Price Responsive Demand
Net Energy Metering Senior Task Force
February 27, 2012

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Background

- White Paper - Paul Centolella and Andrew Ott
- Stakeholder Process
  - How to bring Price Responsive Demand into PJM?
  - Capacity and Energy
  - Vote July 20th, 2011 to move forward
- FERC Decision
  - FERC Technical Conference 2/14/12
  - Energy only Summer of 2012*
  - Capacity Market – 2016/17

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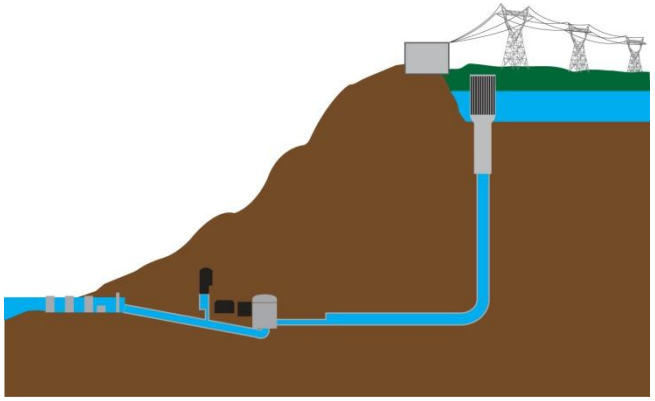
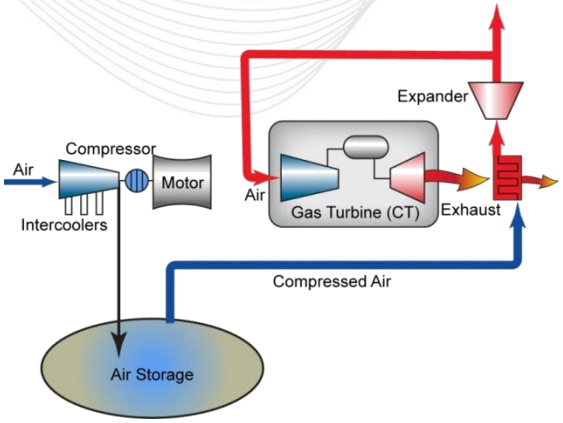
Grid Storage Types and Availability



Pumped Hydro



Compressed Air

Flywheels

Stationary Battery

Mobile Batteries

Water Heaters

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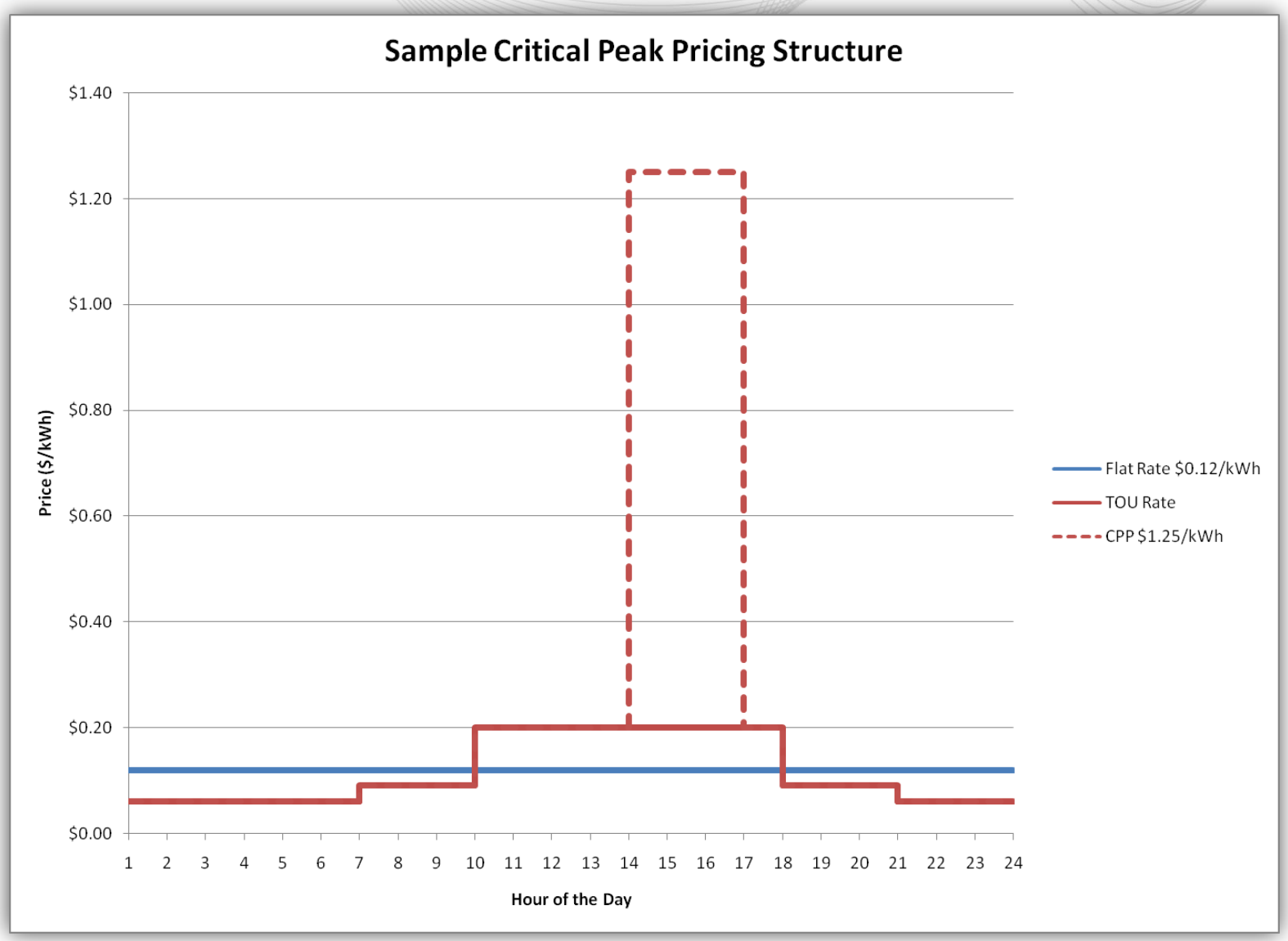
Examples of One Type of Dynamic Retail Rate



