DR Strategy

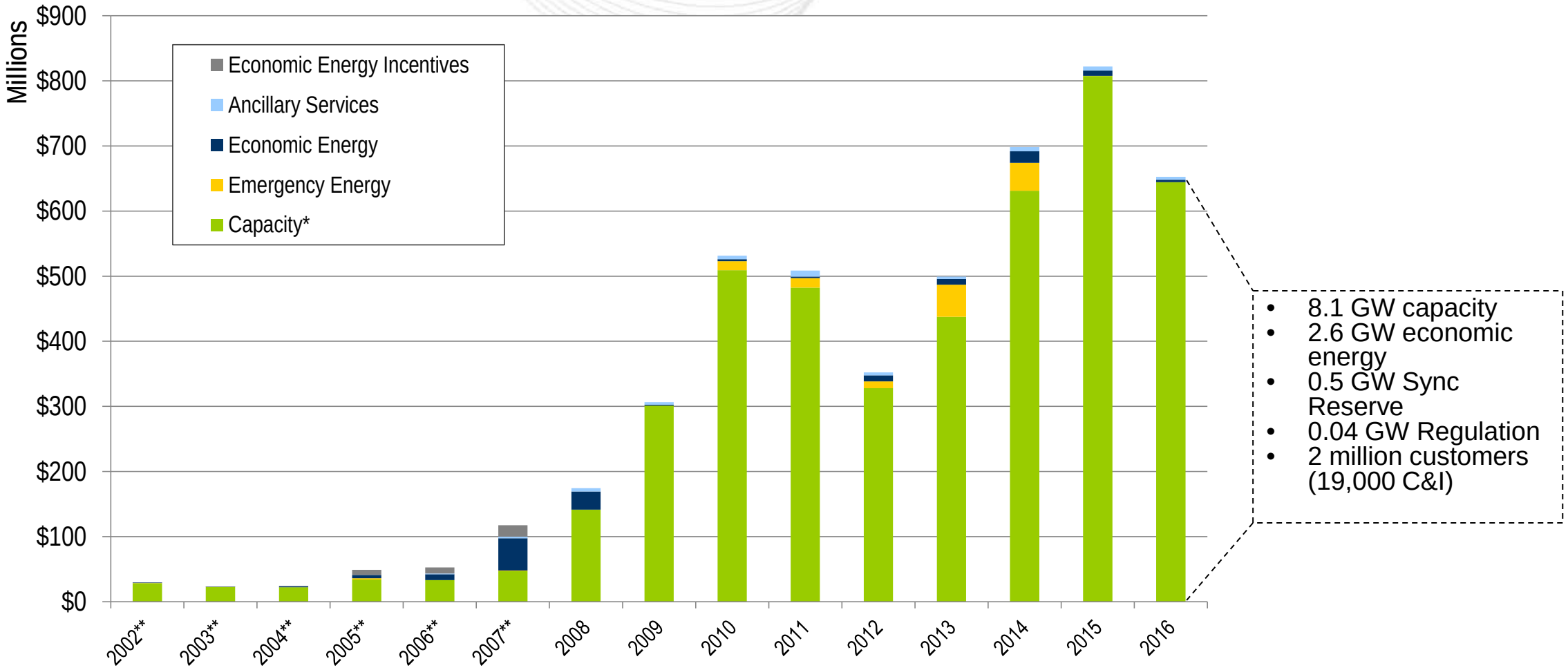
Members Committee Webinar

DR Strategy

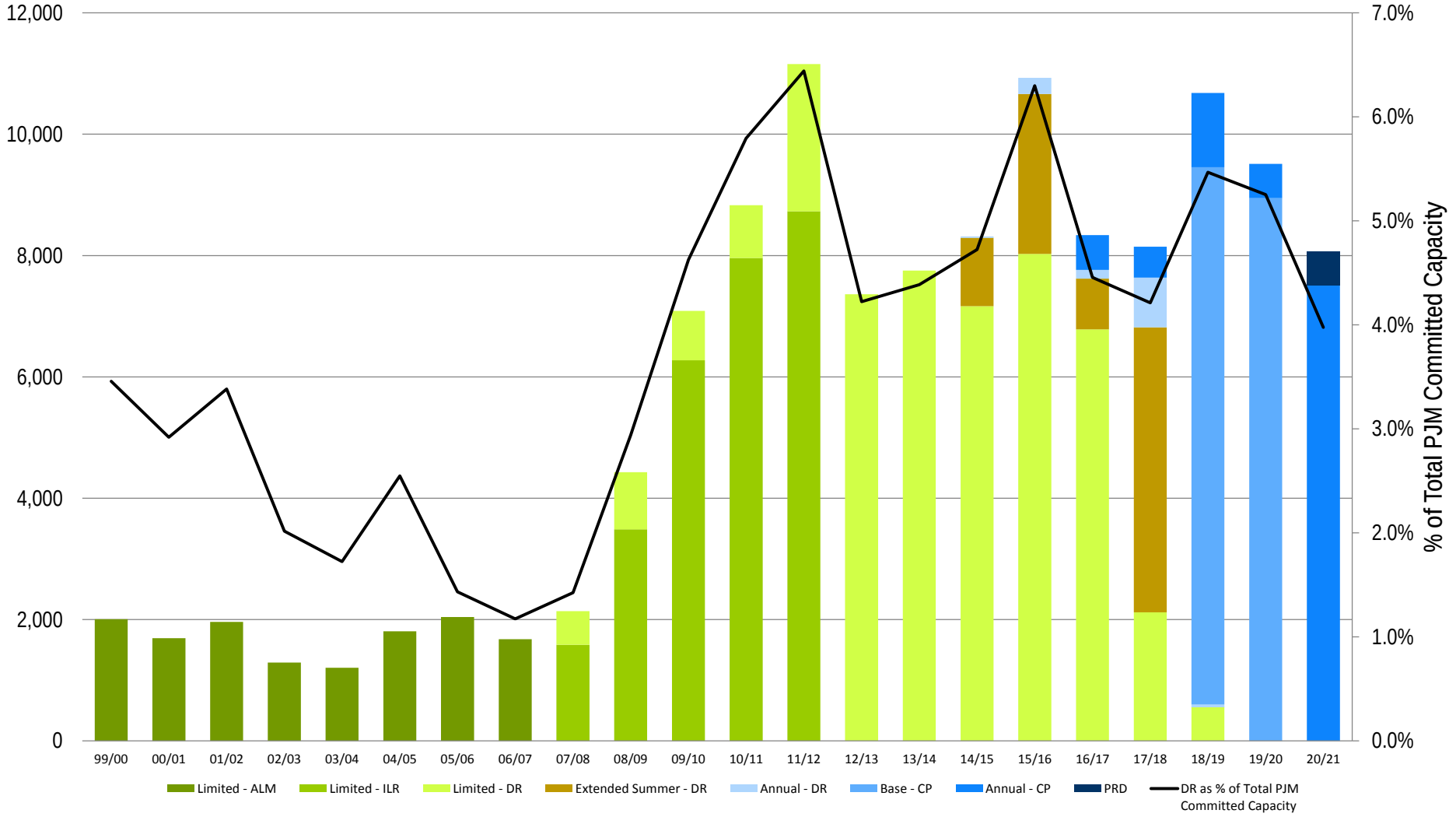
- 10 years since implementation of
  - RPM
  - CSP model
- Opportunities expanded to all markets
- Evolution from “pilots” to “resources”

PJM wide effort to review current DR processes

DR annual revenue by type



DR Capacity Market Participation by Product

