MEMORANDUM

DATE: June 16, 2025

TO: Western Energy Market Governing Body

FROM: Susan L. Pope, Western Energy Market Governing Body Market Expert

SUBJECT: Opinion on California ISO Final Proposal for EDAM Congestion Revenue Allocation (June 6, 2025)

EXECUTIVE SUMMARY

The California ISO June 6, 2025 proposal for Extended Day-Ahead Market (EDAM) congestion revenue allocation (Final Proposal)[1] responds to stakeholder concerns about the FERC-approved EDAM market rules for allocating EDAM congestion revenue among EDAM balancing authority areas (BAAs). For the start-up of EDAM, the Final Proposal would modify the allocation of EDAM congestion revenue to enable EDAM BAAs to make payments to monthly and long-term firm Open Access Transmission Tariff (OATT) customers to provide a more complete congestion hedge for the congestion charges that these customers will pay for balanced self-schedules under EDAM operation.[2] Stakeholder comments support the proposed rules for EDAM start-up coupled with a commitment by the California ISO in the Final Proposal to work over a 12 to 24 month period with stakeholders on a long-term, durable design for allocating congestion revenue.[3]

I support the proposed rules for EDAM start-up, although I have substantial concerns about the possibility of negative outcomes due to self-scheduling incentives and impacts on congestion revenue right (CRR) revenue adequacy. The proposed rules for EDAM start-up provide an incentive for monthly and long-term firm OATT customers to submit balanced self-schedules in order to receive a congestion revenue allocation to offset the congestion costs of serving their loads that stem from congestion on transmission constraints located in another EDAM BAA. Submission of inflexible resource self-

[1] California ISO, *Final Proposal: EDAM Congestion Revenue Allocation,* June 6, 2025, https://stakeholdercenter.caiso.com/InitiativeDocuments/FinalProposal-EDAMCongestionRevenueAllocationJune62025.pdf.

[2] Herein, the market rules for congestion revenue allocation under the Final Proposal that would apply at the start-up of EDAM to allocate congestion revenue to EDAM BAAs corresponding to the parallel flow congestion charges paid by customers using firm monthly or yearly OATT service to support balanced self-schedules will be referred to as the "proposed rules for EDAM start-up". The proposed rules for EDAM start-up would modify the congestion revenue allocation in the approved EDAM tariff.

[3] See *Comments on 5/27 hybrid call,* June 2, 2025, https://stakeholdercenter.caiso.com/Comments/AllComments/98b9032c-abc1-48ff-ab7c-a0c4a879eff7. For example, the Balancing Authority of Northern California states, "[BANC] generally supports the congestion Revenue Alloccation [*sic*] Revised Draft Final Proposal as a workable interim solution while the CAISO and stakeholders take the necessary time to develop a more durable approach that addresses the identified issues surrounding incentives for self-scheduling."

schedules, rather than the submission of bids and offers to EDAM, reduces the potential gains from employing the EDAM software to optimally commit and schedule resources on the EDAM transmission grid. The self-scheduling incentive could materially reduce cost savings relative to previous expectations for EDAM.

Acceptance of the proposed rules for EDAM start-up appears to be necessary to enable the operation of EDAM to begin in May 2026 as planned because the California ISO has identified no superior approach that could enable the provision of a more complete congestion hedge for monthly and yearly firm OATT customers and be developed in time for the start-up of EDAM. I expect the development of an improved EDAM congestion revenue allocation design to require at least one to two years of steady work with stakeholders, which is consistent with the schedule proposed by the California ISO. I also expect an additional year to be required for implementation. My views about timing assume that the long-term approach will be the development of financial rights to congestion revenue, such as CRRs or financial flow entitlements for EDAM transmission constraints engendering material congestion costs. Financial rights are the only approach to congestion revenue allocation that I have encountered during my years working on electricity market design that support efficient unit commitment and dispatch and that can be implemented with transparently equitable rules to balance impacts on parties with existing transmission rights of different kinds, including CRRs. The design of a system of financial flow-based entitlements for the EDAM is both achievable and important; it would remove self-scheduling incentives, thereby unlocking cost savings from EDAM's optimized bid-based unit commitment and dispatch.

The central reason for my support for the proposed rules for EDAM start-up is to enable the California ISO and Western Energy Market (WEM) to move forward with the introduction of EDAM. Operation of EDAM is anticipated to enable substantial cost savings and increases in reliability on behalf of customers of EDAM entities. A second benefit of start-up will be the provision of data and experience to assess the performance of EDAM and identify areas for improvement. The EDAM design is new, and, in my view, it is important to begin the market in May 2026 rather than waiting two or three years for the development and implementation of an improved design for congestion revenue allocation. The market rules and software for EDAM have not been previously tested because, unlike other regional electricity markets, it combines an optimized regional unit commitment and dispatch with OATT service sold separately by participating BAAs. There will be substantial work for the California ISO and stakeholders after start-up to assess the EDAM outcomes and address market rule and software concerns that will likely arise.

Importantly, data and experience provided by actual EDAM operation also will inform improvements to the EDAM design and the long-term design for congestion revenue allocation. Discussions of alternative designs for congestion revenue allocation will likely move forward more quickly with the benefit of actual data illustrating the parallel flows on EDAM BAA transmission constraints arising from different types of EDAM and non-EDAM schedules. Stakeholders will be able to more quickly assess the pros and cons of alternative approaches to congestion revenue allocation when abstract examples can be supported by data analysis. The learning that can occur by running EDAM will move the region toward achieving the efficiency gains that are the objective of the EDAM design. For this reason, I support use of the proposed rules for EDAM start-up while the California ISO undertakes a concentrated stakeholder process to develop a long-term, durable approach for allocating congestion revenues.

My major concern with the proposed rules for EDAM start-up is the incentive for OATT transmission customers with monthly and yearly firm service to self-schedule balanced transactions to receive an allocation of parallel flow congestion revenue. The economic incentive for self-scheduling of out of merit resources is recognized by the California ISO, DMM, Market Surveillance Committee (MSC) and stakeholders.[4] The transmission system flows from inefficiently self-scheduled resources could cause a cascade of impacts on the EDAM commitment and schedules of flexibly offered resources, so that the cost increases from self-scheduling would extend beyond the BAA in which resources have been inefficiently self-scheduled.

The California ISO Final Proposal presents an analysis of PacifiCorp data suggesting that elective self-scheduling of monthly and yearly firm OATT service may not cause large market distortions during the initial operation of EDAM.[5] This analysis relies on PacifiCorp's intention to offer its resources to the EDAM market because "it believes the risk of congestion costs does not outweigh the benefits of economic bidding."[6] However, there could be periods of high parallel flow congestion costs for California ISO constraints that would put political and regulatory pressure on PacifiCorp to self-schedule its OATT network resources so that its network customers would not pay California ISO parallel flow congestion costs. Even the expectation of high congestion costs on certain California transmission constraints would give eligible OATT customers within EDAM entities a strong incentive to self-schedule to avoid parallel flow congestion charges. These self-schedules potentially increase the congestion charges for other customers. The potential for a cascade of self-scheduling could significantly erode the benefits of EDAM.

While the California ISO and DMM recognize that the self-scheduling incentives will reduce the benefits of EDAM relative to those expected under the approved EDAM design, they expect that EDAM will nonetheless yield benefits.[7] I agree that unit commitment and dispatch cost reduction will likely occur for EDAM entities, relative to the current pre-EDAM outcomes in many hours, despite the self-scheduling incentives created by the proposed rules for EDAM start-up. However, the California ISO should consider developing plans to expeditiously limit excessive, inefficient self-scheduling should it occur, because of an experience in PJM in 1997 during which similar self-scheduling incentives required PJM to invoke emergency procedures to maintain reliability.

The proposed rules for EDAM start-up have both benefits and costs for California loads. The principal benefit is that the California BAA will retain some payments for parallel flow congestion revenue paid for

[4] See, for example, Scott Harvey, *Congestion Rent Allocation,* Market Surveillance Committee Meeting, May 2, 2025, https://www.caiso.com/documents/presentation-congestion-rent-allocation-harvey-may-02-2025.pdf and Susan L. Pope, *Parallel Flow Implications for Physical and Financial Transmission Rights,* WEM Governing Body General Session, April 8, 2025, p. 18, https://www.westerneim.com/Documents/Briefing-on-Parallel-Flow-Implications-for-Physical-and-Financial-Transmission-Rights-Presentation-Apr-08-2025.pdf.

[5] Final Proposal, p. 21.

[6] Final Proposal, p. 20.

