

183 FERC ¶ 61,161
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Willie L. Phillips, Acting Chairman;
James P. Danly, Allison Clements,
and Mark C. Christie.

California Independent System Operator Corporation Docket No. ER23-1533-000

ORDER ON TARIFF REVISIONS

(Issued June 1, 2023)

1. On March 31, 2023, pursuant to section 205 of the Federal Power Act (FPA),¹ the California Independent System Operator Corporation (CAISO) filed revisions to its Open Access Transmission Tariff (Tariff) to: (1) provide energy storage resources with opportunity costs when they receive an exceptional dispatch to hold a state of charge; (2) enhance energy storage resources' day-ahead default energy bids to include opportunity costs; (3) require energy storage resources to submit real-time energy bids to cover day-ahead ancillary service awards; and (4) clarify that CAISO will consider the impact regulation awards have on energy storage resources' state of charge.² In this order, we accept the proposed Tariff revisions, effective as of the actual implementation date, as requested, subject to CAISO notifying the Commission of the actual implementation date within five business days after CAISO's actual implementation date.

I. CAISO Filing

2. CAISO states that the four distinct sets of Tariff revisions included in its filing will help improve the performance of energy storage resources and ensure reliability in the CAISO markets. CAISO states that these revisions will require substantial software enhancements, and therefore requests an order by June 1, 2023, so as to implement the provisions to be effective no later than November 1, 2023. CAISO requests authorization to notify the Commission of the effective date of the tariff changes within five business days of implementation.³ The four changes CAISO proposes are discussed in turn below.

¹ 16 U.S.C. § 824d.

² Transmittal at 1.

³ *Id.* at 1-2.

A. Opportunity Costs to Hold State of Charge

3. CAISO explains that energy storage resources can receive an exceptional dispatch⁴ to hold their state of charge to ensure that they will have sufficient charge later in the day and during peak demand. CAISO states that it may need to issue exceptional dispatch orders at times when real-time price signals could inadvertently drain energy storage resources and reduce their state of charge, in turn reducing their ability to perform when they are most needed. CAISO notes that its current settlement rules do not account for energy storage resources holding a particular state of charge. CAISO explains that compensation for energy delivered in response to traditional exceptional dispatch instructions provides compensation at the higher of bid prices or prevailing market prices. CAISO explains, however, that exceptional dispatch to hold a state of charge is essentially a dispatch of zero MWh at a price of zero dollars. CAISO asserts that, as a result, the energy storage resource misses the opportunity to participate in the real-time market without receiving compensation for following the exceptional dispatch instruction.⁵

4. CAISO proposes to implement a new settlement calculation tailored to energy storage resources that receive exceptional dispatches to hold a state of charge, based on an opportunity cost methodology that accounts for the revenues an energy storage resource would have received had it participated optimally in the real-time market. CAISO states that opportunity cost compensation will be based on the difference between two counterfactual values: the revenue maximizing energy dispatch the energy storage resource would have received with and without an exceptional dispatch. CAISO proposes to pay the energy storage resource an additional uplift payment for the operating day only if the revenue maximizing energy dispatch without an exceptional dispatch exceeds the revenue maximizing energy dispatch with an exceptional dispatch.⁶ CAISO

⁴ CAISO's Tariff states that it may issue system reliability exceptional dispatches, in addition to or instead of resources with a day-ahead schedule dispatched by real-time market optimization software during a system emergency, or to prevent an imminent system emergency or a situation that threatens system reliability and cannot be addressed by the real-time market optimization and system modeling. *See* CAISO, CAISO eTariff, § 34.11.1.

⁵ *Id.* at 2.

⁶ *Id.* at 3. CAISO's proposed Tariff language states that CAISO will calculate the resource's opportunity costs based on its master file characteristics, bids, state of charge, day-ahead schedules, and the applicable locational marginal prices. CAISO, CAISO Proposed eTariff, § 11.5.6.1.2 ([Settlement Amounts for RTD IIE from Exceptional Dispatch](#)) (16.0.0).

explains that this opportunity cost would be provided during the exceptional dispatch and for the rest of the operating day, to account for the resource's altered ability to participate in the real-time markets.⁷ CAISO also proposed revisions to its Tariff section detailing real-time market revenues for bid cost recovery⁸ eligible resources to clarify that for energy storage resources that receive an exceptional dispatch to hold a state of charge, the real-time market revenue will include revenues from the opportunity cost to hold the state of charge, but not the exceptional discharge energy to reach the state of charge.⁹

5. CAISO argues that these Tariff revisions are just and reasonable because they account for the unique nature of energy storage resources and compensate these resources fairly when they receive an exceptional dispatch to hold their state of charge. CAISO notes that it hopes to reduce the use of exceptional dispatch, but that resources should be adequately compensated when it is used.¹⁰

