



Memorandum

To: ISO Board of Governors and WEIM Governing Body
From: Eric Hildebrandt, Executive Director, Market Monitoring
Date: March 13, 2024
Re: Department of Market Monitoring report

This memorandum does not require ISO Board of Governors or WEIM Governing Body action.

EXECUTIVE SUMMARY

This memo summarizes analysis by the Department of Market Monitoring (DMM) on two aspects of the performance of the California ISO markets during 2023.

- **Congestion revenue rights auctioned off by the ISO resulted in losses to transmission ratepayers totaling \$58 million during 2023.** Since the ISO made changes in the auction to reduce these losses in 2019, losses from congestion revenue rights have averaged \$62 million per year, compared to losses of \$114 million per year from 2012 to 2018. Since 2019, revenues from sales of congestion revenue rights to non-load serving entities have averaged about 67 percent of the revenues paid out to these entities, compared to about 48 percent prior to 2019. Due to the continued losses from the auction since 2019, DMM continues to urge the ISO to replace the auction with a market for congestion revenue rights based on bids from willing sellers.
- **DMM report on demand response resources.** For the last four years, DMM has released a special report on how demand response resources participated and performed in the California ISO market on the most critical high load days each summer. DMM's report on summer 2023 shows that while a larger portion of demand response resource adequacy capacity was available for dispatch compared to previous years, most demand response resources continued to perform below dispatched levels during key peak net load hours.

Additional details of these issues are provided in this memo. Analysis of congestion revenue rights in 2023 will also be provided in DMM's forthcoming annual report on market issues and performance. DMM's report on demand response during 2023 is provided in a special report released in March.¹

¹ *Demand response issues and performance 2023*, Department of Market Monitoring, California ISO, March 6, 2024: <https://www.caiso.com/Documents/Demand-Response-Report-2023-Mar-6-2024.pdf>

CONGESTION REVENUE RIGHTS

If the ISO did not auction off congestion revenue rights, all congestion revenues would be returned to load serving entities who pay for the transmission system through the transmission assess charge (TAC). However, the ISO auctions off congestion revenue rights to non-load serving entities that are financially backed by these congestion revenues.

While transmission ratepayers receive these auction revenues, payouts to entities purchasing these congestion revenue rights have exceeded these auction revenues every year since the auction began in 2009. This represents a profit to entities purchasing rights in the auction, but represents a loss to transmission ratepayers.

Beginning in 2019, the ISO implemented changes to the congestion revenue rights auction aimed at reducing these losses by (1) limiting the locations for which bids could be submitted in the auction and (2) reducing payouts in some cases based on the amount of congestion revenues received. While these changes have reduced losses over the last years, losses from the congestion revenue rights auction continue to be significant:

- As shown in Figure 1, changes made to the auction beginning in 2019 have reduced losses from an average of \$114 million per year from 2012-2018 to an average of \$62 million in 2019-2023.
- As shown in Figure 2, revenues from sales of congestion revenue rights to non-load serving entities have averaged about 67 percent of the congestion revenues paid out for buyers of these financial rights. Prior to 2019, transmission ratepayers received an average of 48 cents in auction revenues for each dollar paid out to buyers of these financial rights.

In 2023, transmission ratepayers lost about \$58 million, as payments to buyers of auctioned congestion revenue rights continued to exceed auction revenues. As in prior years, most of these losses continue to stem from profits made by purely financial entities and marketers, rather than from entities buying congestion revenue rights as financial hedges. In 2023:

- Financial entities received about \$43 million in profits, or about 73 percent of total losses by transmission ratepayers.
- Marketers received profits of about \$11 million, or about 19 percent of these losses.
- Physical generation entities received about \$2 million in profits from auctioned rights.

