



ICC Workshop on Resource Adequacy in MISO's Zone 4

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Introduction

- Ensuring that adequate resources are available to serve load is a vital objective of most RTOs.
- Capacity markets have been developed to assist in satisfying this objective.
- The designs of the current capacity markets vary substantially from RTO to RTO, and much debate has occurred in MISO regarding market design issues.
- This presentation will:
 - ✓ Review and discuss the role of the capacity market in MISO and the problems with the current design of the capacity market in MISO.
 - ✓ Describe the current resource adequacy situation in Zone 4.
 - ✓ Discuss the changes necessary to ensure that resource adequacy is maintained in Zone 4 and throughout MISO.



Resource Adequacy

- Threshold Question:
 - ✓ **Is the purpose of the MISO markets to provide price signals to facilitate efficient investment, retirement, and maintenance decisions that will satisfy MISO's resource adequacy needs?**
- The answer should be “yes” because efficient market signals:
 - ✓ Will not impede the States' planning processes or ability to oversee or facilitate investment by their regulated utilities;
 - ✓ Provide valuable economic signals that can assist States and their regulated utilities make the most cost-effective choices;
 - ✓ Facilitate efficient capacity imports and prevent inefficient exports;
 - ✓ Facilitate a vibrant forward (bilateral contract market);
 - ✓ Facilitate low-cost merchant investment; and
 - ✓ Ultimately generate substantial savings for MISO's consumers.
- However, most of the States and some participants believe the answer is “no”.



Market-Based Investment/Retirement

- Market-based investment in wholesale electricity markets is ultimately facilitated by the markets' economic signals, including:
 - ✓ Energy and ancillary service net revenues during non-shortages;
 - ✓ Energy and ancillary service net revenues during shortages; and
 - ✓ Capacity market net revenues;
- Long-run equilibrium is achieved when the combination of these expected revenues covers entry costs of the marginal resource.
- “Energy-only markets” include the first two revenue streams and will generally not satisfy RTOs’ planning reserve needs.
 - ✓ In other words, there is “missing money”.
 - ✓ Capacity markets exist primarily to provide the missing money.



Why is There Missing Money in Electricity Markets?

- Planning reserve requirements exceed levels that efficient energy-only markets (with shortage pricing) would provide.
 - ✓ Why? The “1 day in 10 year” reliability standard implies a value of lost load of \$100,000 to \$200,000 per MWh.
 - ✓ Therefore, additional revenues are needed to prompt the higher level of investment needed to satisfy these targets.
- The higher planning margins result in more supply, which reduces the frequency of shortages (and associated shortage revenues).
- Real-time prices may not always fully reflect the value of energy because of the effects of the ISO’s reliability actions:
 - ✓ Committing peaking resources or other generating resources;
 - ✓ Curtailing load; and
 - ✓ Curtailing exports;

Current Resource Adequacy Situation in Zone 4

- Zone 4 is different than other areas in MISO because it is unbundled and subject to retail competition -- wholesale price signals must play a more central role in maintaining adequate resources.
- The “local requirement” for capacity is equal to: the total resource need minus the import capability into the zone. See the following table:

	15/16	16/17	Change
a Total Requirement in Zone 4	11982	12021	39
b Capacity Import Limit	3130	4328	1198
c Local Capacity Requirement (a-b)	8852	7693	-1159
d Total Supply in Zone 4	12944	12945	0
e Total Supply Net of Exports	11994	11122	-872
Surplus excl. Exports (d-c)	3142	3428	286
Surplus incl. Exports (e-c)	4092	5251	1159

- This table shows that Zone 4 is currently more than adequate, but concerns are larger MISO-wide as resources retire and exports to PJM continue to increase.