[7] DMM states, "While the changes outlined in the revised draft final proposal may create increased incentives to self-schedule that could reduce market benefits relative to the approved EDAM design, the implementation of EDAM with this allocation will still create market benefits relative to the current pre-EDAM market." Department of Market Monitoring, *comments on Extended Day-Ahead Market Congestion Revenue Allocation, Revised Draft Final Proposal – May 18, 2025,* June 2, 2025, p. 1, https://stakeholdercenter.caiso.com/Comments/AllComments/98b9032c-abc1-48ff-ab7c-a0c4a879eff7#org-fe874148-5864-48b5-b68a-f613293c30bf

flows on California ISO transmission that the California BAA does not receive today. As the California ISO suggests, this revenue could reduce the underfunding of CRRs. Further, California ISO loads should benefit if the EDAM is able to improve the unit commitment for EDAM entities, relative to their base schedules today.

On the other hand, because there is no OATT service in the California ISO, California loads will not have a way to receive the same allocation of EDAM parallel flow congestion revenue that will be available to loads served by monthly and yearly firm OATT transmission under the proposed rules for EDAM start-up.

Further, there could be costs for California ISO loads due to negative impacts of the proposed rules for EDAM start-up on the revenue adequacy of CRRs. The revenue available to pay CRR holders and, therefore, the value California loads receive from holding CRRs or from the CRR auctions could decline for the following reasons:

- The proposed rules for EDAM start-up will increase potential revenue inadequacy due to congestion settlements for flows on California binding transmission constraints that are in the opposite direction of congestion (generally called "counterflow"). EDAM schedules that cause flows on binding transmission constraints in the counterflow direction will be paid for relieving congestion on the constraints through the EDAM settlements, just as schedules that contribute to congestion are charged for their contributions to congestion through the EDAM settlements. But, while self-schedules of monthly or longer firm transmission will receive a refund of their EDAM parallel flow congestion charges under the proposed rules for EDAM start-up, counterflow that is paid to relieve congestion on the same constraints will not, symmetrically, pay back the EDAM compensation they have received. Thus, congestion revenue that would otherwise have been paid to CRR holders must be used to fund the congestion revenue allocations to eligible non-California firm OATT schedules that are feasible because of counterflow. This will reduce the transmission constraint congestion revenue available to pay out to CRRs and could even cause a negative congestion revenue balance. Whether the counterflow is intentionally or unintentionally scheduled in EDAM, it will contribute to CRR revenue inadequacy when monthly and yearly firm OATT schedules receive a refund for congestion on the same constraint. The potential for strategic scheduling to obtain unwarranted payments for counterflow has been identified as a concern.
- Second, under the proposed rules for EDAM start-up, the congestion revenue collected in EDAM for the flows on derated transmission facilities will be allocated, first, to EDAM BAAs whose eligible OATT customers pay for parallel flow congestion over the constraints for balanced self-schedules. Only the residual congestion revenues (for the reduced capability of the facility) will be available to CRR holders. The proposed rules for EDAM start-up afford a higher priority to the monthly and yearly firm OATT rights than to CRRs when congested transmission is derated, reducing CRR congestion revenue.
- Third, increases in parallel flow on congested California ISO transmission facilities could occur for several reasons because of the incentives created by the proposed rules for EDAM start-up, such as the self-scheduling incentives previously described. If the parallel flows do not pay congestion charges that flow to CRRs, they will reduce CRR revenue adequacy.

The California ISO proposes to monitor the impact of the proposed rules for EDAM start-up on self-scheduling.. Monitoring and transparent reporting of possible problems is critical. Because the market

design is untested there is a material possibility of unintended results, and the California ISO should be prepared to address these quickly, including possible impacts on CRR revenue adequacy. Based on a stakeholder meeting last week, I understand that plans are underway to clarify and address CRR settlements under EDAM.[8]

My support for the Final Proposal does not encompass the two "near-term enhancements" that the California ISO has suggested it would implement by 2027: allocation of parallel flow congestion revenue to cleared, balanced day-ahead market schedules supported by monthly and yearly firm OATT service, in addition to balanced self-schedules; and allocation of parallel flow congestion revenue to CRRs. The possible complexity and negative impacts of these proposals have not been vetted by robust discussion or stakeholder comments The underlying objective of these near-term enhancements is to address two flaws with the currently proposed rules for EDAM start-up, i.e., the self-scheduling incentive and the asymmetric treatment of California BAA load. In my view the most efficient and equitable approach to achieving both of these objectives s likely the development and allocation of financial flow entitlements for major EDAM transmission constraints.

The proposed rules for congestion revenue allocation at EDAM start-up in the Final Proposal are flawed, but they are also a pragmatic step forward. They support EDAM implementation in 2026 while the California ISO and stakeholders work on an efficient and equitable long-term congestion revenue allocation design.

[8] See video recording and presentations for June 12, 2025 stakeholder meeting: *Congestion Revenue Rights (CRR) Modeling and Settlement in the Extended Day-Ahead Market (EDAM), https://www.caiso.com/notices/congestion-revenue-rights-crr-modeling-and-settlement-in-the-extended-day-ahead-market-edam-virtual-workshop-on-6-12-25.*

I. INTRODUCTION

This memorandum provides my comments on the California ISO's June 6, 2025 Final Proposal for EDAM congestion revenue allocation. For the start-up of EDAM, the Final Proposal would address stakeholder concerns by modifying the allocation of EDAM congestion revenue to enable EDAM BAAs to make payments to monthly and long-term firm OATT customers to provide a more complete congestion hedge for the congestion charges that these customers will pay for balanced self-schedules under EDAM operation. It supports EDAM implementation in 2026 while acknowledging that the congestion revenue allocation design in EDAM must be replaced to achieve long-term efficiency and equity.

At the beginning of Section II, below, I explain the California ISO's proposed interim rules for allocating congestion revenue at the start-up of the EDAM (Section II.A), which I refer to throughout as the "proposed rules for EDAM start-up," and the reasons for my support of the rules despite concerns about the attendant self-scheduling incentives and possible impacts on CRR revenue adequacy (Section II.B). Section II.C explains my material concerns about the possible impacts of self-scheduling incentives on the efficiency and, possibly, the reliability of EDAM operations. Section II.D addresses why the proposed rules for EDAM start-up appear to elevate the priority of monthly and yearly firm OATT transmission rights, segueing to an ensuing discussion, in Section II.F, of the impacts of the proposal on California BAA loads and CRR revenue adequacy. In Sections II.F, II.G, and II.H, I explain my agreement with the California ISO that the proposed changes to congestion revenue allocation should not be applied in Western Energy Imbalance Market (WEIM) settlements, concerns about proposed near-term enhancements to the rules proposed for EDAM start-up, and thoughts about the long-term design for congestion revenue allocation.

Section III contains suggestions that the California ISO could consider prior to EDAM start-up. Importantly, the ISO could begin several studies right away to evaluate the potential for negative outcomes due to the concerns discussed herein (Section III.A). It The final section (III.B.) adds my thoughts to the California ISO's list of EDAM outcomes to be monitored.

Section IV presents my conclusions.

II. DISCUSSION OF FINAL PROPOSAL

The Final Proposal would modify the allocation of congestion revenue among EDAM BAAs at the start of EDAM. The change in the allocation of congestion revenue will enable EDAM BAAs to make congestion revenue payments to customers who use their monthly and yearly firm OATT rights that will provide a more complete hedge for the customers' EDAM congestion charges for balanced self-schedules. The motivation for the Final Proposal was to address opposition to the implementation of EDAM stemming from OATT transmission customers' expectation of receiving a more complete hedge for the EDAM congestion charges they will pay than would have been possible under the approved EDAM tariff.

Under the Final Proposal, the market rules for congestion revenue allocation that would apply at the start-up of EDAM address the immediate concerns of EDAM BAA OATT customers, but they also create self-scheduling incentives that will likely reduce the expected benefits from managing congestion in the day-ahead time frame over the expanded EDAM footprint. These known flaws in the proposed rules for

EDAM start-up are material, and there is also a possibility of unanticipated, negative outcomes, because the proposed rules for EDAM start-up have not previously been tested or used in the operation of a day-ahead market with a design similar to EDAM.

Assessment of the Final Proposal entails judging the tradeoff between:

- Starting up the EDAM in 2026 as planned to gain experience with the EDAM design, despite the known flaws with the rules proposed for congestion revenue allocation at the start-up of EDAM. The benefit of EDAM start-up is the expectation of reduced unit commitment and dispatch costs, relative to the use of base schedules under the WEIM design, despite the self-scheduling incentives. A second important benefit would be the provision of data and experience to assess the performance of the market and, probably, identify areas for improvement of the EDAM design. The cost of a 2026 start-up, in the context of the present initiative, is possible market disruption and inefficient outcomes due to the congestion revenue allocation self-scheduling incentives. The California ISO suggests that this disruption could be managed by monitoring the market impact of the self-scheduling incentives and commits to convening stakeholder meetings to develop a long-term approach to congestion revenue allocation to bring to the regional board within 24 months of start-up.[9]
- Delaying the start-up of EDAM to enable the development of a congestion revenue allocation approach that would avoid self-scheduling incentives and more fully support the gains in operational efficiency sought by the EDAM design. The downside of this alternative is that the design of such an approach would require at least two or three years of sustained effort by the California ISO and stakeholders. Moreover, discussions of alternative designs would be less productive in the absence of data provided from the initial implementation of EDAM, e.g., regarding the extent of day-ahead parallel flows each EDAM BAA has across the binding transmission constraints of neighboring EDAM BAAs.