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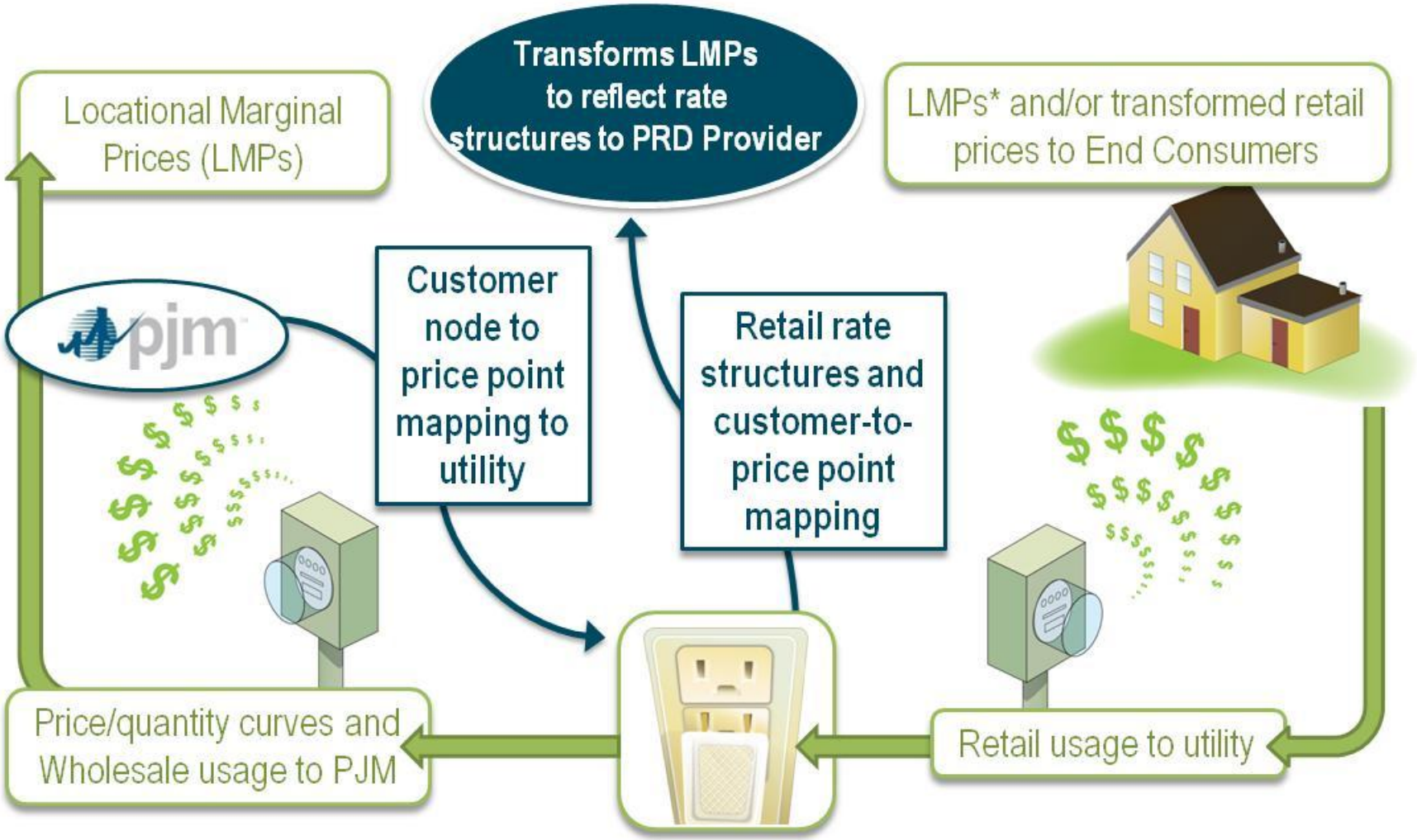
PRD Feedback Loop



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Elastic vs. Inelastic Demand

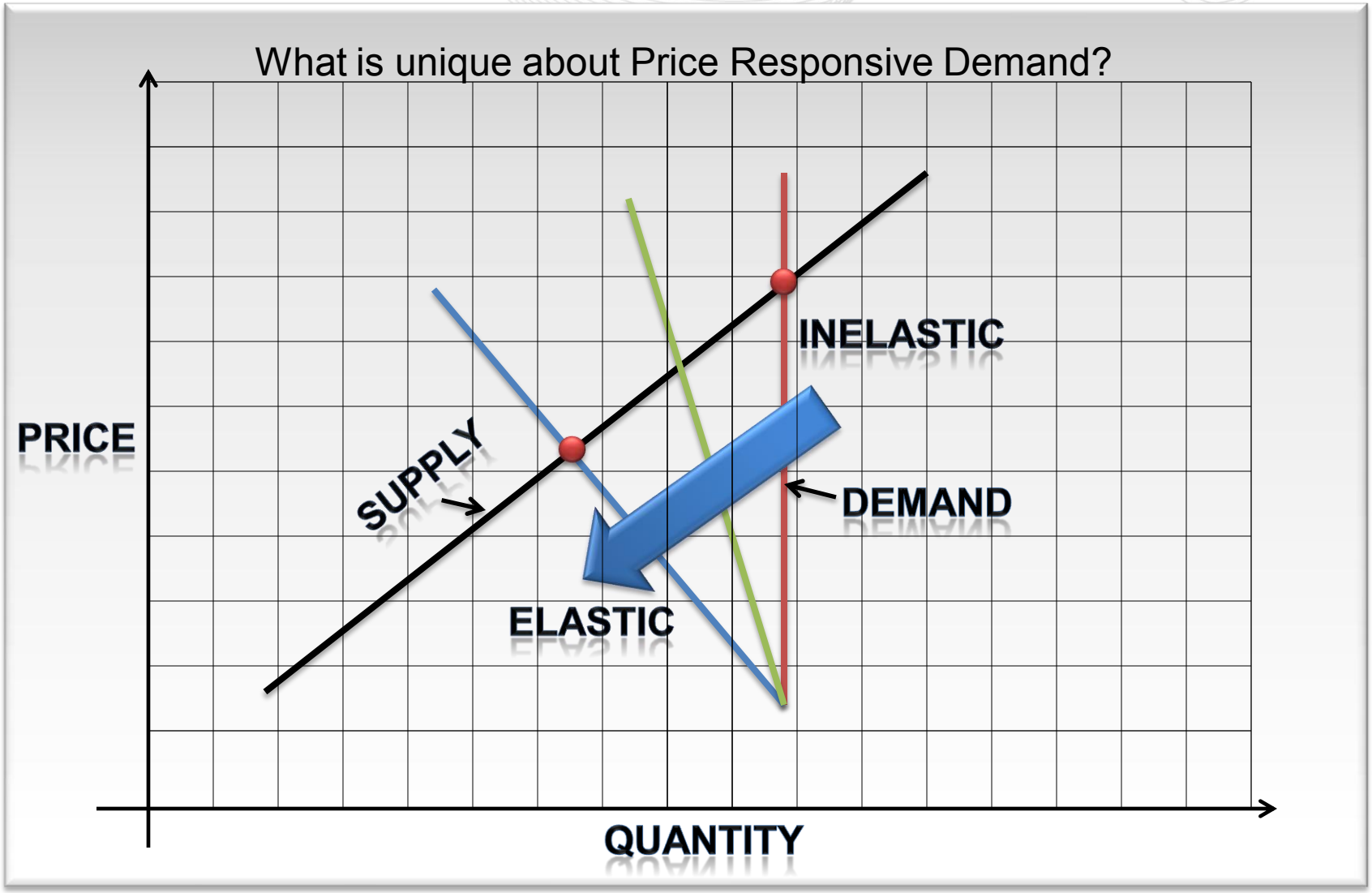

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Figure 4: Market Clearing in Hour 4