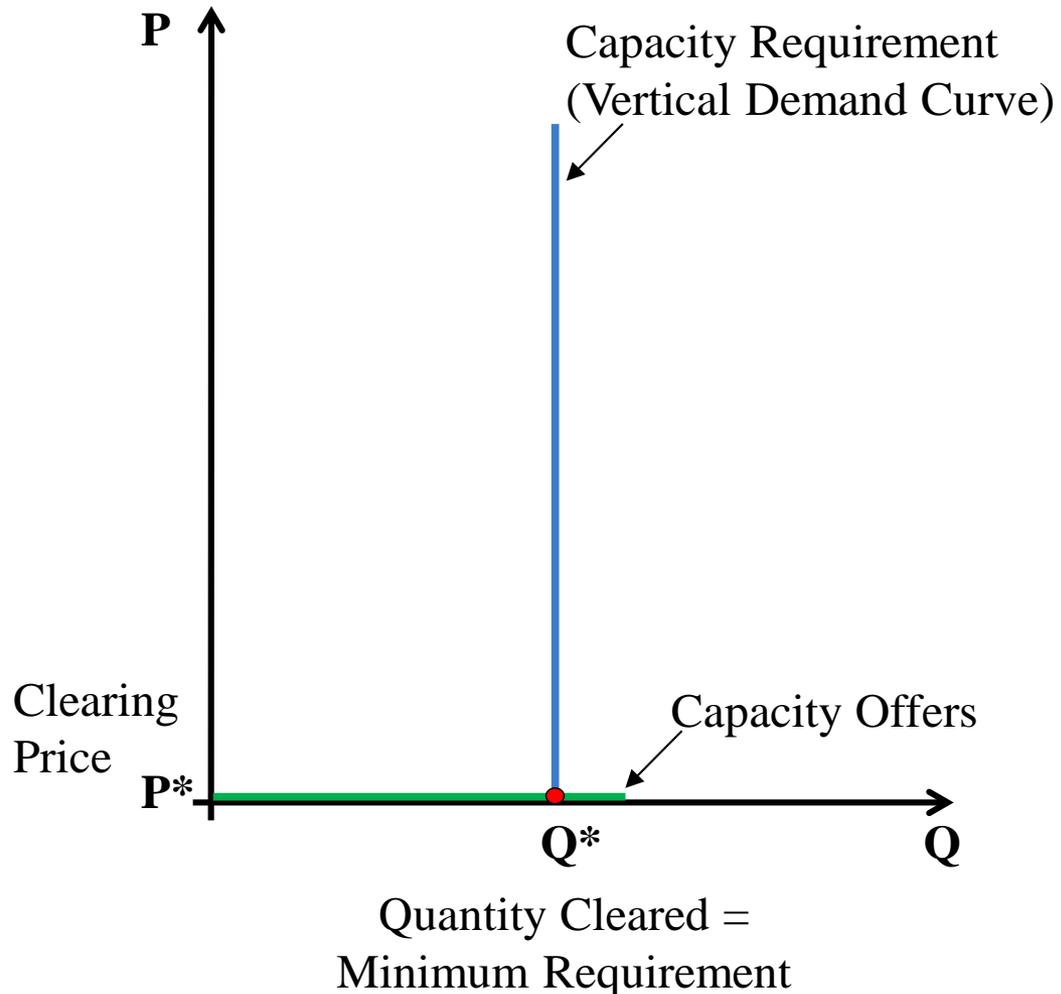


What Changes Are Needed in the Capacity Market? Zone 4 and Beyond

- The demand needs to be changed to reflect the marginal reliability value it provides.
 - ✓ This requires that the current “vertical demand” curve (capacity in excess of the minimum requirement has no value) be replaced by:
 - ✓ A sloped demand curve (recognizing the surplus over the minimum requirement provides diminishing incremental reliability).
- The following figure shows that vertical demand curves generally result in prices close to zero there is a capacity surplus.
- The vertical demand curve raises significant issues regarding the long-term performance of MISO’s capacity market.
 - ✓ This market will be volatile, which can hinder long-term contracting and investment by making future market revenues difficult to forecast.
 - ✓ Since these prices do not reflect the true value of capacity, the market will not provide efficient prices to govern forward contracting, investment and retirement decisions.