Figure 1. Auction revenues and CRR payments to non-load serving entities

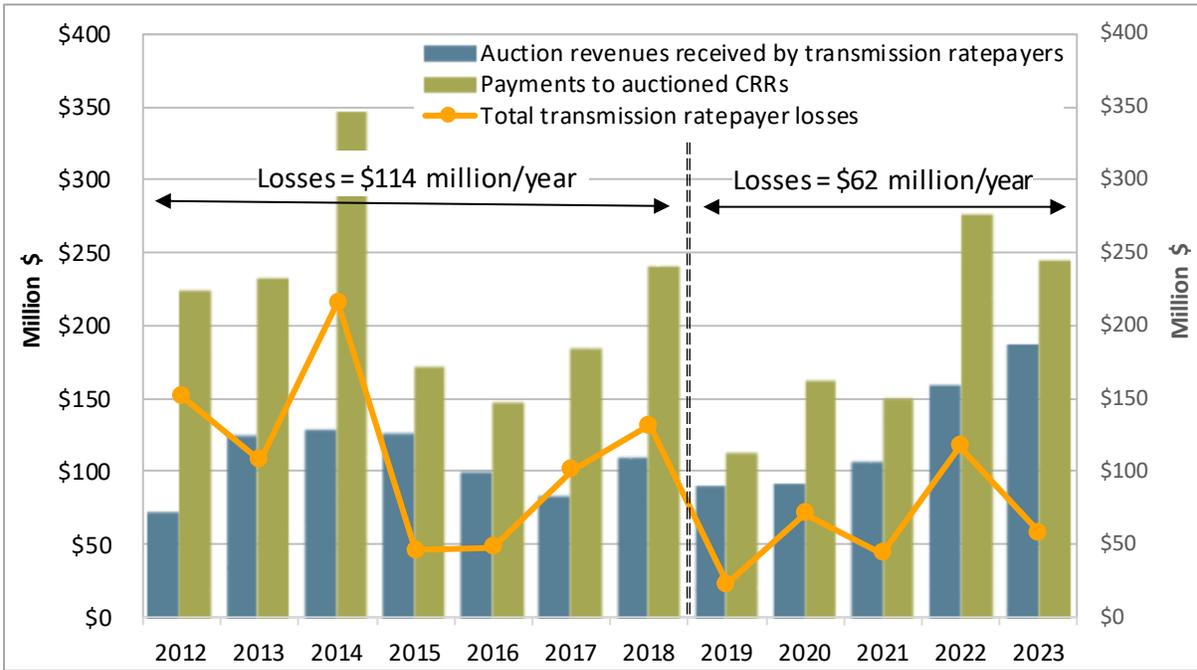
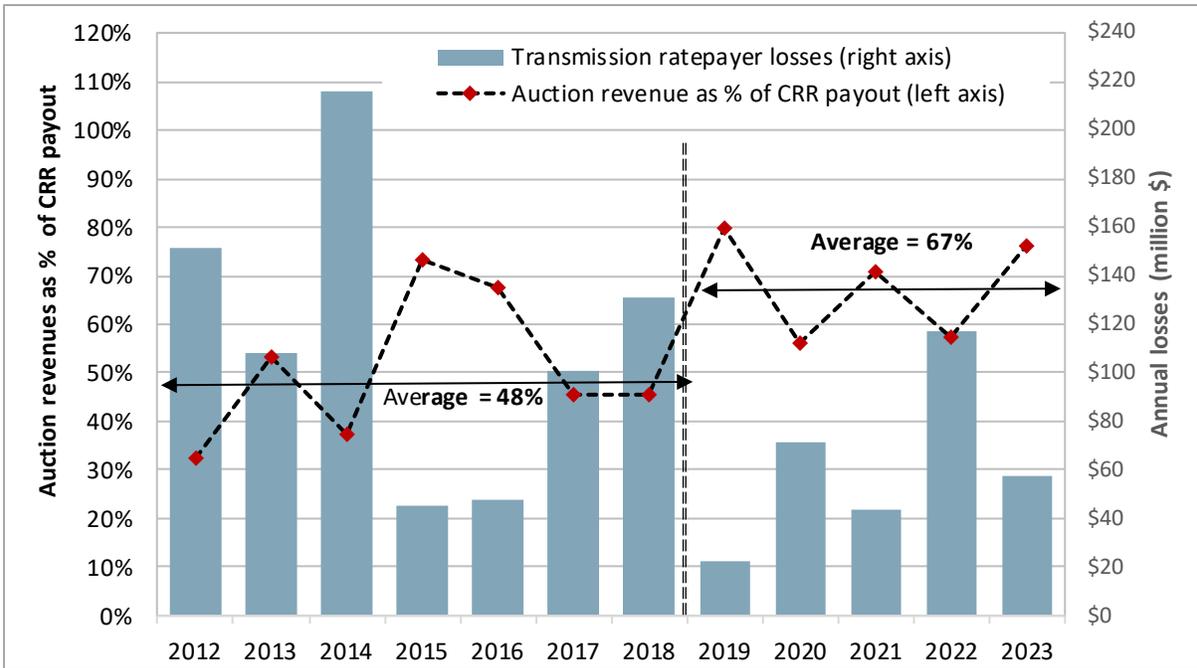