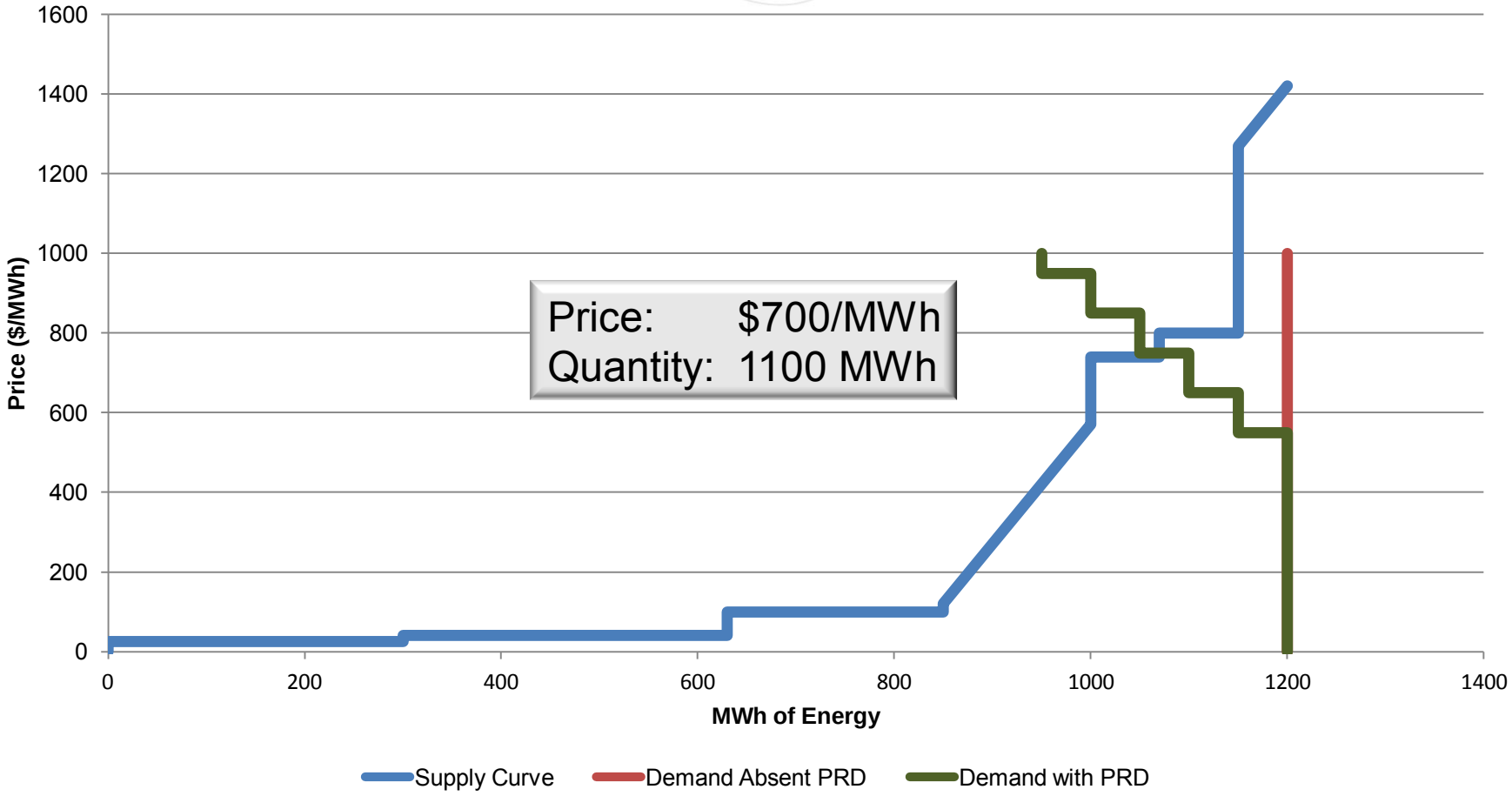

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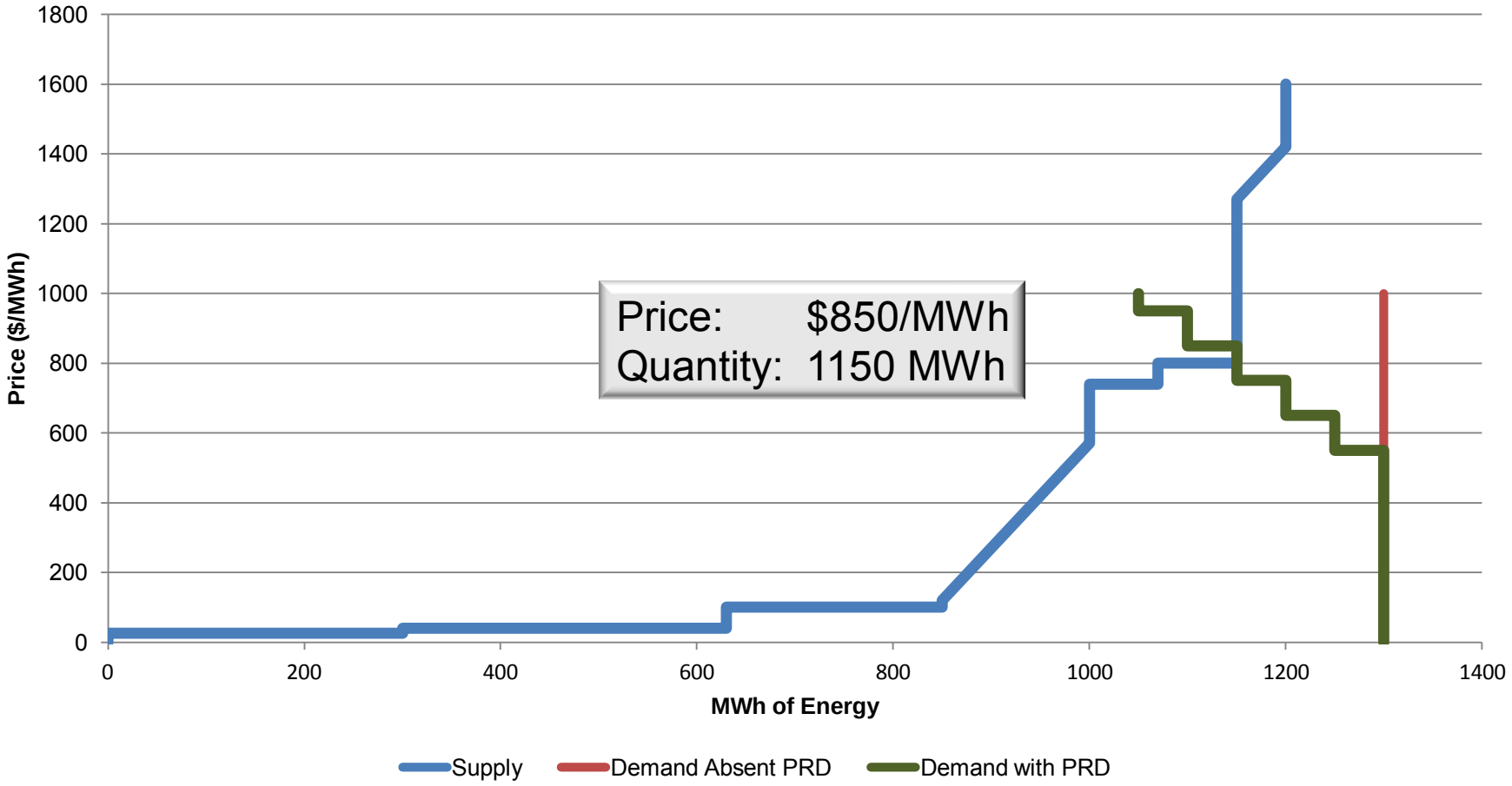
Figure 5: Market Clearing in Hour 5



