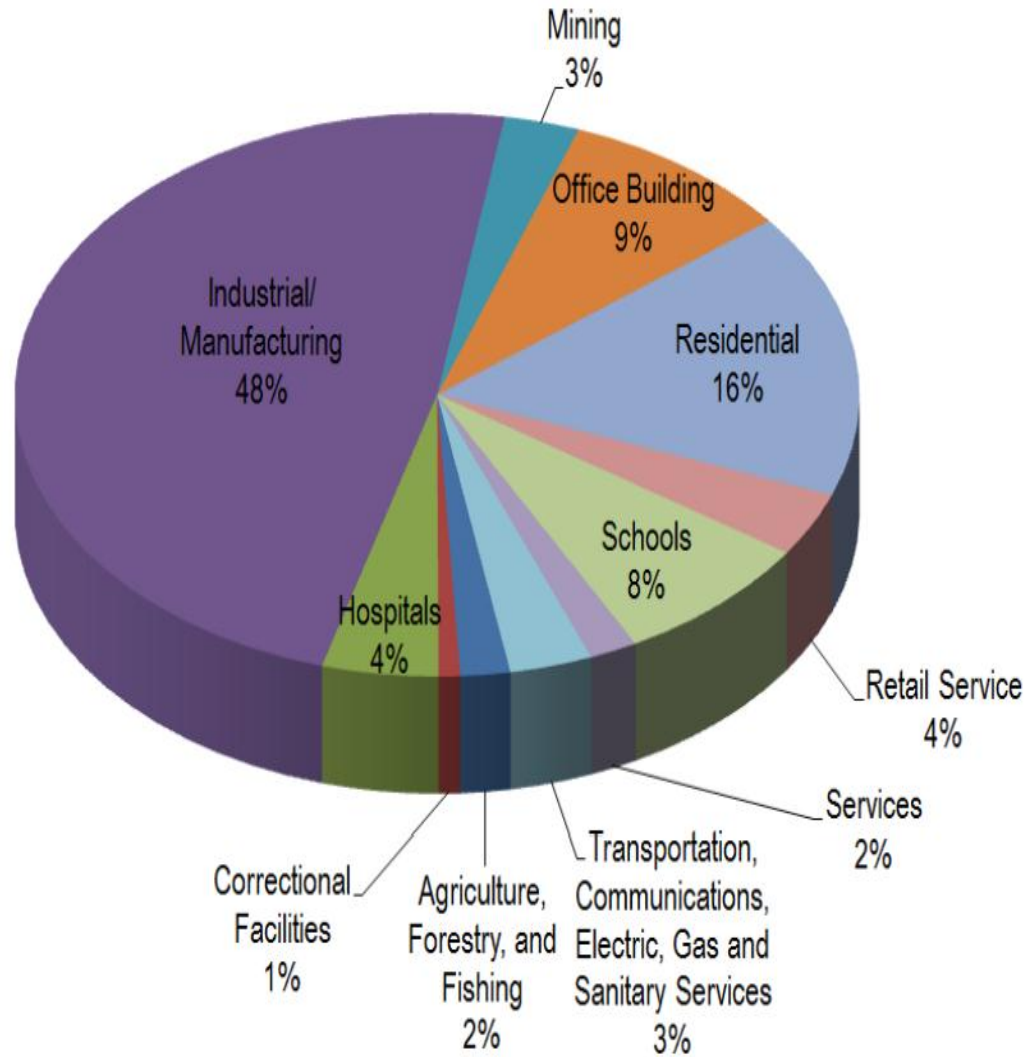
**21% of U.S. GDP
produced in PJM**

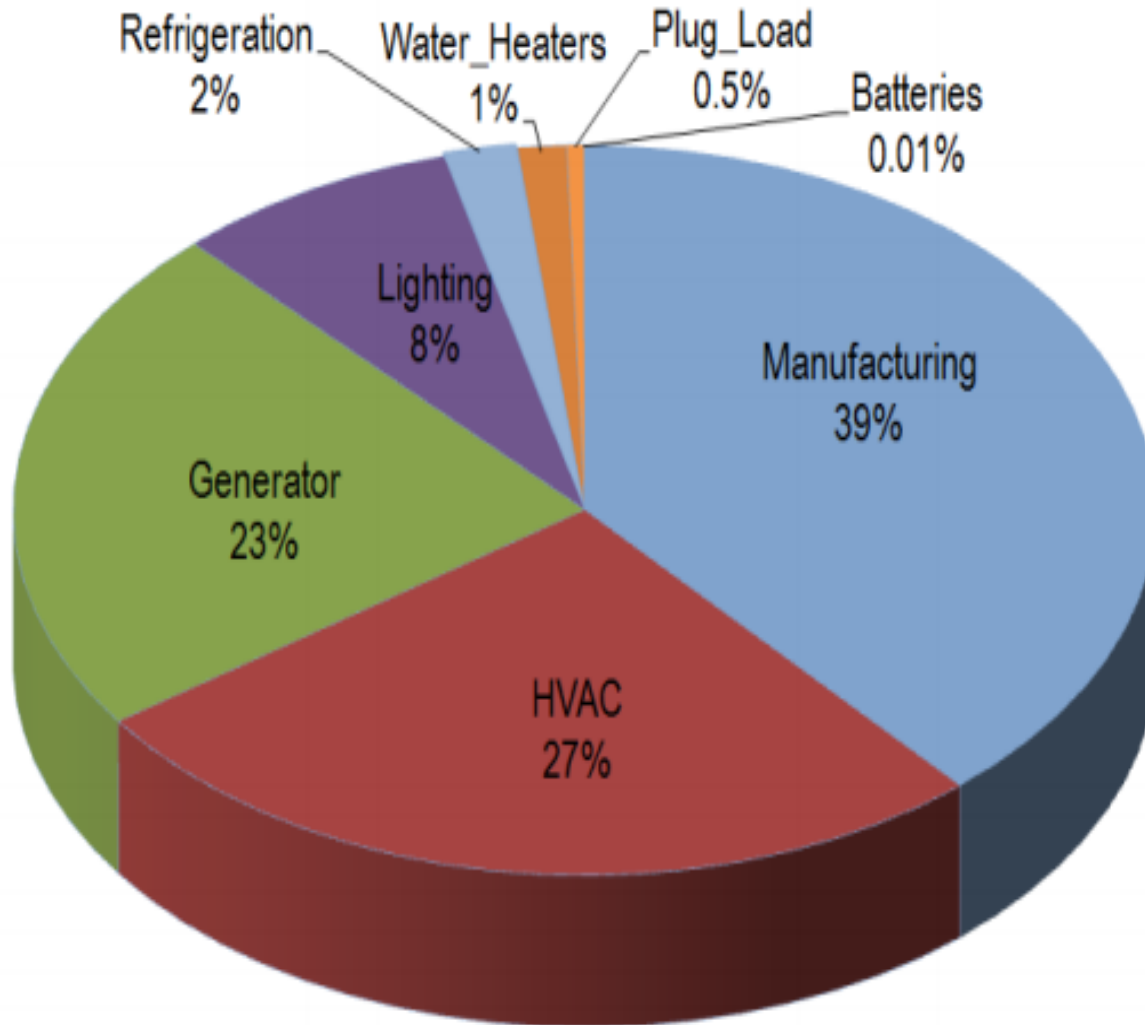
KEY STATISTICS

Member companies	900+
Millions of people served	61
Peak load in megawatts	165,492
MW of generating capacity	183,604
Miles of transmission lines	62,556
2013 GWh of annual energy	791,089
Generation sources	1,376
Square miles of territory	243,417
States served	13 + DC



Demand Response Registrations Business Segments in 2014/15





- The total capacity procured in RPM auctions for a particular delivery year is allocated based on each zone's share of the final RTO peak load forecast for the delivery year.
- Load Forecasts are updated each January



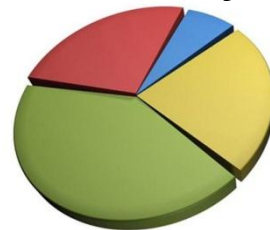
- The total capacity procured in RPM auctions for a particular delivery year is allocated based on each zone's share of the RTO load for:
 - the 4 highest summer peak hours,
 - the single highest winter peak hour,