B. Default Energy Bid Enhancements

6. CAISO states that it has observed cases in which scheduling coordinators for energy storage resources submit day-ahead bids at a consistent price throughout the day, but the resources nonetheless receive day-ahead schedules to discharge during the late afternoon hours rather than the highest priced hours in the evening.¹¹ According to CAISO, this suboptimal dispatch has occurred when a resource's day-ahead bids were higher than that resource's default energy bids, and market power mitigation triggered during the afternoon hours and not the evening hours. CAISO explains that in these circumstances, the market optimization scheduled the resource for discharge energy when the resource appeared less expensive because of the mitigated bids. CAISO explains that it calculates the energy storage resource default energy bid based on the outputs of the market power mitigation pass of the day-ahead market, which are unknown to scheduling coordinators when they submit bids.¹²

⁷ Transmittal at 3.

⁸ CAISO explains that the purpose of bid cost recovery is to ensure resources recover their costs when the markets do not provide sufficient revenues. *Id.*

⁹ CAISO, CAISO eTariff, § 11.8.4.2.1 (RTM Bid Cost Recovery Amount) (31.0.0).

¹⁰ Transmittal at 4.

¹¹ *Id.* at 5-6.

¹² *Id.*

7. CAISO proposes to revise the day-ahead default energy bid for energy storage resources by including an opportunity cost component like the one used in the calculation for the real-time default energy bids for energy storage resources.¹³ CAISO states that the default day-ahead energy bid for energy storage resources is the summation of energy costs and variable operations costs, plus the standard 10% adder in the day-ahead market power mitigation process. In the real-time market power mitigation process, CAISO calculates the default energy bids of energy storage resources by including the standard 10% adder to the higher of: (1) the sum of expected energy cost and the variable operation cost; and (2) the opportunity cost.¹⁴

8. CAISO explains that its proposed opportunity cost calculation for the day-ahead default energy bid would be the same as in the real-time market default energy bids, except that CAISO will use the advisory prices from the day-ahead market power mitigation process rather than the locational marginal prices from the day-ahead market (which would not have been produced yet). CAISO states that it will use the lowest price of energy during the highest-priced period over which the resource could have discharged, based upon advisory prices from the market power mitigation process. CAISO argues that the advisory prices are essentially the first prices available for day-ahead default energy bids and will serve the same function in the day-ahead default energy bids as the day-ahead prices serve in the real-time default energy bids. According to CAISO, this will ensure that energy storage resources are dispatched during the highest-priced hours. CAISO notes that it will continue to monitor the market power mitigation process as it and scheduling coordinators gain experience with energy storage resources.¹⁵

C. Bidding Requirements for Ancillary Services

9. CAISO explains that ancillary service awards are for capacity, and when resources receive ancillary service awards, they must have the capability to convert that capacity into energy if CAISO issues a real-time energy instruction to meet the ancillary service award. CAISO notes that its current rules governing the provision of ancillary services predate the proliferation of energy storage resources in the market.¹⁶ CAISO explains

¹³ CAISO, CAISO eTariff, § 39.7.1.8 (Calculation of Default Energy Bids) (41.0.0).

¹⁴ *Id.* To calculate the opportunity cost, CAISO uses the lowest price of energy during the highest priced period over which the resource could have discharged, based upon the price from the day-ahead market at the relevant price node on the trading day.

¹⁵ Transmittal at 6.

¹⁶ *Id.* at 7-8.

that to ensure energy storage resources have sufficient state of charge to meet continuous energy requirements for their ancillary service awards, energy storage resources must have a state of charge that would enable the energy storage resource to provide its ancillary service award for one hour in the day-ahead market, and 30 minutes in the real-time market. CAISO explains that when an energy storage resource will not have sufficient state of charge to meet its ancillary service award, CAISO will dispatch the resource in a manner to ensure a sufficient state of charge. According to CAISO, this is not always possible, such as in instances in which the state of charge is too far from the required state of charge to move the resource in a timely manner to meet its award. CAISO states that although the real-time market will rescind an ancillary service award that an energy storage resource cannot meet, the real-time market must then procure the ancillary services from other resources, which can be overly expensive or completely unavailable, thus jeopardizing reliability.¹⁷

10. To address this, CAISO proposes to require scheduling coordinators for energy storage resources to submit accompanying energy bids in the real-time market that cover at least half of any capacity awarded for ancillary services from the day-ahead market.¹⁸ CAISO explains that, if a resource deviates from the state of charge anticipated by the day-ahead market and is in danger of being unable to meet its ancillary service award, the real-time energy bid will ensure that the resource will still be able to charge or discharge.¹⁹

11. CAISO states that it only proposes to require real-time energy bids covering half of a day-ahead ancillary service award at the recommendation of stakeholders based on CAISO's analysis of three months of data for energy storage resources, including 35,000 records where energy storage resources received either regulation up or regulation down awards. CAISO notes that it paired that data with observed real-time information about changes in state of charge between the beginning of the award to the end of the award and concluded that the 50% energy requirement will cover most cases where there is heavy demand on energy from energy storage resources providing ancillary services.²⁰

¹⁷ *Id.*

¹⁸ CAISO states that these “covering” energy bids must be the opposite direction of the ancillary service award; bids to charge must accompany capacity awarded for regulation up, spinning reserve, and non-spinning reserve; and bids to discharge must accompany capacity awarded for regulation down. *Id.* at 8-9; CAISO, CAISO eTariff, § 30.5.2.7 (Supply Bids) (33.0.0).