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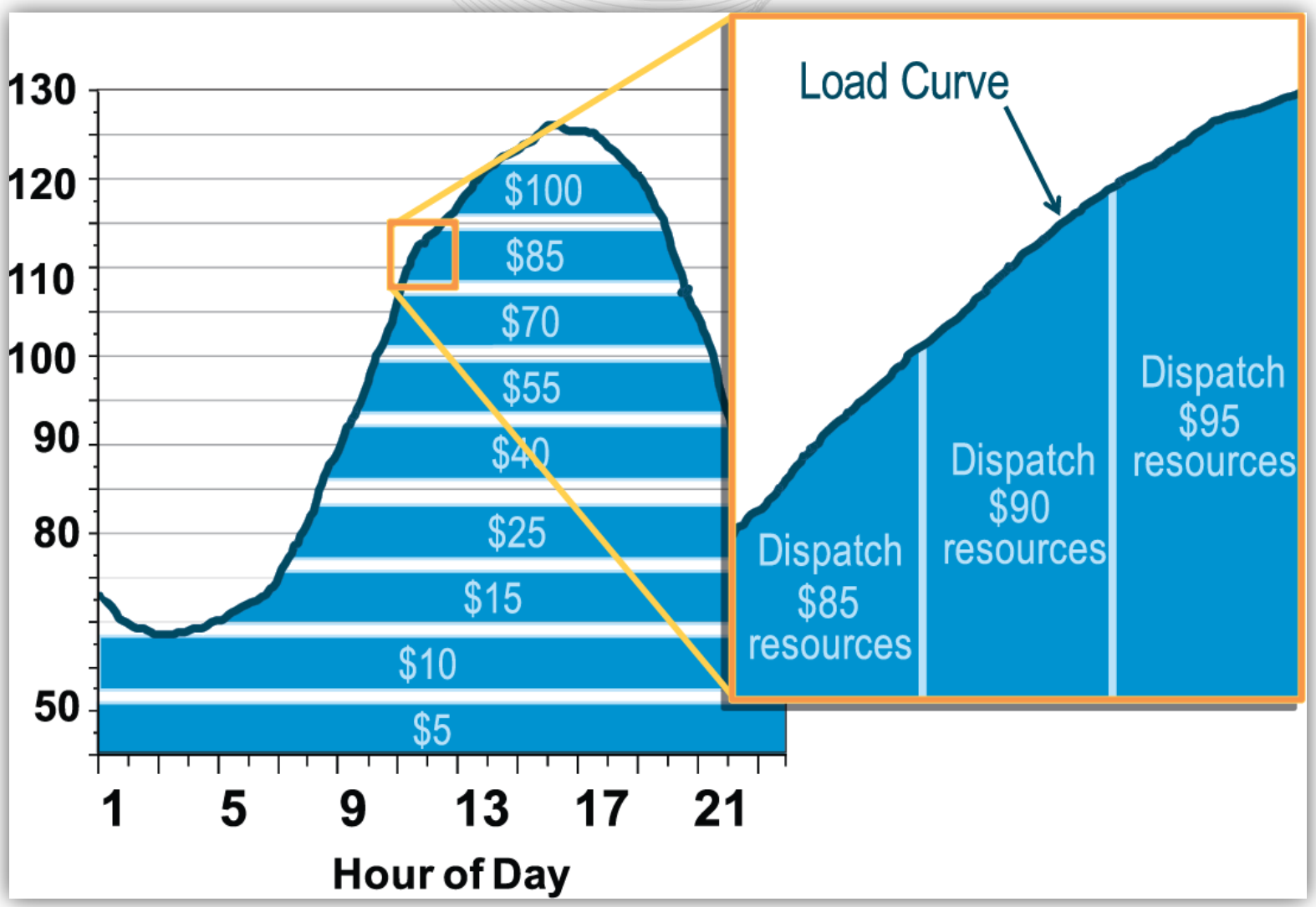
Today's Economic Dispatch of Supply Resources



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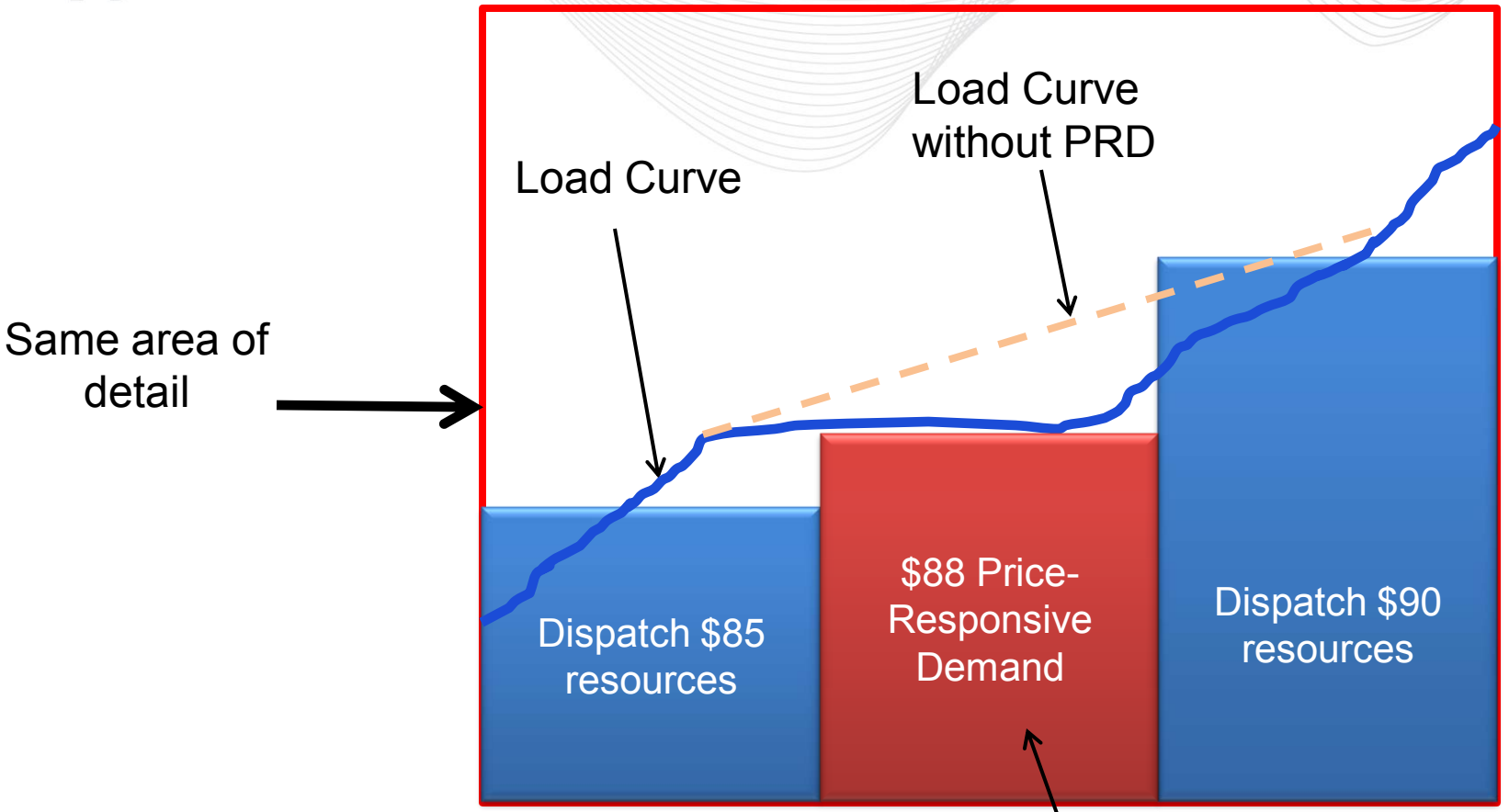
Dispatch Incorporating Price Responsive Demand