 - The highest peak from each day of a performance assessment event from the most recent full one-year period covering 11/1 thru 10/31.



Comparison of Current Method vs Withdrawn Method

	Current Method	As-Filed Method		
	% of RTO	Nov '13 - Oct '14	Nov '12 - Oct '13	Nov '11 - Oct '12
AE	1.64%	1.32%	1.60%	1.65%
AEP	14.51%	16.49%	15.08%	15.19%
APS	5.40%	6.34%	5.58%	5.51%
ATSI	8.19%	8.13%	8.35%	8.06%
BGE	4.41%	4.48%	4.43%	4.52%
COMED	14.13%	11.45%	13.47%	14.05%
DAYTON	2.15%	2.20%	2.15%	2.12%
DPL	2.59%	2.92%	2.52%	2.56%
DQE	1.83%	1.71%	1.75%	1.82%
DUKE	3.40%	3.12%	3.22%	3.30%
EKPC	1.23%	1.75%	1.24%	1.22%
JCPL	3.87%	2.97%	3.76%	3.56%
METED	1.82%	1.92%	1.91%	1.87%
PECO	5.35%	5.05%	5.37%	5.16%
PENLC	1.79%	2.07%	1.98%	1.91%
PEPCO	4.11%	4.15%	4.12%	4.16%
PL	4.43%	5.11%	4.74%	4.60%
PS	6.38%	5.20%	6.28%	6.05%
RECO	0.26%	0.19%	0.26%	0.24%
UGI	0.12%	0.14%	0.13%	0.13%
VEPCO	12.40%	13.29%	12.06%	12.31%
PJM RTO	100.00%	100.00%	100.00%	100.00%

