Comments on Resource Adequacy Modeling and Program Design Track 2 – Second Revised Straw Proposal

Department of Market Monitoring

November 6, 2026

Overview

The Department of Market Monitoring (DMM) appreciates the opportunity to comment on the *Resource Adequacy Modeling and Program Design Track 2 Second Revised Straw Proposal* published on October 2, 2026.[1] These comments add to our previous comments dated June 4, 2026, and include additional detail on the resource adequacy availability incentive mechanism (RAAIM) penalty incentive event frequency and price.[2]

DMM recommends the ISO demonstrate that the proposed two-tier assessment framework would provide sufficient incentive to limit the amount of resource adequacy (RA) capacity sold to the expected availability of the resource. RAAIM penalties should be calibrated so that expected non-availability costs are commensurate with bilateral RA prices and discourage the sale of RA capacity that is unlikely to be available. The ISO should clearly articulate and empirically assess how well the proposed two-tier assessment incentive meets this design objective.

Finally, DMM reiterates that the implementation of an unforced capacity (UCAP) framework should not be viewed as a replacement for a RAAIM penalty structure that adequately disincentives the sale of capacity that may be unavailable to the CAISO market.

Comments

The ISO has not yet demonstrated that the two-tier assessment framework would provide sufficient incentive to limit the sale of RA capacity to the expected availability of the resource

DMM continues to recommend RAAIM incentive event frequency and prices be designed to ensure that resources do not have an incentive to sell RA capacity in excess of what they can reasonably expect to make available to the market.[3] To align RA supply with expected market availability and operational capabilities, RAAIM penalty pricing should be aligned with market conditions such that expected

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[1] *Resource Adequacy Modeling and Program Design – RAAIM and Outage Substitution (Track 2) – Second Revised Straw Proposal*, California ISO, October 2, 2026: https://stakeholdercenter.caiso.com/InitiativeDocuments/Second-Revised-Straw-Proposal-Resource-Adequacy-Modeling-and-Program-Design-Track-2-Oct-02-2026.pdf

[2] *Comments on Resource Adequacy Modeling and Program Design Track 2 – Revised Straw Proposal*, Department of Market Monitoring, August 6, 2026: https://www.caiso.com/documents/dmm-comments-on-resource-adequacy-modeling-and-program-design-track-2-revised-straw-proposal-aug-06-2026.pdf

[3] *Ibid.*

penalties for non-availability meet or exceed any potential gains from selling RA capacity that cannot reliably perform.

As discussed in previous comments, under the proposed two-tiered RAAIM assessment framework, the ISO would need to trigger RAAIM penalties on a regular basis to have RAAIM penalties commensurate with RA prices. Furthermore, DMM has noted the likelihood of a tier 2 penalty is relatively low since the CAISO balancing authority area (BAA) rarely fails the Western Energy Imbalance Market resource sufficiency evaluation (RSE). As a result, there is low expectation of the CAISO BAA failing the extended day-ahead market RSE and triggering the tier 2 penalties.[4]

In the second revised straw proposal, the ISO provided a historical lookback analysis of the frequency in which the tier 1 RAAIM penalty would be triggered. The ISO calculated that from 2023-2025 there would have been 47 operating days that RAAIM penalties would have been triggered. This includes 2025, which only had two days and two hours where tier 1 RAAIM penalties would have been triggered.[5] These findings—along with previous analysis by DMM—suggest that the frequency of such events appears insufficient to create a penalty structure commensurate with bilateral RA capacity prices, and would not discourage the sale of RA capacity that is unlikely to be available.[6]

Table 1 presents an analysis of the impact of the RAAIM penalties (in $/kW-month) given different levels of event hours per month and day-ahead prices. For example, this analysis shows that for the proposed RAAIM penalty to be approximately similar to the current RAAIM penalty price, which is 60 percent of the capacity procurement mechanism soft-cap price, there would need to be 40 event-hours at a day-ahead price of $100/MWh, or 10 event-hours and day-ahead prices of $400/MWh. Moreover, DMM has previously recommended that the current RAAIM penalty price would need to be increased to discourage the sale of RA capacity that is unlikely to be available.

In previous comments, DMM presented an empirical analysis estimating hypothetical tier 1 RAAIM trigger events using different levels of the uncertainty adder. This analysis found that in 2025, the hypothetical tier 1 RAAIM events had prices varying from $31/MWh to $80/MWh, with a mean and median of approximately $51/MWh.[7] Extending the analysis from Table 1, for a tier 1 RAAIM trigger to

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[4] *Comments on Resource Adequacy Modeling and Program Design Track 2 – RAAIM Reform Presentation*, Department of Market Monitoring, March 23, 2026: https://www.caiso.com/documents/dmm-comments-on-rampd-track-2-raaim-reform-mar-02-2026-input-session-ahead-of-straw-proposal-mar-23-2026.pdf