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

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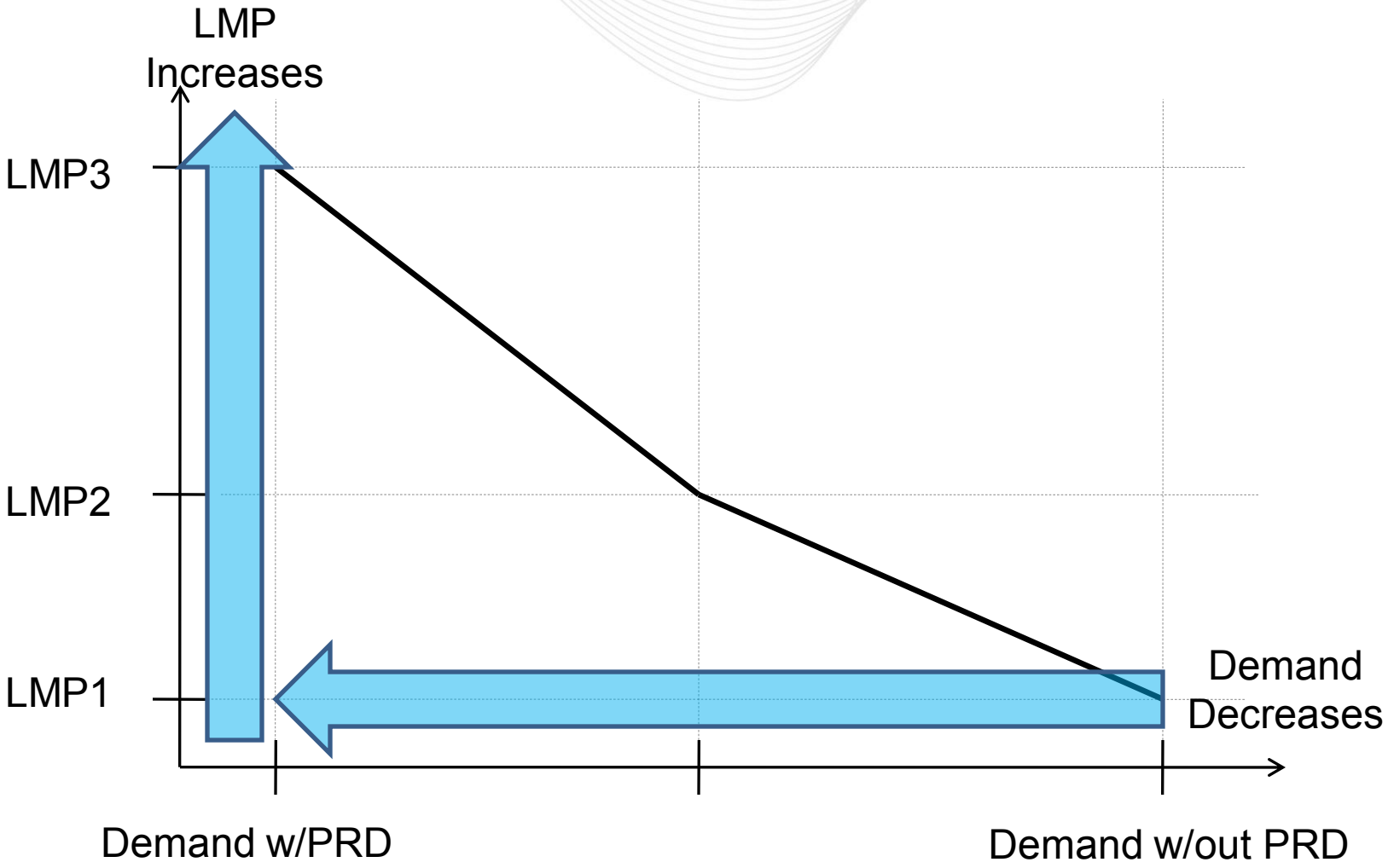
Price Responsive Demand



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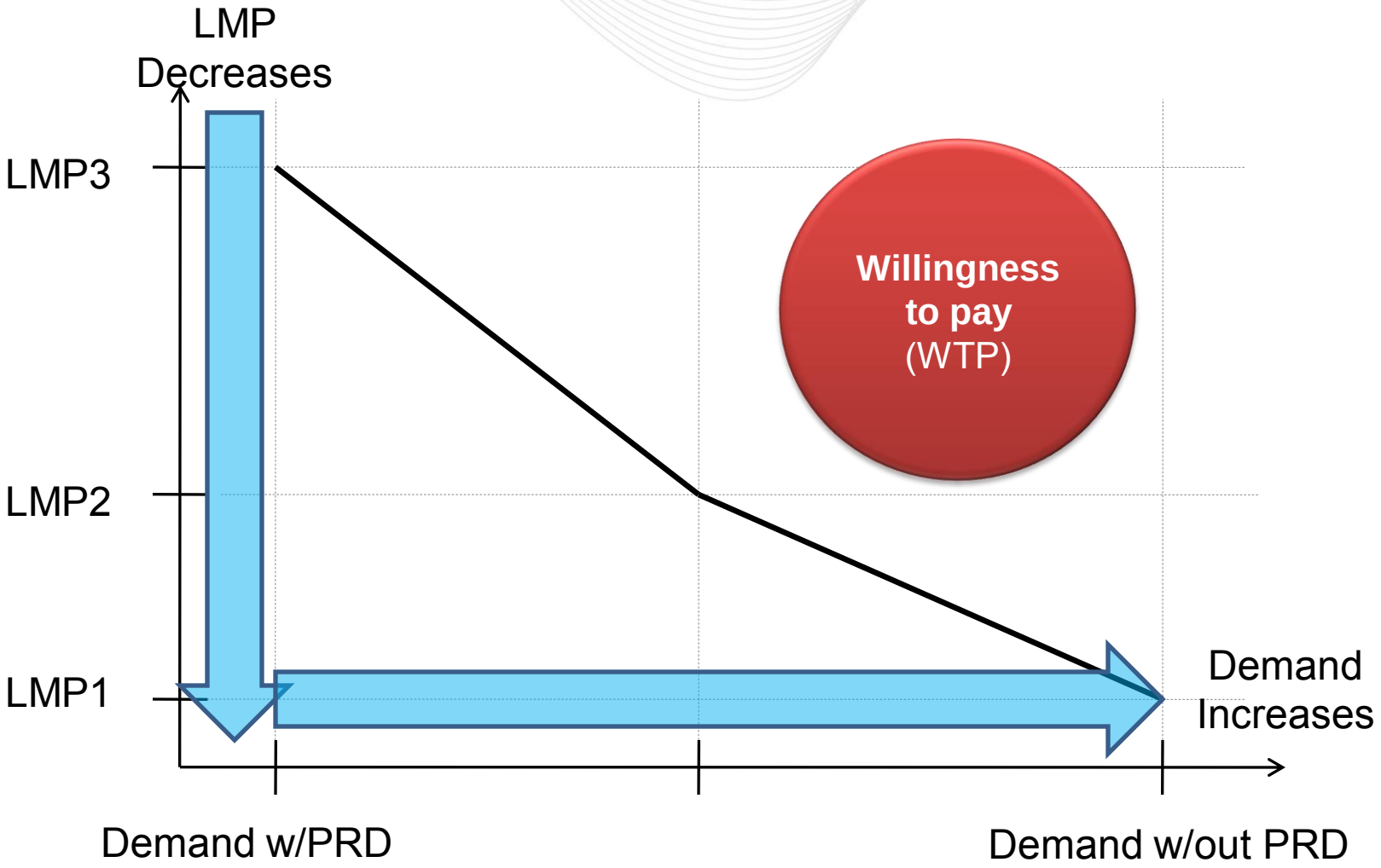
Price Responsive Demand