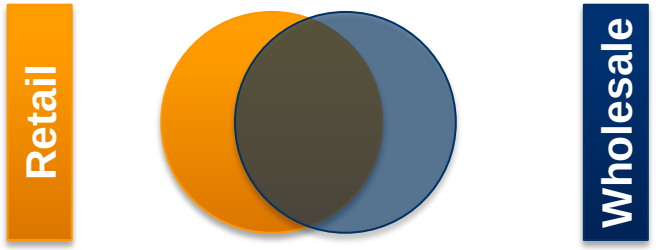


Strategic Objectives

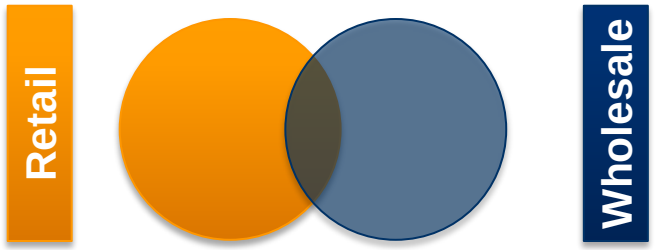
- Ensure DR is a predictable, reliable, and transparent resource to manage the grid,
- Enable price sensitive demand for more efficient market outcomes, and
- Increase alignment of wholesale and retail market incentives through coordination with state retail regulatory authorities.

