



CALIFORNIA ISO

Resource Adequacy & Market Power Mitigation

California ISO

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Part I

Resource Adequacy



Resource Adequacy

Resource Adequacy Paradigm

- In 2002, the State, FERC and the ISO understood that the State would take the lead role in ensuring *resource adequacy*.
- Thus, the resource adequacy paradigm for California involves the state *developing* and *implementing* a resource adequacy program designed to ensure the *long-term reliability* of the system through the imposition of *capacity* requirements and *forward contracting* by load-serving entities.
- Complementing that construct, the ISO continues to ensure the *short-term reliability* of the system through day-ahead and real-time spot *energy* markets whose rules are aligned with reliable operation of the grid.



Resource Adequacy

Resource Adequacy Paradigm

- Under this construct, load-serving entities enter into forward commitments for *capacity* that provide a means for suppliers to recover their fixed costs and all players use the ISO's proposed spot markets to optimize their *energy* requirements/obligations and potentially supplement a supplier's cost recovery.
- Scarcity associated with LSEs meeting their capacity requirements (year-ahead and month-ahead obligations) will be reflected in the price of forward contracts, subject to CPUC review.



Resource Adequacy

Resource Adequacy Paradigm

- The California structure achieves the same objectives as the Eastern markets...facilitating infrastructure investment...by creating a platform for investment through long-term forward contracts.



Resource Adequacy

CPUC Order - Overview

- Adopted Resource Adequacy Requirements provide a framework for ensuring “revenue adequacy” in the marketplace
- Adopted RAR provide that the IOUs must build/contract sufficient capacity to serve their load plus reserves, thus establishing an opportunity for suppliers to enter into forward contracts.
- Forward contracts are the primary means to ensure that suppliers can recover their fixed costs.



Resource Adequacy

CPUC Order – Provisions Supporting Revenue Adequacy

- ✓ **Load-Serving Entity Obligation** – obligation of load-serving entities to procure the resources necessary to serve their load plus reserves (*long-term reliability*). It is the ISO's role to maintain the *short-term reliability* of the system.
 - ✓ **Reserves** – Load-serving entities will be required to procure sufficient *capacity* to serve their forecast load plus 15-17% reserves)
 - ✓ **Obligation** - Load-serving entities will be required to procure 90% of their forecasted summer peak obligations one-year out and 100% of their capacity obligation one-month in advance
 - ✓ **Deliverability** – Resources procured by load-serving entities must be deliverable to load (three-part test: aggregate load, imports, local capacity)



Resource Adequacy

CPUC Order – Provisions Supporting Revenue Adequacy

- ✓ **Availability** – All resources procured by load-serving entities should be made available to the ISO (bid or scheduled) so as to ensure they are available to serve real-time load (*short-term reliability*)

- ✓ **Reporting** – Load-serving entities will be required to report how they have met their *obligations*.

- ✓ **Compliance** – Detailed measures will be developed in Phase 2.



Resource Adequacy

Impact on ISO Market Design

- RUC Availability Payment – Based on the CPUC order, should the ISO continue to offer a Residual Unit Commitment (“RUC”) Availability Payment? The ISO anticipates that it will recommend that the Availability Payment be eliminated.
- RUC Self-Provision – ISO needs to work with stakeholders to determine how the concept of RUC self-provision works with the CPUC’s adopted availability requirement.



Resource Adequacy

Timing Considerations

- In order for the ISO Board to make an informed and *timely* judgment regarding the need for TAPAS (Transitional Alternative Pricing & Settlement), the ISO needs feedback from FERC on its proposed Market Power Mitigation (LMPM) measures by January.
- At present, the ISO is designing its systems/software to accommodate either a PJM-style mitigation mechanism or a NY/NE-style mitigation mechanism. Thus, moderate variations to those approaches will not impact systems/software implementation. However, radical departures from either of those forms of mitigation will likely have an impact on both cost and schedule.



Resource Adequacy

Conclusion

- Revenue Adequacy – CPUC’s adopted Resource Adequacy Requirements provide a platform for forward contracting by Load Serving Entities that will ensure “revenue adequacy” in the marketplace.

Moreover, should the implementation details worked out through CPUC process require any further action by the ISO to assure the revenue adequacy of resources needed for reliability, there is more than sufficient time prior to MRTU implementation for FERC, the State, and the ISO to address such concerns through other mechanisms.

