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Memorandum

To: ISO Board of Governors and Western Energy Markets Governing Body

From: Elliot Mainzer, President, Chief Executive Officer

Date: November 17, 2026

Re: **Final 2027-2029 market design roadmap**

This memorandum does not require ISO Board of Governors or WEM Governing Body action.

EXECUTIVE SUMMARY

This informational memo summarizes the ISO's final 2027-2029 Market Design Initiatives Roadmap (Roadmap) informed by stakeholder input and feedback throughout the market design catalog and roadmap development process.

The Roadmap adjusts schedules for active initiatives to allow sufficient time for further analysis, stakeholder re-engagement, and broad consensus on decisional items. It targets 2027 decisions on prioritized items in seven initiatives: Extended Day-Ahead Market (EDAM) Congestion Revenue Allocation, Price Formation Enhancements, Intertie Schedule Modeling Enhancements, Demand and Distributed Energy Market Integration, Storage Design and Modeling, Congestion Revenue Rights Enhancements, and Resource Adequacy Modeling and Program Design initiatives. Five of the decisions under these initiatives are expected to fall under the primary authority of the Western Energy Markets (WEM) Governing Body and three are expected to fall under the primary authority of the ISO Board of Governors. This approach advances near-term decisions where proposals are expected to be most mature. For efforts not expected to reach a decision in 2027, the Roadmap provides an opportunity for re-engagement and robust dialogue to advance the topics for decision in 2028 or beyond.

The Roadmap is being finalized with EDAM now in operation. The ISO and PacifiCorp successfully launched EDAM on May 1, 2026, and Portland General Electric joined the market on October 1, 2026. A functioning regional day-ahead market now provides real

operational experience that can better inform and shape the market design areas that continue to evolve. It also gives entities across the West that are evaluating day-ahead market participation a concrete basis for assessing the market and engaging in its design.

A particularly important consideration in finalizing the Roadmap is the renewed engagement of the Bonneville Power Administration (BPA) in the ISO's market design processes. BPA has conveyed its perspectives on market design through Administrator Travis Kavulla's September 3 letter to the Regional Organization for Western Energy (ROWE), its May and November 2026 comments in the catalog and roadmap stakeholder process, its comments in individual ISO market design initiatives, and recent discussions between ISO and BPA market design staff. Together, these communications express BPA's desire to re-engage on key market design topics, consistent with themes raised by other stakeholders, particularly highlighting the priority of certain initiatives. These include EDAM congestion revenue allocation, targeted market power mitigation reforms, effective scarcity pricing, attribution certainty for low-carbon emission resources under greenhouse gas accounting, and appropriate valuation of hydroelectric resource flexibility. The Roadmap reflects BPA's communications, and through the pacing of relevant initiatives in 2027, gives BPA and other stakeholders a practical opportunity to effectively engage in these efforts.

On November 13, eleven utilities wrote a joint letter[1] to the ISO's President and CEO supporting additional flexibility in the Roadmap to allow for BPA's re-engagement in the market design stakeholder processes. The utilities encouraged the ISO to give BPA and other interested entities a practical opportunity to re-engage, understand progress to date across market design initiatives, contribute their perspectives, and work through issues such as price formation and congestion revenue allocation alongside stakeholders already engaged in these efforts. At the same time, they emphasized that this should not require restarting existing initiatives, but rather thoughtful sequencing, focused technical engagement, and sufficient staff resources to further the progress and bring developed proposals to the WEM Governing Body for consideration in 2027.

The Roadmap is designed to ensure that the priorities of all stakeholders receive serious and timely consideration, while preserving the transparent, inclusive decision-making process needed to achieve durable market design improvements. It provides a clear path in 2027 to conclude the items stakeholders identified as highest priority, which align with those more recently raised by BPA and the eleven utilities. It also sets decision timelines that allow time to carefully weigh the technical and policy implications of design options and to ensure that proposals are mature and well supported before they advance.