Weighing these choices, I support the elements of the Final Proposal pertaining to the allocation of congestion revenues at the start of EDAM, although I have substantial concern about the possibility of negative outcomes due to self-scheduling incentives. My support does not extend to the two "near-term enhancements" that California ISO has proposed to implement by 2027..

I explain my views on important elements of the Final Proposal in the following sections.

A. Proposed Rules for Congestion Revenue Allocation at EDAM Start-Up

The California ISO and stakeholders considered a range of alternative approaches for providing monthly and yearly firm OATT customers with a more complete hedge against EDAM congestion charges. The issue, to be more specific, pertains to the parallel flows that OATT schedules in one BAA can cause on binding constraints in neighboring BAAs. Under EDAM, an OATT customer's congestion charge will include the cost of parallel flows on binding constraints in neighboring EDAM BAAs, but the EDAM market rules do not include a mechanism to enable a compensating payment to monthly and yearly firm OATT customers to hedge the congestion charge for the parallel flows.

[9] Final Proposal, p. 4.

All approaches considered for amending the EDAM market rules to enable a congestion hedge for parallel flows had material disadvantages, for example:

- The design and allocation among EDAM BAAs of any type of financial transmission right, similar to CRRs or the flow entitlements on interties in PJM and MISO, would have been infeasible to accomplish before the start-up of the EDAM.[10]
- So-called "opt-outs" of OATT transmission would have provided a level of service superior to that of existing OATT service.[11]
- The initial California ISO straw proposal would have led to an unintended cost shift by allocating more parallel flow congestion revenue to an EDAM BAA than needed to hedge the congestion charges paid by customers using OATT transmission service.

Under the Final Proposal at the start-up of EDAM, the California ISO would provide an allocation of congestion revenue to EDAM BAAs equal to the parallel flow congestion charges paid for balanced self-schedule in their footprint using OATT yearly or monthly firm transmission service, which may be either Network Integration Transmission Service (NITS) or Point to Point Transmission Service (PTP). This modification to the allocation of EDAM congestion revenue would enable EDAM BAAs to provide a more complete congestion hedge to customers paying congestion charges for self-scheduled balanced transactions based on monthly or yearly firm OATT service. The California ISO commits to working over a 12 to 24 month period with stakeholders on a long-term, durable design for allocating congestion revenue.

The process for evaluating alternative congestion revenue allocation designs necessarily relied on the California ISO's knowledge of data availability, staffing, and system architecture to judge implementation feasibility prior to EDAM start-up. The range of alternatives considered was constrained and guided by the ISO's recommendations. Thus, I do not have sufficient information to confirm that the proposed rules for EDAM start-up are the best approach that could have been put forward under the circumstances but can conclude that no clearly superior alternative was considered.

Importantly, stakeholders and the DMM support moving forward with the congestion allocation rules proposed and the California ISO believes they can be implemented prior to EDAM start-up.

B. Enabling EDAM Start-Up

The primary benefit of the proposed rules for congestion revenue allocation is that they would enable the EDAM to start up as planned in 2026. Implementation of EDAM is expected to reduce unit commitment and dispatch costs, relative to the use of base schedules under the WEIM design, despite the self-scheduling incentives. However, as discussed below, there is a possibility of extreme self-scheduling outcomes under which this would not occur.

A second important benefit of initiating EDAM would be the provision of data and experience to assess the performance of the EDAM market and, probably, identify areas for improvement of the EDAM design. The EDAM design is new and, based on my experience working on the start-up of regional electricity markets, it is likely to take some time to validate the initial market outcomes and identify the

[10] See Pope, April 8, 2025, pp. 12-16.
[11] See Pope, April 8, 2025, p. 20.

reasons for any anomalous results. It is important to begin the market in 2026 rather than waiting two or three years for the development of an improved design for congestion revenue allocation. The market rules and software for EDAM have not been previously tested because, unlike other regional markets, it combines an optimized regional unit commitment and dispatch with OATT service sold separately by participating BAAs. There will be substantial work for the California ISO and stakeholders after start-up to address market rule and software concerns that can be expected to arise.

A related benefit is that operation of EDAM, even with the proposed rules for EDAM start-up, will provide data illustrating the interaction of parallel flows on binding EDAM BAA transmission constraints arising from different types of EDAM schedules. This will be useful in explaining the issues that need to be addressed in a long-term design for congestion revenue allocation. To be more specific, the data will illustrate the challenges of defining the rights to parallel flows and allocating them among parties with different types of claims, i.e., CRRs and firm OATT rights held by customers in EDAM BAAs, the terms of which may not be identical. Additionally, even if the California ISO identifies decreases in efficiency (or even reliability) resulting from the incentive to self-schedule, it would motivate the stakeholder process for designing a long-term congestion revenue allocation approach.

C. Inefficient Self-Scheduling Incentive

The primary goal of EDAM is to enable the optimized commitment and dispatch of resources based on bids and offers from resources across the EDAM footprint. The objective is to reduce the cost of serving EDAM load, while also maintaining grid reliability, through efficient day-ahead scheduling of the combined transmission and supply resources of the EDAM BAAs.

A major concern with the proposed rules for EDAM start-up in the Final Proposal is the incentive for OATT transmission customers with monthly or yearly firm service to self-schedule balanced transactions to receive an allocation of parallel flow congestion revenue. The economic incentive for eligible OATT customers to self-schedule under the Final Proposal design is well-documented and is recognized by the California ISO, DMM, MSC and stakeholders. The incentive, which is also referred to as the "use-it-or-lose-it" problem, is thoroughly explained in Dr. Scott Harvey's May 2, 2025 MSC presentation.

The incentive to self-schedule arises because OATT transmission customers will be eligible to receive a congestion revenue payment to offset EDAM congestion charges for parallel flow on constrained transmission facilities in neighboring BAAs *only if* they submit balanced self-schedules to use their monthly or yearly firm OATT transmission rights. If their balanced schedules are expected to cause material parallel flows on congested transmission, OATT customers often will be able to serve their load less expensively by self-scheduling, because if they do not self-schedule they will not be eligible to receive a rebate of their EDAM parallel flow congestion charges through receipt of an allocation of EDAM congestion revenues. The incentive is strongest when the OATT schedule would cause material flows across a congested constraint in a neighboring EDAM BAA (in the direction of congestion).

When supply resources are self-scheduled, they do not submit flexible offers to the EDAM unit commitment and dispatch; their schedules cannot be reduced in the EDAM optimization if this would enable a more efficient outcome. This increases the costs of meeting EDAM load for two, related reasons. First, resources that are self-scheduled might be out-of-merit if they were to offer flexibly; they are a more expensive way to serve the associated OATT load than alternative resources that EDAM

could have instead scheduled based on flexible offers. Second, the transmission flows from the self-scheduled resources can lead to inefficient schedules for resources that have provided flexible EDAM offers. For example, a unit with a significant minimum generation block and minimum run time might have to be committed in EDAM because the transmission flows from a self-scheduled resource make it infeasible to reliably meet load with a less expensive alternative resource. The transmission flows from an inefficiently self-scheduled resource can cause the displacement of a more efficient resource generally used to serve load. The flows from self-scheduled resource thus cause a cascade of impacts on the EDAM commitment and schedules for other resources, further increasing the costs of loads served by the BAA with the inefficient self-schedule as well as other EDAM BAAs. Related impacts on CRR revenue adequacy are discussed in a later section.

While the DMM recognizes that the self-scheduling incentives will reduce the benefits of EDAM relative to those expected under the approved EDAM design, it expect thats EDAM will nonetheless yield benefits.[12] The California ISO assessment of PacifiCorp OATT rights also sets the expectation that cost savings will still be achieved because, despite self-scheduling, the EDAM commitment may improve on the base schedules that BAAs individually submit to participate in the WEIM today (including California ISO integrated forward market (IFM) schedules).