¹⁹ Transmittal at 8-9.

²⁰ *Id.* at 9.

12. CAISO explains that this requirement will only apply to energy storage resources, because conventional resources cannot run out of “charge” like energy storage resources can.²¹ CAISO also proposes to revise its Tariff to clarify that for conventional resources, an ancillary service bid *or submission to self-provide* an ancillary service submitted to the day-ahead market may be, but is not required to be, accompanied by a real-time energy bid that covers the capacity offered for the ancillary service. CAISO states that this revision is not a change in policy but merely a clarification that the reference to “bid” does not exclude submissions to self-provide.²²

13. CAISO argues that the real-time energy bid requirement is just and reasonable because it addresses an immediate reliability issue and is based on actual, persistent, and often significant situations in which energy storage resources have failed to meet their ancillary service requirements.²³

D. Regulation Award Clarifications

14. CAISO explains that its Tariff addresses what energy storage resources must do to meet regulation requirements and likewise identifies what CAISO will do when energy storage resources fail to comply with those requirements. CAISO states, however, that its Tariff does not speak generally to CAISO’s responsibility to provide energy storage resources with achievable regulation awards given their constraints. Therefore, CAISO proposes to revise its Tariff to state:

Consistent with the requirements of this Section, the CAISO will use all reasonable efforts to commit, schedule, and dispatch Non-Generator Resources offering Regulation while recognizing the impact of Regulation awards on their State of Charge in the Day-Ahead and Real-Time Markets. The CAISO will include examples in the Business Practice Manual detailing how the Day-Ahead and Real-Time optimizations will account for Regulation awards in determining the State of Charge in subsequent intervals.²⁴

²¹ *Id.* at 8.

²² *Id.* at n.30; CAISO, CAISO eTariff, § 30.5.2.7 (Supply Bids) (33.0.0).

²³ Transmittal at 9.

²⁴ CAISO, CAISO eTariff, § 8.4.1 (Operating Characteristics Required to Provide AS (21.0.0)).

15. CAISO argues that this revision will clarify its responsibility to refine its optimization software continually based on energy storage resources' inputs and operational experience in providing regulation.²⁵

16. Finally, CAISO proposes to also include a specific requirement in its Tariff that it will provide examples in its business practice manual detailing how the day-ahead and real-time optimizations will account for regulation awards in determining the state of charge in subsequent intervals. CAISO argues that these operational details do not constitute a rate, term, or condition of service under the FPA and the Commission's rule of reason, but that CAISO wants to ensure these details are transparent to market participants. CAISO states that such examples will enable market participants to make better regulation submissions and work with CAISO to refine its optimization.²⁶

17. CAISO states that the Commission should approve these Tariff revisions as just and reasonable, because they commit CAISO to work with market participants to continue improving how the market optimization issues regulation awards to energy storage resources. CAISO observes that energy storage resources frequently elect to bid to provide regulation, but energy storage resources and CAISO have struggled too frequently for energy storage resources to actually meet their awards, so they must work together to continue to refine the optimization.²⁷

II. Notice and Responsive Pleadings

18. Notice of CAISO's filing was published in the *Federal Register*, 88 Fed. Reg. 20,507 (Apr. 6, 2023), with interventions and protests due on or before April 21, 2023. Timely motions to intervene were filed by the Cities of Anaheim, Azusa, Banning, Colton, Pasadena, and Riverside, California, the Northern California Power Agency, and the City of Santa Clara, California. Timely motions to intervene and comments or protests were filed by CAISO's Department of Market Monitoring (DMM), Marin Clean Energy (Marin), and Vistra Corp. and Dynegy Marketing and Trade, LLC (together, Vistra). On May 3, 2023, CAISO submitted a Motion for Leave to Answer and Answer to the Vistra Protest (CAISO Answer). On May 19, 2023, Vistra submitted a Motion for Leave to Answer and Answer to the CAISO Answer (Vistra Answer).

²⁵ Transmittal at 10. CAISO notes that the Commission required similar provisions in Order No. 841. *Id.* (citing *Elec. Storage Participation in Mkts. Operated by Reg'l Transmission Orgs. & Independent Sys. Operators*, Order No. 841, 162 FERC ¶ 61,127 (2018), *order on reh'g*, Order No. 841-A, 167 FERC ¶ 61,154 (2019)).

