



California ISO

Variable Operations and Maintenance Cost Review - 2023

Final Proposal

August 24, 2023

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I. Executive Summary

Variable operations and maintenance (VOM) adders are a market instrument through which scheduling coordinators can reflect a resource's operations and maintenance (O&M) costs in the CAISO's day-ahead and real-time markets. VOM adders can be negotiated with the CAISO or, if no negotiation takes place, the VOM adders are automatically set to a pre-determined default value.

The CAISO has committed to review the default VOM adder values once every three years. During the previous VOM Cost Review initiative in 2020,¹ the CAISO reviewed and updated the default VOM adder values. These default VOM adder values were updated to an inflation reference year of 2019. Given that three years have elapsed since that reference year, the CAISO determined that it is appropriate to review the current default VOM adder values. In this paper, the CAISO reviews the current default VOM adder values and determines that an update is warranted due to the higher-than-normal inflation rates since 2019.

The CAISO proposes to update the current default VOM adder values by applying an 18.73% inflation adjustment to all default values. This 18.73% inflation adjustment is based on data from the US Bureau of Labor Statistics. In the previous VOM Cost Review, the CAISO also performed a more comprehensive review of other aspects related to O&M costs in addition to updating the default values. These changes included updates to the VOM cost framework and the introduction of cost categorization principles. As a typical triennial review, the CAISO is not proposing to make changes to these elements. The CAISO believes that the WEIM Governing Body has joint authority with the CAISO Board of Governors over the proposed changes.

The CAISO appreciates the comments submitted by Salt River Project, the only stakeholder to submit comments, on the draft final proposal. In response to that feedback, the CAISO updates the inflation reference point used to calculate the proposed default VOM adder values from December 2022 to June 2023, resulting in a slightly higher inflation adjustment.

II. Background

Variable operations and maintenance (VOM) adders are a market instrument through which scheduling coordinators can reflect a resource's variable operations and maintenance (O&M) costs in the CAISO's day-ahead and real-time markets.

VOM adders are a component of most resources' default energy bids (DEBs) and all default commitment costs.² DEBs are used in the local market power mitigation process to limit the bids the CAISO markets use in determining resource schedules when a resource is found to have the potential to exert market power. The DEB mitigation system seeks to mirror competitive outcomes when participants might have the ability to exercise local market power. In such cases, the CAISO may adjust a resource's submitted energy bid downward to the resource's DEB or the competitive locational marginal price, whichever is higher. Default commitment costs serve a similar purpose but function differently in practice. Instead of applying only when the potential for the exercise of market power exists, default commitment costs

¹ <https://stakeholdercenter.caiso.com/StakeholderInitiatives/Variable-operations-maintenance-cost-review>

² There are several types of DEB options in CAISO's markets. VOM adders are included only in the variable cost-based DEB option. The variable cost-based option is the most commonly used option for thermal generators.

always serve as the cap of the values that scheduling coordinators may submit for minimum load cost bids, start-up cost bids, and transition cost bids. These bids are then used by the CAISO’s market processes in its determination of whether to commit the resource and for bid cost recovery settlements.

VOM adders can be negotiated with the CAISO or, if no negotiation takes place, the VOM adders are automatically set to a pre-determined default value. The pre-determined value varies based on the resource’s fuel and generation technology type (natural gas combined cycle gas turbine, hydro, etc.).

III. Review of current default VOM adder values

The CAISO has committed to review the default VOM adder values once every three years. This commitment has been articulated in previous iterations of this stakeholder process and is codified in the BPMs. The previous default VOM adder updates used 2019 values as the reference year, making 2022 the next appropriate reference year. As 2022 data is now available, the CAISO is fulfilling its commitment to review the default VOM adder values.

Table 1 has the currently effective default VOM adder values. There are three types of adders: the variable energy O&M adder, variable minimum load O&M adder, and variable start-up O&M adder.

Table 1 – Current default VOM adder values

Technology Type	Default Variable Energy O&M Adder (\$/MWh)	Default Variable Minimum Load O&M Adder (\$/run-hour/MW)	Default Variable Start-up O&M Adder (\$/start/MW)
Coal	2.69	-	-
Steam turbines	0.33	-	-
Natural gas-fired combined-cycle	0.59	1.74	-
Frame combustion turbines	0.97	-	52.13
Aeroderivative combustion turbines	2.15	4.38	-
Reciprocating internal combustion engines	1.10	-	-
Nuclear	1.08	-	-
Biomass	1.65	-	-
Geothermal	1.16	-	-
Landfill gas	1.21	-	-
Hydroelectric	-	0.65	-
Solar	-	-	-
Wind	0.28	-	-
Other (e.g., storage, demand response)	-	-	-

During the previous VOM Cost Review stakeholder process, the CAISO determined these current values based on data provided by an external consultant and values gathered from other external sources such

as the NYISO's Cost of New Entry (CONE) studies. The CAISO also used data from VOM adders that had been negotiated directly with scheduling coordinators. All of these sources were inflation-adjusted to 2019 year dollars using consumer price index data available from the US Bureau of Labor Statistics (BLS).