[5] *Resource Adequacy Modeling and Program Design – RAAIM and Outage Substitution (Track 2) – Second Revised Straw Proposal*, Figure 15, California ISO, October 2, 2026: https://stakeholdercenter.caiso.com/InitiativeDocuments/Second-Revised-Straw-Proposal-Resource-Adequacy-Modeling-and-Program-Design-Track-2-Oct-02-2026.pdf

[6] *Comments on Resource Adequacy Modeling and Program Design Track 2 – RAAIM Reform Presentation*, Department of Market Monitoring, March 23, 2026: https://www.caiso.com/documents/dmm-comments-on-rampd-track-2-raaim-reform-mar-02-2026-input-session-ahead-of-straw-proposal-mar-23-2026.pdf

[7] *Comments on Resource Adequacy Modeling and Program Design Track 2 – Straw Proposal*, Department of Market Monitoring, June 4, 2026: https://www.caiso.com/documents/dmm-comments-on-resource-adequacy-modeling-and-program-design-track-2-straw-proposal-jun-04-2026.pdf

equal the current RAAIM penalty at the observed 2025 prices, approximately 80 event-hours would need to occur *per month* for parity.

Table 1. RAAIM prices, event frequency, and resulting penalties as a capacity price

RAAIM prices and event occurrence, and resulting penalty in $/kW-month		Day-ahead Price ($/MWh)			
		$100	$200	$400	$600
Events (hours per month)	10	$1	$2	$4	$6
	20	$2	$4	$8	$12
	30	$3	$6	$12	$18
	40	$4	$8	$16	$24
	50	$5	$10	$20	$30

To increase penalties beyond the current RAAIM penalties, as would be required to align with the value of RA capacity, would require many more event hours per month at 2025 prices. However, the ISO found that under the assumptions used in the second revised straw proposal analysis, there were only two event-hours in all of 2025.[8,9] DMM recommends the ISO further extend their tier 1 historical lookback analysis, and incorporate prices to allow stakeholders to compare the proposed RAAIM structure with current and historical RA capacity prices.

In the most recent California Public Utilities Commission (CPUC) RA report, the CPUC reported that for 2023-2025, the average price for RA ranged from $11.78/kW-month to $17.31/kW-month.[10] Comparing these bilateral RA prices to hypothetical penalties shown in Table 1, this would require approximately 30 to 40 event-hours per month at day-ahead prices of $400/MWh, assuming no tier 2 event is triggered.

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[8] *Resource Adequacy Modeling and Program Design – RAAIM and Outage Substitution (Track 2) – Second Revised Straw Proposal*, California ISO, October 2, 2026: https://stakeholdercenter.caiso.com/InitiativeDocuments/Second-Revised-Straw-Proposal-Resource-Adequacy-Modeling-and-Program-Design-Track-2-Oct-02-2026.pdf

[9] In previous comments, DMM highlighted the importance of the magnitude of the uncertainty adder to have sufficient tier 1 RAAIM penalties triggered. In the empirical exercise presented in previous comments, DMM selected five representative uncertainty values and estimated the number of days that would result in a potential tier 1 RAAIM trigger. Conversely, in the historical analysis shown in the second revised straw proposal, the ISO selected the uncertainty adder from historical uncertainty in demand, wind and solar generation, and RA availability, including potential additional outages or derates. The ISO then calculated the number of hours and days the tier 1 RAAIM trigger would be activated with their selected uncertainty adder.

[10] *2023 Resource Adequacy Report*, California Public Utilities Commission Energy Division, August 2025, p 25: https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/resource-adequacy-homepage/2023-resource-adequacy-reportv2.pdf

Based on the 2025 prices from DMM's historical lookback analysis under different levels of uncertainty, this would require approximately 300 event-hours per month, assuming no tier 2 event is triggered.

DMM recommends the ISO demonstrate how the proposed framework under a reasonable set of assumptions can result in expected penalties for non-availability that are sufficient to discourage the sale of RA capacity that is not reasonably expected to be available. If the proposed framework is unable to accomplish this objective, DMM recommends the ISO consider a different approach that could more effectively do so.

Lastly, DMM reiterates that there is still a role for an availability mechanism like RAAIM, even in the context of an unforced capacity (UCAP) accreditation framework. In 2025, the California Public Utilities Commission (CPUC) issued a decision to implement a UCAP framework that will incorporate historical availability when determining the amount of RA a resource will be able to supply to the market. The role of UCAP is to ensure accurate and consistent reporting of a resource's expected operational capability to the market.

The UCAP framework also provides incentives to minimize outages that will impact future capacity accreditation. While UCAP overlaps with RAAIM in providing additional incentives to minimize certain outage types, RAAIM functions as the primary incentive for resources to meet must-offer obligations and to be available in the day-ahead and real-time markets.[11] The two policies serve different functions. While they should be incentive-aligned in their development, DMM does not view the implementation of a UCAP framework as a replacement for a RAAIM penalty structure that adequately disincentives the sale of capacity that may be unavailable to the CAISO market.

[11] *Comments on Track 1 Proposals*, Department of Market Monitoring, October 9, 2025: https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M604/K003/604003026.PDF