This year, the Roadmap also introduces a new resource to help stakeholders quickly understand the status of initiatives carrying over into 2027. We have developed short briefing documents for each initiative which summarize the issues under consideration to

[1] Joint Parties comment letter, November 13

date, where alignment is emerging or issues may be resolved, and outline the design areas to be addressed in the coming months. These briefings will also make it easier for BPA and other stakeholders to re-engage without restarting existing work.

This section describes the key market design initiatives in the Roadmap and how each reflects stakeholder input, including, where relevant, the priorities BPA and other stakeholders have communicated. It then summarizes the decisions expected in 2027 and how the 2027 catalog and roadmap process will prepare for the transition to ROWE governance. Changes from the draft roadmap are summarized in the Appendix.

DISCUSSION

1. Key Market Design Initiatives

EDAM Congestion Revenue Allocation

This initiative is focused on establishing a durable, long-term design for congestion revenue allocation in EDAM, evolving from the transitional framework that is in place currently. Stakeholders supported prioritizing this work and arriving at a durable design that is workable considering the different transmission service paradigms across the evolving EDAM footprint. Stakeholders also support continued exploration of a design in which congestion revenues are allocated based on transmission rights and their effects on constraints rather than on market schedules, with continued focus on the common simultaneous feasibility test (SFT) approach for congestion revenue rights and open access transmission tariff transmission rights. BPA's September 3 letter also identified this initiative as an important topic for re-engagement, and BPA's recent comments within the initiative support continued evaluation of the described approach and various associated design elements under consideration.

Continued stakeholder engagement on congestion revenue allocation will provide opportunities for further dialogue and alignment on important elements of the design including the eligibility of other transmission service products (e.g., monthly firm and conditional firm), further consideration of CAISO balancing area Congestion Revenue Rights (CRRs) and their representation within the feasibility test, the relative merits of settling congestion revenues with EDAM entities rather than directly with transmission customers, and the treatment of congestion revenue entitlements as obligations versus options. These choices have important implications for EDAM participants, other entities considering day-ahead market participation, including BPA and its transmission customers, and the stakeholder process will provide an opportunity to evaluate these design elements and help shape a durable design.

Within the Roadmap, this initiative is prioritized for a Q3 2027 decision by the WEM Governing Body, with the objective of supporting implementation in fall 2028. This timeline is important to accommodate the anticipated entry of additional EDAM participants. The ISO

welcomes continued technical engagement by all stakeholders to resolve outstanding design questions and evaluate the associated tradeoffs.

Price Formation Enhancements

This umbrella initiative contains several topic tracks: scarcity pricing, fast-start pricing, and market power mitigation. The pacing and prioritization of these different tracks has been carefully considered taking into account stakeholder input, including BPA's September 3rd letter, which recognizes the importance of this initiative.

Scarcity Pricing

This track of the Price Formation Enhancements initiative considers both incremental design enhancements to the scarcity pricing mechanisms and a more comprehensive restructuring of scarcity pricing within the market. Most stakeholders support ensuring that scarcity pricing retains a high priority and view effective scarcity price signals as essential to appropriately compensating resources, encouraging investment, and reducing reliance on out-of-market interventions. While EDAM already incorporates scarcity pricing mechanisms, there are opportunities to evaluate both targeted refinements, such as improving price signals during emergency conditions, as well as a more comprehensive pricing design that would gradually signal increasing scarcity as it develops.

Given the complexity of scarcity pricing, a comprehensive redesign would be difficult to complete in 2027. However, more focused improvements to existing scarcity pricing mechanisms could be advanced for decision in 2027, building on proposals already developed through the stakeholder process to date.

Fast-Start Pricing

This track of the Price Formation Enhancements initiative considers the merits of fast-start pricing within the evolving EDAM footprint, considering the existing market features and products developed to value flexible resources such as the imbalance reserve product and the flexible ramping product. Stakeholders previously deprioritized fast-start pricing; consequently, no pending initiative is expected to produce a fast-start pricing decision in 2027. The ISO nonetheless plans to re-engage stakeholders in the continued discussions on this topic on the timeline indicated in the Roadmap.

