

Current State of DR and overview of PRD at PJM

MADRI

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Baltimore, MD

Capacity Market transition toward Capacity Performance (CP) annual requirement

Now through 19/20 DY

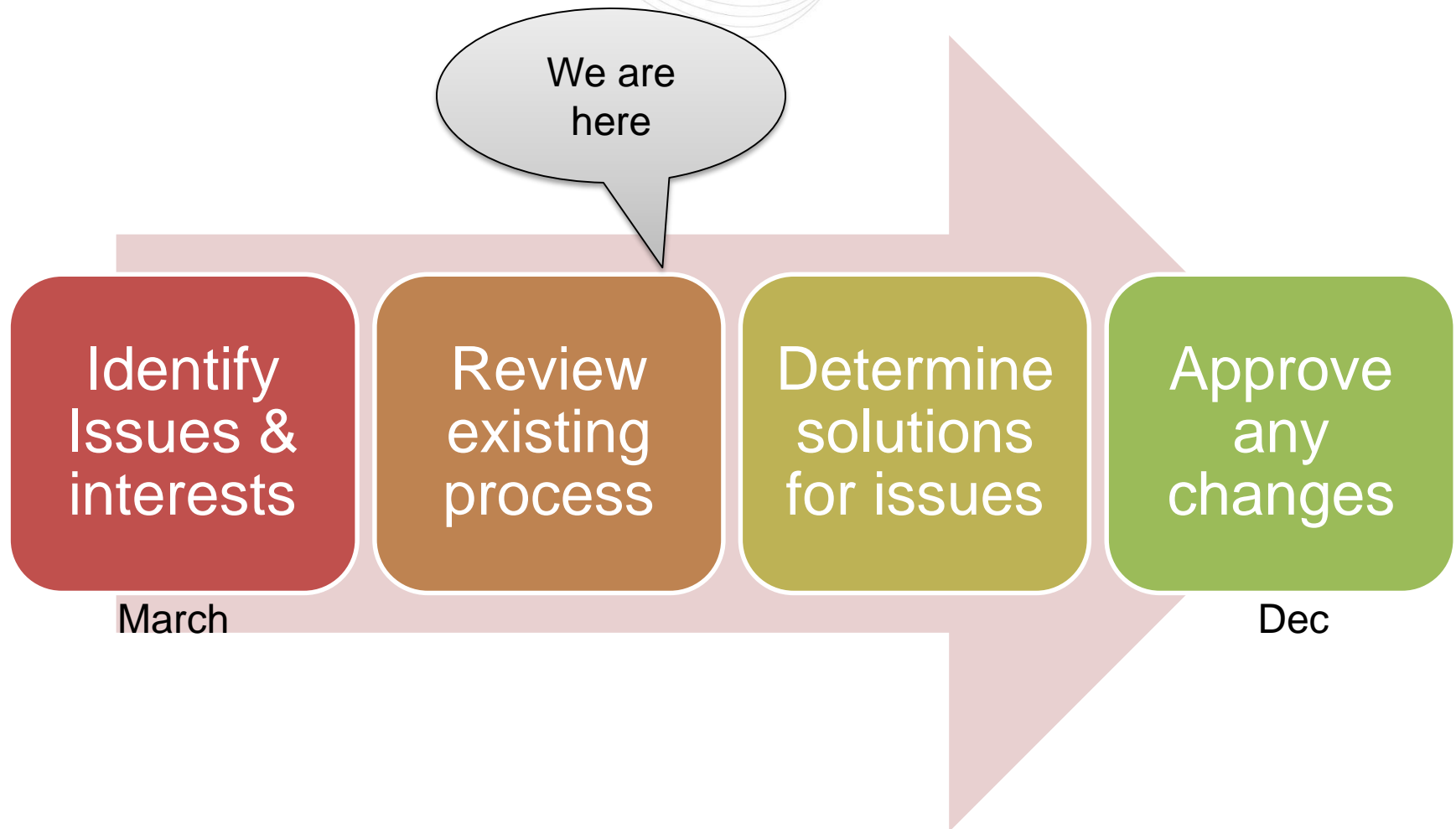
