Final Proposal for Reserve Scarcity Pricing Design

Shucheng Liu, Ph.D.
Principal Market Developer

California ISO
Your Link to Power

Stakeholder Conference Call
July 18, 2008
CAISO Scarcity Pricing Stakeholder Process

1. Project is triggered
   - Issue ID Paper or Study Plan

2. Straw Proposal or Study Results

3. Final Draft Proposal or Recdtn's
   - Board of Governors

You are here

Opportunities for Stakeholder Input
Issues Discussed in Scarcity Pricing Proposal

Discussion will focus on issues revised in this proposal

- Scarcity Pricing scope - revised
- Scarcity Pricing triggers - unchanged
- Scarcity Reserve Demand Curve - unchanged
- RA resources A/S must-offer - revised
- A/S cost allocation - revised
- RA resource Scarcity Pricing payment - unchanged
Scope of Scarcity Pricing

The CAISO Proposal:

- To seek Board approval for a Scarcity Pricing mechanism in the CAISO Region only

- To defer decision on when to enable Scarcity Pricing in Sub-Regions until nine months after startup of MRTU

  - CAISO will evaluate, and develop if determined, a new 30-minute A/S product to meet the needs in A/S Sub-Regions
  - Sub-regional Scarcity Pricing design should consider the new A/S product
Triggers of Scarcity Pricing

The CAISO Proposal:

- To trigger Scarcity Pricing only by the violation of minimum A/S requirements based on the WECC Minimum Operating Reliability Criteria (MORC) and NERC control performance criteria.
Scarcity Pricing Demand Curve

The CAISO Proposal:

- A joint Demand Curve for Regulation Up, Spinning, and Non-Spinning
- A tiered system-wide Demand Curve with three segments in Non-Spinning section
- Maximum scarcity price tied to the energy bid cap
- A separate Demand Curve for Regulation Down
Scarcity Reserve Demand Curve Value of the CAISO Region

<table>
<thead>
<tr>
<th>Reserve</th>
<th>Percent of Energy Bid Cap</th>
<th>Bid Cap = $750/MWh ($/MWh)</th>
<th>Bid Cap = $1000/MWh ($/MWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulation Up</td>
<td>20%</td>
<td>$150</td>
<td>$200</td>
</tr>
<tr>
<td>Spinning</td>
<td>10%</td>
<td>$75</td>
<td>$100</td>
</tr>
<tr>
<td>Non-Spinning Shortage &gt; 210 MW</td>
<td>70%</td>
<td>$525</td>
<td>$700</td>
</tr>
</tbody>
</table>
| Non-Spinning Shortage > 70 &  
  ≤ 210 MW                      | 60%                       | $450                       | $600                        |
| Non-Spinning Shortage ≤ 70 MW | 50%                       | $375                       | $500                        |
| Sum                           | 100%                      | $750                       | $1000                       |
| Regulation Down               | 60%                       | $450                       | $600                        |
### Scarcity Reserve Market Clearing Prices of the CAISO Region

<table>
<thead>
<tr>
<th>Reserve</th>
<th>Bid Cap = $750/MWh ($/MWh)</th>
<th>Bid Cap = $1000/MWh ($/MWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulation Up</td>
<td>$750</td>
<td>$1000</td>
</tr>
<tr>
<td>Spinning</td>
<td>$600</td>
<td>$800</td>
</tr>
<tr>
<td>Non-Spinning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shortage &gt; 210 MW</td>
<td>$525</td>
<td>$700</td>
</tr>
<tr>
<td>Shortage &gt; 70 &amp; ≤ 210 MW</td>
<td>$450</td>
<td>$600</td>
</tr>
<tr>
<td>Shortage ≤ 70 MW</td>
<td>$375</td>
<td>$500</td>
</tr>
<tr>
<td>Regulation Down</td>
<td>$450</td>
<td>$600</td>
</tr>
</tbody>
</table>
RA Resources A/S DAM Must-Offer Requirement

The CAISO Proposal:

- All RA resources are required to submit A/S bids for 100% of A/S certified RA capacity into the DAM.
- CAISO will honor RA capacity energy self-schedules unless there is insufficient A/S supply in the DAM.
- Hydro RA resources should submit A/S bids in the DAM for all available A/S capacity based on expected available energy.
- Non-Dispatchable Use Limited RA resources and hydro RA resource energy self-schedules will be exempted from the must-offer requirement.
The CAISO are working with the CPUC on RA A/S must-offer issue

- The CAISO intends to file a motion with the CPUC seeking clarification or, in the alternative, modification of the D.06-07-031, the CPUC’s “Opinion on Remaining Phase 1 Issues in R.05-12-013”
  
  - The CAISO will ask the CPUC to clarify that the RA product includes an A/S offer obligation to the extent the RA capacity is certified to provide A/S services
  - In the alternative, the CAISO will ask the CPUC to modify the Resource Adequacy product to make clear that the RA capacity has an offer obligation to the CAISO for Energy and A/S to the extent the RA capacity is certified to provide A/S services
A/S Cost Allocation

The CAISO Proposal:

- Not to consider the issue of A/S cost allocation by Sub-Regions at this time

  - FERC June 20, 2008 Order: “[w]e reiterate here that the CAISO’s procurement of ancillary services supports the use of the entire CAISO control area and, therefore, it is appropriate to allocate the costs associated with this procurement to all load in the CAISO control area.”
Scarcity Pricing and RA Capacity Payments

The CAISO Proposal:

- Not to exclude RA capacity from receiving scarcity prices, nor to adjust capacity payments for now.
  - RA payment is for the must-offer obligation, like RUC payment. It is not for the services the RA resources provided in the CAISO markets.
Scarcity Pricing and Demand Response interact with each other

- Improving price response by Demand Response resources is discussed in the MAP Demand Response design stakeholder process
- Scarcity Pricing design takes into consideration the incentives for Demand Response resources
## Next Steps

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 29, 2008</td>
<td>CAISO Draft Proposal</td>
</tr>
<tr>
<td>February 13, 2008</td>
<td>Stakeholder Meeting</td>
</tr>
<tr>
<td>May 20, 2008</td>
<td>CAISO Revised Draft Proposal</td>
</tr>
<tr>
<td>May 27, 2008</td>
<td>Stakeholder Conference Call</td>
</tr>
<tr>
<td>June 3, 2008</td>
<td>Stakeholder Comments Due</td>
</tr>
<tr>
<td>July 11, 2008</td>
<td>CAISO Final Proposal</td>
</tr>
<tr>
<td>July 18, 2008</td>
<td>Stakeholder Conference Call</td>
</tr>
<tr>
<td>July 25, 2008</td>
<td>Stakeholder Comments Due</td>
</tr>
<tr>
<td>September 8-9, 2008</td>
<td>Presentation to CAISO Board of Governors</td>
</tr>
</tbody>
</table>
Written Comments

Please submit written comments to

SPComments@caiso.com

using the template posted at

http://www.caiso.com/1bef/1bef12b9b420b0.html

Written comments are due by July 25, 2008