Connecting Wholesale and Retail Pricing: A Look at Required Policy and Market Design Decisions

Amparo Nieto
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Wholesale Energy Markets – What are the existing constraints?

- Today’s US wholesale markets are designed around a myriad of administrative parameters
  - Energy Price Caps
  - ISO-administered Capacity Markets
  - Out-of-market arrangements for emergency resources
  - ISO Scarcity Pricing for operating reserves

- Implications:
  - Market entry and exit incentives remain heavily influenced by regulatory policy decisions
  - Potential *higher cost (higher investments)* needed to maintain system reliability as compared to a less intervened market
What can “sensitive” demands do for the markets?

Price-Responsive Demand (a.k.a. PRD) enabled by smart meters can bring back the missing value of scarce capacity to the energy markets.

$\$/MWh

P1 = VOLL

P0 = MC Gen

Demand

Available Capacity

Demand

In fixed retail rates

Voluntary load curtailments at the market-clearing price
What do We Have Now?

- “Supply-side” Demand Response (DR) resources (mostly C&I customers) are present and strong
  - Energy markets (Economic DR)
  - Capacity market (Emergency DR) – most successful
  - Ancillary Services Markets (Reserves)

- Main problem of supply-side DR is its reliance on customer baselines (prone to errors)

- PRD along with dynamic pricing is superior in that it allows a transition towards market-based incentives
Other Added Value of PRD

- Predictable response of PRD in peak conditions should be factored in LSE’s load forecast
  - Lower capacity obligations – the largest potential cost saving to a retailer
  - Lower planning reserve margins (e.g. the % above peak load to meet a LOLH target) and
  - Reduced role of capacity markets in signaling need for capacity expansion

- Retail dynamic rates that adopt localized (nodal or subzonal) triggering mechanisms of critical events will allow efficient price-setting
Dynamic Prices work differently from ISO supply-side DR programs

<table>
<thead>
<tr>
<th>ISO – Emergency DR</th>
<th>CPP/ PTR/ RTP*</th>
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<tbody>
<tr>
<td>6-10 hours per event, 10 -12 days June-Sep (Limited) or all summer (unlimited)</td>
<td>Limits on Events: 6 to 4 hours per event, up to 10 to 12 days in Summer</td>
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<tr>
<td>Notification: 2 hours</td>
<td>Notification: Evening on the day before, or same day</td>
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<td>Incentives: ISO market capacity price and higher of Bid or LMP</td>
<td>Incentives: LMP + Capacity market price + Transmission + Distribution avoided costs</td>
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<tr>
<td>Triggers: PJM emergency alerts, system-wide or locally</td>
<td>Triggers: PJM alerts/ DA weather forecast/ DA LMPs/ local network congestion</td>
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(*) CPP = Critical Peak Pricing; PTR = Peak Time Rebate; RTP = Real-Time Price
What will Make PRD Succeed?

- PRD will only attract enough interest if the right platform is created at the ISO level – PJM’s new PRD plan is a step in the right direction.

- Dynamic rates that include load automation (e.g. smart thermostats) will be most effective yet other options may also work with PRD.

- Meaningful progress of PRD with residential customers will require state regulatory commissions to embrace dynamic rates for default service.
Contact us

Amparo Nieto

NERA Los Angeles
213 346 3041
amparo.nieto@nera.com