²⁶ *Id.*

²⁷ *Id.* at 11.

A. Protest and Comments

1. Marin Comments

19. Marin argues that CAISO's proposal to provide compensation for opportunity costs incurred when energy storage resources are exceptionally dispatched to hold a state of charge is a step in the right direction.²⁸ Marin supports the fact that CAISO's proposed counterfactuals would be calculated not only for the exceptional dispatch but also the remainder of the operating day to account for the impacts of the exceptional dispatch on the resource's ability to participate in the real-time market through the remainder of the operating day.²⁹

20. However, Marin requests CAISO to provide greater clarity as to how energy storage resources would be protected from charging at unnecessarily high prices to maintain charge and to recharge. Marin states that energy storage resources, when exceptionally dispatched to discharge, are thereafter exposed to potentially high market prices during times necessary to recharge, or, alternatively, be subject to further exceptional dispatch later in the day to potentially charge and hold a state of charge until peak hours. Further, Marin states that CAISO does not propose to calculate opportunity costs to reach a specified state of charge.³⁰

21. Marin believes that further detail regarding the timing of CAISO's exceptional dispatch instructions and their effect on energy storage resources' compensation throughout the operating day would be helpful both to the Commission in considering this filing and to CAISO market participants operating energy storage resources. Marin argues that such details would allow energy storage operators to plan for optimal resource performance, in terms of grid reliability, compensation, and meeting any conditions on a manufacturer's warranty.³¹

2. DMM Comments

22. DMM supports CAISO's proposed Tariff revisions and states that they will improve the reliability of ancillary services awarded to energy storage resources. DMM states that the revisions should also improve the efficiency of energy storage resource

²⁸ Marin states that it is a California Community Choice Aggregator which serves communities in Contra Costa, Marin, Napa, and Solano counties.

²⁹ *Id.* at 5.

³⁰ *Id.* at 5-6.

³¹ *Id.* at 6.

exceptional dispatch settlement and improve the ability of the day-ahead market to consider the intraday opportunity costs of energy storage resources when subject to local market power mitigation.³²

23. DMM states that the proposed Tariff revision to recognize the impact of regulation awards on energy storage resources' state of charge will prevent the market software from awarding many consecutive hours of regulation in one direction that becomes infeasible after several consecutive intervals of deployment.³³ DMM argues that CAISO's proposal to require real-time energy bids of at least 50% of an energy storage resource's day-ahead awarded ancillary services quantity will help to ensure that the energy storage resource has sufficient real-time energy bid range to allow this constraint to function as intended.³⁴ DMM notes that CAISO's proposed real-time energy bid requirements associated with day-ahead ancillary service awards will constrain the amount of ancillary service awards that an energy storage resource can receive in a given hour, but explains that this constraint may be appropriate to the extent that it ensures that energy storage resources only receive ancillary service awards up to the amount that can be effectively managed by the ancillary services state of charge constraint.³⁵

24. DMM argues that compensation of opportunity costs associated with holding a state of charge will provide incentives for energy storage resources to follow exceptional dispatch instructions while also supporting the development of more efficient storage exceptional dispatch tools.³⁶ Finally, DMM explains that including opportunity costs in the day-ahead energy storage resource default energy bid should improve the ability of the day-ahead market to accurately reflect intraday opportunity costs for energy storage resources when they are mitigated.³⁷

3. Vistra Protest

25. Vistra states that it generally supports the first three sets of revisions but has a limited protest to the fourth set in which CAISO proposes to clarify that it will use all

³² DMM Comments at 2.

³³ *Id.* at 3.

³⁴ *Id.* at 4.

³⁵ *Id.* at 5-6.

³⁶ *Id.* at 6-7.

³⁷ *Id.* at 8-10.

reasonable efforts to commit, schedule, and dispatch non-generator resources offering regulation while recognizing the impact of those awards on their state of charge.³⁸

26. Vistra argues that CAISO's proposal to revise its Tariff to provide it with broad discretion to account for the impact of regulation awards on an energy storage resource's state of charge when determining regulation awards and commitments—without providing any detail regarding the parameters and rules that will be applied to account for a resource's state of charge—is inconsistent with the FPA and prior Commission precedent.³⁹ Vistra states that how CAISO will account for energy storage resources' state of charge when committing, scheduling, and dispatching such resources for regulation significantly affects service, rates, and charges, and therefore must be incorporated into the Tariff.⁴⁰ According to Vistra, the parameters or rules CAISO intends to use must be incorporated into the Tariff, and CAISO should be required to file them with the Commission for its review.⁴¹

27. Finally, Vistra argues that both Commission precedent and Order No. 841 require that parameters and rules governing regulation services and energy storage resources be incorporated into the Tariff rather than incorporated into the business practice manuals.⁴² Vistra states that, in *Energy Storage Association v. PJM Interconnection, L.L.C.*, the Commission granted, in part, complaints against PJM Interconnection, L.L.C. for its failure to include the parameters governing its regulation signals for dynamic, fast dispatch resources—like battery energy storage—in its tariff.⁴³ Vistra asserts that Order No. 841 requires that an energy storage participation model that accounts for a resource's state of charge, minimum state of charge, maximum state of charge, minimum charge limit, and maximum charge limit and associated parameters and constraints must be in the tariff.⁴⁴ Vistra asks that the Commission reject this proposed addition to Tariff section 8.4.1.1 without prejudice to CAISO making a subsequent filing that incorporates

³⁸ Vistra Protest at 2 (citing Transmittal at 10).