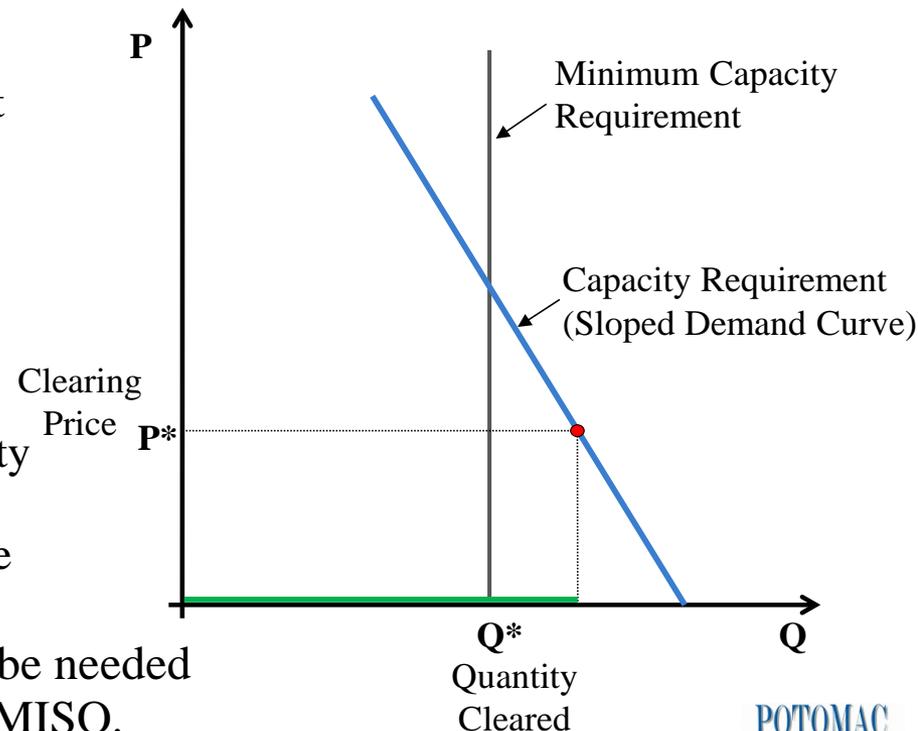
Vertical Capacity Demand Curve





Sloped Capacity Demand Curve

- A sloped demand curve reflects the fact that additional capacity above the minimum does have reliability value (which decreases as the excess increases).
 - ✓ The price (P^*) would be determined by the marginal value of additional capacity as represented by the sloped demand curve, rather than by a supply offer.
- A sloped demand curve will:
 - ✓ Provide more efficient prices that reflect the prevailing surplus.
 - ✓ Improve price stability, which should facilitate investment by reducing price risk.
 - ✓ Reduce incentives to withhold capacity by raising the opportunity costs of withholding (foregone revenues) and decreasing its price effects.
- Some form of demand curve will be needed in Zone 4 and ideally throughout MISO.





Alternative Procurement Timeframes

- The NYISO and MISO capacity markets clear immediately prior to the planning period.
 - ✓ This “prompt” procurement should facilitate efficient forward bilateral contracting in investment/retirement decisions.
 - ✓ These markets recognize that the RTOs’ capacity market need not serve as a substitute for forward contracting.
- However, Some capacity markets (ISO New England and PJM) procure capacity 3 years in advance of the planning period.
 - ✓ This “forward procurement” allows developers to participate in the auction, but only performs well when many new resources are offered competitively.
 - ✓ ISO’s have implemented revenue “lock-in” provisions to help assure this, but this provisions create other inefficiencies by discriminating against existing resources.
 - ✓ The forward procurement also creates risk for the RTO’s customers and generators with older resources.
- While in improved demand curve is essential, it is not clear that mandatory procurements of capacity three years in advance is beneficial.