Through this track, there are additional opportunities to weigh the value of fast-start pricing against alternative mechanisms, such as enhancements to the imbalance reserves and flexible ramping products, which provide opportunities to recognize and compensate the flexibility provided by hydroelectric and other dispatchable resources. During the discussions, stakeholder may introduce additional ideas for consideration.

The ISO proposes continued technical evaluation of these alternatives during 2027, including their potential benefits, costs, and interaction with existing market products, rather than committing at this stage to a specific fast-start pricing outcome.

Market Power Mitigation

This track of the Price Formation Enhancements initiative evaluates design enhancements to the accuracy and precision of BAA-level market power mitigation across the markets. Most stakeholders support evolving the market power mitigation design based on the principle that mitigation should prevent the exercise of market power without unnecessarily suppressing legitimate competitive offers or resource compensation. This was also an important market design element identified by BPA in its September 3 letter. The ISO agrees that mitigation measures should be appropriately targeted and not unnecessarily interfere with efficient price formation.

Several reforms under consideration in this track should directly address these considerations, including a design for grouping balancing authority areas for mitigation assessments, adjusting how the market calculates withholdable capacity for entities with load-serving obligations, and focusing mitigation only on suppliers determined to be pivotal. Collectively, these changes have the potential to reduce the frequency of mitigation for resources in EDAM and Western Energy Imbalance Market (WEIM) balancing areas, including BPA's balancing area.

However, additional issues must be resolved before a market power mitigation proposal is brought forward for decision. These include consideration of the treatment of the CAISO balancing area as structurally competitive or alternatively test of competitiveness. Further analysis of the effects of that treatment will be performed.

Additional work and analysis are needed to evaluate the effects of changing the CAISO balancing area's default competitive status and consideration of intertie bids within the market power mitigation framework. The ISO will continue this work, although the timeline for developing solutions and working through the implications of updated analysis is not yet clear. Even so, certain elements of market power mitigation appear particularly well positioned for a 2027 decision. The proposed grouping approach has meaningful stakeholder support, particularly from EDAM entities, even though the treatment of the CAISO balancing area remains an important unresolved issue.

Greenhouse Gas Accounting

This initiative is a broad market design effort which will be launched in 2027 to support evolving regulatory frameworks on greenhouse gas emissions in the electric sector, along with evaluation of potential market design enhancements informed by stakeholder input and EDAM operational experience.

One track of the GHG Accounting market design effort is associated with the linkage of the Washington and California emission programs and considering any associated market implications that may need to be considered. Another track is a broader market design effort focused on consideration of potential enhancements to the existing GHG accounting mechanism in effect in the EDAM and WEIM, informed by operational experience. While the EDAM's existing greenhouse gas accounting design can provide a high degree of attribution certainty for low-carbon generation, including BPA's hydroelectric resources, there are opportunities to consider further enhancements to this design as may be suggested by stakeholders or informed by operational experience. One of those potential areas of exploration is related to the "GHG net export constraint" which is intended to further reduce secondary dispatch. Another potential area of exploration is whether the concept of committed capacity within the greenhouse gas accounting framework provides sufficient means for appropriate attribution. There may be additional suggestions from stakeholders, informed by their operational experience, that can further be considered in evaluating the associated tradeoffs between any enhancements that may be considered.

The Roadmap makes space for this effort in 2027 recognizing that meaningful and robust discussions can start, but timing of a policy decision would depend on the scope of items considered, the priority assigned to the initiative, and the level of stakeholder consensus that can be achieved.

Imbalance Reserves

In its September 3 letter, BPA recognized the progress represented by EDAM's imbalance reserves product. BPA has also expressed interest in ensuring that the market appropriately values operational capacity, respects the physical characteristics and opportunity costs of energy-limited resources, and does not unnecessarily restrict the flexibility of the federal hydropower system.

