

**CAISO Congestion Revenue Rights
Auction Analysis Report**
CRR Auction Efficiency Analysis Working Group

December 19, 2017



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As the CRR initiative progresses, we look forward to working on ways to improve the auction and thereby magnify its benefits

- **CAISO's CRR Auction Analysis Report was an important first step in assessing the efficiency of the CRR auction**
 - Provided a comprehensive assessment of CRR auction participation levels, pricing outcomes, and transmission outage submission and modeling practices
 - Identified the root causes of CRR auction inefficiency
 - Focused on CRR auction performance that can be analyzed within the scope of the CAISO market data
- **CRR auctions are utilized to reduce the cost of power consumed by end-use customers**
 - Without these products [Financial Transmission Rights (“FTRs”) and “virtual” transactions], our company and others would have to charge higher prices to manage the increased risk. This “risk premium” cost would wind up being included in retail sales, which directly increases consumer costs.” -Testimony of Chris Moser, Senior Vice President for NRG Energy, Inc. before the Subcommittee on Energy and Commerce Committee, U.S. House of Representatives Washington, DC on November 29th, 2017



The CRR Auction Analysis Report identified numerous areas where improvements to the CRR auction can be undertaken

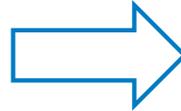
- **The CRR report showed that transmission outage and constraint modeling practices are key drivers of CRR auction efficiency**
 - Provided a detailed assessment of the factors that promote symmetry between the CRR and IFM market models
 - Transmission outage submission practices
 - Un-modeled constraints
 - CAISO transmission outage modeling practices
 - Provided specific examples where improvements to the CRR auction would promote revenue adequacy and rationalize the value of transmission capacity
- **DC Energy’s analysis determined that over 70% of all CRR revenue inadequacy for the period of June 2016 and August 2016 through March 2017 can be attributed to non-modeled transmission outages or non-modeled nomograms**



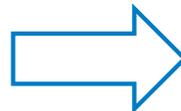
DC Energy's recommendations address the root cause of the inefficiencies identified in the CAISO's CRR auction report

Reported Source of Inefficiency

Timeliness of planned transmission outage submissions: 57% of outages subject to the 30-day rule were not submitted on time

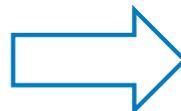


Un-modeled transmission constraints (e.g., 23040_CROSSTRIP)



CAISO modeling practices:

- Outage deration procedure
- Exclusion of outages with <24-hour duration
- Transmission line limit symmetry



DC Energy Recommendation

- Adherence to the tariff requirement (i.e., 30-day rule)
- Expand the definition of Significant Facilities within the 30-day rule to include 100kV elements

- Provide advanced notification of changes to congestion management (i.e., newly monitored/changes to constraints)
- Publish Operating Procedures (e.g., operating procedure 7820)

CAISO and stakeholders expeditiously review outage modeling practices with the goal of addressing revenue inadequacy and aligning pricing outcomes



In order to accurately assess the efficiency of the CRR auction, the interaction of network elements must be considered

- **The use of “single definition awards” to assess auction liquidity can lead to misinformed conclusions**
 - When measuring the liquidity or competitiveness of the auction all awarded paths must be assessed within the full network model
 - CRR network capacity can be awarded in many configurations, which promotes the liquidity of the overall market
- **The “Net CRR payment by constraint” tables can lead to inaccurate depictions of CRR auction efficiency**
 - The information in the tables could lead one to make erroneous conclusions regarding the absence of congestion in the IFM or CRR auction
 - For example, a constraint binding in the IFM might not bind in the CRR auction due to a more limiting Nodal Group Constraint that was not enforced for a given day in the IFM. Obviously, this does not mean there was zero auction revenue contribution for the same congestion in the CRR auction.