³⁹ *Id.* at 3.

⁴⁰ *Id.* at 4-7.

⁴¹ *Id.* at 7.

⁴² *Id.* at 9-13.

⁴³ *Id.* at 10-11 (citing *Energy Storage Ass'n v. PJM Interconnection, L.L.C.*, 162 FERC ¶ 61,296 (2018)).

⁴⁴ *Id.* at 12 (citing Order No. 841, 162 FERC ¶ 61,127 at PP 178, 206; Order No. 841-A, 167 FERC ¶ 61,154 at PP 4, 90, 93).

into its Tariff the parameters and rules that will be applied when accounting for the impact of regulation awards on an energy storage resource's state of charge and demonstrates that such parameters and rules are just and reasonable and not unduly discriminatory or preferential.⁴⁵

B. CAISO Answer

28. CAISO asserts that Vistra mischaracterizes the proposed Tariff revisions. CAISO explains that its Tariff provides that CAISO will observe MWh constraints of energy storage resources in its market processes when scheduling coordinators for these energy storage resources have state of charge constraints.⁴⁶ CAISO contends that, contrary to Vistra's assertions, it has proposed no discretionary authority to account for the impact of regulation awards on an energy storage resource's state of charge when determining regulation awards and commitments.⁴⁷ CAISO contends that it simply committed to provide examples in the business practice manuals to help ensure scheduling coordinators for energy storage resources understand how CAISO market optimization accounts for energy storage resources' state of charge in issuing regulation awards.⁴⁸

29. CAISO explains that the proposed Tariff provision is similar to Tariff provisions the Commission required to comply with Order No. 841 and to Tariff provisions that apply to hybrid resources and co-located resources.⁴⁹ CAISO asserts that its proposed revisions seek to account for the effect of regulation awards in prior intervals upon an energy storage resource's state of charge so that such resources have charging or discharging headroom to meet subsequent awards. CAISO contends that its proposed

⁴⁵ *Id.* at 3.

⁴⁶ CAISO, CAISO eTariff, § 27.9 (Non-Generator Resources MWh Constraints) (4.0.0).

⁴⁷ CAISO Answer at 2 (citing Vistra Protest at 3).

⁴⁸ *Id.* at 2-3.

⁴⁹ *Id.* at 3 (citing CAISO, CAISO eTariff, § 27.9 (Non-Generator Resources MWh Constraints) (4.0.0); *id.*, § 27.13 (Aggregate Capability Constraint) (1.0.0); *id.*, § 30.5.6 (Non-Generator Resource Bids) (6.0.0), § 30.5.6.1). CAISO points out that the term "reasonable efforts" appears in the CAISO's Commission-approved Tariff 192 times. *Id.* at n. 9.

Tariff revisions do not refer to further detail, parameters, or rules, but simply the impact of regulation awards on state of charge.⁵⁰

30. CAISO states that Vistra cites to various Tariff provisions that include scheduling parameters for transmission constraint relaxation and penalty prices such as section 27.4.3.3.1 (Scheduling Parameters for Transmission Constraint Relaxation).⁵¹ CAISO explains that this provision demonstrates how static figures are inserted as elements in its market optimization algorithm. CAISO argues that these figures exist *ex ante* to the optimization and do not result dynamically from any market input or processes, unlike regulation awards and state of charge, neither of which can be specified before the optimization's market run but are specific to the resources and their market inputs in the relevant market intervals. CAISO explains that, where appropriate, it includes regulation parameters in the Tariff and does not rely on its business practice manuals to specify them.⁵²

31. CAISO argues that its proposed Tariff revisions and future business practice manual examples are consistent with the rule of reason.⁵³ CAISO contends that Vistra's argument is based on the flawed premise that CAISO proposes to use its business practice manuals for rates, terms, and conditions of service. CAISO explains its proposed Tariff revisions will allow it to provide examples in the business practice manual to help inform market participants of CAISO's practices, and that it plans to work with stakeholders to provide these examples. CAISO asserts that the Commission describes business practice manuals as "guides for internal operating procedures and to inform market participants of the CAISO's practices," and that providing examples is among the most common and basic uses.⁵⁴ CAISO states that it agrees with Vistra that other ongoing stakeholder initiatives that may consider state of charge and optimization changes should be filed with the Commission prior to implementation.⁵⁵ CAISO asserts that its past filings and

⁵⁰ *Id.* at 3-5.