The ISO sees opportunities for further alignment in this area, particularly as operating experience with the new imbalance reserves product grows.

Potential areas for evaluation include the methodology for determining imbalance reserve requirements, demand curves and offer price limits, default availability bids, multi-segment offers, and the treatment of energy-limited resources. The ISO also sees value in examining whether additional modeling capabilities could better recognize the multi-day operating constraints and interdependencies of hydroelectric resources.

Not all potential enhancements in this area will necessarily be feasible or appropriate, as each involves evaluating tradeoffs and impacts among resource flexibility, operational reliability, and market efficiency. Nevertheless, operational experience will provide an increasingly useful basis for identifying improvements. The ISO would welcome BPA's and

other stakeholders' assistance in identifying the specific operational constraints and market outcomes that warrant attention.

During 2027, the ISO intends to prioritize evaluating imbalance reserve performance with stakeholders and to consider enhancements as needs are identified. This follows through on the ISO's commitment to work with stakeholders after EDAM go-live on configuring and tuning five key market parameters that can significantly influence market outcomes: the proportion of deployed reserves, envelope constraint multipliers, the default bid price for imbalance reserves, the set of enforced constraints, and the imbalance reserve demand curve. Although this work is not explicitly reflected on the Roadmap, the ISO remains committed to collaborating with stakeholders on tuning these parameters to support efficient market outcomes as part of the existing forums on market performance. To the extent that particular market design changes are necessary, these would be included within the EDAM Market Design Enhancement initiative.

Intertie Schedule Modeling Enhancements

This initiative evaluates enhancements to the modeling of schedules at CAISO balancing area interties to improve the modeling accuracy, congestion management, and price formation of intertie schedules. The initiative also considers the potential of phasing out intertie bidding at interties between the CAISO and an EDAM balancing area. The initiative launched earlier this year and is slated for decision in Q2 2027 by the WEM Governing Body. As the initiative progresses, stakeholders can provide input on this important effort and the opportunities for engagement allow for consideration of potential alternate methods to manage and mitigate the tradeoffs associated with either part of the initiative.

Some stakeholders have also asked the ISO to make economic bidding mandatory at EDAM balancing area interties. Under the current EDAM design, each EDAM entity determines whether to allow economic bidding at its interties. In addition, a form of economic bidding is already available at EDAM interties for designated resources. The ISO believes this flexibility should remain in place until existing EDAM entities and new entrants have gained more operational experience with the market. For this reason, the Roadmap does not include an initiative to require economic bidding at EDAM interties, although stakeholders may raise the topic in a future catalog and roadmap process.

Demand and Distributed Energy Market Integration

This initiative adjusts the timing of certain tracks to focus 2027 efforts on the nonconforming load forecasting enhancements track. This work is particularly time-sensitive given the growth of data center and other significant nonconforming loads interconnecting across the EDAM and WEIM footprint. In light of that near-term focus, the demand flexibility enhancements decision has been deferred from Q3 2027 to Q3 2028. The status of the end-user exports in demand response performance measurement track has been changed from

“design development” to “California and western state agency coordination,” as the ISO will work directly with the CPUC and CEC until the CPUC releases its recommendations in June 2028 under SB 913, and will continue to coordinate with other state agencies and stakeholders as market design evolves. The “Track 1-3” prefixes have been removed from the track titles to reflect this resequencing.

Storage Design and Modeling

Topic Group 2, originally a single Q1 2027 decision, is now split so that the default energy bids decision (Q2 2027) precedes the uplift decision (Q1 2028). This responds to stakeholder requests to prioritize default energy bids while ensuring all design elements are thoroughly considered. To focus stakeholder and ISO resources on completing Topic Group 2, the Topic Group 3 (state-of-charge management) decision moves from Q2 2027 to Q3 2028, a more realistic timeline for completing both topic groups.

