Congestion revenue rights auction efficiency

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Certain partial funding approaches may disincentivize model gaming and highly speculative behavior in the auctions

- Measured demand pays all shortfalls to fully fund auctioned congestion revenue rights
  - Measured demand fully funds auctioned congestion revenue rights
  - Holders of allocated rights on the same constraints as auctioned rights do not receive equivalent payouts because they are measured demand and pay uplift
- If all rights share shortfalls appropriately, all rights flowing on the same constraint receive an equivalent payout
- If certain constraints were mostly purchased on a speculative basis
  - Holders of rights purchased to game model differences would pay back their share of the shortfall
  - Holders of low-value highly speculative rights would pay back their share of the shortfall

De-rating congestion revenue rights ex ante versus ex post

- In ex ante approaches, the ISO de-rates congestion revenue rights prior to the day-ahead market
  - Shape the congestion revenue rights quantity to the hourly granularity
  - Allows market participants to adjust forward energy positions prior to day-ahead market to be consistent with their final supply delivery hedge
  - Potential incentives for higher bid-values depending on de-rate method
- In ex post approaches, the ISO charges congestion revenue rights holders for shortfalls after the day-ahead market
  - Shape the congestion revenue rights payouts to the hourly granularity
  - Payouts aligned with revenues collected in the day-ahead market
  - Potential to eliminate incentives to game model differences between the congestion revenue rights market and day-ahead market

De-rating congestion revenue rights ex ante versus ex post

- Under either ex ante or ex post approach, the ISO will not pay congestion revenue rights holders for the full quantity of the congestion revenue rights all the time

- Participants likely will lower their bid values in anticipation of lower payouts

- Are there any partial funding approaches that reduce the incentive for market participants to lower bid values in the auction?

De-rate CRR quantity prior to the day-ahead market based on bid value

- One day prior to day-ahead market, re-run the simultaneous feasibility test using the most recent day-ahead model
  - Most accurate model
  - Allow participants the opportunity to react to the de-rate

- De-rate congestion revenue rights to hourly granularity based on available transmission and bid value
  - The ISO would de-rate lowest value congestion revenue rights first
  - Basing on bid values provides the incentive to not completely reduce bid values in auctions