Figure 2. Auction revenues as percent of CRR payments to non-load serving entities



DMM continues to recommend that the ISO take steps to discontinue auctioning congestion revenue rights that are financially backed by transmission ratepayers. The auction continues to cause significant losses for transmission ratepayers each year. DMM recommends that the ISO modify auction into a market based on bids to sell congestion revenue rights from willing sellers – rather than transmission ratepayers.

The ISO has also performed analysis of the congestion revenue rights auction and discussed these results at a meeting of the Market Surveillance Committee in late 2023.² The ISO has indicated that it is “in the process of a holistic assessment of the [congestion revenue rights] market performance” and is conducting further analysis of this issue.

DEMAND RESPONSE RESOURCES

Background

Demand response accounted for roughly 3 percent of total system resource adequacy capacity (or about 1,680 MW) in July and August 2023. Almost all the demand response capacity in the ISO market falls in three categories:

- **Utility reliability demand response resources (RDRR).** This capacity is usually only offered or called upon under emergency conditions after the ISO issues a system warning. This accounts for about 51 percent of the resource adequacy requirements met by demand response (or about 850 MW).
- **Utility proxy demand response.** This capacity is scheduled or bid into the ISO markets as *proxy demand response* resources. This accounts for about 26 percent of resource adequacy requirements met by demand response (or about 430 MW).
- **Third party proxy demand response.** This capacity is managed by non-utility demand response providers who contract to sell capacity to load serving entities. This capacity is referred to as *supply plan demand response* since it is explicitly shown on monthly resource adequacy plans as supply providing resource adequacy capacity. This capacity is scheduled or offered in the ISO markets as *proxy demand response* resources. This accounts for about 20 percent of resource adequacy requirements met by demand response (or about 333 MW).

Almost all utility demand response is from programs operated by investor-owned utilities under California Public Utilities Commission (CPUC) jurisdiction. This capacity is not shown on resource adequacy supply plans, but is instead subtracted from the resource adequacy requirements of each load serving entity. When reducing these requirements, the CPUC

² *Congestion Revenue Rights Discussion*, Market Surveillance Committee Meeting General Session November 29, 2023. <https://www.caiso.com/Documents/CongestionRevenueRights-Presentation-Nov29-2023.pdf>

applies several adders to the actual capacity of utility demand response programs, which totaled about 18 percent in 2023.³

DMM's reports on demand response focus on the peak net load hours of the most critical days of each year. In 2023, this includes nine days when the ISO issued a Restricted Maintenance Operations (RMO) notice or an Energy Emergency Alert (EEA).⁴

Availability of demand response resources

DMM assesses the *availability* of demand response resources based on the amount of capacity self-scheduled or bid into the ISO markets. DMM does not assess the extent to which any demand response capacity bid into the market could perform if dispatched. When assessing the availability of utility demand response resources, DMM compares the amount of capacity offered from these resources to the reduction in resource adequacy requirements resulting from these resources after inclusion of adders totaling about 18 percent applied by the CPUC in 2023.

In 2023, about 85 percent of all resource adequacy demand response capacity was bid into the ISO market across peak net load hours on critical days. This is a significant improvement from the previous two years, when about two thirds of resource adequacy demand response was unavailable in the ISO markets. This improvement is due in part to the fact that high load days included in DMM's 2023 report did not fall on any holidays or weekends, when availability of demand response resources tends to be lower.