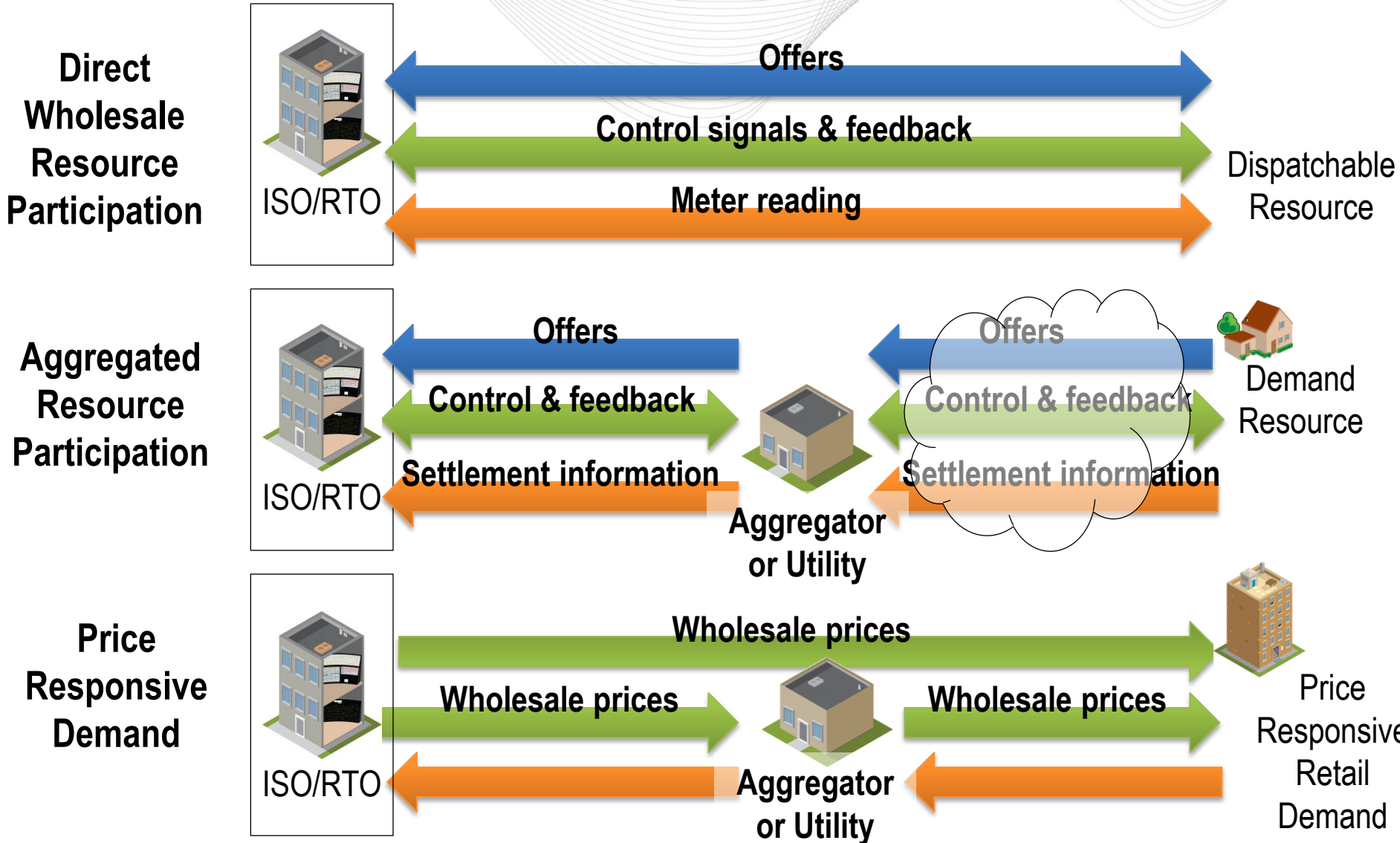
- Each day, EDCs upload to PJM an allocation of the load serving responsibility within their zone
- PJM scales the allocations uniformly, if necessary, so that the total uploaded quantity equals the total MW assigned to the zone
- Load charges are the product of the RPM final zonal capacity price and the LSE's share of the total MW assigned to the zone
- Charges are calculated daily and billed weekly