Resource Adequacy Modeling and Program Design

The near-term focus within this CAISO BA focused initiative for 2027 will be iterating and refining the Track 2 work on outage substitution and availability incentive mechanisms while taking into account interactions with the CPUC’s implementation of Unforced Capacity (UCAP), with a target to bring that for decision in Q3. That timing allows for continued meaningful stakeholder input and thorough exploration of implications across areas. The Track 3b decision (backstop reform and long-term CAISO BAA approach to EDAM RSE) moves from Q4 2027 to Q2 2028, reflecting the significant design work underway in other RAMPD tracks and the capacity of stakeholders and the ISO to advance these efforts concurrently. Design development for Track 3b and Track 4 (Flex RA) will also start one quarter later in 2027, allowing a focus on Unforced Capacity (UCAP) and Track 2 first. The Roadmap also targets a Q3 2027 decision by the ISO Board of Governors on Track 5, Maximum Import Capability (MIC) enhancements. This work will consider improvements to how MIC is allocated and transacted, giving load-serving entities and resource developers greater long-term certainty about import capability as they plan and contract for resources.

Congestion Revenue Rights Enhancements

The Phase 2a (modeling enhancements) decision moves from Q1 2027 to Q2 2027 to allow time to complete the necessary design work. The Phase 2b (product definition and CRR auction and allocation process enhancements) decision moves from Q3 2027 to Q2 2028 to preserve focus on EDAM Congestion Revenue Allocation, the outcome of which may affect the evaluation of potential enhancements to congestion revenue rights.

Virtual Bidding

As part of the EDAM design, virtual bidding is supported within the CAISO balancing area and is an optional feature for EDAM balancing areas joining the market. The ISO has committed to evaluating, through a stakeholder process, an EDAM-wide virtual bidding framework after two years of market operational experience. The ISO recommends that design development begin no sooner than 2029, rather than 2028, to allow time for the seven entities joining EDAM in 2027 and 2028 to gain familiarity with day-ahead market participation.

2. 2027 Decisional Items

The Roadmap includes eight decisions in 2027: five under primary WEM Governing Body authority and three under primary ISO Board of Governors authority. Decision dates are "no sooner than" dates and may change based on initiative progress and stakeholder feedback. Projected 2027 decisions are listed below by expected decisional authority.

The ROWE Board is expected to begin making decisions on design initiatives within its jurisdiction in Q1 2028. To prepare for this transition, next year's 2027 roadmap process will classify existing initiatives as ROWE-jurisdictional or non-ROWE-jurisdictional.

2027	WEM Governing Body Decisions	ISO Board of Governors Decisions
Q1		
Q2	PFE Track 1: Near-term BAA-level market power mitigation and emergency pricing	CRR Phase 2a: Modeling enhancements
	Storage Topic Group 2: Default energy bids	
	Intertie Schedule Modeling Enhancements	
Q3	EDAM Congestion Revenue Allocation	RAMPD Track 2: Outage substitution and availability and incentive mechanisms
		RAMPD Track 5: MIC Enhancements
Q4	DDEMI: Nonconforming load forecasting enhancements	

This sequencing gives the ISO and stakeholders the space and time needed to work through these issues ahead of the governance transition. Notably, most of the items

positioned for decisions in 2027 have already made substantial progress in the stakeholder process. These are critical topics that were already priorities, and recent input from BPA, the joint letter from 11 utilities, and stakeholder comments reinforce the need to focus on them and drive them to resolution in 2027. Items without established decision dates can be considered for prioritization in the 2027 catalog and roadmap process, which will also sort initiatives into ROWE-jurisdictional and non-ROWE-jurisdictional classifications before the ROWE Board begins making decisions in Q1 2028. The ISO's commitment is to give these issues serious consideration, transparent analysis, and an appropriate place in the stakeholder process—not to predetermine outcomes or establish arrangements outside that process.

NEXT STEPS

Management will present the Roadmap at the December 2026 governance meetings, highlighting the changes described in this memo and previewing the decisional items expected for 2027. The annual design catalog and roadmap process will begin again in January 2027, when stakeholders will be invited to submit potential design initiatives for ISO consideration.