1. Assessment of Potential PacifiCorp Self-Scheduling

In response to concerns about self-scheduling, the Final Proposal provides an assessment of the potential for elective self-scheduling in PacifiCorp at the start of EDAM.[13] California ISO identifies a limited quantity of PTP and NITS rights that might be electively self-scheduled, given PacifiCorp's publicly stated intention to economically bid its network supply to serve its network customers because "it believes the risk of congestion costs does not outweigh the benefits of economic bidding."[14] PacifiCorp's decision to take advantage of the opportunity for economic commitment of its network resources is sensible as long as the cost reductions it estimates it realizes from economic unit commitment are not materially different from the charges its market schedules incur for parallel flow congestion.

A California ISO analysis of PacifiCorp data suggests that elective self-scheduling might not cause large market distortions during the period in which the California ISO develops a long-term design for the allocation of EDAM congestion revenues if PacifiCorp economically bids its network supply. Unfortunately, the analysis has not been subjected to scrutiny and does not eliminate the possibility that additional, elective self-schedule, even if it were small as a percentage of the resource capacity of PacifiCorp, might have a significant impact on congestion costs for California transmission.

2. Incentive to Self-Schedule with Significant Congestion in the California ISO

However, there could be periods when the congestion charges PacifiCorp pays for parallel flow on the California ISO system are so high that it might choose not to offer its network supply economically. Significant congestion costs could occur within the California ISO for one or a combination of reasons,

[12] DMM, June 2, 2025, p. 1.
[13] Final Proposal, pp. 19-21.
[14] Final Proposal, p. 20.

such as a material reduction in California transmission capability, the outage of significant generation, high loads, or high solar output in the southern part of the WEM.

In particular, PacifiCorp could incur significant congestion charges for parallel flow on California ISO constraints in many hours because the energy flows from solar resources cause congestion in the south to north direction in California, on the same transmission facilities supporting parallel flows for network resources in PacifiCorp east that serve load in PacifiCorp west. In this situation, PacifiCorp could face political and regulatory pressure to submit balanced self-schedules supported by its firm OATT rights to avoid paying high parallel flow congestion charges to serve its network load. If PacifiCorp were to self-schedule its network resources, this could further increase congestion costs on transmission constraints within California. This is because PacifiCorp's self-schedules would include resources that would not have been scheduled in the EDAM market based on their flexible offers because the resources would be out of merit due to the flow impact of the resources' schedules on already constrained transmission within California. The potential for this situation to create a strong potential for self-scheduling of network resource in PacifiCorp east could be studied prior to EDAM implementation.

High congestion costs within the California ISO would, in addition to placing pressure on PacifiCorp to self-schedule, also put pressure on other customers within any other EDAM entities to use their eligible OATT service to schedule energy deliveries that depend on scheduled and unscheduled flows on the California system. As congestion in California increases, OATT customers within EDAM entities with yearly or monthly firm service will have a strong incentive to employ balanced self-schedules to avoid congestion charges. In short, when substantial congestion occurs on elements of the California ISO transmission system that support transmission use scheduled outside of the California BAA, or even when such congestion is expected to occur, self-scheduling by EDAM entities other than PacifiCorp could increase transmission congestion within the California ISO, which would put further pressure on PacifiCorp to submit balanced, inflexible NITS schedules into EDAM, and vice versa.

It is important to note that the incentive to self-schedule balanced OATT transactions using monthly and yearly firm service in EDAM likely cannot be discerned from the congestion prices observed in WEIM today. This is because WEIM base schedules that have parallel flows on constrained California transmission facilities will be efficiently dispatched down when they submit flexible bids to the WEIM; the flexible bids enable entities to purchase energy in the WEIM to supply their load at a lower cost than that of their base scheduled resource. WEIM congestion prices today reflect congestion after the real-time redispatch has occurred. In contrast, the EDAM unit commitment and dispatch and the resulting EDAM prices will reflect the full amount of balanced self-schedules employing firm yearly and monthly OATT service. Even if these schedules will later be economically redispatched down in WEIM, they will be fixed in EDAM. Consequently, EDAM congestion prices could be materially higher than those observed in WEIM today. And, as discussed above, substantial congestion prices for parallel flows on California ISO constraints could trigger a cascade of inflexible EDAM balanced self-schedules by parties that can avoid paying parallel flow congestion charges by using their monthly and yearly firm OATT rights. An increase in self-scheduling is another reason why parallel flow and congestion in California may be higher under EDAM than observed in the WEIM today.

When there is material congestion in the California ISO the self-scheduling incentives of the proposed rules for EDAM start-up could substantially limit the ability of EDAM to reduce costs through the optimized unit commitment and the inflexible schedules could also impair the system operator's ability

to manage system reliability. Further, it would increase locational marginal prices (LMPs) within the California BAA and increased parallel flows on California transmission could decrease the congestion revenues available to pay California ISO CRR holders.[15]

For this reason, if this Final Proposal is implemented for EDAM, it will be important for the California ISO to monitor self-scheduling of PacifiCorp network resources, particularly during periods of high congestion on California ISO transmission constraints.

Further, even if incremental PacifiCorp self-scheduling turns out to be limited, this should not rationalize a delay in the schedule for developing a long-term approach to congestion revenue allocation. I suggest this be viewed as a fortunate occurrence that might not extrapolate to the assumption that self-scheduling will remain limited as other BAAs join EDAM or as load grows over time and there is the potential for increased transmission congestion or changes in the pattern of transmission congestion.

3. Flexible Offers for Real-time Dispatch

Under the Final Proposal, resources self-scheduled in EDAM could be offered flexibly in the real-time WEIM. I agree with this approach because it will support efficient real-time dispatch and reliability. The real-time dispatch cannot correct any inefficiencies in the unit commitment occurring due to self-scheduling, however, and would be limited in adjusting the dispatch of units that might not have time to arrange for additional gas supplies, for example. This approach to the real-time dispatch mirrors that in use today in the WEIM, where base schedules can offer flexibility and be dispatched in the imbalance market. Any differences between WEIM dispatch schedules and EDAM schedules would be settled at real-time prices, as in the WEIM today.

As Scott Harvey explained in his May 2nd MSC presentation, there is a potential downside to the market rule allowing resources self-scheduled in EDAM to offer flexibility in the WEIM. The problem is explained in detail and illustrated in his presentation. In brief, this market rule would allow an OATT customer with monthly or yearly firm rights to profit through the following series of actions:

- Self-schedule an out-of-merit resource to serve load in EDAM and pay no net congestion charge for the self-schedule because of the allocation of congestion revenue to the self-schedule;
- Offer the self-scheduled resource into the WEIM dispatch based on its actual costs, with the expectation that it will be dispatched down;
- Pay the imbalance charge for the reduction in the resource's WEIM schedule, relative to its EDAM schedule;
- Serve load at the real-time price paid per the imbalance charge (which by assumption is less than the cost of the out-of-merit resource) without paying any congestion charge (because the congestion charge was pre-paid in EDAM and then offset by the receipt of an allocation of congestion revenue).

As Dr. Harvey notes, this same strategy could be employed today using base schedules. It boils down to taking advantage of the opportunity to prepay for transmission at zero cost through submission of EDAM self-schedules. Whether effectuated through the submission of self-schedules in EDAM or base

[15] The impact on the revenue adequacy of CRRs will depend on the level of parallel flow in comparison to the quantities of parallel flow assume in the SFT constraining the quantity of awarded CRRs.

schedules in WEIM, the strategy creates inefficiency and increases costs when an out-of-merit resource self-schedule impacts the optimized bid-based unit commitment and subsequent dispatches.

It would be reasonable for both the California ISO and DMM to create monitoring screens identifying instances of self-scheduled resources routinely buying out of their EDAM schedules (or base schedules) at real-time prices that are likely less than the cost of the self-scheduled resources.

D. Elevation of Priority of OATT Transmission Rights

Like the opt-out approach some stakeholders advocated, the allocation of EDAM congestion revenues to balanced self-schedules using monthly or yearly firm OATT transmission services could provide a level of priority for OATT transmission under EDAM that is superior to existing OATT service. The elevation of priority could occur because the full amount of OATT rights will likely be available to a customer during grid conditions when the amount of OATT service might be reduced in the absence of EDAM. For example, if there were a reduction in EDAM transmission capacity, it appears that OATT transmission customers could submit self-schedules for the full amount of their transmission service without paying a congestion charge, while parties without OATT service that are bidding into the EDAM would be dispatched to accommodate the OATT transmission use.

This (re)dispatch may, *de facto*, occur today but the intention was to remove the financial asymmetry under EDAM by exposing both OATT and non-OATT customers to the marginal cost of transmission congestion. With the proposed rules for EDAM start-up, eligible OATT customers with balanced self-schedules are not exposed to congestion charges, so do not have an incentive to voluntarily reduce their transmission use when there is a reduction in transmission capability. Also, with the larger EDAM footprint, in comparison to the footprint of individual BAAs, the dispatch will more likely be able to automatically accommodate OATT schedules, even with some reduction in transmission capability. Unless the quantity of the eligible OATT rights were reduced to reflect changes in transmission capability, their insulation from congestion charges will confer to them a higher priority than customers who will pay high congestion prices for their schedules.