⁵¹ *Id.* at 5 (citing Vistra Protest at 7).

⁵² *Id.* at 5-6 (citing, *e.g.*, CAISO, CAISO eTariff, §§ 27.1.2 (Ancillary Service Prices) (8.0.0), 27.1.2.3.1, 27.1.2.3.5, 27.1.3 (Regulation Mileage Clearing Price) (2.0)).

⁵³ *Id.* at 6-7 (citing *City of Cleveland v. FERC*, 773 F.2d 1368, 1376 (D.C. Cir. 1985)).

⁵⁴ *Id.* at 7 (citing *Cal. Indep. Sys. Operator Corp.*, 119 FERC ¶ 61,313, at P 343 (2007)).

⁵⁵ *Id.* at 8 (citing Vistra Protest at 8).

current initiatives demonstrate that it does file such Tariff changes and will continue to do so.⁵⁶

32. CAISO explains that Vistra states that it is not obvious what parameters or rules CAISO will apply when accounting for the impact of regulation awards on an energy storage resource's state of charge absent inclusion in the Tariff.⁵⁷ CAISO asserts that Vistra misunderstands the optimization and the rule of reason. CAISO explains that the impact of regulation awards on each energy storage resource's state of charge will depend on numerous dynamic factors, and that it intends to include examples in the business practice manuals because it is impossible to provide universal, fixed rules. CAISO explains that, rather, it plans to work with stakeholders to provide examples in the business practice manuals that show the likely impact of regulation awards on energy storage resources' state of charge based on the myriad factors that may affect the amount of energy the resource may provide and the resulting impact on the resource's state of charge, which also depends on the resource's size, round-trip efficiency, continuous energy limits, and capacity limits. CAISO argues that Vistra would have the Commission believe that CAISO's proposed Tariff revision is the entirety of its rates, terms, and conditions on energy storage resources and state of charge, even though this is not the case.⁵⁸ CAISO also asserts that it continues to comply with Order No. 841 and, if it had failed to provide sufficient specifics regarding energy storage resources and regulation awards, the Commission would have already required further compliance.⁵⁹

33. Additionally, CAISO states that Marin misunderstands the proposal and that the Commission should disregard Marin's comments. CAISO asserts that Marin raised a hypothetical example wherein an energy storage resource could be exposed to high energy prices to recharge if CAISO exceptionally dispatched it to fully discharge early in the day, but CAISO is unaware of any instance in which this has occurred. CAISO argues, however, that this issue is not relevant to whether CAISO's proposed Tariff revisions in the instant proceeding are just and reasonable.⁶⁰

⁵⁶ *Id.*

⁵⁷ *Id.* (citing Vistra Protest at 7-8).

⁵⁸ *Id.* at 8-11 (citing, *e.g.*, CAISO, CAISO eTariff, § 8.4.1 (Operating Characteristics Required to Provide AS) (20.0.0), 8.4.1.1(g); *id.*, § 8.3.2 (Procurement from Internal and External Resources) (3.0.0), § 8.3.2.1.1).

⁵⁹ *Id.* at 11-15 (citing *Cal. Indep. Sys. Operator Corp.*, Docket No. ER19-468-003 (Nov. 24, 2020) (delegated order)).

⁶⁰ *Id.* at 17-18.

C. Vistra Answer

34. Vistra reiterates that the rules that are applied to determine what resources receive market awards and dispatch instructions must be contained in CAISO's Tariff and filed with the Commission.⁶¹ Vistra argues that CAISO's Answer attempts to explain away this lack of detail in its Tariff or in its instant filing regarding the rules that will be applied to ensure that regulation awards and dispatch instructions are achievable by stating that its proposed tariff revisions "do not refer to further detail, parameters, or rules" and instead refer only to the "impact of regulation awards on state of charge."⁶² Vistra contends that CAISO's explanation supports Vistra's contention that CAISO's proposed Tariff language omits any detail regarding the rules, constraints, or parameters that CAISO will apply to ensure that energy storage resources are not provided with regulation awards and dispatch instructions that they cannot meet given their state of charge. Vistra disputes CAISO's attempts to cast the level of detail contained in its proposed tariff language as consistent with other provisions set out in the CAISO Tariff. Vistra claims that each example CAISO provides includes a critical element that is missing from the proposed Tariff language at issue here: a specific constraint or limit that CAISO is required to account for in its market processes.⁶³ Vistra contends that in contrast to the Tariff sections that CAISO cites, its proposed Tariff language is a black box, as it does not provide any detail regarding the constraints, parameters, or rules that CAISO plans to apply in its market optimization to recognize the impact of regulation awards on state of charge. Vistra asserts that CAISO's proposal also does not address whether there are situations in which CAISO will ignore the impact of regulation awards on an energy storage resource's state of charge in order to meet other constraints or objectives.⁶⁴

