

**UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION**

**California Independent System)
Operator Corporation)**

Docket No. ER22-2881-000

**MOTION TO INTERVENE AND COMMENTS
OF THE DEPARTMENT OF MARKET MONITORING
OF THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION**

Pursuant to Rules 212 and 214 of the Rules of Practice and Procedure of the Federal Energy Regulatory Commission (“FERC” or “Commission”), 18 C.F.R. §§385.212, 385.214, the Department of Market Monitoring (“DMM”), acting in its capacity as the Independent Market Monitor for the California Independent System Operator Corporation (“CAISO”), submits this motion to intervene and comment in the above-captioned proceeding.

I. MOTION TO INTERVENE

DMM respectfully requests that the Commission afford due consideration to these comments and motion to intervene, and afford DMM full rights as a party to this proceeding. Pursuant to the Commission’s Order 719, the CAISO tariff states “DMM shall review existing and proposed market rules, tariff provisions, and market design elements and recommend proposed rule and tariff changes to the CAISO, the CAISO Governing Board, FERC staff, the California Public Utilities Commission, Market Participants, and other interested entities.”¹ As this proceeding involves CAISO tariff provisions that would affect the efficiency of CAISO markets, it implicates matters within DMM’s purview.

¹ CAISO Tariff Appendix P, Section 5.1.

II. SUMMARY

In this filing, CAISO proposes tariff changes that would exclude market intervals from bid cost recovery calculations when a storage resource is dispatched to manage its state of charge in order to preserve an ancillary services award. CAISO is proposing this change in response to unintended market outcomes identified by DMM involving high bid cost recovery payments for storage resources providing downward regulation.

DMM supports CAISO's proposed tariff changes. DMM believes CAISO's proposed tariff changes are consistent with theoretically correct market design that will improve overall market efficiency. With the proposed changes, participants will have improved incentives to manage battery storage resources more efficiently through their own market scheduling and bidding practices. The proposed changes also remove a significant potential flaw in current settlement rules that has resulted in unnecessarily high bid cost recovery payments and could be exploited to extract even higher bid cost recovery payments from the market. The scenario targeted by this tariff filing accounts for the majority of real-time bid cost recovery paid to energy storage resources year-to-date in 2022. These relatively high bid cost recovery payments have resulted from market conduct that does not appear to be designed to exploit or manipulate the existing rules. However, bid cost recovery payments could be dramatically inflated by scheduling and bidding behavior specifically designed to exploit existing market rules for bid cost recovery.

DMM supports the CAISO's decision to file the proposed changes without a stakeholder process, and to ask for the requested settlement rules changes to become effective one day after its filing, upon approval by the Commission. This approach avoids the potential for any concern about intentional exploitation of this flaw in current bid cost

recovery rules while the proposed changes are under consideration by stakeholders and the Commission. DMM believes the changes being proposed at this time are an effective, targeted and robust solution to the issue that is currently being observed and resulting in unnecessary and excessive bid cost recovery payments.

DMM also supports the CAISO's proposal to conduct a stakeholder process after filing, in order to fully consider all potential long-term solutions to this issue. While DMM supports CAISO's proposed tariff changes, we note that the proposed changes narrowly address one source of energy storage bid cost recovery, and do not address other issues with energy storage bid cost recovery design that may need to be addressed.