E. Impacts on California BAA Loads and CRRs

The proposed rules for congestion revenue allocation at EDAM start-up appear to benefit loads in the California BAA because the receipt of parallel flow congestion revenue could improve the revenue adequacy of CRRs. However, the Final Proposal rules to be applied at the start-up of the EDAM to compensate customers with balanced, eligible OATT self-schedules from parallel flow congestion charges do not extend to California, and there is also a potential for these market rules to adversely affect the revenue adequacy of CRRs.

1. Parallel Flow Congestion Cost Payments to California BAA

The immediate benefit of the EDAM to California loads is that other EDAM BAAs will pay congestion charges for their EDAM scheduled parallel flows on congested transmission facilities within the California ISO footprint to the extent that those flows are not supported by monthly or longer-term firm transmission service. Under the Final Proposal rules for congestion revenue allocation at the time of EDAM start-up, California BAA receipts of congestion cost payments for such parallel flows will be less than under the approved EDAM tariff. This is because a portion of the parallel flow congestion revenue

the California BAA collects will be returned to EDAM BAAs to provide a more complete hedge for balanced self-schedules based on monthly or yearly firm OATT rights.

However, the California BAA will retain parallel flow congestion revenue remaining after congestion revenues are returned to EDAM BAAs for balanced EDAM self-schedules utilizing eligible OATT service. This is revenue that the California BAA does not receive today and, as the California ISO suggests in the Final Proposal, can reduce the underfunding of CRRs.[16] Further, California ISO loads should benefit if the EDAM is able to improve the unit commitment for EDAM entities, relative to their base schedules today.

2. No Congestion Revenue Allocation for California BAA Parallel Flows on Other EDAM BAAs

Because there is no OATT service in the California BAA, California loads will not have a way to receive the same allocation of EDAM congestion revenue that is afforded to loads served by eligible OATT transmission in other EDAM BAAs under the proposed rules for EDAM start-up of the Final Proposal. Both the California ISO and stakeholders have discussed the asymmetry of the Final Proposal in this regard.

Under the proposed rules for EDAM start-up, California customers will pay congestion charges if their IFM/EDAM schedules cause parallel flows over constrained transmission in other EDAM BAAs. They have exposure to parallel flow congestion charges under EDAM that they have not been exposed to under WEIM but, unlike other EDAM BAAs, there is no proposed mechanism for them to receive any refund of their parallel flow congestion charges. If California BAA parallel flows and congestion charges are substantial, this would be a concern during the transition period to a long-term congestion revenue allocation design. On the other hand, if California BAA EDAM schedules have little impact on congested transmission constraints within other EDAM BAAs, California ISO loads would not pay material congestion charges for parallel flow. When its EDAM simulation tools are operating, the California ISO should be able to estimate the magnitude of the parallel flow congestion that California BAAs could pay to PacifiCorp under a variety of grid conditions.

3. CRR Revenue Adequacy

a. EDAM Schedules Providing Counterflow

Under the Final Proposal the congestion revenues available to pay CRR holders also could be reduced by EDAM entity schedules that cause parallel flow on one or more California transmission constraints in the counterflow direction. This problem could occur through the following sequence of intentional or unintentional actions:

- A self-schedule is submitted in an EDAM BAA that causes parallel flow in the counterflow direction over a California ISO constraint that is binding in EDAM. In EDAM settlements (which are effectuated through the EDAM BAA), this schedule receives a net positive payment for relieving congestion on the constraint. This is the expected and intended settlement result for

[16] The extent to which EDAM BAA parallel flows have been a cause of underfunding, as opposed to other possible sources of underfunding, depends on the assumptions about parallel flow (including that from EDAM BAAs) currently employed in the CRR simultaneous feasibility test (SFT). Thus, while the revenue for parallel flow congestion costs could reduce CRR underfunding, the absence of previous collection of congestion revenues for the parallel flow may not be the cause of underfunding.

counterflow schedules under the LMP market design.[17]

- At the time, an EDAM self-schedule is submitted that causes parallel flow on the same California ISO constraint, except that the flow is in the direction of congestion. This second schedule is balanced and uses eligible OATT rights, so its EDAM congestion charges are offset by the receipt of an allocation of EDAM congestion revenue.

  It is easiest to describe the result of these two transactions by assuming that they are exactly offsetting, i.e., they are submitted for the same megawatt quantities and at the same locations, but in opposite directions. The sum of the scheduled EDAM injections and withdrawals at each location is zero because the injection scheduled for one of the transactions offsets the withdrawal scheduled for the other.

- With this assumption, the net effect of the two transactions in EDAM is a payment of congestion revenue to the first transaction that relieves transmission congestion on the California constraint. This payment reduces the overall amount of congestion revenue the California ISO collects to pay holders of CRRS that have flows on the relevant constraint.

Variants on the pattern of transactions described here could occur intentionally (to garner payments of congestion revenue for the provision of counterflow) or unintentionally. Either way, they would reduce the congestion revenue available to pay CRR holders and, in the extreme, could even cause the residual congestion revenue for a constraint to be less than zero.

Intentional, strategic use of this strategy to receive unwarranted payments of congestion revenue would not necessarily employ equal and opposite schedules, might impact multiple constraints, and might be effectuated with disguised entity names. The strategy might be pursued through complicated daisy chains of offsetting transactions. Such strategies have been used in other ISOs where the market rules present opportunities for unwarranted profits. In the present case, the defining characteristic of the strategy would be the receipt of net payments for the provision of counterflow after accounting for all the settlements for a set of related transactions.

Unfortunately, it appears to me that the increase in CRR revenue adequacy I describe here could occur because of *any* counterflow schedule that relieves a binding California ISO constraint. The counterflow does not necessarily have to originate in a transaction self-scheduled in a non-California ISO BAA. It can arise whenever a balanced self-schedule based eligible OATT rights causes parallel flows on a constraint that is relieved by counterflow schedules that are paid to relieve congestion, because the OATT self-schedule of monthly or longer firm transmission receives a refund of its parallel flow congestion charge, but the counterflow does not refund its EDAM settlement receipts for relieving congestion. The seriousness and complexity of this issue lie in observing that settlements for EDAM schedules for generation and load throughout the EDAM footprint could contain congestion components reflecting the provision of counterflow on constrained California transmission facilities (the congestion component

[17] Even if an OATT reservation were available to support this transaction, it would not be submitted with the schedule because, if it were, the transaction would receive a negative allocation of congestion revenue under the current proposal. The congestion revenue allocation would offset the payment the transaction receives for providing counterflow to relieve the binding constraint.

would increase the LMP for EDAM supply and decrease the LMP for EDAM load). Thus, the counterflow giving arise to this problem could be arising in any number of EDAM schedules.

Whether intended or unintended, the congestion revenue settlements for parallel flow under the proposed rules for EDAM start-up would divert congestion revenues intended for payments to CRRs, whenever there is counterflow on California transmission constraints from OATT schedule parallel flows eligible for a congestion revenue allocation. The diversion of congestion revenue will reduce the value of CRRs, and the compensation California loads receive directly from CRRs or via proceeds of CRR auctions. In its June 2nd comments, the DMM identified the potential for this pattern of offsetting schedules and noted that they would need to be monitored and prevented.

I am not aware of any approach that has previously been used to limit the potential counterflow to reduce CRR congestion revenue in the ways described above. Transitional measures could be needed to limit the impact on CRR revenue adequacy. Since the counterflow schedules are valuable in relieving binding transmission constraints, it would not be advisable to discourage them in the design of any interim rules.

The only principled solution of which I am aware would be replacement of the proposed rules for EDAM start-up in the Final Proposal through development and allocation of financial rights to the congestion value of flows over constrained transmission facilities within EDAM, whether these flows arise from scheduled or unscheduled flows. The rights would be allocated among all EDAM BAAs (including consideration of the impact of counterflow rights) and the quantity of the rights could be equitably reduced when there are reductions in transmission capability. Each EDAM BAA might be allocated a fixed set of these financial rights and could use the congestion revenue from them to support the congestion hedges provided by their CRRs or eligible firm OATT rights, in lieu of the congestion revenue allocation proposed for the start-up of EDAM.

The impacts of the CRR revenue adequacy identified herein could be addressed in the stakeholder meetings that the California ISO has announced for purposes of discussing the impact of EDAM implementation on CRRs.

b. Derate of Binding California ISO Transmission Constraint

When there is a reduction in the capacity of binding California ISO transmission constraints and EDAM accommodates the full amount of EDAM balanced self-schedules supported by eligible OATT service, the market rules that would be applied at EDAM start-up under the Final Proposal could reduce the congestion revenues available to compensate CRR holders.[18] Under the Final Proposal, the reduced congestion revenues collected in EDAM for the flows on derated transmission facilities will be allocated, first, to EDAM BAAs whose monthly or yearly firm OATT customers pay for parallel flow congestion over the constraints for balanced schedules; only the residual congestion revenues (for the reduced capability of the facility) will be available to CRR holders.

