



Battery BCR Issues and Recommendations

Department of Market Monitoring

Storage BCR and DEB enhancements
Initial workshop - July 8, 2024

Existing CAISO bid cost recovery (BCR) rules

- Designed for traditional generators
- Do not consider battery attributes (e.g., state of charge, constraints)
- For storage resources, can lead to inefficient market outcomes with reliability implications
- Can lead to inappropriate or unwarranted bid cost recovery payments for storage resource
 - Can be exacerbated by pending rule changes for bidding over soft offer cap

Current BCR rules are designed for traditional generators

- A primary purpose of BCR is to incentivize efficient bidding by allowing for recovery of discrete or “lumpy” commitment costs of traditional generators (eg, start-up and minimum load)
- Concept of commitment doesn’t exist for batteries = no commitment costs
- May be other reasons for BCR to apply to batteries...but rules need to consider impact of unique battery operating constraints, state of charge (SOC) and operator driven SOC changes

Current BCR rules do not consider battery attributes

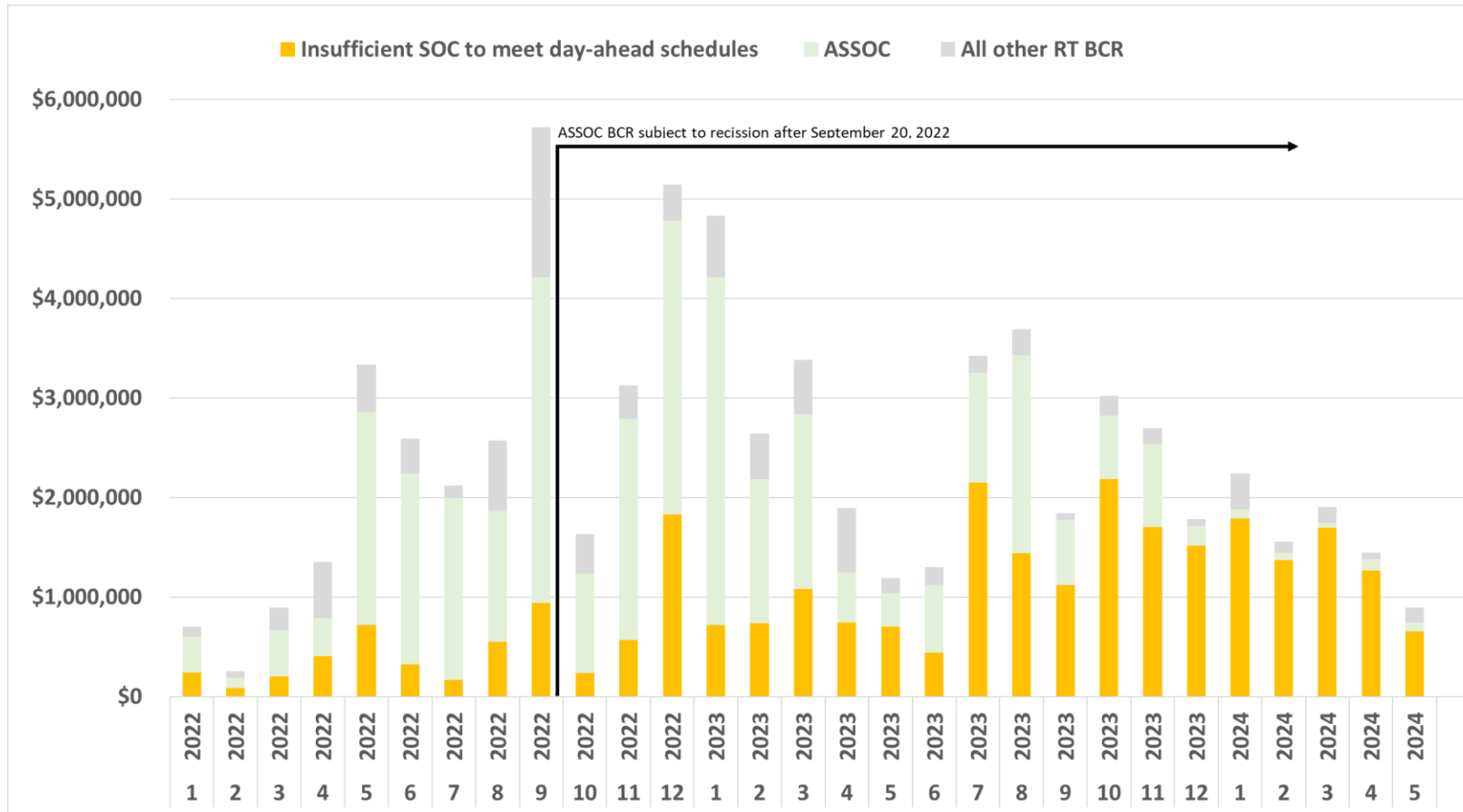
- In general, BCR rules allow for consideration of bid costs that result from market dispatch (not from outages or self-schedules)
- Basic rule applies to storage as well, but there are a number of ways in which storage resources may experience outage-related or operator imposed limitations that still lead to BCR (e.g., min or max SOC in an OMS card)
- BCR rules do not consider constraints unique to storage (eg, SOC)
 - May limit operation in a given interval, directly influenced by bidding and market participation in earlier intervals