III. COMMENTS

DMM supports CAISO's proposed tariff changes

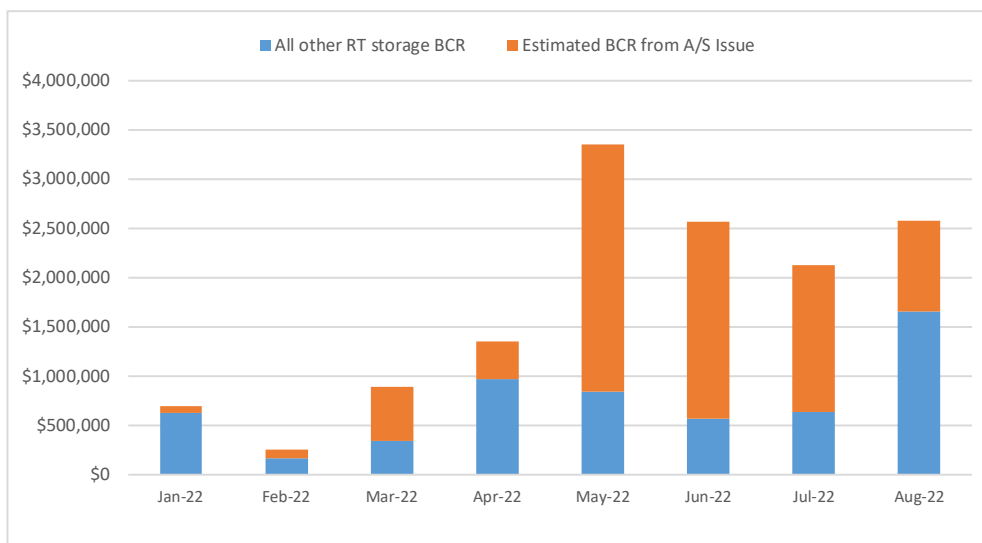
DMM supports the CAISO's proposal to exclude market intervals from bid cost recovery calculations when a storage resource is dispatched to manage its state of charge in order to preserve an ancillary services award. This unanticipated source of bid cost recovery was identified by DMM and brought to the attention of the CAISO, and has been a major driver of bid cost recovery payments to energy storage resources in 2022.

In 2022 to date, DMM estimates that energy storage resources have received approximately \$13.8 million in real-time bid cost recovery payments. DMM further estimates that approximately \$8 million (or 58 percent) of this total is the result of uneconomic real-time dispatches issued by the market software to manage state of charge related to ancillary services awards. In the three months from of May to July, DMM estimates that this issue may be the cause of as much as 75 percent of real-time bid cost

recovery paid to storage resources. Figure 1 summarizes DMM’s estimates of real-time bid cost recovery paid to CAISO energy storage resources in 2022 year-to-date.

Figure 1. Estimated real-time bid cost recovery payments to energy storage resources

January 1, 2022 – August 31, 2022



In 2022, all bid cost recovery associated with this issue appears related to intervals where storage resources are providing regulation down service and must be discharged uneconomically in order to maintain sufficient charging headroom to continue providing regulation down. A commonly observed scenario is one where an energy storage resource has regulation down awards in the early and middle hours of the day, and has a progressively increasing state of charge associated with the provision of regulation down service. As the state of charge reaches the maximum allowable level to be able to continue providing regulation down, the 5-minute market dispatches the resource to discharge in order to reduce the state of charge. When this discharge is uneconomic

based on submitted real-time energy bids and market prices, any unrecovered energy bid costs are considered in calculation of daily bid cost recovery. In this scenario, elevated energy bids potentially submitted for legitimate business reasons may further exacerbate bid cost recovery payments, and may create additional challenges in the effectiveness of behavioral monitoring as a sustainable means to address this issue.

CAISO's proposed changes are consistent with the intention of the bid cost recovery mechanism and supported by principles of efficient market design

In addition to supporting the CAISO's proposed changes as a means to prevent potential gaming or manipulation of current market rules to further inflate energy storage bid cost recovery, DMM supports the CAISO's proposed tariff changes as the theoretically correct market design.

The primary purpose of the bid cost recovery mechanism is not for general cost recovery in every situation. Rather, bid cost recovery is primarily intended to allow recovery of discrete or "lumpy," non-marginal costs such as start-up and minimum load costs of traditional generators. Because energy market prices are set by energy bids, and because of intertemporal constraints faced by traditional generators, other discrete operating costs may not be fully recovered through energy market revenues. The bid cost recovery mechanism fills this potential revenue gap and therefore incentivizes traditional generators to bid in a way that properly allocates costs across the three-part bid components of start-up, minimum load, and energy. Failure to ensure recovery of start-up and minimum load costs through uplift payments where necessary may instead incentivize generators to include all costs in energy bids, leading to inefficient market outcomes.

All generators that have been awarded regulation service are subject to uninstructed imbalance energy settlement at the 5-minute price when moved by automatic generation control. These automatic movements for frequency regulation do not consider energy bids and are not considered in bid cost recovery calculations. Resources providing regulation anticipate these settlements – including when they may occur at prices inconsistent with real-time energy bids – and may be expected to reflect any associated costs in bids to provide regulation service. This treatment is appropriate because these costs are not the type of discrete costs for which bid cost recovery is primarily intended.