Retail Customer's Opportunity to Manage Electricity Cost by Changing Consumption

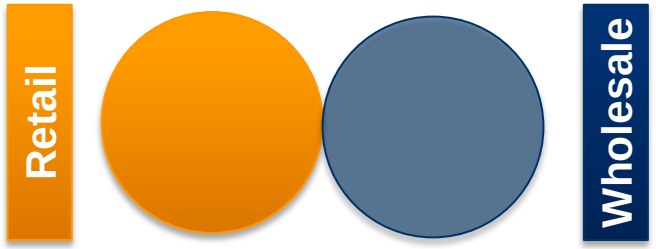
Manage Electricity Cost - Overlap of Retail Market Cost Reduction vs Wholesale Market Revenue Opportunities



Energy (80% of cost) - significant overlap between retail market cost reduction and wholesale market revenue opportunities



Capacity (16% of cost) - minor overlap between retail market cost reduction (peak shaving) and wholesale market revenue opportunities



Ancillary Services (4% of cost) - no significant overlap between retail market cost reduction and wholesale market revenue opportunities

Evaluation Process for potential changes

Legend	
Gap (Regulatory)	Indicates how difficult it would be from a regulatory standpoint (State and Federal) to implement the future state.
Gap (Stakeholders)	Indicates how much support/opposition there would be from PJM stakeholders to implement the future state. Large gap means more than 1 stakeholder group would oppose.
Gap (Cost)	Indicates how much it would cost PJM stakeholders (PJM, members, people/process/system changes) to implement the future state.
Value (Benefit)	Reflects value future state would bring to all stakeholders (PJM & members). Value represents increased reliability and lower costs and/or risk.
	Large gap between current vs future state (Cost>$5mm), Value = Not a significant amount of value or difficult to quantify.
	Medium gap between current vs future state (Cost $1-5mm), Value = Significant value for at least one whole member sector or PJM
	Small gap between current vs future state (Cost <$1mm), Value = Major perceived value to PJM and most member sectors.
Timeframe	Long term = attribute on the radar 5+ years in the future, Medium term = attributes to consider over the next 3 to 5 years after DR participation in CP is better known, Short term = attributes to consider over next 2 years.

Evaluation Process (example)

Time Frame	Market	Attribute	Current	Future	Regulatory	Stakeholders	Cost	Value
Short	Capacity	Product	DR, PRD (proposed WLR)	Consistent DR mechanism for wholesale market participation.				
Short	Capacity	Aggregation	Ability to aggregate by registration and by resources (DR or other permitted types)	Optimize aggregation rules in capacity market to enable seasonal DR customers to fulfill CP commitment				
Short	Capacity	Capacity Dispatch	Dispatch by variety of parameters through administrative procedures	Develop model that will provide optimal DR dispatch strategy based on current state of system, forecast, and prior use of DR.				
Short	Capacity	Training	Training not required	Implement mandatory training to ensure all CSPs are ready when DR is dispatched				

Short term Objectives: Transition to CP (annual capability through aggregation)

- Maintain DR in wholesale capacity market and transition to capacity performance
  - Optimize aggregation rules in capacity market to enable seasonal DR customers to fulfill CP commitment.
  - Continue to align with retail capacity allocation to minimize retail/wholesale issues. Look to develop approach that is more consistent year round.
  - Consider accepting registrations after start of DY to enable more customers to meet RPM/FRR commitment.
- Develop DR dispatch model to optimize dispatch and release of DR.
- Review DR and PRD rules and consider integrating into one approach.
- Continue to increase PJM operational visibility of DR.
- Implement broader energy market changes (5 min settlements, hourly offers, price caps).
- Identify any needed enhancement for Distributed Energy Resources that operate as DR.
- Implement a more flexible and robust tool (DR Hub) to manage DR at PJM.
- Implement mandatory training to ensure all CSPs are ready when DR is dispatched.

DR in the wholesale capacity market

- Customer load reductions on the retail side may not be as effective as participation directly in the wholesale capacity market:
  - Customers need to predict when to curtail to reduce peak load contribution
    - curtail more often to avoid missing one of the peak days.
    - No curtail because did not know it was needed
  - The grid may not need the customer to curtail on the peak day if there are more economic supply resources available
  - The total amount of capacity procured will not significantly change for several years (forecast is stochastic process).
    - When 1 customer's capacity requirement goes down, the other customers' capacity requirements may go up, which may lead to cost shifting, and
  - A forecast of demand reductions in the future based on past behavior is not as transparent and reliable as a future commitment to reduce load.

Medium term Focus: Ensure DR capabilities are aligned with DR commitments

- Ensure DR commitments reflect DR capabilities by developing and implementing:
  - More robust and comprehensive capacity testing requirements.
  - Synchronized Reserve testing with enhanced performance measurement (CBL approach).
- Work with states and other stakeholders on other options to recognize the value of seasonal resource flexibility.
- Refine PJM ability to dispatch DR by quantity and by location.

Long Term Direction: look for opportunities to move DR in the energy market to the demand side

- Look for opportunity to move DR in the energy market to demand side (cost savings) by modifying or eliminating energy compensation.
- Collaborate with Load Serving Entities to support contracts/pricing that fosters demand elasticity.
- Expand participation in Ancillary Services markets where performance is comparable to generation.
- Foster investment and implementation of DR automation
- Look for opportunity to move Energy Efficiency to demand side (cost savings) by eliminating capacity compensation.