Part II

Market Power Mitigation



Discussion Topics

- Overview of Market Power Mitigation Proposal
- Preferred Local Market Power Mitigation: PJM-style
- Cost -vs.- Bid-based Reference Levels for LMPM
- Conduct and Impact Test Thresholds
- Testing for Competitiveness of Constraints
- Frequently Mitigated Units



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Proposed Market Power Mitigation Mechanisms

- **Bid Caps for Energy and Ancillary Services**
- **System Market Power Mitigation for Energy**
 - Supplier can be pivotal at system-level even if LMPM is effective.
 - No assurance that bid cap will stay at \$250.
 - Absence of DA MOO warrants having backstop measure to address system market power.
- **Local Market Power Mitigation for Energy**
 - PJM-style mitigation with proxy variable cost-based default bids.
 - Conduct & Impact test mitigation provides too much opportunity in California for windfall to non-marginal units resulting from local market power.
 - Bid-based mitigation too susceptible to manipulation given frequency of incremental dispatch for local constraints in California.



Damage Control Bid Caps

- **Energy: \$250/MWh Soft Bid Cap**
 - Energy bids above \$250 are
 - Not eligible to set the MCP,
 - Paid uplift if dispatched (subject to cost justification and refund).

- **Ancillary Services: \$250/MWh Hard Bid Cap**



System Market Power Mitigation for Energy

- Day-Ahead and Real-Time.
- Applied only to internal resources.
- Conduct and impact tests within Mitigation Zones (e.g. NP15, SP15, and ZP26). **(new)**
- Use generation-weighted average LMP for impact test. **(new)**
- The entire bid is mitigated for the impact test (and remains mitigated if the impact test within that zone fails).
- Reference Prices for system-wide mitigation are determined in the following order: bid-based, negotiated, cost-based, MCP.



Local Market Power Mitigation - Energy -

➤ PJM-like Mitigation (Preferred)

- Dispatched out-of-sequence bids mitigated without conduct and impact tests.
- Out-of-sequence applies to incremental dispatches when non-competitive constraints are applied.
- Energy mitigated only for incremental portion dispatched.
- Energy bids mitigated, subject to monotonicity, of the overall bid curve, i.e., to the higher of
 - Highest accepted bid from competitive pass, or
 - Default Proxy Bids (established proxy variable cost formula).



Local Market Power Mitigation - Energy (cont) -

➤ Conduct and Impact Tests (Alternative)

- Apply conduct test to all un-dispatched energy bids.
- Bids mitigated to cost-based Default Proxy Bids to test for market impact.
- Apply impact test within Local Mitigation Areas (**new**) – Any LMP that violates impact test threshold will trigger mitigation of all units that fail conduct test within same Local Mitigation Area.
- Proposed conduct and impact test thresholds are the minimum of \$10 or 20%.
- Local Mitigation Areas will be developed in coordination with the development of locational capacity requirements for Resource Adequacy. (**new**)



Preference for Mitigation to Proxy Variable Cost in LMPM

- **Bid-based mitigation creates incentive to bid so as to increase reference level.**
- **Bid-based mitigation is prone to hockey stick bidding**
- **Incentives to manipulate reference levels not as great under SMPM (where bid-based mitigation is proposed).**
- **Exceptions to using proxy variable cost:**
 - **Non-thermal Units**
 - **Inter-temporal Opportunity Cost**



Test Thresholds in the Alternative LMPM

- **ISO recognizes that there are load pockets within which there will be frequent opportunity to exercise local market power.**
- **Test thresholds in excess of \$10 or 20% may result in excess windfall to all units within load pocket as a result of local market power.**
- **Comparable test thresholds in NYISO (\$3 - \$10 or 20%) and ISO NE (\$25 or 25%).**



Competitive Constraint Test

- **Competitive constraints have adequate competition in supply of energy to relieve congestion on that constraint.**
- **Applied in assessing dispatch of energy to meet system load without limitations of local uncompetitive constraints.**
- **Initial Designation: Path 15, Path 26, Ties, and interfaces to certain pre-designated generation pockets.**
- **Testing**
 - **Residual Supply Index under a nodal pricing paradigm in a looped network model is untested.**
 - **PJM notes that even their proposed ‘no three-pivotal supplier’ test is not a perfect predictor of actual behavior.**
 - **Separate assessment of market competitiveness in both the forward and real-time markets.**



Competitive Constraint Test (cont.)

- **Premature to prescribe specific formulaic approach for assessing workably competitive conditions on specific paths.**
 - **Gain experience under actual LMP for a full year of operation,**
 - **Limit initial set of competitive paths to the current zonal interfaces and interfaces to other pre-designated generation pockets where the interface does not connect to a local load pocket.**



Frequently Mitigated Units

- **Frequently mitigated units can recover fixed costs through bilateral agreements.**
- **Bid adders are not an appropriate remedy**
 - **Likely to overcompensate some units.**
 - **Administrative adder likely to be capitalized into contract prices.**
- **If frequently mitigated unit is critical for reliability, ISO will utilize RMR framework if necessary.**