

EDAM

EXTENDED DAY-AHEAD MARKET

REVISED

STRAW PROPOSAL



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I. Introduction & Executive Summary

A. Introduction

This revised straw proposal for the Extended Day-Ahead Market (EDAM) reflects significant stakeholder input and design changes from the initial April 28, 2022 straw proposal. The California ISO's EDAM is a voluntary day-ahead electricity market with the potential to deliver significant economic, environmental, and reliability benefits to participants across the West. EDAM will more efficiently and effectively integrate renewable resources and address the significant operational challenges presented by a rapidly changing resource mix, emerging technologies, and the impacts of climate change. EDAM builds upon the proven ability of the Western Energy Imbalance Market (WEIM) to increase regional coordination, support state policy goals, and meet demand cost-effectively.

Since its inception in 2014, the WEIM has grown to 19 participating entities and has produced more than \$2.3 billion in benefits to its participants.¹ By 2023, the number of participants will grow to 22 entities, representing approximately 79 percent of the load across the Western Interconnection. By leveraging the significant resource diversity and transmission connectivity that exists between the major supply and demand regions of the West, the WEIM has clearly demonstrated the value of strong collaboration across a broad regional footprint. EDAM will provide significant additional benefits through optimal commitment and scheduling of supply in the day-ahead timeframe. The EDAM design will apply equitably to all EDAM entities, including the ISO, ensuring a level playing field for market participants, inside and outside of California.

The EDAM design also will support the rapidly evolving western resource adequacy landscape. Recognizing there are differences in how the various programs ensure resource adequacy within their jurisdictions, EDAM will provide a market platform that complements, coordinates, operationalizes, and maximizes the value of these programs through the use of the ISO's sophisticated security constrained economic dispatch and commitment capability. This will ensure participants can account for the capacity and optimize use of resources they have procured to support reliability within their footprint.

This revised straw proposal is a result of continuing extensive, open and collaborative stakeholder engagement, including more than five hundred pages of stakeholder comments on the straw proposal and stakeholder discussions during the EDAM workshops held in July. The ISO will continue to actively engage stakeholders as it works towards completing the EDAM design. Stakeholder engagement on this revised straw proposal will resume with a day-long stakeholder meeting on August 29, 2022, followed by in-person meetings on September 7th and 8th, 2022, and the submission of written stakeholder comments by September 20th, 2022.

B. Design Changes from April 28 Straw Proposal

In the revised straw proposal, the ISO has endeavored to synthesize the valuable significant stakeholder input and build upon the initial EDAM design reflected in the straw proposal by (1) proposing important enhancements and (2) providing additional details, descriptions, and examples regarding the different EDAM design elements. This revised straw proposal delves deeper into these and the other EDAM design elements. Several significant design changes from the initial April 28, 2022 straw proposal are summarized as follows:

¹ *Western Energy Imbalance Market Benefits Report First Quarter 2022*, April 21, 2022. [Link](#)

- **Transmission Commitment in EDAM** – Firm and conditional firm point-to-point transmission rights not scheduled ahead of the Day-Ahead Market (10 a.m.) will be made available to the market to support EDAM transfers. Unsold transmission by the transmission provider will be made available to the market hurdle free. Transmission customers can voluntarily release transmission rights for EDAM optimization, and the ISO will allocate transfer revenue associated with those rights directly to the transmission customer. The design also includes a proposed mechanism for transmission providers to recover potential foregone transmission revenues resulting from their participation in EDAM. This seeks to keep transmission providers as whole as possible from a transmission revenue recovery perspective.
- **EDAM Resource Sufficiency Evaluation (RSE)** – Firm energy contracts, *i.e.*, WSPP Schedule C contracts, will count toward the EDAM RSE. Recognizing that the source and transmission may be unknown when the day-ahead market run is executed, we introduce a tagging requirement such supply cleared in the day-ahead market to provide greater confidence in these arrangements. Intertie bids at the ISO border that are under contract to an ISO LSE or otherwise have a contract under the ISO tariff will be eligible for the ISO RSE and will also be subject to the tagging requirements. Regarding EDAM RSE failure consequences, the revised proposal focuses on an administrative surcharge under all conditions to incentivize meeting the RSE. It also introduces mechanisms to address ISO LSE’s concerns regarding their discretion to manage supply above what the ISO needs to meet its RSE to better manage grid reliability challenges if conditions change between day-ahead and real-time. The pooled WEIM RSE approach is proposed, where EDAM entities passing the EDAM RSE are evaluated together, rather than individually, in the WEIM RSE.
- **Convergence Bidding** – This proposal maintains the one-year transition period to convergence bidding for EDAM entities. After that first year, the EDAM entity will have the option to adopt convergence bidding in their area or elect for another year of transition. After the second transition year, an EDAM entity would be expected to transition to convergence bidding, absent any findings that doing so poses adverse outcomes. Subsequent new entrants to the EDAM will have the same option to adopt convergence bidding at the onset of their participation or elect a one-year transition period prior to enabling convergence bidding. Throughout these transitions, the ISO will monitor the market’s performance and evaluate any unintended adverse consequences, and it will be ready to engage with stakeholders to adjust this framework as necessary.
- **Transfer Revenue and Congestion Revenue Allocation** – There will be a generally applicable 50:50 sharing of transfer revenues across all interfaces between EDAM BAAs, subject to commercial arrangements that may require exceptions. In addition, in instances where congestion arises from an internal intertie constraint enforced within a BAA, the ISO will allocate the congestion revenue fully to the BAA where the constraint is modeled.
- **GHG Accounting and Reporting** – The EDAM will start with the resource specific approach to GHG accounting because this is a known, implementable approach that