Annual &
Summer
Products

May 2017 BRA

20/21 DY and future

Annual (CP)
Product
Only

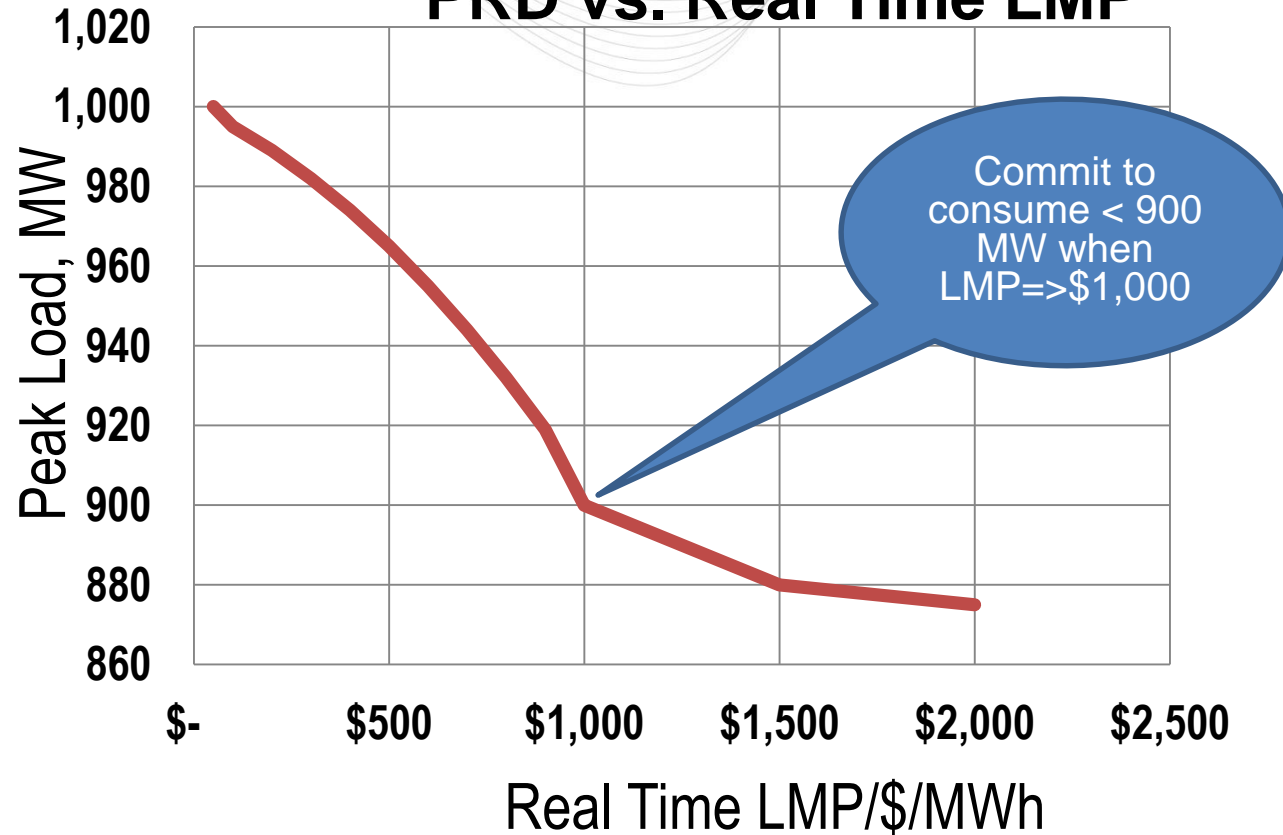
Recent FERC CP order— largely affirmed prior ruling & denied most of rehearing requests. Additional compliance filing still needed



