Reserve Shortage Pricing and Capacity Markets

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The Question

Since the purpose of capacity markets is to provide generators the "missing money," why is there a need for reserve shortage pricing either in regions with capacity markets (PJM, New York ISO, ISO New England), or in regions with non-market resource adequacy designs (California, Midwest ISO and Ontario).

> "There is no reason to increase the maximum price in PJM markets in order to implement scarcity pricing. PJM has not provided evidence that, given an RPM construct that procures capacity well in excess of what is needed to meet system reliability requirements, prices in excess of the $1000 offer cap are needed to make PJM's system reliable."[1]

1 Protest and Compliance Proposal of the Independent Market Monitor for PJM, Docket ER09-1063-004, July 19, 2010 p. 33

Missing Incentives

Electric system reliability depends not only on the nominal megawatts of physical generating capacity in the ground, and contracted demand response, quantities of those resources, but also on the characteristics and performance of those resources.

- Providing the “missing money” through a capacity market introduces “missing incentives” with respect to capacity resource characteristics and performance;
- Capacity market designs attempt to compensate for the “missing performance incentives” with administrative rules, but these efforts are only partially successful.
- Attempting to use capacity market rules to elicit capacity resources with the optimal mix of characteristics to meet load over the operating day is a path we can foresee inevitably ending badly from the standpoint of both reliability and consumer cost.
- Combining a capacity market design with shortage pricing can potentially provide some of the “missing incentives,” without introducing undue political or regulatory risk.

Missing Incentives

The “missing incentives” are both performance incentives and investment incentives.

- The missing performance incentives impact the efficient operation of existing assets;
- The missing investment incentives impact the kind and characteristics of the assets that are available to maintain reliability.

Performance Incentives:

Missing performance incentives impact:

- Demand response performance and cost;
- Resource availability (economic outages, forced outages);
- Resource maintenance scheduling (planned outages);
- The scheduling and delivery of interchange.

Performance Incentives

In an energy only market, if a generation is off-line due to a scheduled outage during a shoulder month capacity shortage and price spike, it loses this opportunity to recover part of its return of and on investment.

- In a typical capacity market design, with no shortage pricing, there is no capacity market penalty to a resource being unavailable due to a scheduled outage in the off-peak months, nor do energy market revenues provide incentives to bring a unit back quickly from an outage when needed.
- The complexity of California ISO's replacement capacity proposal[1] provides a good illustration of the difficulty of compensating for the missing incentives in a capacity market or requirement system.

1 See Replacement Requirement Scheduled Generation outages, Draft Final Proposal, May 17, 2012 at http://www.caiso.com/informed/Pages/StakeholderProcesses/ReplacementScheduledGenerationOutages.aspx

Investment Incentives

Missing investment incentives impact:

- Investment in intermittent resources with greater or lesser reliability value;
- Investment in energy limited vs. conventional resources;
- Load serving entity forecasting and contracting incentives;
- Deliverability rules and the operation of existing capacity with grandfathered deliverability vs. investment in new generation with lower costs.
- Investment in thermal resources with higher ramp rates and shorter start times, and that are economic in the energy market and on-line or able to start quickly when needed.

Investment Incentives

An important economic and reliability issue in many regions in coming years will be sustaining the mix of resources required to accommodate higher levels of intermittent generation. Capacity market designs are very poorly suited for this task:

- Not all capacity resources need to have the necessary characteristics and requiring that all capacity resources have them would needlessly inflate consumer costs;
- Conversely, it is not enough to simply contract for and construct resources with the needed flexibility, they have to be committed, on-line, and able to be dispatched appropriately when needed.
- Using a combination of shortage pricing and perhaps ramp capability pricing to provide the necessary incentives through energy and ancillary service revenues is much more likely to maintain reliability and minimize consumer costs.

Investment Incentives

In an energy only market design, load serving entities need to hedge themselves against their consumers actual peak load. In a capacity market system the capacity target is based on a weather adjusted load forecast. Load serving entity capacity market costs depend on the forecast peak load, not the actual peak load.

- This means there is no decentralized response when it becomes apparent that the load forecast is too low.
- This also means that there is too little adjustment when it is apparent that the load forecast is too high.

The Way Out

The adverse reliability impact of the “missing incentives” in a capacity market system can also be addressed by contracting for more, and committing more, capacity than would be necessary to sustain reliability in a market with better incentives.

- Maintaining excess capacity is expensive and total consumer power costs can be reduced by contracting for less capacity that has more optimal characteristics and performance.
- Committing excess capacity is also expensive and total consumer power costs can also be reduced if the availability of capacity with more optimal characteristics and performance would reduce the amount of capacity that needs to be committed.

The Way Out

The way out is not to discover “the capacity market design” which efficiently resolves all of these “missing incentives.”

- There is no set of capacity market rules that will efficiently replace all the missing incentives;
- The best compromise is to blend a capacity market system with some shortage pricing, to balance between all revenues in the capacity market or all revenues in the energy market.

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