



# 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

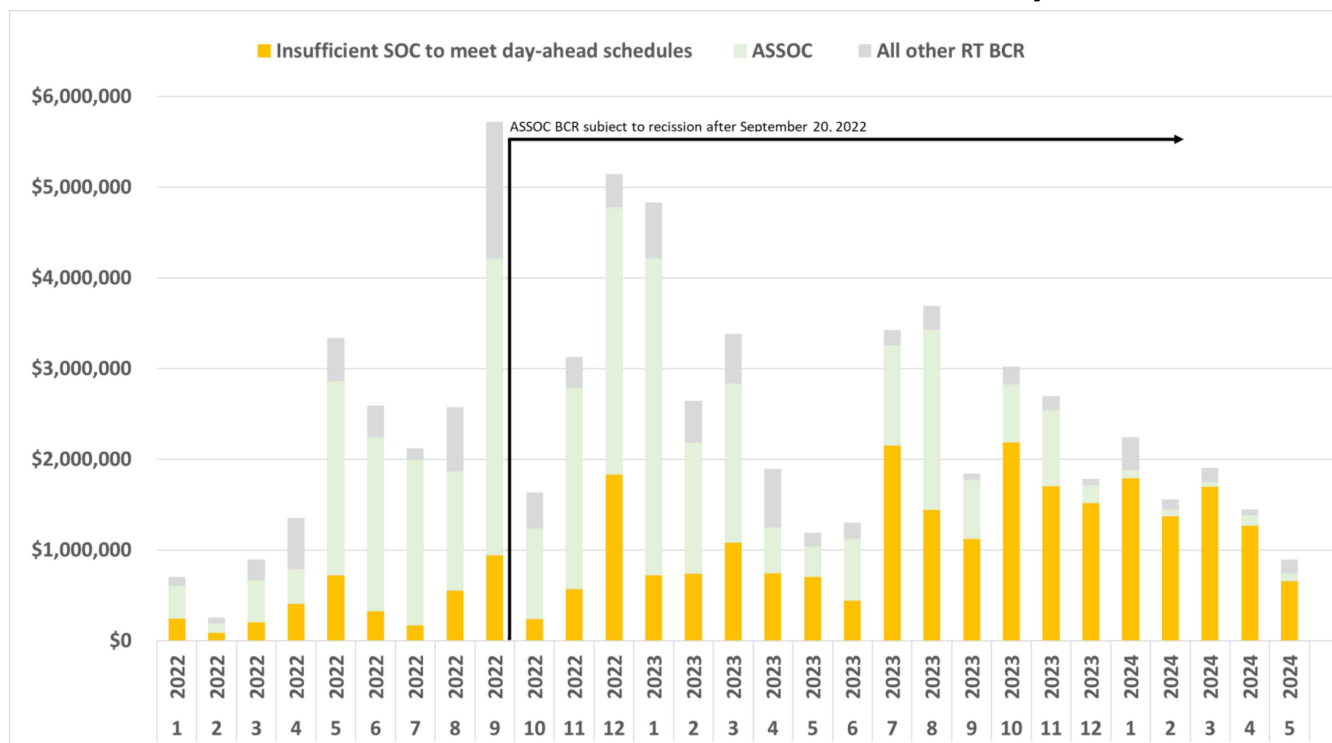
- In general, BCR rules allow for consideration of bid costs that result from market dispatch (not from outages or self-schedules)
- Basic rule applies to storage as well, but there are a number of ways in which storage resources may experience outage-related or operator imposed limitations that still 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