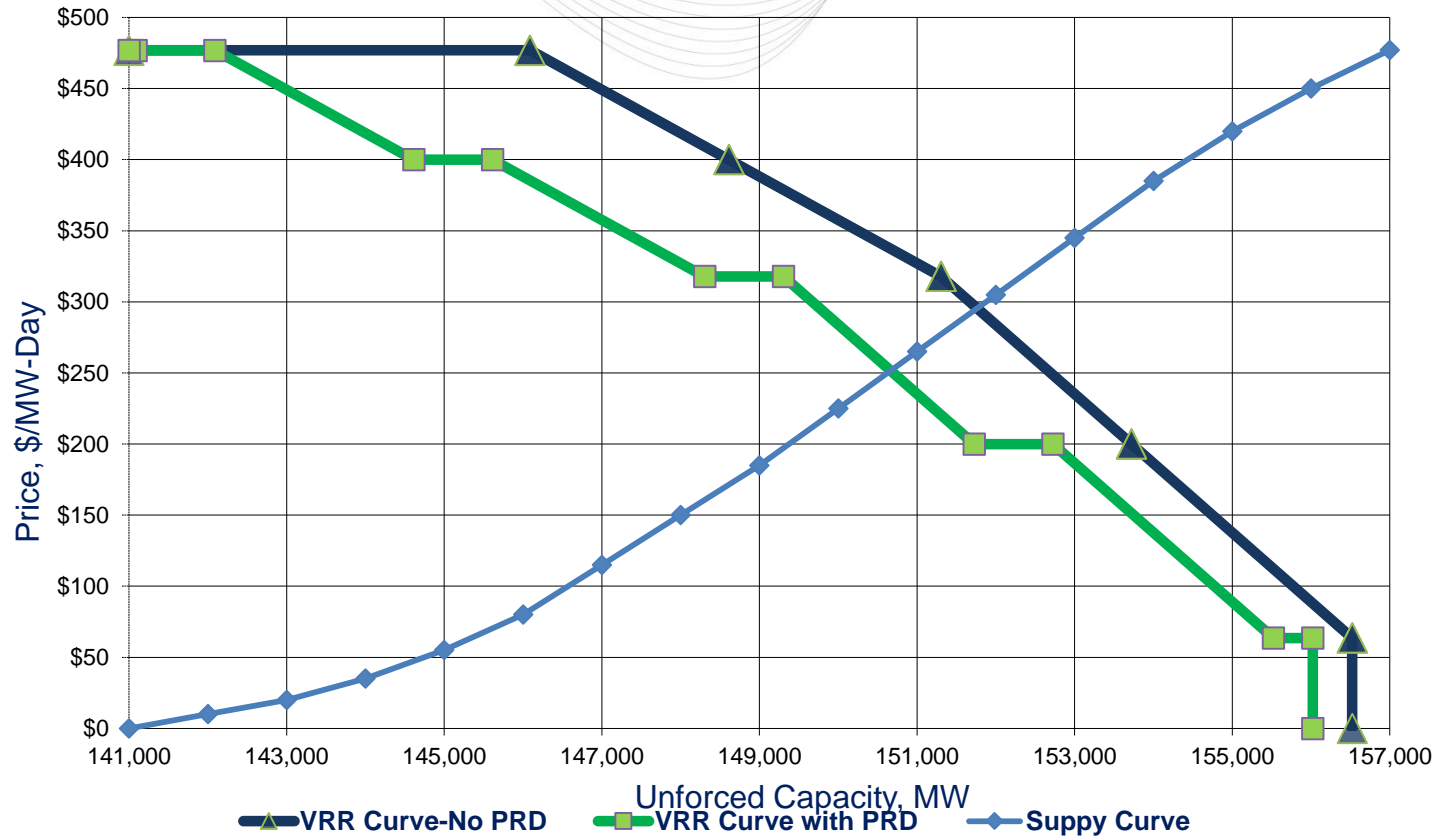
- Resource aggregation business rules
- Retail peak shaving
 - Limited impact on future forecast used to determine capacity requirement
 - 1 year lag impact on individual customer (depends on EDC PLC allocation process).
- Thoughts about different ways to fulfill capacity requirements
 - Allocation of 1 in 10 LOLE risk to summer
- Demand Response M&V
 - CBL used for non-summer period

Rules became effective 2012, no participation to date

PRD vs. Real Time LMP



Price Responsive Demand (PRD) – load that will automatically respond to energy prices and be off the grid during PJM emergency in exchange for reduction in capacity requirement.