Drivers of battery BCR

- **Day-ahead battery BCR** has been almost exclusively associated with unanticipated interactions between submitted storage resource parameters and features of the day-ahead optimization; anomalies
- **Real-time battery BCR** has been almost exclusively driven by battery resource constraints not considered in BCR rules
 - ASSOC (addressed September 2022)
 - State of charge (continues to be major driver of real-time battery BCR)

Most real-time battery BCR results from state of charge limitations

Estimated incremental reduction in real-time BCR by driver



Settlements as of T+70B. Earlier preliminary data for April and May 2024. Older data not updated to reflect resettlement in later settlement cycles.

BCR when SOC limitations cause day-ahead schedule buyback

- **Inefficient:** removes exposure to real-time prices during hours of day-ahead schedules and distorts perceived real-time opportunity cost of not delivering day-ahead schedules; can create incentives to obtain incremental real-time market schedules at the expense of day-ahead awards
- **Reliability implications:** related to inefficient bidding incentives, reduced likelihood that day-ahead schedules will be deliverable in real-time without manual intervention, or that SOC generally will align with real-time needs

Recommendations

- Consider eliminating day-ahead BCR for battery storage resources
- Consider eliminating most real-time BCR for battery storage resources
 - Start from a position of eliminating all real-time BCR for storage resources
 - Carefully consider potential cases where real-time BCR may be warranted; should be the only remaining situations where battery storage resources can receive real-time BCR
 - Focus first on addressing real-time BCR from buying back day-ahead schedules (leading driver of storage BCR payments, inefficiency, and reliability implications)
- Continue to closely monitor battery BCR
 - DMM will continue to monitor battery BCR, ISO should also
 - Cases which appear to involve intentional manipulation subject to referral to FERC

Eliminating BCR for SOC limitations supports efficiency and reliability

- Incentivizes more accurate estimation of day-ahead bidding parameters; day-ahead scheduling more likely to be feasible in real-time
- Incentivizes real-time bids that reflect intraday opportunity costs based on real-time prices
 - Expected intraday opportunity cost reflected in bids align with expected real-time conditions when resources exposed to real-time prices
 - Can improve reliability by better aligning SOC with real-time system needs (eg, supporting deliverability of peak hour day-ahead schedules)
- Eliminating BCR associated with OMS limitations on SOC is consistent with treatment of other OMS MW derates

Changes support use of additional constraints to model batteries

- A significant portion of BCR paid to battery resources has been the result of unintended interactions between battery constraints (eg: SOC limitations, ASSOC) and BCR design
- Eliminating most BCR for batteries would provide freedom to add additional constraints that may be needed to accurately model battery storage resources, with limited concern of additional unintended uplift