The payment, first, of congestion revenue allocations associated with monthly or yearly firm OATT rights with parallel flows on binding constraints, despite a reduction in the capability of these California ISO

[18] The impact on CRR holders of revenue inadequacy due to the derating of California transmission capability is compounded because none of it is borne by a reduction in congestion revenues allocations to EDAM BAAs for balanced OATT self-schedules. All revenue inadequacy is passed through to CRR settlements.

constraints, prior to assigning congestion revenue to CRR holders, amounts to affording a higher priority to the OATT rights than to CRRs. The CRRs are financial rights to the congestion value accruing to the California transmission system. There is no justification for this reduction in the relative priority and value of CRRs.[19]

The California ISO could monitor the extent to which the congestion revenue allocation for derated California transmission facilities favors holders of monthly or yearly firm OATT rights. If this materially reduces the congestion revenue paid to CRR holders, it could work with stakeholders to design stop-gap measures to reduce this problem for the period prior to implementation of a long-term approach to congestion revenue allocation. Such measures could reduce the congestion revenue allocation to monthly and yearly firm OATT transmission service when California ISO transmission is less available to support parallel flows from balanced self-schedules.

c. Parallel flows from New OATT service

The sale of new monthly or yearly firm OATT service that causes EDAM parallel flows on congested California ISO transmission also could reduce the congestion revenue available to pay CRR holders under the Final Proposal. This potential might exist today for the sale of new OATT service by WEIM entities.[20] The difference under EDAM is that OATT service is necessary to obtain a hedge against the costs of EDAM parallel flow congestion. Some stakeholders have expressed concern that there are no rules to limit the amount of new parallel flow on material transmission constraints in California that could be created by the sale of new monthly or yearly firm OATT transmission service by EDAM entities.[21] I agree with this concern despite assertions and expectations that approval of new OATT service will be constrained by current Available Transfer Capacity (ATC) limits. For instance, new OATT service will likely be provided in conjunction with the completion of additions to the transmission grid and this could increase parallel flows through California. I do not have sufficient knowledge of the practices for awarding PTP service and for approving new network resources to rule out the possibility that the Final Proposal could stimulate parties to find ways to obtain new monthly or yearly firm OATT service to schedule parallel flows on constrained California transmission at zero net cost.

The California ISO could monitor the extent to which new monthly and yearly firm OATT service is receiving allocations of parallel flow congestion revenue for California transmission constraints by tracking the contract record numbers (CRNs) associated with such allocations. If previously unseen CRNs arise and receive material congestion revenue allocations, the California ISO and stakeholders could design stop-gap measures to reduce this problem for the period prior to implementation of a long-term approach to congestion revenue allocation.

F. No Change to WEIM Congestion Revenue Allocation

I agree with the California ISO that the proposed changes to congestion revenue allocation to provide a hedge for parallel flow congestion charges for balanced self-schedules using monthly and yearly firm

[19] Note that the same reduction in the priority and value of CRRs relative to OATT service could occur today when transmission is derated.

[20] Whether this occurs today depends on how parallel flow from OATT schedules is represented in the CRR SFT and in the IFM today.

[21] See Pacific Gas & Electric, *Comments on 5/27 hybrid call,* June 2, 2025, https://stakeholdercenter.caiso.com/Comments/AllComments/98b9032c-abc1-48ff-ab7c-a0c4a879eff7.

OATT rights should be applied only in the EDAM. The rules for allocating congestion revenue in the WEIM are operating without difficulty under an approved tariff. It would be an unnecessary complication to attempt to apply revised congestion allocation rules in real-time to the subset of WEIM entities that are participating in EDAM.[22]

G. Near-Term Enhancements

I have substantial concerns about the two near-term enhancements to congestion revenue allocation that the California ISO put forward starting in the Draft Final Proposal: the allocation of parallel flow congestion revenue to cleared, balanced day-ahead market schedules supported by eligible OATT service, in addition to balanced self-schedules; and the allocation of parallel flow congestion revenue to CRRs.[23] The California ISO has committed to start work on these enhancements as soon as possible so that they can be implemented in approximately 2027.[24]

Based on my experience from working on similar market design efforts, I do not think it will be possible to craft a workable design for either near term enhancement by 2027. The California ISO has not provided details of the design changes it envisions would enable the near-term enhancements and their possible negative impacts and complexity were not considered via robust discussion or stakeholder comments. In my view, discussions of the near-term enhancements could consume valuable time and will ultimately converge on discussion of the same issues that will be central to the design of a system of flow-based entitlements.

1. Parallel Flow Congestion Revenue Allocation to CRRs

CRRs are different from OATT transmission rights in several ways that would impede efforts to extend the proposed rules for EDAM start-up to them.

The most important difference is that there will not be balanced EDAM schedules within the California ISO corresponding to CRRs, so the allocation of parallel flow congestion charges collected in other EDAM BAAs based on California CRRs could not be readily tied to physically feasible California injections and withdrawals scheduled in EDAM. CRRs are financial rights to congestion settlements in every hour; the payments to the owner of a CRR do not depend on the owner's day-ahead market (i.e., IFM) schedules. The intentional separation of CRR settlements from day-ahead schedules supports efficient unit commitment and dispatch, but it does not fit with the proposed rules for congestion revenue allocation for EDAM start-up.

One California ISO suggestion was to allocate parallel flow congestion revenue in other EDAM BAAs to the California BAA based on the outstanding CRRs, without regard to California BAA EDAM schedules.[25]

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[22] As a point of clarification, vis-à-vis a statement in the Final Proposal (p. 26), it would be feasible to implement a system of financial congestion hedges in a market design that included a real-time market (but no day-ahead market) and in which all real-time injections and withdrawals were settled at real-time LMPs. The lack of such a precedent is not valid support for the California ISO proposal to not extend the changes contemplated in the Final Proposal to the WEIM. This is inconsequential, however, because other reasons for this element of the proposal are sufficient.

[23] Final Proposal, pp. 31-33.

[24] Final Proposal, p. 4.

[25] "For the CAISO balancing area – which does not offer PTP and NITS products – parallel flow congestion revenue allocation is based on affected CRRs by the external constraint located in an EDAM balancing area." California ISO,

The conceptual flaw with this approach is that it creates the potential for significant congestion rent shortfalls. If congestion revenue were allocated based on CRRs, the congestion revenue collected on binding transmission constraints in non-California EDAM entities often could be insufficient to pay both holders of CRRs and the congestion revenue allocations owed to parties who have used monthly or yearly firm OATT rights for balanced self-schedules. This arises because the CRR flows over binding transmission constraints in non-California EDAM entities may not be physically feasible in conjunction with the eligible OATT flows on the constraints scheduled in EDAM.

Because of this infeasibility, stakeholders would need to negotiate how the congestion revenue collected on the constraints would be allocated between CRRs and parties who have exercised eligible OATT transmission rights. It *appears that this inevitably would lead to the same discussion required to define and allocate flow entitlements on material EDAM constraints among the EDAM BAAs as will likely be required for a long-term congestion revenue allocation design.*[26]

Possibly in recognition of the revenue inadequacy that could result from allocating congestion revenues to CRRs that would be infeasible in the EDAM dispatch, there is a separate suggestion that "the CAISO balancing area would retain parallel flow congestion revenues resulting from a transmission constraint in a neighborng EDAM balancing area with *effectiveness on CAISO day-ahead energy and imbalance reserve schedules*."[27] I understand this to mean that the CRR congestion revenue allocation to the California BAA for a non-California transmission constraint would be limited by the parallel flow congestion revenues paid by California BAA schedules for flow on the constraint. The difficulty with this modified approach is that California load and supply may be dispatched in EDAM to avoid causing flows on constrained non-California facilities. They may not pay material congestion charges for parallel flows on these facilities, but they might still face prices that are significantly impacted by congestion. Consequently, with this modified approach, the actual payments due to the CRRs California loads might hold to hedge congestion could be well above the actual congestion charges California BAA EDAM schedules have paid for flows on the constraints. But, under this modified approach the CRR payments would be limited to the amount of congestion revenue the California BAAs pay for the constraint in EDAM. [28]

A final point is that if congestion revenue allocations were made to CRRs, the CRR SFT model would need to be modified to represent transmission constraints in non-California EDAM BAAs. The

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Extended Day-Ahead Market (EDAM) Congestion Revenue Allocation Initiative, Stakeholder Meeting, May 27, 2025 presentation, p. 24, https://stakeholdercenter.caiso.com/InitiativeDocuments/Presentation-EDAM-Congestion-Revenue-Allocation-Presentation-May-27-2025.pdf.