35. Vistra argues that the result is a Tariff provision that fails to provide the Commission and market participants with even the most basic understanding of whether, and how, CAISO will limit commitments, schedules, and dispatches to account for an energy storage resource's state of charge and that the consequence is to provide CAISO with broad discretion to apply any rules, constraints, and parameters that it believes are reasonable. Vistra asserts that CAISO appears to acknowledge as much, stating that its

⁶¹ Vistra Answer at 2 (citing *Energy Storage Ass'n v. PJM Interconnection, L.L.C.*, 162 FERC ¶ 61,296, at P 104 (2018); *Cal. Indep. Sys. Operator Corp.*, 175 FERC ¶ 61,245, at P 166 (2021); and *Cal. Indep. Sys. Operator Corp.*, 126 FERC ¶ 61,147, at P 57 (2009)).

⁶² *Id.* (citing CAISO Answer at 4).

⁶³ *Id.* at 2-3 (citing CAISO, CAISO eTariff, §§ 27.9, 30.5.6.2, 27.13).

⁶⁴ *Id.* at 3-4.

proposed language is designed specifically to provide CAISO with the freedom to modify its approach to accounting for the state of charge on an ongoing basis.⁶⁵ Vistra contends that providing the Commission and market participants with advance notice of the rules that will be applied by submitting the proposed tariff language for approval helps avoid unintended consequences that may inadvertently limit the participation of energy storage resources, or distort market outcomes, by providing both the Commission and market participants the opportunity to understand and assess these rules before they are implemented.⁶⁶

36. Vistra disagrees with CAISO's claims that it does not have any specific rules, constraints, or parameters that it plans to apply to ensure that regulation awards are achievable. Vistra explains that throughout the stakeholder process CAISO described specific methodologies that it planned to apply in connection with its proposal, including the application of certain multipliers, in both the day-ahead and real-time market, to ensure that charging or discharging schedules do not exceed the physical limits of the energy storage resource and to add to the day-ahead market optimization a new constraint to restrict the amount of regulation up and down that it can provide in the day-ahead market.⁶⁷ Vistra notes that CAISO's characterization of the multipliers as the output of CAISO's market optimization conflicts with CAISO's representations during the stakeholder process; if this were the case, then CAISO would not be able to specify these values in its business practice manuals as described in its stakeholder process' Final Proposal to the CAISO Board of Governors.⁶⁸ Vistra therefore contends that CAISO's statements in the Final Proposal support the conclusion that there is a specific methodology or set of rules that CAISO intends to apply that can be described in the Tariff. Further, Vistra asserts that if CAISO has not decided what methodology it plans to apply, then CAISO's filing is premature and CAISO should re-file after its proposal has been fully developed. As such, Vistra requests that the Commission accept the first three sets of CAISO's proposed Tariff revisions and sever, and reject, CAISO's fourth set of proposed Tariff revisions.⁶⁹

⁶⁵ *Id.* at 4 (citing Transmittal at 10).

⁶⁶ *Id.* at 5.

⁶⁷ *Id.* at 5-6 (citing CAISO Energy Storage Enhancements Final Proposal at 8 (Oct. 27, 2022) (Final Proposal)).

⁶⁸ *Id.* at 6-7 (citing Final Proposal at 8).

⁶⁹ *Id.* at 7-9.

III. Discussion

A. Procedural Matters

37. Pursuant to Rule 214 of the Commission's Rules of Practice and Procedure, 18 C.F.R. § 385.214 (2022), the timely, unopposed motions to intervene serve to make the entities that filed them parties to this proceeding.

38. Rule 213(a)(2) of the Commission's Rules of Practice and Procedure, 18 C.F.R. § 385.213(a)(2) (2022), prohibits an answer to a protest unless otherwise ordered by the decisional authority. We accept CAISO's and Vistra's answers because they have provided information that assisted us in our decision-making process.

B. Substantive Issues

39. We find CAISO's proposed Tariff revisions to be just and reasonable and not unduly discriminatory and preferential. We accept the proposed Tariff revisions, effective as of the actual implementation date, as requested, subject to CAISO notifying the Commission of the actual implementation date within five business days after the actual implementation date.⁷⁰

40. We find that the proposed Tariff revisions that would provide opportunity costs to energy storage resources when they receive an exceptional dispatch to hold their state of charge will help to ensure that energy storage resources are compensated for the service they provide. This new opportunity cost compensation approach compensates energy storage resources for the period of exceptional dispatch to hold a state of charge, as well as for the effect of exceptional dispatch on those resources during the remainder of the operating day. As such, CAISO's proposal also provides energy storage resources with the incentive to follow exceptional dispatch instructions by accounting for the costs of holding a certain state of charge when doing so prevents the resource from participating optimally in the real-time market.