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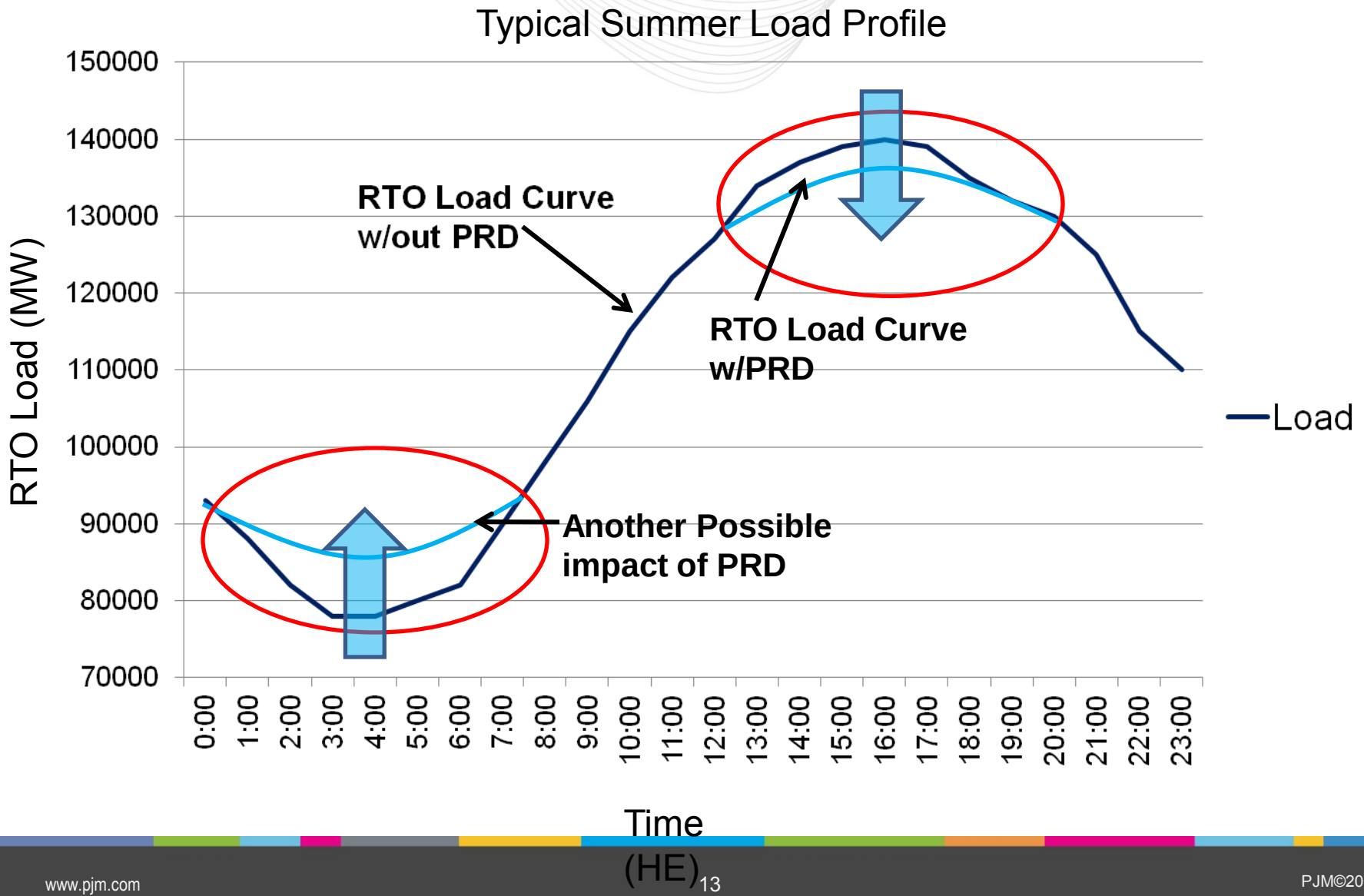
Potential Impacts of Price Responsive Demand