[26] The lack of simultaneous feasibility of CRRS along with monthly and yearly firm OATT rights might be bridged by finding other sources of revenue to fund the congestion revenue shortfall. However, this could start the California ISO down a slippery slope toward a financial rights design that deviates further and further from other designs that have been vetted and approved from the perspectives of efficiency and equity.

[27] California ISO, *Revised Draft Final Proposal: EDAM Congestion Revenue Allocation,* May 19, 2025, p. 32 (emphasis added), https://stakeholdercenter.caiso.com/InitiativeDocuments/Revised-Draft-Final-Proposal-EDAM-Congestion-Revenue-Allocation-May-19-2025.pdf.

[28] The California ISO has already started work to address the challenges that EDAM poses for CRRs, including some of the issues discussed herein. See video recording and presentations for June 12, 2025 stakeholder meeting: *Congestion Revenue Rights (CRR Modeling and Settlement in the Extended Day-Ahead Market (EDAM), https://www.caiso.com/notices/congestion-revenue-rights-crr-modeling-and-settlement-in-the-extended-day-ahead-market-edam-virtual-workshop-on-6-12-25.*

modifications would limit the quantity of parallel flow that the CRRs made available through the CRR allocations and auctions cause on these constraints. In the absence of these model changes, an unlimited quantity of CRRs could potentially be sold that rest on such parallel flows, and these would be eligible for allocations of congestion revenue under the counterfactual considered here. Decisions about how much parallel flow CRRs will be allowed on non-California EDAM constraints in the CRR allocations and auctions is, in effect, a decision about the flow rights of CRRs. *Here, again, the effort would appear to reduce to defining the relative entitlements of CRRs and all other EDAM BAAs to flows on congested EDAM transmission facilities.*[29]

2. Parallel Flow Congestion Revenue Allocation to Balanced Market Schedules

The California ISO suggests enabling allocations of parallel flow congestion revenue to balanced EDAM market schedules supported by monthly and yearly firm OATT service in order to reduce self-scheduling On the surface, the approach could enable more efficient unit commitment and dispatch whenever there is little doubt that the resulting EDAM market schedule would be supported by the scheduling entity's monthly and yearly firm OATT service. In other situations, though, an entity's network resource might be dispatched down, so that transmission to serve some of the entity's load might not be covered by its eligible OATT service. In this case, the entity likely would not be willing to offer its network resource to the market unless it were reasonably sure that its cost saving from serving its load with an alternate source of supply (i.e., its savings buying from the market at the market price) would be less than its EDAM congestion charge. While extending the congestion revenue allocation to market-scheduled resources might at times reduce the self-scheduling incentive of the proposed rules for EDAM start-up, it would not remove it during times of significant congestion. And it is at times of significant congestion when self-scheduling would lead to the greatest losses in EDAM efficiency.[30]

An additional downside of the proposal is that it would provide functionality over and above that provided by monthly and yearly firm OATT contracts today. It would improve the conditions under which OATT service could be used to appropriate an allocation of congestion revenue. Further, such a change could become embedded in the WEM with the unintended result of impeding desirable market enhancements in the future. For instance, it could be more difficult to convert existing OATT service to CRRs if there were an expectation that the CRR allocation should accommodate any megawatt amount of exercise of the underlying OATT service.

A final issue, as some stakeholders have noted, is that there would be an implementation issues to design an equitable method to determine *which* EDAM market-scheduled supply injections and load withdrawals are supported by eligible OATT service when the megawatts of scheduled supply are not

[29] Financial flow rights could be similar to the firm flow entitlements defined between PJM and MISO.

[30] DMM and MSC evaluations of extending the proposed rules for congestion revenue allocation to market schedules associated with eligible OATT service conclude that this would create worse incentives and less equitable outcomes than the present proposal. See Eric Hildebrandt, *Department of Market Monitoring report, June 12, 2025, pp. 1-2, https://www.caiso.com/documents/decision-on-edam-congestion-revenue-allocation-dmm-comments-june-2025.pdf*, and James Bushnell, Scott Harvey, and Benjamin F. Hobbs, *MSC Opinion on Extended Day-Ahead Market (EDAM) Congestion Revenue Allocation*, The Market Surveillance Committee of the California ISO, Draft of June 13 2025, p. 28, https://www.caiso.com/documents/market-surveillance-committee-opinion-decision-on-edam-congestion-revenue-allocation-june-2025.pdf.

equal to the megawatts of scheduled load. Some pairs of supply and load could earn a higher allocation of parallel flow congestion revenue than others.

The underlying objective of the proposed near-term enhancements is to address two flaws with the currently proposed rules for EDAM start-up, i.e., the self-scheduling incentive and the asymmetric treatment of California BAA load. In my view the most efficient and equitable approach to achieving both of these objectives would be the development and allocation of financial flow entitlements for major EDAM transmission constraints. In my view, discussions of the near-term enhancements could consume valuable time and ultimately evolve to discussion of the same issues that will be central to the design of a long-term approach for congestion revenue allocationThe most efficient and equitable approach to achieving the near-term goals is most likely expeditious development and allocation of financial flow rights for major EDAM transmission constraints.

I suggest California ISO and its stakeholders focus narrowly on whether it is worth spending material time on designs for the near-term enhancements that are not clearly a segue to the long-term design.
Long-Term Design for Congestion Revenue Allocation

The proposed 24-month period for developing a long-term congestion revenue allocation design is appropriate. I encourage the California ISO to immediately start discussion of development of a system of financial flow-based rights or entitlements. These might not be CRRs, because CRR revenue adequacy rests on the *total* congestion revenue collected for a day-ahead market footprint. The sources of CRR congestion revenue are not tracked at the BAA level or associated with specific BAAs in the manner that might be needed under the WEM market structure. I encourage the exploration of ways to define and allocate financial flow entitlements in WEM to allow EDAM BAAs to have different approaches to making financial rights available with, or in addition to, OATT rights. Flow-based financial entitlements will require agreement on MW limits by constraint and EDAM BAA; negotiated rules to equitably reconcile existing physical and financial rights with physical feasibility; and possible innovations on traditional CRR frameworks.

III. RECOMMENDATIONS

A. Prior to EDAM Implementation

I would like to make a few suggestions for the California ISO to consider prior to EDAM implementation.

1. New OATT Rights

As previously discussed, under the proposed rules for EDAM start-up, there is a potential incentive for parties to seek to purchase new monthly or yearly firm OATT service from EDAM BAAs to avoid future congestion charges for parallel flow. The California ISO has explicitly rejected the suggestion to limit the application of the proposed rules for EDAM start-up to existing OATT service arrangements. However, given the unknown potential for parallel flows from new OATT service, I suggest that there be no implicit or explicit guarantee that the proposed rules for EDAM start-up would necessarily extend to new OATT service for any period. New OATT service might arise, for example, from unanticipated sales of PTP service within an EDAM BAA.

If there is no material increase in the provision of monthly or yearly firm OATT service by EDAM entities, then the lack of such a guarantee would not be an issue.

However, if there were a material increase, such a statement could protect the rights of existing monthly and yearly firm OATT customers and customers who benefit from CRRs. This is because increases in parallel flow on existing facilities from new service could dilute the value of existing physical and financial rights if there were an apportionment of the flow rights for a transmission facility, whether this were to occur due to a transmission derating, for example, or to undertake an allocation of financial flow rights.

It might not be difficult for the California ISO to identify the use of new OATT service under EDAM, and this service might receive no differential treatment at the start-up of EDAM. In the future, however, it may be important to distinguish "historical" rights from those that might have occurred because of the incentives created by these proposed rules for EDAM start-up.

This suggested change could be included in the tariff filing for the present initiative or considered for a subsequent tariff filing. The California ISO could implement the suggested distinction, should it be necessary, through the calculation of the congestion revenue allocations to EDAM BAAs. No change to the EDAM BAA OATTs would necessarily be required.

2. California BAA Parallel Flow Congestion Charges

As previously discussed, California BAA loads will have exposure to parallel flow congestion charges under EDAM that they have not been exposed to under WEIM but, unlike other EDAM BAAs, there is no proposed mechanism for them to receive a refund of their parallel flow congestion charges.