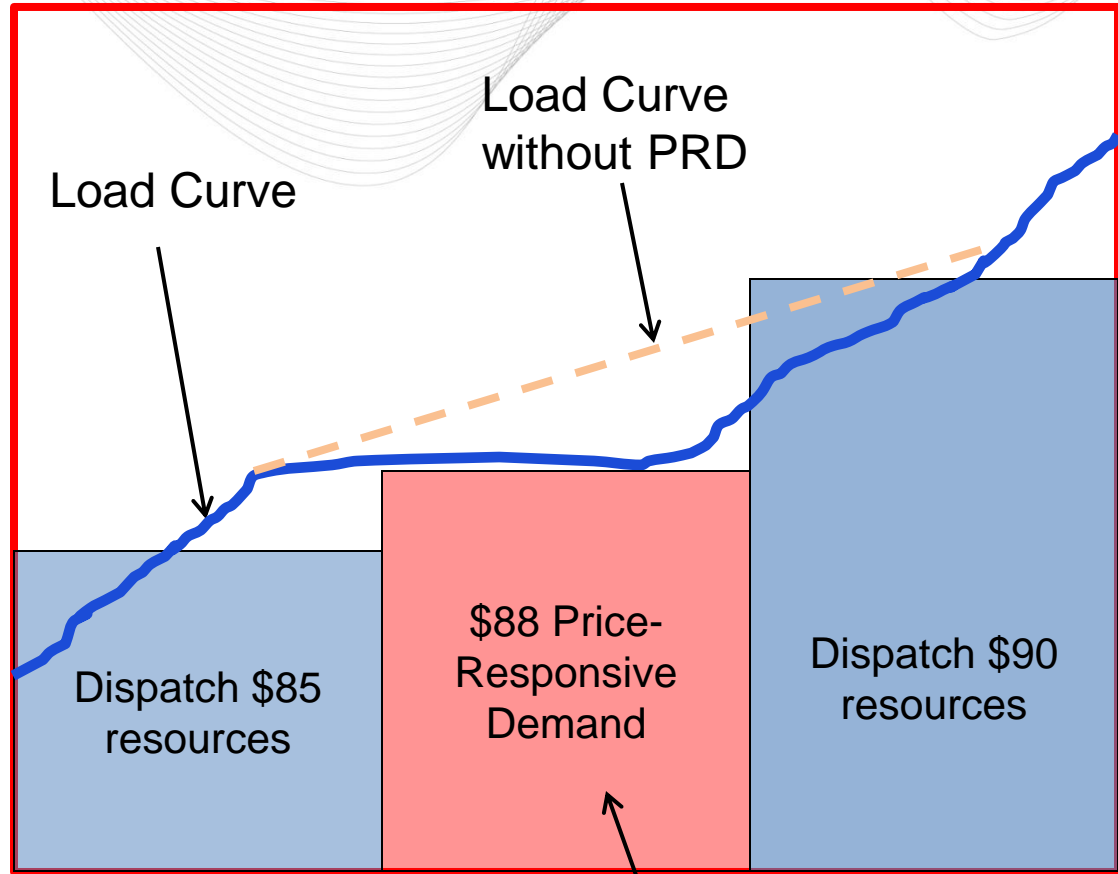
- FERC's Price Formation NOPR proposals:
 - Settle energy transactions in its real-time markets at the same time interval it dispatches energy (implications for DR participating as a supply-side resource)
 - Settle operating reserves transaction in its real-time markets at the same time interval it prices operating reserves
 - Trigger shortage pricing for any dispatch interval during which a shortage of energy or operating reserves occurs

- PJM intends to change market rules to settle energy and ancillary services in the Real-time Energy Market at the same time interval as that used for dispatch = 5 minutes
 - PJM co-optimizes energy and ancillary service
 - Intertie transaction would be included
- PJM investigating timeline requirements and costs of implementation

- PJM recommends more flexibility for the “any dispatch interval” shortage pricing trigger
 - Transient energy related operational issues rather than stressed system conditions warranting shortage pricing
 - Practical limitations on grid resources’ and market participants’ ability to instantaneously respond to shortage conditions
- Market rules require PJM to confirm that the shortage will last at least 30 minutes
- Alternatively revise the operating reserve demand curve to ensure a price gradient based on different degrees of shortage



- Option for wholesale participation by load reduction capability accounted for on the load side of the market
- Market rules require:
 - Metering capable of providing hourly interval usage values
 - Dynamic retail rates that are triggered by nodal Locational Marginal Prices in the PJM energy market
 - Automated response (and supervisory control for capacity market participants that can override automated controls)



No dispatch of additional resources due to demand response at indicated price level