For our 2023 VOM cost review, the CAISO considers several factors:

- Inflation: Since 2019, many indicators of price levels show historically-high increases. For example, the BLS Consumer Price Index for All Urban Consumers increased 16% from December 2019 to December 2022.³ The higher-than-normal levels of inflation are an indicator that the current default values need to be updated. Price levels have further risen from December 2022 to June 2023 by an additional 3% relative to December 2019, for a total increase of 18.73% relative to December 2019.
- Frequency of VOM negotiations: The CAISO continues to conduct a steady but not an abnormally high amount of negotiations for VOM adder values. If the default values were too high for many resources, this would indicate that negotiations aren't needed and thus the CAISO would conduct VOM negotiations infrequently; conversely, if the default values were too low, the CAISO would be constantly negotiating VOM adder values in high volumes. Given that the frequency and volume of VOM negotiations falls between these two extremes, this factor does not indicate whether or not an update is warranted.
- Review of external sources: As explained above, NYISO's CONE report was a key input into the previous update of the default VOM adder values. The most recent CONE study was performed back in 2020 which is not reflective of the current costs.

Of the three factors, the CAISO believes that the inflation factor should be weighted most heavily because it is most quantitatively rigorous indicator. As such, the CAISO's review of the current default VOM adder values indicates that an update is appropriate.

In addition to updating the default VOM adder values, the previous review also codified certain cost categorization principles and included a more comprehensive update to the VOM cost framework. This more substantial stakeholder initiative took several years to complete and went beyond the scope of the typical triennial default VOM adder review. As this is a typical triennial review, the CAISO does not believe an issue paper is necessary.

IV. Proposal

The CAISO proposes to update the default VOM adder values with an 18.73% inflation increase. This increase is based on the BLS Consumer Price Index for all Urban Consumers from December 2019 to June 2023.

Stakeholder Feedback

The CAISO received one set of comments from stakeholders. The CAISO appreciates that Salt River Project (SRP) took the time to review the proposal and provide detailed comments. SRP suggests that the CAISO perform the VOM cost review annually rather than triennially. The CAISO does not believe this is appropriate at this time because of resource constraints and the requirement to obtain approval from the CAISO Board of Governors and the WEIM Governing Body for the associated tariff changes. SRP

³ BLS Consumer Price Index for All Urban Consumers (<https://www.bls.gov/cpi/data.htm>)

also points out that the current default VOM adder values for coal resources appears to be based on 2018 year dollars. The CAISO reviewed the basis of the current default VOM adder values for coal resources, noting that they are in 2019 year dollars rather than 2018 year dollars⁴.

SRP also suggests that the CAISO use a forward-looking indicator of inflation, rather than a retrospective indicator. If the CAISO does not use a forward-looking indicator, SRP suggests using a more recent reference point. The CAISO does not believe that using a forward-looking indicator is appropriate at this point given the uncertainty of future inflation rates as supply chains constraints continue to unwind and the economy reacts to actions taken by the Federal Reserve. However, given that the proposal is taking place in the latter half of 2023, the CAISO does believe that updating the inflation reference point used to calculate the proposed default VOM adder values from December 2022 to June 2023 is appropriate. This results in a slightly higher inflation adjustment of 18.73%, rather than the 16% increase that was proposed in the draft final proposal.

Proposal

The proposed default VOM adder values are shown in Table 2.

Table 2 – Proposed default VOM adder values

Technology Type	Default Variable Energy O&M Adder (\$/MWh)	Default Variable Minimum Load O&M Adder (\$/run-hour/MW)	Default Variable Start-up O&M Adder (\$/start/MW)
Coal	3.19	-	-
Steam turbines	0.39	-	-
Natural gas-fired combined-cycle	0.70	2.07	-
Frame combustion turbines	1.15	-	61.89
Aeroderivative combustion turbines	2.55	5.20	-
Reciprocating internal combustion engines	1.31	-	-
Nuclear	1.28	-	-
Biomass	1.96	-	-
Geothermal	1.38	-	-
Landfill gas	1.44	-	-
Hydroelectric	-	0.77	-
Solar	-	-	-
Wind	0.33	-	-
Other (e.g., storage, demand response)	-	-	-

⁴ See VOM Cost Review (2020) Final Proposal, page 11 of Appendix F.

