



# Day-Ahead Market Enhancements

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Market Design Policy

Market Surveillance Committee Meeting  
General Session  
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# Topics for discussion

- Do the new day-ahead capacity products create a double payment?
- Real-time offer cap for resources awarded RCU/IRU
- Market power mitigation for capacity products
- New: deviation settlement for reliability capacity and imbalance reserves
- DMM discussion on optimization horizon for FRP to maintain imbalance reserves

# MARKET SURVEILLANCE COMMITTEE

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## Day-Ahead Market Enhancements Discussion

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ISO Public



California ISO | WESTERN ENERGY IMBALANCE MARKET

# Topic

- How should reliability capacity and imbalance reserves (RC/IR) provided by RA resources be compensated?
  1. *RUC Model*: Through RA payments
  2. *Spot Market Model*: As much as possible through spot market (IFM, RT markets) revenue

# Compensation

- **“RUC Model”**: If through RA payments, then:
  - RA resources offer at zero and would not be paid market clearing prices for RC/IR.
    - ✓ Or could offer at positive value and if not taken, then would “buy out” (compensate ISO for purchase of non-RA RC/IR)
  - RA contract prices would, in part, reflect owner expectations about magnitudes & frequency of short-run costs incurred to provide RC/IR
  
- **“Spot Market Model”**: If as much as possible through spot markets:
  - Spot market offers reflect short-run variable cost of making capacity available, and possibly market power
  - RA contract prices will not need to reflect short-run costs to provide RC/IR, and might reflect expectations about rents in those market
    - ✓ There won't be a double-payments problem in the long-run

# Advantages of RUC Model for RC/IR Compensation

- Least disruption to present RA system
  - Won't require renegotiation of RA contracts, changes in CPUC cost-recovery for utility RA assets, or adjustments to CAISO MOO tariff
  - *But:*
    - eventually a transition may be necessary in EDAM
    - existing contracts should not prevent us from moving towards a more sensible market design to meet the needs of a grid with a changing gen fleet
  
- Avoid risk of double payment, especially in transition period before old RA contracts renegotiated or expire
  - *But:* if RA market is competitive, RA costs in longer-term will reflect increased spot market revenues
  
- Avoid need for market power mitigation of RC/IR offers

# Advantages of Spot Market Model for RC/IR Compensation

- Under competitive conditions:
  - More efficient allocation of RC/IR among resources, since offers will reflect variable costs of making capacity available
    - ✓ Costs can depend on gas costs, expectations of real-time prices (option value), and other time varying factors.
    - ✓ Gas markets have changed since when RUC was first designed
    - ✓ But under RUC Model, can buy out (promote efficiency)
  - Stronger incentive to be available when and where needed for RC/IR
    - ✓ Lesser reliance on administrative penalties for being unavailable when needed
    - ✓ Pricing will be more reflective of market conditions to incent the performance that will be needed to balance load and generation with the prospective resource mix.
  - RA contracts will involve less guesswork, and may avoid risk premiums (from covering uncertain variable costs)
- Rolling the cost into RA favors some LSEs and virtual traders over others.
  - It lowers the cost of underbidding in the DAM or submitting virtual supply because it reduces RUC costs that are allocated to underbid loads and virtual supply bids.
  - The costs are instead allocated to LSEs who have to contract for higher cost RA at the margin. This is a cost shift away from the LSEs and virtual traders that are responsible for some of the costs.

# Previous MSC Opinions

- “We conclude that short-term markets should be the primary source of economic incentives for providing flexibility to the CAISO system. There are two reasons for this conclusion.
  - “First, short-term energy, reserves, and flexiramp markets respond by providing energy precisely when needed during ramp periods, and thereby avoid the very serious conceptual and practical problems of trying to accurately evaluate the contribution of imports, storage, start-limits, energy-limits, and other attributes in resource adequacy markets.
  - “Second, whether there is a market failure in those short-term markets that would yield too little flexibility is not well understood.
  
- “There are several changes that are being made or could be made to the CAISO markets to ensure that flexible resources are appropriately incented. These include ....”