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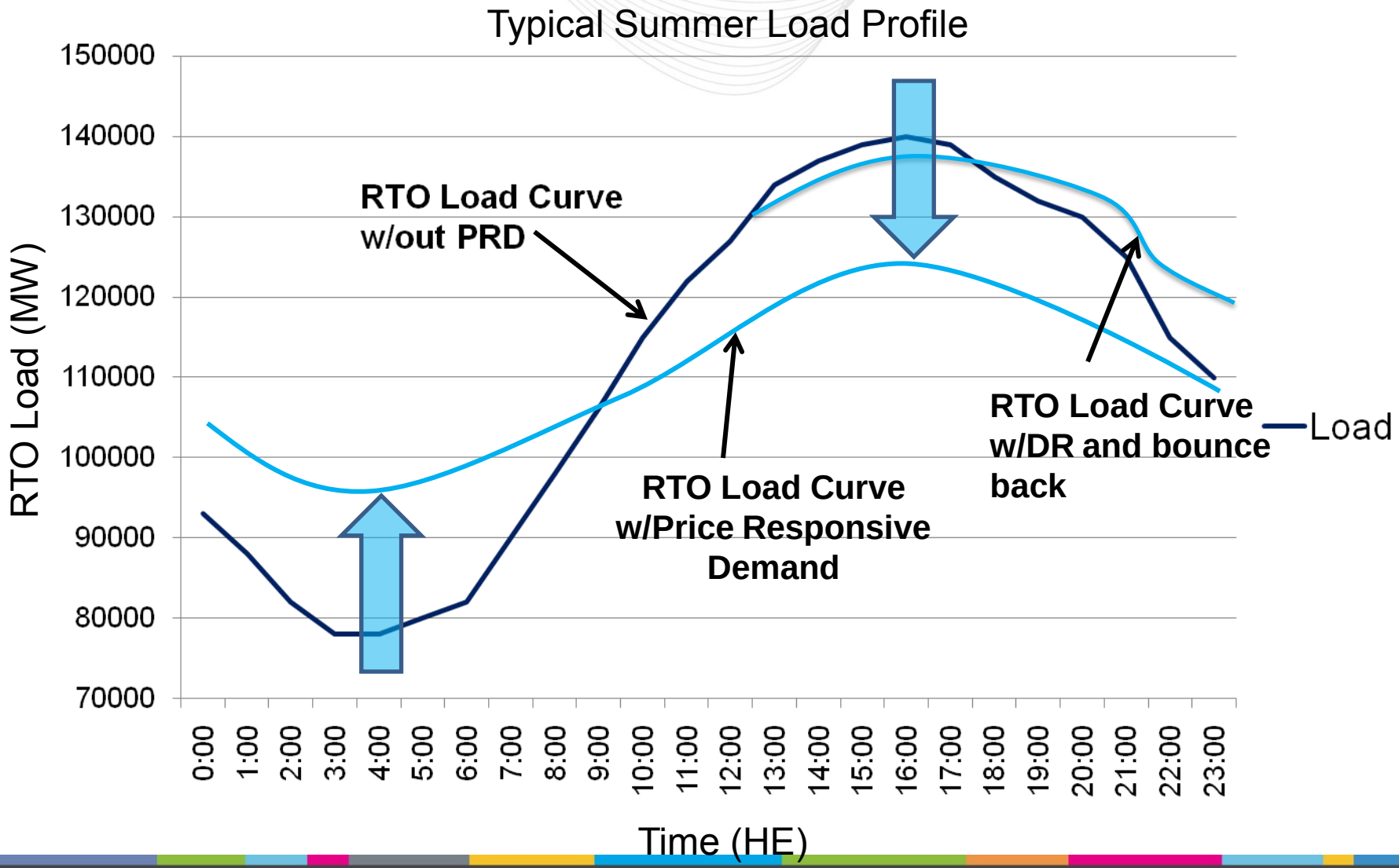
Possible Outcomes from Price Responsive/Elastic Demand



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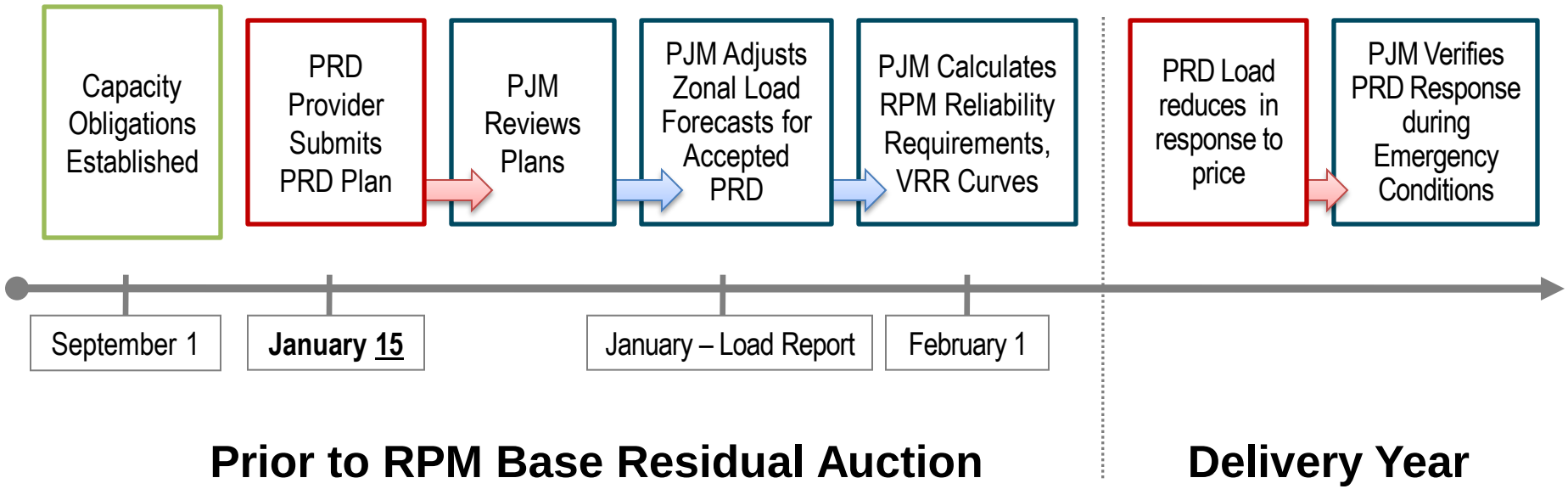
How is PRD incorporated in Load Forecast, Planning and RPM Clearing Processes?



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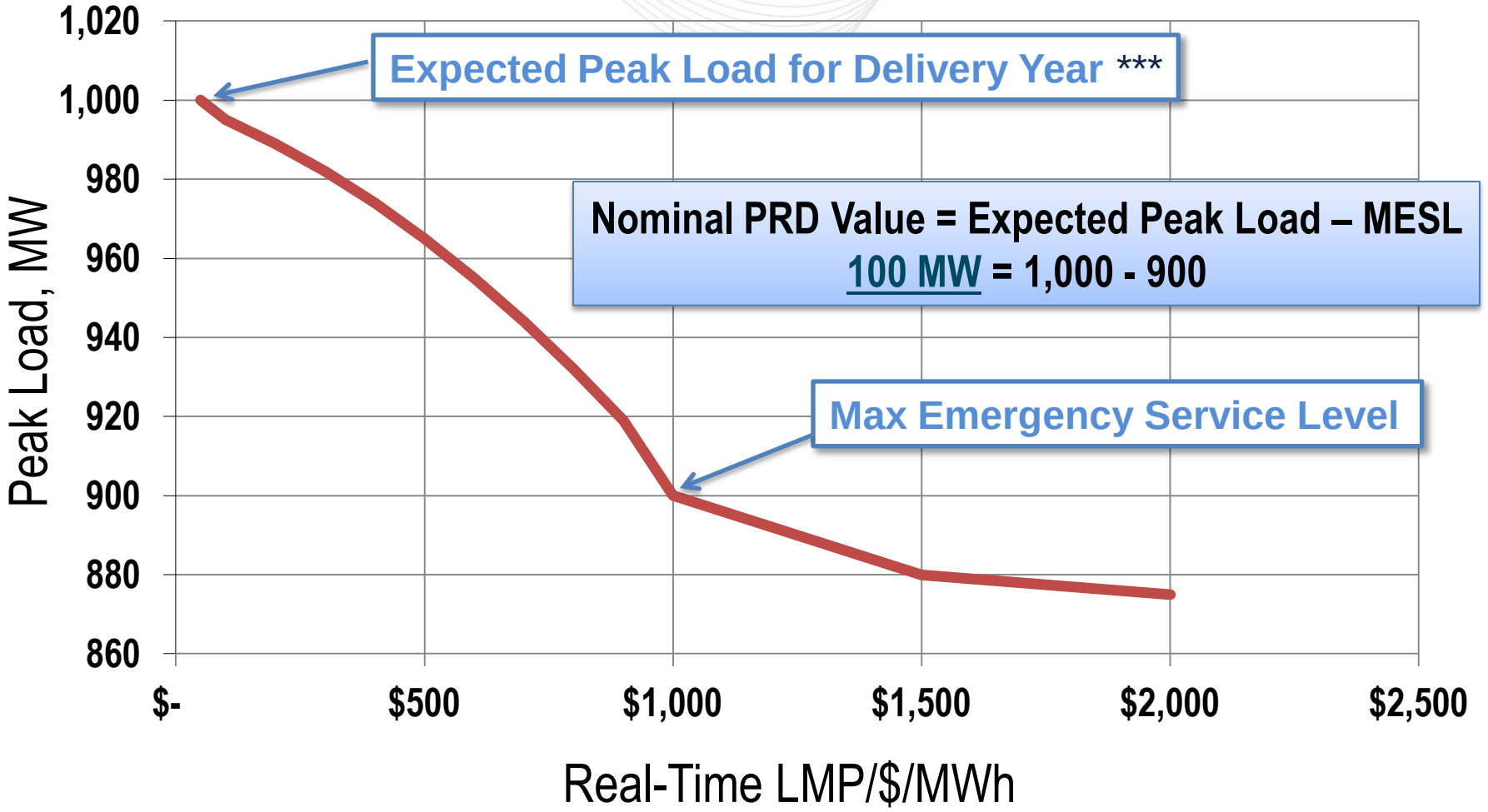
PRD vs. Real Time LMP