<http://www.caiso.com/InitiativeDocuments/FinalProposal-VariableOperations-MaintenanceCostReview.pdf>

The CAISO believes that the BLS Consumer Price Index is appropriate because it is consistent with the inflation adjustment methodology used in the previous VOM Cost Review.

The CAISO corroborated that belief using negotiated VOM adders as a reference point. A number of resources in CAISO's markets have negotiated VOM adder values and the CAISO corroborated the appropriateness of the proposed update in the chart above by comparing these values to the existing set of negotiated VOM adder values. These negotiated values serve as a good point of reference to determine the reasonableness of the proposed default VOM adder values because the negotiated values reflect resource-specific costs and are thus indicative of actual costs. The CAISO compared the proposed default VOM adder values to internal benchmarks derived from negotiated VOM adder values. Even after considering the higher inflation increase in this final proposal, the proposed default VOM adder values are slightly more conservative (i.e. lower) than the benchmarks.

This is appropriate because the default VOM adder values should balance being sufficiently conservative while also high enough to be useful. The values should be sufficiently conservative because, if they weren't, scheduling coordinators might be able to collect market revenues above their actual costs. However, they should also be useful in that they should be used by some scheduling coordinators in lieu of negotiations. Furthermore, this is consistent with the methodology used in the previous VOM Cost Review which used benchmarks based on negotiated values as the "cap" for the default VOM adder values.

As explained above, NYISO's CONE report was a key input into the previous update of the default VOM adder values. At the time of publishing this paper, the 2020 CONE report was the most recent version publically available so this could not be used to corroborate the proposed default VOM adder values.

As a reminder, the default VOM adder values are simply default values to be used if a scheduling coordinator does not wish to go through the negotiation process. Accordingly, if a scheduling coordinator believes the values are too low or otherwise inadequate, they can negotiate a more appropriate resource-specific value.

The CAISO does not propose to make any changes to the cost categorization principles included in the CAISO tariff, nor do we propose any changes to the VOM cost framework such as those included in the previous VOM Cost Review. At the time, those changes were deemed necessary due issues that were arising during VOM adder negotiations arising from the lack of explicit cost categorization principles. Since the implementation of the cost categorization principles and updated VOM cost framework, the CAISO has experienced fewer such issues during VOM adder negotiations.

V. WEIM Decisional Classification

This initiative proposes to adjust variable operation and maintenance adders, which are one element of total costs of operations and maintenance, which may be reflected in market bids. As explained below, CAISO staff believes that the WEIM Governing Body has joint authority with the Board of Governors over the proposed changes.

Under the Charter for EIM Governance, the Board and the WEIM Governing Body have joint authority over any "proposal to change or establish any CAISO tariff rule(s) applicable to the EIM Entity balancing authority areas, EIM Entities, or other market participants within the EIM Entity balancing authority

areas, in their capacity as participants in EIM. This scope excludes from joint authority, without limitation, any proposals to change or establish tariff rule(s) applicable only to the CAISO balancing authority area or to the CAISO-controlled grid.” The changes proposed here would all be “applicable to EIM Entity balancing authority areas, EIM Entities, or other market participants within EIM Entity balancing authority areas, in their capacity as participants in EIM.” They would not be applicable “only to the CAISO balancing authority area or to the CAISO-controlled grid.” Accordingly, these proposed changes would fall within the scope of joint authority.

VI. Stakeholder Timeline

The schedule for stakeholder engagement is detailed below in Table 3. The CAISO will discuss this final proposal paper with stakeholders during a call on Thursday, August 31 at 11:00AM PT. The CAISO will also discuss the draft tariff language that accompanies this proposal during that call. Stakeholders can submit written comments regarding this draft final proposal paper by Thursday, September 14.

Please note that the dates below are tentative until the CAISO publishes a notice formally confirming them.

Table 3 – Stakeholder timeline

Date	Milestones
July 24, 2023	Post draft final proposal
July 31, 2023	Hold stakeholder call on draft final proposal
August 14, 2023	Stakeholder written comments due on draft final proposal
August 24, 2023	Post final proposal and draft tariff language
August 31, 2023	Hold stakeholder call on final proposal and draft tariff language
September 14, 2023	Stakeholder written comments due on final proposal and draft tariff language
September 20, 2023	CAISO Board of Governors and WEIM Governing Body joint decision