In 2023, the availability of different types of demand response continued to vary significantly:

- During the hours used in this analysis, bids from reliability demand response resources met or slightly exceeded resource adequacy capacity of these resources, even with inclusion of the 18 percent capacity adder applied by the CPUC in 2023.
- Bids from utility proxy demand resources averaged about 41 percent of resource adequacy credits (with inclusion of the adder applied by the CPUC). Since these resources are not shown on supply plans, they are not subject to a must-offer requirement and are not subject to any penalties if they fail to bid in their resource adequacy capacity. This may explain why such a large portion of this capacity was unavailable to the ISO during peak hours on high load days in summer 2023.
- Third party demand response was available up to 96 percent of their resource adequacy capacity in the day-ahead market and 69 percent in the real-time market.⁵

³ This includes adders for resource adequacy requirements associated with the planning reserve margin of 9 percent, transmission losses of about 3 percent, and distribution losses of about 6.5 percent. In 2024, the adders for the planning reserve margin and transmission losses will be removed by the CPUC, reducing the total adder to about 6.5 percent for distribution losses.

⁴ The ISO declared an EEA 1 on July 20, two EEA Watches on July 25-26, and issued RMO notices on August 15-17 and August 28-30.

⁵ The more limited availability of demand response capacity in real-time can primarily be attributed to demand response programs with start-up times of more than 255 minutes, which qualify these resources as long-start.

Greater availability of supply plan demand response may be due largely to supply plan resources being subject to penalties under the *resource adequacy availability incentive mechanism* (RAAIM) for failing to bid in up to their resource adequacy capacity.

Performance of demand response

Most demand response resources submit very high priced bids when offered into the ISO markets. As a result, most demand response capacity is dispatched during a relatively small portion of hours. DMM assesses the *performance* of these resources based on reported load reductions relative to the level at which these resources are actually scheduled or dispatched in the ISO market.

Under ISO market rules, the load reduction achieved by demand response resources is measured by comparing actual metered loads to a hypothetical baseline of estimated load if demand response was not dispatched. For almost all resources, this hypothetical baseline is determined based on metered usage during the same hours on prior days when demand response was not dispatched. Calculations of baseline usage are performed and self-reported by demand response providers. The scope of DMM's report does not include any assessment of the accuracy of the baseline usage methodology and calculations.

In 2023, about 76 percent of the total demand response capacity dispatched in real-time was reported to have performed as scheduled or dispatched. The performance of different types of demand response continued to vary significantly:

- Utility reliability demand response resources reported load reductions averaging about 71 percent of their dispatched level in real-time, compared to about 89 percent in 2022.
- Utility proxy demand resources reported load reductions averaging about 97 percent of their dispatched level in real-time, compared to about 85 percent in 2022.
- Third party proxy demand resources reported load reductions averaging about 37 to 46 percent of their dispatched level in real-time.⁶ This compares to about 37 to 47 percent in 2022.

Recommendations

DMM's report also follows up on prior recommendations made by DMM for improving the availability and performance of demand response resources used to meet resource adequacy requirements. The CPUC has recently made a number of changes to the treatment of demand response resources that count toward resource adequacy requirements. These changes include the following:

⁶ The higher 41 percent performance capped at individual resource schedules averaged 37 percent on high load days in summer 2023. When considering load curtailments in excess of individual resource schedules, performance of supply plan demand response resources averaged 46 percent. These average performances are very similar to high load days in summer 2022.

- The CPUC has reduced the adders that are applied to utility demand response when reducing the resource adequacy requirements of load serving entities. In 2022, the CPUC reduced these adders from a total of about 24 percent to about 18 percent. Starting in 2024, the CPUC will reduce these adders to a distribution adder of about 6.5 percent.
- The CPUC has expanded the days on which utility demand response must be available and offered in the ISO markets. This includes a requirement that demand response be available on weekends and holidays.
- The CPUC has expanded testing of demand response, and capacity awarded to demand response resources will be de-rated based on performance during test events.

The ISO, CPUC, and California Energy Commission are continuing to work on addressing some important issues pertaining to demand response. This includes enhancing resource adequacy counting methodologies to account for the variable nature of some demand response resources. DMM supports these efforts, and has recommended considering a performance-based penalty or incentive structure for demand response used to meet resource adequacy requirements. DMM has also recommended that the ISO consider tariff changes to better define deadlines and penalties on data submission to ensure all necessary historical data is available to assess the validity of baseline submissions.