Once it knows the shift factors for California injections and withdrawals on PacifiCorp constraints, the California ISO should be able to estimate the magnitude of the parallel flow congestion that California BAAs could pay to PacifiCorp under a variety of grid conditions. It will be important to study, in particular, the possible magnitude of these charges assuming self-scheduling of PacifiCorp network resources during tight system conditions, such as when there is high south to north congestion between California and the Pacific Northwest. The question is whether, under this circumstance, there could be congestion on PacifiCorp constraints while there are material parallel flows from California BAA schedules on these PacifiCorp constraints. The latter might occur, for example, because of changes in the California EDAM schedules that occur because of PacifiCorp self-schedules. As previously discussed, there could be strong incentives for the use of monthly and yearly firm OATT self-schedules during tight grid conditions. It should be a priority to assess whether there are circumstances that could lead to inequitable results for California loads after EDAM start-up and, if so, to address them prior to start-up.

3. EDAM Testing

The California ISO undoubtedly has a detailed plan to test the EDAM software once it is available. At the risk of stating the obvious, the testing should test the impact on EDAM unit commitment solutions from a range of self-scheduling scenarios. It will be important to understand whether there are situations when high levels of self-scheduling could cause problems for the EDAM solver or, even, potential problems with maintaining real-time system reliability. For example, it will be important to understand whether there could be situations in which self-scheduling might lead to violations of locational requirements for imbalance reserves.

I suggest the California ISO consider developing plans to expeditiously limit excessive, inefficient self-scheduling should it occur, especially because of an experience in PJM in 1997 during which similar self-scheduling incentives required the ISO to invoke emergency procedures to maintain reliability. EDAM tariff rules might be considered that would apply to the network resources of EDAM BAAs under certain grid conditions.

B. Monitoring

California ISO's plan to collect data on self-scheduling behavior is essential. The incidence and impacts of self-scheduling will provide critical feedback and justification for post-launch design improvements.

The Final Proposal states that the California ISO will monitor the following information upon EDAM start-up:

- "Identification of the binding transmission constraints, and their frequency, in each EDAM balancing area."
    - In each hour when a material constraint binds, it would be helpful if the ISO also could track the energy and imbalance energy shadow prices of the binding constraint and the energy flow on the constraint. This would enable investigation of the specific conditions, such as high loads, transmission outages, or large amounts of self-scheduling that are associated with hours with unusually high shadow prices, if such an assessment were needed.
- "Effects of binding transmission constraints on congestion prices within the EDAM balancing area in which the constraint is located and in neighboring EDAM balancing areas."
    - It would be helpful if the ISO could store this information by hour and location to assist in diagnostics, if needed. It would also be helpful to record this information separately for energy and imbalance reserves and to compare it to WEIM outcomes.
- "Allocation of congestion revenues among EDAM balancing areas resulting from these constraints."
    - It would be helpful if the ISO could store information about these allocations by hour, identifying the portion of the congestion revenue allocation to each BAA attributable to each binding constraint. This would help in diagnosing the cause of any unusual allocation results, if needed. It would also enable examination of the portion of the congestion revenues on each constraint flowing to each BAA.
    - For each hour, it would be helpful if the ISO could store information about the residual congestion revenue on each California ISO constraint that is available to pay CRRs.
- "Magnitude and frequency of self-schedules across EDAM balancing areas, including self-schedules exercising firm OATT transmission rights (associated with use of CRN), NITS and PTP transmission rights registered with the market operator."[31]
    - It would be helpful if the ISO could store this information by hour and record the source and sink location of each balanced schedule to assist in diagnostics, if needed. For example, there might be specific combinations of self-schedules that limit parallel flows through neighboring EDAM BAAs, or that tend to cause EDAM solutions that increase parallel flows.

[31] Quoted passages in this list are from the Final Proposal, p. 29.

Some self-scheduling patterns could lead to difficulties with EDAM solution time or constraint violations.

- Additionally, it would be helpful if the ISO could break information out from this larger data set information about the magnitude and frequency of self-schedules in each EDAM balancing area using new monthly and yearly firm OATT service, i.e., using new CRN numbers.[32]
- New monthly and long-term firm PTP OATT service sold by EDAM entities that have historically provided counterflow on constraints with substantial congestion costs. This would be a straightforward way to identify relatively simplistic efforts to profit from payments for counterflow.

IV. CONCLUSION

I support the proposed rules for EDAM start-up, although I have substantial concerns about the possibility of negative outcomes due to self-scheduling incentives and impacts on congestion revenue right (CRR) revenue adequacy. Submission of inflexible resource self-schedules, rather than the submission of bids and offers to EDAM, reduces the potential gains from employing the EDAM software to optimally commit and schedule resources on the EDAM transmission grid.

Acceptance of the proposed rules for EDAM start-up appears to be necessary to enable the operation of EDAM to begin in May 2026 as planned because the California ISO has identified no superior approach that could enable the provision of a more complete congestion hedge for monthly and yearly firm OATT customers and be developed in time for the start-up of EDAM. My views about timing assume that the long-term, superior approach will be the development of financial rights to congestion revenue, such as CRRs or financial flow rights for EDAM transmission constraints for which there are material congestion costs. The design of a system of financial flow-based rights for the EDAM should be achievable and is central to realizing cost savings from EDAM's optimized bid-based unit commitment and dispatch.

The proposed rules for EDAM start-up would enable the California ISO and WEM to move forward with the introduction of EDAM. Operation of EDAM is anticipated to enable substantial cost savings and increases in reliability on behalf of customers of EDAM entities. The operation of EDAM also will provide data and experience to improve the EDAM design and inform the long-term design for congestion revenue allocation. I expect the learning that can occur from beginning EDAM operations sooner rather than later will move the WEM forward more quickly toward achieving the efficiency gains that are the objective of the EDAM design.

My major concern with the proposed rules for EDAM start-up is the incentive for OATT transmission customers with monthly and yearly firm service to self-schedule balanced transactions to receive an allocation of parallel flow congestion revenue. The transmission system flows from inefficiently self-scheduled resources could cause a cascade of negative impacts on costs that would extend beyond the EDAM BAA in which resources have been inefficiently self-scheduled. There could be periods of high parallel flow congestion costs for California ISO constraints that would put political and regulatory pressure on EDAM entities such as PacifiCorp to avoid paying parallel flow congestion charges by self-

[32] It would be advisable for the California ISO to investigate whether the potential for new OATT service in PacifiCorp in advance of EDAM go-live.

scheduling their OATT network resources rather than offering them into the market. While the California ISO recognizes that the self-scheduling incentives will reduce the benefits of EDAM relative to those expected under the approved EDAM design, they expect that EDAM will nonetheless yield benefits. I agree that cost reductions should occur in many hours but have concerns about the negative consequences of self-scheduling during hours with high congestion.

The proposed rules for allocating congestion revenues during EDAM start-up have both benefits and costs for California loads. The principal benefit is that the California BAA will some receive payments for parallel flow congestion revenue on California ISO constraints that are not received today and, as the California ISO suggests, these revenues could reduce the underfunding of CRRs. Further, California ISO loads should benefit if the EDAM is able to improve the unit commitment for EDAM entities, relative to their base schedules today.

On the other hand, because there is no OATT service in the California ISO, California loads will not have a way to receive a refund of the EDAM parallel flow congestion revenue they will pay through EDAM settlements. Further, there could be costs for California ISO loads due to a number of potential negative impacts of the proposed rules for EDAM start-up on the revenue adequacy of CRRs.

I encourage the California ISO to assiduously monitor self-scheduling activity, as proposed, and to prepare plans to limit it if anticipated or unanticipated EDAM scheduling activities materially affect the EDAM software solution time or have unacceptable impacts on costs or reliability. Monitoring and transparent reporting of possible problems is critical, and I provide suggestions for additional data that could be collected to assist in assessing self-scheduling and CRR revenue adequacy impacts. Based on a recent meeting, I understand that plans are underway to clarify and address CRR settlements under EDAM.[33] Prior to start-up, I suggest that the California ISO also study the potential for material negative impacts on California ISO load due to payments for parallel flow congestion costs.

My support for the Final Proposal does not encompass the two "near-term enhancements" that the California ISO has suggested it would implement by 2027: allocation of parallel flow congestion revenue to cleared, balanced day-ahead market schedules supported by monthly or yearly firm OATT service, in addition to balanced self-schedules; and allocation of parallel flow congestion revenue to CRRs. The possible complexity and negative impacts of these proposals have not been vetted by robust discussion or n stakeholder comments.

The proposed rules for congestion revenue allocation at EDAM start-up in the Final Proposal are flawed, but they are also a pragmatic step forward. They support EDAM implementation in 2026 while the California ISO and stakeholders work on an efficient and equitable long-term congestion revenue allocation design.

[33] *Memorandum from Anna McKenna to the ISO Board of Governors and Western Energy Markets Governing Body r.e., Decision on EDAM congestion revenue allocation,* June 12, 2025, p. 4, stating "Management will also explore potential congestion revenue rights modeling enhancements, through a separate process, to reduce the impact of parallel flows from neighboring EDAM balancing areas on the funding of released congestion revenue rights."