builds upon and enhances the current WEIM framework. Throughout this initiative, however, we will continue to vet and evaluate the alternate approaches, the zonal approach and a LADWP approach presented in recent stakeholder workshops, as a possible evolution of the GHG accounting framework.

- **EDAM Administrative Fee Framework** – An EDAM systems operations charge will be applied to metered flows in MWh of supply and demand. This is a similar assessment to the Grid Management Charge (GMC) system operations charge.

C. Executive Summary

The EDAM presents a comprehensive design that enables the day-ahead market over multiple BAAs participating in the WEIM. Informed by extensive stakeholder input, the revised straw proposal provides discrete solutions for specific design features.

Underlying the EDAM design are several threshold features. First, as with the WEIM, voluntary participation is a key design feature, allowing for ease of entry and exit for a WEIM entity that decides to participate in the EDAM. Second, the ISO will maintain its commitment to structuring an equitable rate design for EDAM onboarding and participation fees, resulting in fair and reasonable rates for its market participants. Finally, the market design will ensure confidence in market transfers. A robust supply pool, driven by resource sufficiency requirements, will position EDAM participants to effectively address changes and uncertainty in conditions from day-ahead to real-time, improving their response to reliability challenges.

The EDAM design leverages existing features of the ISO day-ahead market common in other day-ahead markets across the country. The design also will consider enhancements proposed in contemporaneous stakeholder initiatives that will harness flexibility across the larger footprint by incorporating an imbalance reserve product and improved price formation.

This revised straw proposal is separated into three substantive parts to facilitate review: (1) pre-market activities, (2) day-ahead market processes and features, and (3) post-market processes and outputs.

1. Pre-Market Activities and Inputs

Leading up to the day-ahead market, an EDAM entity will identify the amount of transmission available to the market and will organize its supply portfolio to meet its expected system needs.

Transmission Commitment: An EDAM entity and its transmission customers will make transmission available for the day-ahead market to commit supply within the EDAM BAA and carry out transfers between EDAM BAAs. The revised straw proposal seeks to maximize the transmission made available to support transfers between EDAM BAAs. Under the proposed design, transmission customers and transmission providers will make available to the market high-quality transmission — firm and conditional firm — between EDAM BAAs. Transmission rights associated with delivering supply to meet the resource sufficiency evaluation, *i.e.*, bucket 1 transmission, are made available to the market in return for transfer revenue as compensation. Transmission that remains unscheduled by the start of the day-ahead market at 10 a.m. will be made available for transfers between EDAM BAAs and will receive transfer revenues. Transmission customers can exercise their transmission rights after that, but may be exposed to congestion price differences. This proposal introduces the opportunity to release transmission to the market in advance of the day-ahead market in return for transfer revenues

from the EDAM, settled directly with the ISO. Firm transmission between EDAM BAAs still available and unsold before 10 a.m.² will be made available for transfers. Finally, the proposal provides a framework to enable transmission providers to recover certain transmission revenues that may be forgone as a result of their participation in EDAM. This will help keep transmission providers whole from a transmission revenue recovery perspective comparable to their pre-EDAM operations. Transmission revenues recoverable through the EDAM would include those (1) historically associated with non-firm and short-term firm point to point transmission services (wheeling access charge revenues for the ISO), (2) attributable to similar transmission services on new-build transmission facilities that increase transfer capability between EDAM BAAs, and (3) related to transfers wheeling through an EDAM entity's system in excess of its EDAM imports and exports.