[www.caiso.com/Documents/FinalOpinion-FlexibleResourceAdequacyCriteriaMustOfferObligation.pdf](http://www.caiso.com/Documents/FinalOpinion-FlexibleResourceAdequacyCriteriaMustOfferObligation.pdf) (2014). See also [http://www.caiso.com/Documents/FinalMSCOpiniononFlexibleRampingProudct-Mar\\_102016.pdf](http://www.caiso.com/Documents/FinalMSCOpiniononFlexibleRampingProudct-Mar_102016.pdf)



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# **REAL-TIME OFFER CAP FOR RESOURCES AWARDED RCU/IRU**

## Current day-ahead market does not distinguish the energy cost of resources when awarding capacity

- Current DAM optimization is indifferent to the underlying energy cost of resources when determining capacity awards
- Big concern for RCU and IRU because they will routinely be dispatched for energy in real time
- Optimal to award upward capacity products to unloaded resources with lowest underlying energy cost because they would be most cost-effective if needed in real-time

# The proposal is to have a real-time energy offer cap for resources awarded RCU and IRU

- Real-time energy offer cap incentivizes high-cost resources to increase their capacity offers → decreases chance those resources will be awarded
- Set on hourly basis before DAM closes
- Ideally, real-time energy offer cap set at the marginal price of meeting the P97.5 net load forecast using all available day-ahead energy bids
- ISO can adjust the real-time offer cap if market conditions change between DA and RT

# Example

RT energy offer cap = \$150/MWh

	Underlying Energy Cost	RT Availability Cost	Cost of Offer Cap	Capacity Bid
Resource A	\$25	\$5	\$0	\$5
Resource B	\$100	\$5	\$0	\$5
Resource C	\$250	\$5	\$100	\$105

## Stakeholders agreed on importance of issue but some questioned the method

- Could lead to price distortion
- Does not go far enough to address the issue
- ISO evaluated alternatives
  - Do not schedule/compensate high energy cost resources for upward capacity
  - Algebraic combinations of energy and capacity bid price
- Are these tradeoffs worth it? Are there other alternatives to consider?

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# MARKET POWER MITIGATION OF CAPACITY PRODUCTS

# ISO proposes to extend local market power mitigation to reliability capacity and imbalance reserve bids

- Suppliers will offer to sell energy, reliability capacity, and imbalance reserves in the day-ahead market
- A supplier may be able to exercise market power in providing reliability capacity or imbalance reserve awards when constraints bind in deployment scenarios

# Proposal for market power mitigation of capacity products

- Allow imbalance reserves bids up to \$247
  - Reflects FRP relaxation price
- Evaluate constraints for uncompetitive conditions and mitigate reliability capacity and imbalance reserve offers effective on binding constraints
- If market power detected, mitigate capacity bids to \$30
  - ~90<sup>th</sup> percentile of historical spin price – assumed a competitive capacity price
  - With offer cap: bids would be mitigated to  $\$30 + \text{MAX}(0, \text{DEB} - \text{RT Offer Cap})$



# Stakeholder comments to capacity MPM proposal

- Demand curve is sufficient mitigation of imbalance reserves
- “Competitive capacity price”
- Spinning reserves may not be a good baseline
- More granular price floor (hourly/monthly)

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# CAPACITY DEVIATION SETTLEMENT

# Issues Identified by MSC and Stakeholders

- Need a stronger real-time incentive for availability of capacity products
  - Consequences of non-performance in RT could be very costly when capacity is tight
- Excess compensation
  - Excess compensation of energy opportunity cost to resources awarded both RC/IR and FRP
- RCU/VS tradeoff
  - May create a gaming opportunity between reliability capacity and virtual bids
  - May be incentive for non-RA resources to provide DA RCU and RT energy

## Considering a deviation settlement for day-ahead capacity products

- Settle deviations from day-ahead capacity schedules at prices reflecting real-time conditions
- Best settlement price appears to be RT FRP price
- Resources that submit economic offers and receive no energy, AS, or FRP awards keep their IR/RC payment
- What about hourly block resources? Other resources that are not eligible to provide FRP?