California ISO

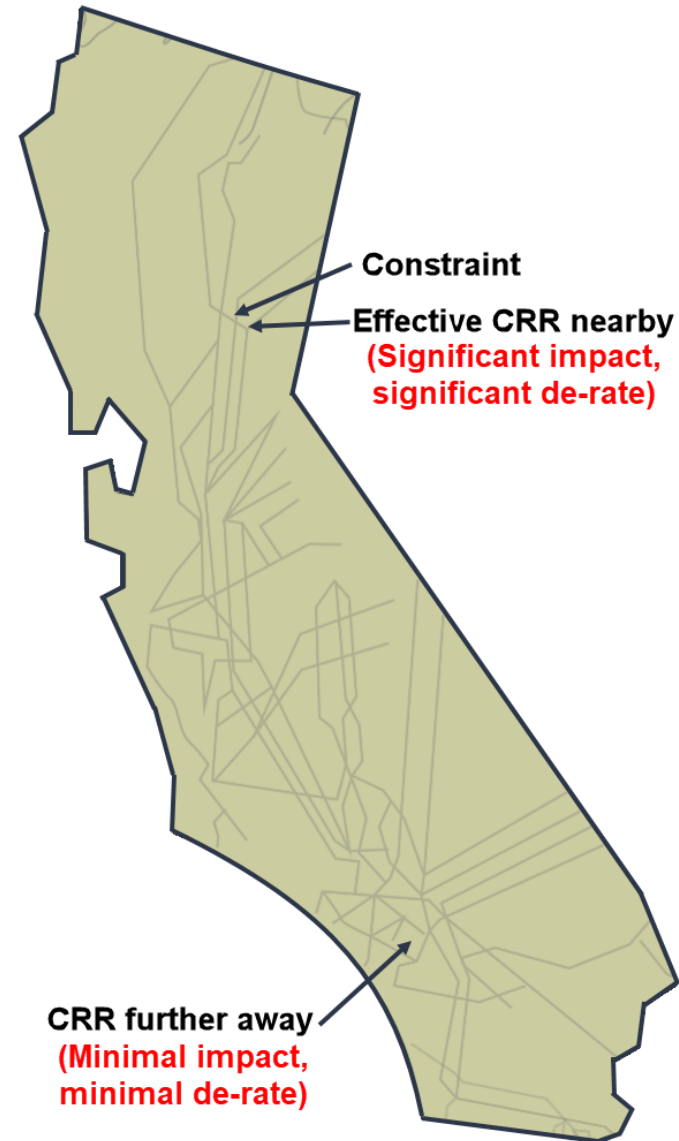# CRRs shaped to the hour every day

California ISO
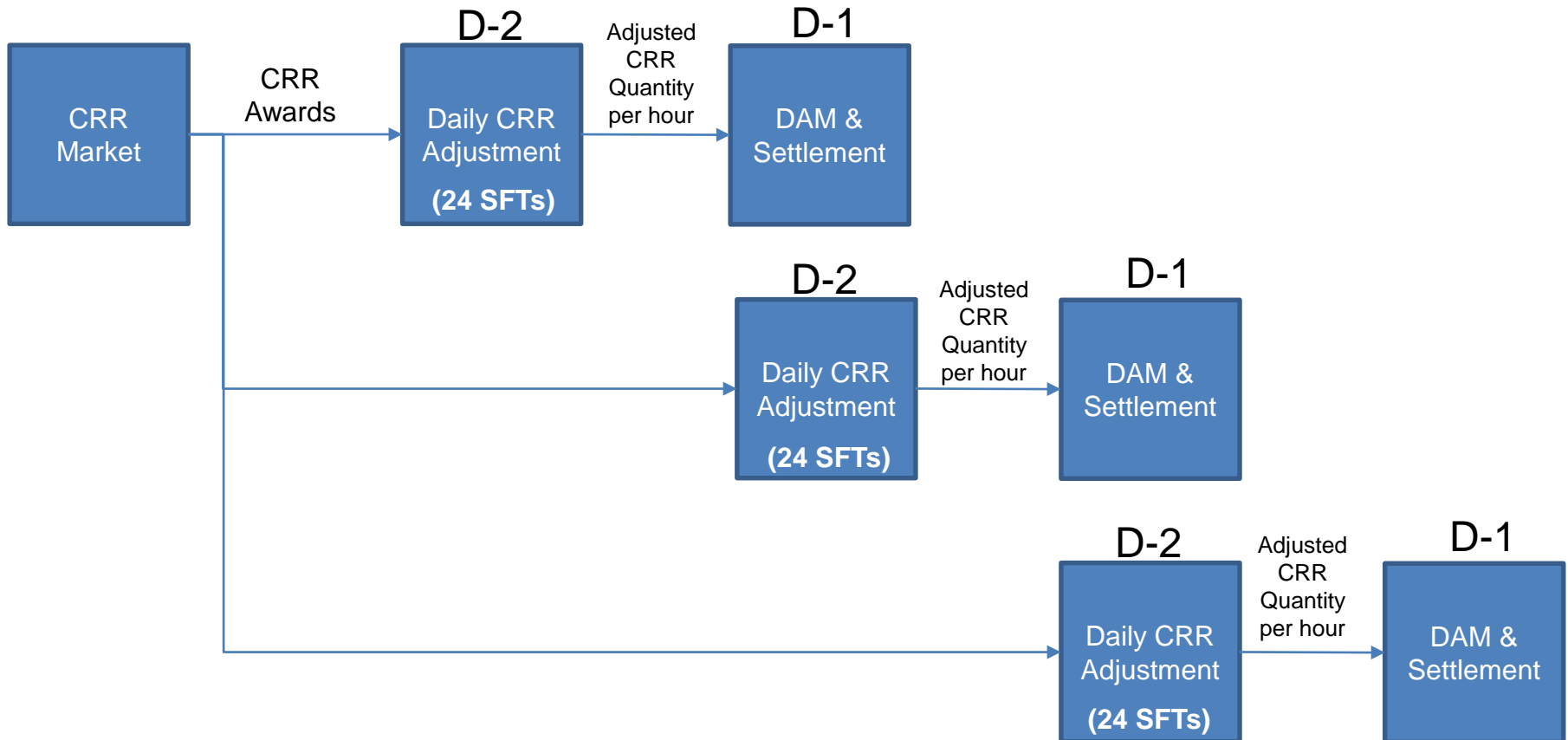
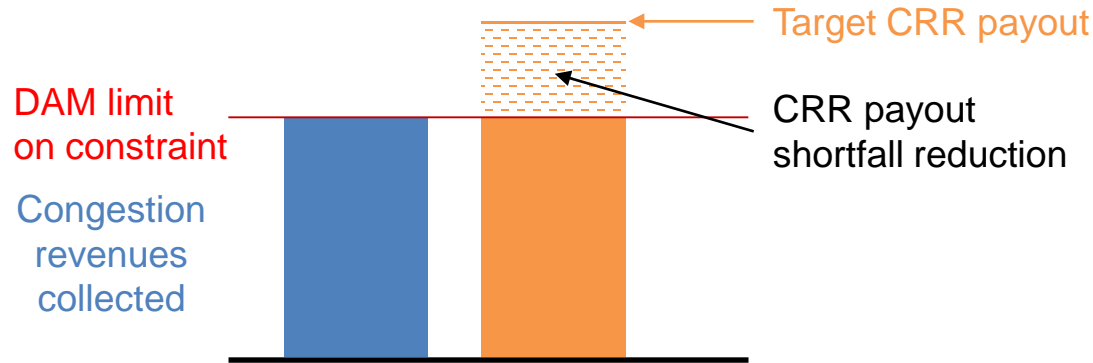# Daily CRR adjustments cleared using simultaneous feasibility test