41. We find that the proposal to include an opportunity cost component in the day-ahead default energy bid for energy storage resources, including the use of the advisory prices from the day-ahead market power mitigation process to calculate that opportunity cost component, should improve the efficiency of CAISO's dispatch of energy storage resources by dispatching such resources to inject energy in the hours expected to have the highest prices, when they are most needed.

⁷⁰ CAISO must submit its subsequent filing to confirm the actual effective date for the Tariff revisions using Type of Filing Code 150 – Report.

42. We find that the proposed bidding requirements for ancillary services provided by energy storage resources are just and reasonable. Requiring energy storage resources to submit real-time energy bids in the opposite direction of the day-ahead ancillary service award will help to ensure that energy storage resources have the ability to meet their ancillary service awards and associated operational requirements, and thereby improve reliability. Specifically, CAISO has supported its proposal to require scheduling coordinators for energy storage resources to submit accompanying energy bids in the real-time market that cover at least half of any capacity awarded for ancillary services in the day-ahead market by showing that the requirement will cover most cases where there is heavy demand for energy from energy storage resources.

43. We find that CAISO's proposed Tariff revisions to clarify its responsibility to provide energy storage resources with achievable regulation awards given their constraints are just and reasonable. We agree with CAISO that these revisions clarify CAISO's responsibility to continue to refine its optimization software based on energy storage resources' inputs and operational experience in providing regulation, and do not provide CAISO with broad, new discretion. We are not persuaded by Vistra's protest. CAISO's proposed revisions to section 8.4.1.1(g) requiring it to use all reasonable efforts to recognize the impact of regulation awards on state of charge are similar to other provisions of CAISO's Tariff that describe how CAISO will optimize its system. For instance, section 27.9 of the Tariff states that "CAISO will observe MWh constraints in the IFM, RUC, Real-Time Unit Commitment, and FMM as part of the co-optimization."⁷¹ In addition, section 30.5.6.1 requires CAISO to "use reasonable efforts to issue Real-Time Market Schedules that respect Hybrid Dynamic Limits."⁷² As in this proceeding, those provisions require CAISO to take numerous dynamic factors into account in the market optimization; they do not establish new static parameters or standards.

44. CAISO's proposal to include examples in its business practice manuals is consistent with current practice. In other parts of CAISO's existing Tariff, CAISO includes provisions that require CAISO to provide examples in the business practice manuals.⁷³ And the Commission has described CAISO's business practice manuals as "guides for internal operating procedures and to inform market participants of the CAISO's practices... meant to provide further explanation of the CAISO's practices but

⁷¹ CAISO, CAISO eTariff, § 27.9 (Non-Generator Resources MWh Constraints) (4.0.0).

⁷² CAISO, CAISO eTariff, § 30.5.6.1 (Non-Generator Resource Bids) (6.0.0).

⁷³ CAISO, CAISO eTariff, app. DD, §§ 3.5.1 (Interconnection Requests) (15.0.0); *id.*, § 6.8.1 (Initial Activities & Phase I Study Request for Queue Cluster) (20.0.0).

not significantly affect any rates, terms or conditions.”⁷⁴ As is the case with other examples that are currently in CAISO’s business practice manuals, the examples contemplated in this proposal provide such further explanation of CAISO’s practices. Accordingly, we find that such examples do not need to be included in the Tariff under the rule of reason. We note further that CAISO’s filing includes Attachment D, the Final Proposal presented to stakeholders. At pages 10-11 of that proposal, CAISO describes the changes to the state of charge equation that will account for Frequency Regulation dispatch. We find it appropriate that such equations be included in a Business Practice Manual. We encourage CAISO and its stakeholders to continue to work on refinements to its market processes to most optimally integrate all resources into the market.

45. The Commission has already found CAISO in compliance with Order No. 841, and CAISO’s proposed Tariff provisions here do not violate Order No. 841.⁷⁵ Therefore, we disagree with Vistra’s argument that Order No. 841 warrants rejection of CAISO’s filing.

The Commission orders:

(A) CAISO’s proposed revisions to its Tariff are hereby accepted, to become effective on CAISO’s actual implementation date, as requested, as discussed in the body of this order.

(B) CAISO is hereby directed to notify the Commission of the actual effective date of the Tariff revisions within five business days after the actual implementation date in an eTariff submittal using Type of Filing Code 150 – Report.

By the Commission.

(S E A L)

Kimberly D. Bose,
Secretary.

⁷⁴ *Cal. Indep. Sys. Operator Corp.*, 119 FERC ¶ 61,313 at P 343.

⁷⁵ *See Cal. Indep. Sys. Operator Corp.*, Docket No. ER19-468-003 (Nov. 24, 2020) (delegated order); Order No. 841, 162 FERC ¶ 61,127 at P 187.