APPENDIX

STAKEHOLDER ENGAGEMENT

The ISO began stakeholder engagement on the roadmap in January by opening a window for stakeholders to submit suggested market design initiatives for the catalog. Stakeholders then ranked the catalog submissions to indicate their priorities. In April, stakeholders were invited to provide written feedback through a survey, and 23 stakeholders submitted comments. The comments and survey results informed an initial roadmap published for stakeholder feedback, and that feedback in turn informed the draft roadmap.

Following publication of the draft roadmap on September 24, the ISO engaged stakeholders through three public meetings. At an October 1 stakeholder meeting, ISO design staff reviewed schedule updates for each active initiative and the considerations behind them, described stakeholder submissions not included in the draft roadmap, and previewed changes to the 2027 catalog and roadmap process. The ISO also presented the draft roadmap at a Regional Issues Forum meeting (October 5) and at a Body of State Regulators meeting (October 9) to review schedule adjustments and solicit feedback on priorities.

Stakeholders generally supported the draft roadmap and its focus on advancing existing initiatives, while emphasizing the need for realistic sequencing that allows meaningful participation. Key themes included:

- **Load-serving entities** (IOUs, public power, and others) supported the proposed portfolio but cautioned that it leaves limited capacity for additional work, and asked for clearer scope, timing, and coordination on resource adequacy, congestion costs, and demand flexibility initiatives.
- **EDAM entities and other regional stakeholders** supported additional time for technically complex regional initiatives, particularly EDAM congestion revenue allocation, and sought greater attention to EDAM intertie bidding, seams, price formation, and alignment with the transition to ROWE governance.
- **Storage, distributed energy resource, and demand response** market participants sought clearer or accelerated milestones, phased implementation, and separate tracks so that broader issues do not delay near-term improvements.
- **Price formation** views were generally divided: some participants sought faster progress on comprehensive scarcity pricing, while others supported targeted market power mitigation but opposed further work on scarcity pricing and fast-start pricing.

CHANGES FROM THE DRAFT ROADMAP

Based on stakeholder feedback, the Roadmap adds design development time for several initiatives, enabling more stakeholder engagement and analysis and, ultimately, more durable, consensus-driven proposals. The changes also reduce the number of concurrent design tracks within individual initiatives so stakeholders can engage more meaningfully on each. The table below summarizes changes to decision dates. For stakeholder submissions not incorporated into the draft or Roadmap, the ISO has published a disposition of these items with the Roadmap on November 17.

Initiative	Draft Roadmap Decision Date	Final Roadmap Decision Date
Congestion Revenue Rights Enhancements: Phase 2a, Modeling Enhancements	Q1 2027	Q2 2027
Congestion Revenue Rights Enhancements: Phase 2b, Product definition and CRR auction and allocation process enhancements	Q3 2027	Q2 2028
Demand and Distributed Energy Market Integration: Demand Flexibility	Q3 2027	Q3 2028
Intertie Schedule Modeling Enhancements	Q4 2027	Q2 2027
Price Formation Enhancements Track 1: Near-term BAA-level market power mitigation and emergency pricing	Q4 2027	Q2 2027
Price Formation Enhancements Track 2: Integrated evaluation of comprehensive scarcity pricing and market power protections	Q4 2027	Q3 2028
Resource Adequacy Modeling and Program Design: Track 2, Outage substitution and availability and incentive mechanisms	Q2 2027	Q3 2027
Resource Adequacy Modeling and Program Design: Track 3b, Backstop reform and long-term ISO BAA solutions to EDAM RSE	Q4 2027	Q2 2028
Storage Design and Modeling: Topic Group 2a: Default Energy Bids	Q1 2027	Q2 2027
Storage Design and Modeling: Topic Group 2b, Uplift	Q1 2027	Q1 2028
Storage Design and Modeling: Topic Group 3, State-of-Charge Management	Q2 2027	Q3 2028