- **Perform daily CRR adjustment**
  - First use annual auction bids on each of the hourly 24 models
    - Cap each CRR's bid curve at the awarded quantities in the annual auction
    - De-rates determined by maximizing auction revenues and taking the difference between the adjusted quantity and the previously awarded quantity
    - Allocated CRRs can be inserted at high bid-value or market clearing price (priority determination)
  - More capacity will still be available
    - Execute same process but with monthly auction bids and allocation nominations to further fill in the available transmission
  - Resulting priority follows the order in which CRRs were released and bid-in values: (1) annual allocated, (2) annual auctioned, (3) monthly allocated, and (4) monthly auctioned

Adjust payments to CRRs based on effectiveness on binding constraints

- After the day-ahead market, calculate the revenue shortfall per constraint

- Reduce payments to only those congestion revenue rights effective on specific constraints that generated the revenue shortfall

Constraint

Effective CRR nearby
(Significant impact, significant de-rate)

CRR further away
(Minimal impact, minimal de-rate)

California ISO

Adjust payments to CRRs based on effectiveness on binding constraints

Target CRR payout

DAM limit
on constraint

CRR payout
shortfall reduction

Congestion
revenues
collected

$$Imbalance^k = \lambda^k * \left(\sum_{i=1}^{N} -SF_i^k * MW_i^{IFM} - \sum_{j=1}^{M} MW_j^{CRR} * \left(SF_{src,j}^k - SF_{snk,j}^k \right) \right)$$

$$Factor^k = \alpha^k = min \left(1, \frac{Flow^{DAM,k}}{Flow^{CRR,k}} \right)$$

$$Adj. Payment_j^k = \alpha^k * \lambda^k * MW_j^{CRR} * \left(SF_{src,j}^k - SF_{snk,j}^k \right)$$

Other approaches under consideration with potentially short implementation timelines

- Lower the percentage of system capacity released in the annual congestion revenue rights process

- DMM and Southern California Edison proposal to eliminate using the available transmission system in the auction

- Implement reserve prices
  - Point-to-point based on historical day-ahead market congestion between nodes
  - Data analysis on impact on auction revenue shortfall of low-priced congestion revenue rights

THANK YOU

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