Energy storage resources face an additional cost of providing regulation service that traditional generators do not. The physical characteristics of energy storage resources are such that provision of regulation service requires the resource to maintain a certain amount of charging or discharging capability. The cost of real-time charging and discharging to maintain this capability is a cost to storage resources of providing regulation service.

This cost is similar in nature to expected costs of automatic generation control movements faced by all resources providing regulation, as discussed above. However, under current CAISO market design, bid cost recovery payments prevent storage resources from realizing the additional cost of maintaining state of charge to support regulation awards. Instead, this cost of storage resources providing regulation service is borne by measured demand through allocation of bid cost recovery payments made to storage resources.

Because they do not face this additional cost of providing regulation service, storage resources may submit regulation bids that do not reflect their full cost of providing regulation service. This outcome is inefficient as it does not allow CAISO's day-ahead market to consider all costs when determining the least cost solution to meet regulation needs. Further, providing bid cost recovery payments for this type of cost is not consistent with the primary intent of the bid cost recovery mechanism.

Due to the inefficiencies described above, DMM does not view it as appropriate for storage resources to receive bid cost recovery associated with maintaining state of charge to support a regulation award. Energy storage resources should instead reflect the expected cost of charging and discharging to maintain a regulation award in day-ahead bids to provide regulation service. This is similar to other costs associated with providing regulation service that may be reflected in market bids for regulation, and allows the day-ahead market optimization to fully consider costs of each resource awarded regulation.

CAISO's proposed tariff changes do not address other known issues with energy storage bid cost recovery design

The tariff changes proposed in the immediate filing are an important enhancement that will improve market efficiency and address a significant recent driver of unnecessary bid cost recovery payments to storage resources. However, it is important to note that there are other known market design issues related to bid cost recovery for energy storage resources that remain unaddressed.

One specific issue that is not addressed by CAISO's proposed changes is the potential for bid cost recovery resulting from differences between real-time and day-ahead

state of charge. Resources may be eligible for bid cost recovery when real-time state of charge differs from the day-ahead state of charge such that day-ahead awards become infeasible.

State of charge is considered a physical operating constraint of a storage resource when determining market dispatch. When physical operating constraints of a resource are not the result of a submitted de-rate or other predefined circumstance, such constraints do not typically preclude a resource from receiving bid cost recovery where appropriate. However, resource operators could take actions to impact state of charge, creating differences in values between the real-time and day-ahead markets. Because current bid cost recovery rules do not consider what may cause real-time state of charge to diverge from the day-ahead value, this has potential to create large and inappropriate bid cost recovery payments should a resource operator intentionally create differences in real-time and day-ahead state of charge for the purpose of unwinding day-ahead schedules.

Additionally, DMM notes that existing bid cost recovery rules were designed for traditional generators and do not contemplate the unique characteristics of storage resources. Therefore, even when not the result of intentional actions, it has not been established that bid cost recovery is appropriate when driven by differences between real-time and day-ahead state of charge.

In addition to supporting the current proposed tariff changes, DMM has also encouraged the CAISO to prioritize a more complete review of bid cost recovery design for energy storage resources in the near future.

DMM supports the CAISO's decision to file at the Commission without a stakeholder process

DMM understands that the CAISO's choice to forgo a stakeholder process in advance of filing with the Commission was driven by concern of revealing a market issue that could be exploited before it could be addressed. DMM understands and appreciates this concern, and DMM supports the CAISO's course of action.

DMM supports the CAISO's plan to conduct a stakeholder process after this filing to assess all potential solutions to the identified energy storage bid cost recovery issue. DMM supports this process to provide the opportunity for open discussion of the issue, and to hear all stakeholder perspectives and possible solutions. However, for the reasons discussed above in these comments, DMM believes that CAISO's proposed tariff changes are consistent with efficient market design and represent a robust long-term solution.

IV. CONCLUSION

DMM respectfully requests that the Commission afford due consideration to these comments as it evaluates the proposed tariff provisions before it.

Respectfully submitted,

By: /s/ Adam Swadley

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Independent Market Monitor for the
California Independent System Operator

Dated: September 19, 2022

CERTIFICATE OF SERVICE

I hereby certify that I have served the foregoing document upon the parties listed on the official service lists in the above-referenced proceedings, in accordance with the requirements of Rule 2010 of the Commission's Rules of Practice and Procedure (18 C.F.R. § 385.2010).

Dated at Folsom, California this 19th day of September, 2022.

Jennifer Shirk
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