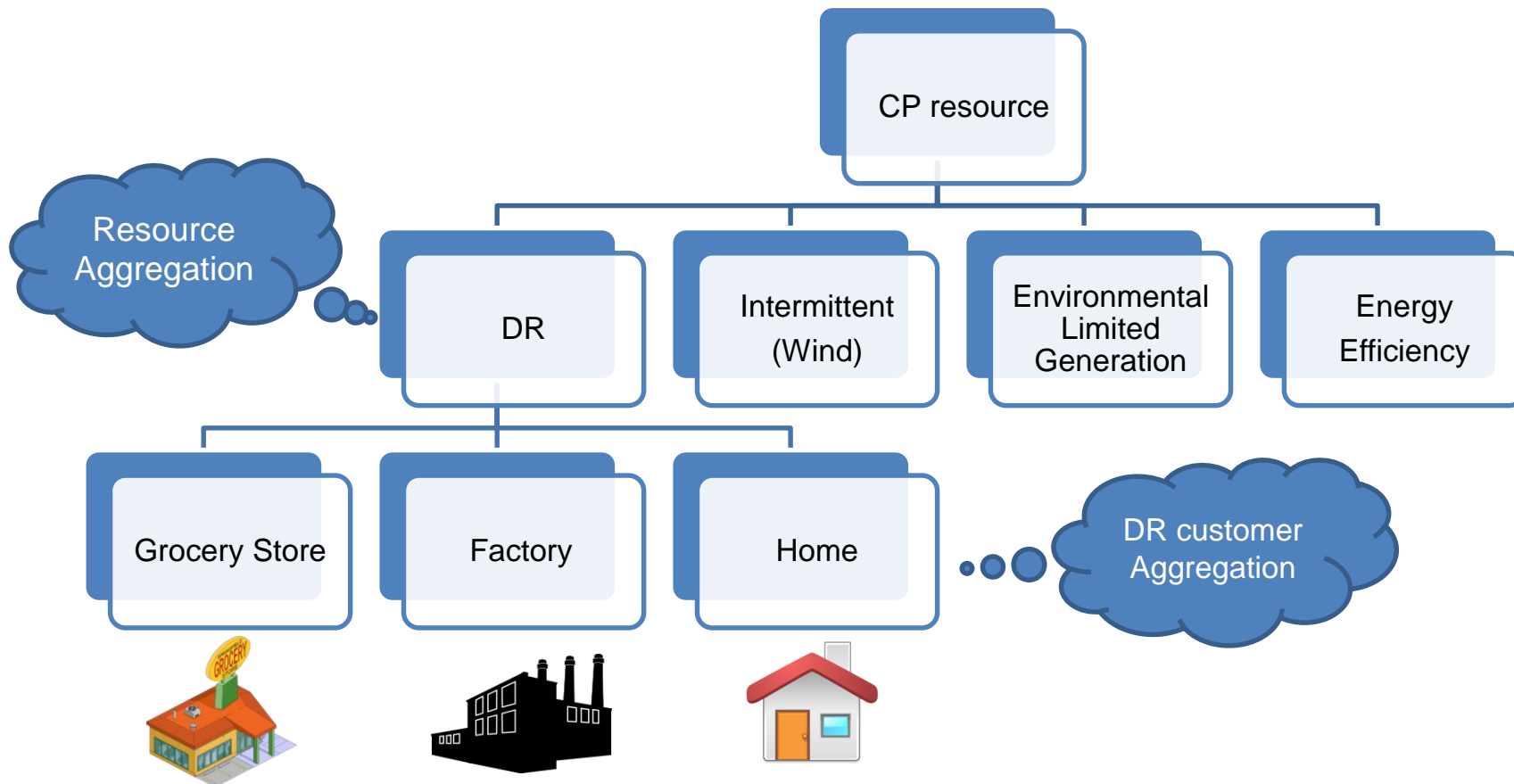
PRD will shift or change the demand curve which will reduce the overall capacity requirement

PRD vs DR/CP comparison in capacity market

Process	PRD	DR/CP
RPM	BRA or 3 rd IA if forecast goes increases, No replacement	BRA and IAs, replacement allowed
Plan	PRD provider	CSP
Revenue	No revenue – bill credit to LSE based on FZCP if cleared in BRA	Revenue to CSP based on auction clearing price
Registration	pnode required (and limits aggregation), Dynamic retail rates (linked to nodal LMP). Not allowed to participate as economic DR	Registration not permitted after start of DYs.
Reporting	PRD hourly curve (load and LMP) by pnode	Expected reductions by dispatch group
Dispatch & Notification	PRD provider dispatches from price curve and supervisory control during Max Emergency. Eligible to set LMP	PJM dispatch/release by zone/subzone by type by lead time Eligible to set LMP
Verification	Adjusted MESL	FSL in summer (similar to MESL) and CBL in non-summer
Penalty	Daily deficiency charge (FZCP * > of 1.2 or \$20/mwday Event – same as daily deficiency charge * 365	Daily deficiency charge (RPM price * > of 1.2 or \$20/mwday Event – Net Cone * 365/30
Testing	Same	same
Add Back	Based on emergency event and 5 CPs	Based on emergency and economic events

Please see current Governing Documents for additional details, actual rules may change in the future

- CP resource aggregation
- PRD load reduction calculation
- PJM emergency procedures and PRD



PRD Max Emergency Event Compliance during the Delivery Year

Maximum Emergency Service Level (MESL)		900 MW
Forecast zonal peak load		10,000 MW
Actual zonal peak load at the Max Emergency condition		10,500 MW
Ratio of actual load to forecast load	10,500/10,000	1.05
Tolerance MESL	$900 * 1.05$	945 MW
LSE reduces the load to		955 MW
Shortfall (Load in Excess of Tolerance MESL)	$955 - 945$	10 MW