***determined consistent with the 50/50 load forecast that is the input to RPM Auction

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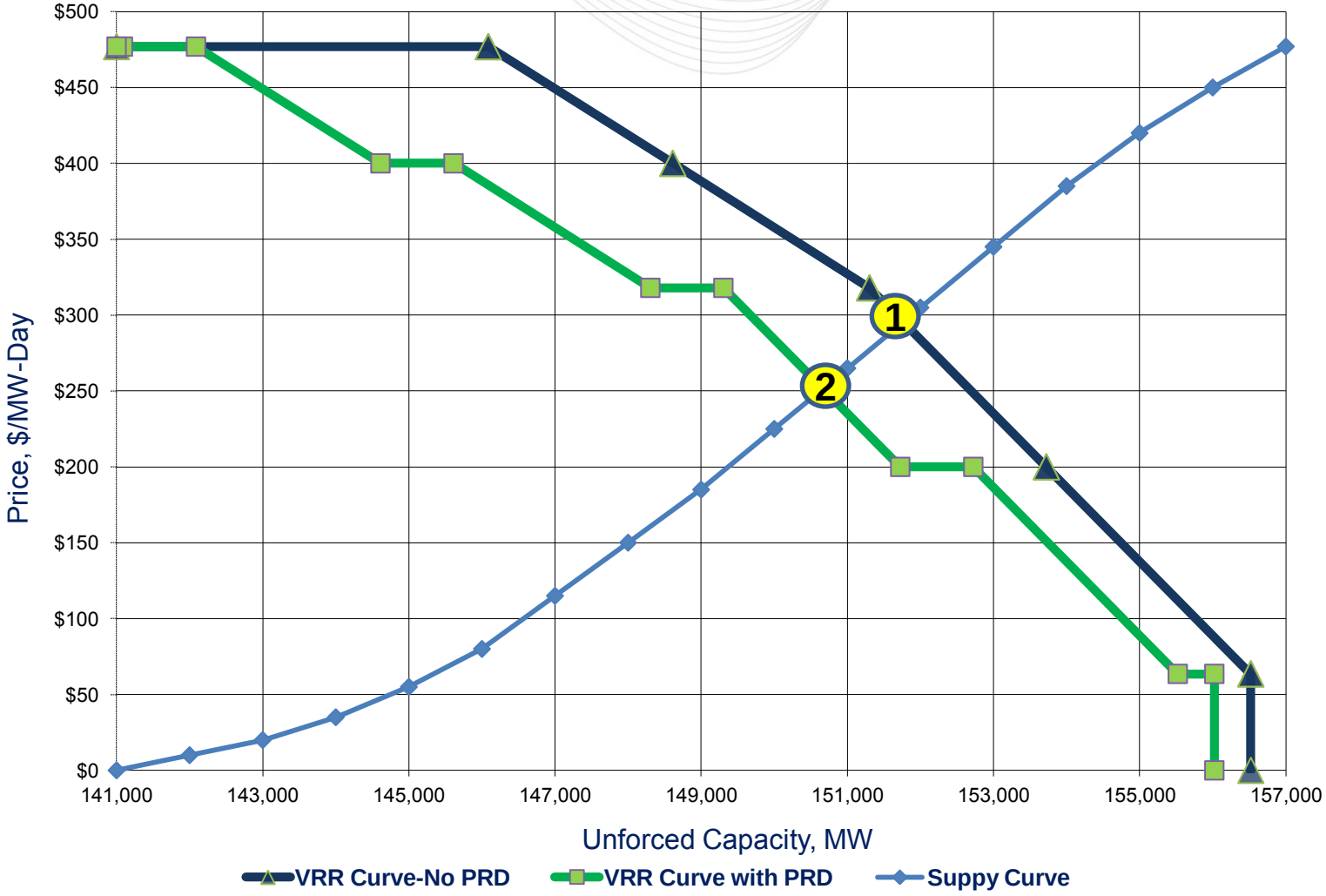
Figure 1: Initial and PRD-Adjusted VRR Curve for RTO (VRR - A demand curve referred to as 'Variable Resource Requirement (VRR) Curve' is established based on the target capacity to be procured in BRA.



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Comparison of DR LSE Peak Shaving, PRD

ANOTHER Option to participate on demand-side, rather than supply-side…

	Load Serving Entity (LSE) Peak Shaving	PJM Demand Response (DR) Resource	PJM PRD
Characteristics	LSE Manages Peak Load Contribution (PLC) outside of any PJM program	Offered as Supply Resource in Capacity & Energy Markets	Reduces Load Forecast (and therefore Reliability Requirements) in Capacity Market
Performance Requirements	LSE proactively manages load, especially during expected 5 Coincident Peak (CP) days.	Different Requirements: •Unlimited •Summer Only Unlimited •Limited	PRD Provider implements dynamic prices that produce predictable reduction in demand during emergency conditions
Financial Impact	Reduce Peak Load Contribution (PLC) and purchase less capacity in next delivery year.	Receive revenue based on RPM results. Capacity Resource deficiency + event or test deficiency penalty	Reduces net capacity obligation charges during delivery year. Penalties if load is not reduced
Metering Requirements	No explicit requirement but if competitive jurisdiction interval meter may be required to see full impact to customer.	Interval metering required unless part of 500 MW pilot or direct load control program	Interval Metering Supervisory Control

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