Day-Ahead Resource Sufficiency Evaluation (RSE): Leading up to the day-ahead market, the ISO and each EDAM entity must have sufficient supply and reserves to meet its forecasted demand and uncertainty. The RSE design allows EDAM BAAs to test resource sufficiency on an advisory basis ahead of the day-ahead market run and to cure any deficiencies. The RSE recognizes the ability of different resources to count towards resource sufficiency, including different demand response programs. This revised proposal (1) describes how firm energy contracts count for the RSE where source and transmission may not be known ahead of the day-ahead market (*i.e.* WSPP Schedule C contracts) and (2) introduces measures to improve confidence in these arrangements such as monitoring performance and imposing tagging requirements. Also, the revised straw proposal provides consequences for failing to pass the EDAM RSE in the form of an administrative surcharge. This is intended to incentivize forward procurement of supply and passing the RSE. BAAs that pass the EDAM RSE will be tested for the WEIM RSE together as a pool, rather than individually, thus deriving the diversity benefit of imbalance reserve procurement and decreasing their overall WEIM RSE obligation.

2. Day-Ahead Market Processes and Features

The day-ahead market processes and inputs in EDAM are:

Integrated Forward Market (IFM) and Residual Unit Commitment (RUC): The IFM and RUC are the two primary processes of the day-ahead market. The IFM balances supply and demand, resulting in optimized supply committed schedules and market transfers. The RUC process runs after the IFM and will procure incremental or decremental capacity, as a backstop to the IFM, to ensure there is sufficient physical capacity to meet demand in real-time. These are integral processes commonly reflected in day-ahead market designs. Thus, the proposal retains them as part of the EDAM market design. The proposal also continues to include the requirement that all energy offered into the day-ahead market, including energy offered in excess of RSE needs, must also be offered as reliability capacity to ensure an optimal market solution across the footprint. Capacity awarded through these processes must be offered into the real-time market to ensure it is available and re-optimized based on real-time conditions.

Market Power Mitigation: Market power mitigation tools ensure that when supply is limited, suppliers cannot exercise market power to unduly influence prices. This proposal continues to extend the WEIM market power mitigation methodology to the EDAM. WEIM entities are already familiar with this design, which has functioned well. The ISO and stakeholders will continue to evaluate potential enhancements to this market power mitigation framework in the *Price Formation Enhancements*³ initiative, which we are conducting in parallel

² *I.e.*, Bucket 3 transmission.

³ *Price Formation Enhancements Initiative* web page - [Link](#).

with the EDAM initiative. Any enhancements adopted in that initiative may inform the EDAM market power mitigation structure as well.

Convergence Bidding: Convergence bidding (commonly known as virtual bidding) allows market participants to submit financial bids in the day-ahead market that do not represent physical supply or demand. Convergence bidding is a common feature of forward electricity markets and improves price convergence between the day-ahead and real-time markets. At the onset of the EDAM, there is a one year transition period without convergence bidding for the EDAM entrants to allow opportunity to gain experience in the market. At the conclusion of the transition period, the EDAM entity will have the option to enable convergence bidding in its BAA or elect for an additional one-year transitional period, after which they will transition to convergence bidding. Subsequent new entrants to the EDAM will have the same option to adopt convergence bidding at the onset of their participation or elect a one-year transition period prior to enabling convergence bidding. Throughout these transitions, the ISO will monitor the market's performance and evaluate any unintended adverse consequences, and it will be ready to engage with stakeholders to adjust this framework as necessary.

External Resource Participation: Resources located outside of the EDAM footprint may desire to participate in the day-ahead market with supply offers at EDAM boundary interties; *i.e.*, interties between EDAM and non-EDAM BAAs. This proposal continues to extend the WEIM model of external resource participation to the EDAM. Under this model, source-specific supply associated with pseudo-tied and dynamically scheduled resources can economically bid and self-schedule at the EDAM footprint boundary interties. Non-source specific supply (non-pseudo, non-dynamic) located outside of the EDAM footprint that is contracted with the EDAM entity (or a load serving entity located within the BAA) can continue to be self-scheduled at the EDAM footprint boundary interties. This framework does not permit non-specific source supply to submit economic intertie bids. We propose, however, to continue full intertie bidding – from both source-specific and non-source specific supply – at the interties between the ISO BAA and non-EDAM BAAs, which reflects the current practice in the WEIM. Intertie bidding, through the submission of economic bids, has been a longstanding feature of the ISO market design, and the ISO has mechanisms in place that mitigate the risks posed by these types of arrangements. We will work with EDAM entities, as they gain experience in the EDAM, to reevaluate intertie bidding in the future.

3. Post-Day-Ahead Market Outputs

The day-ahead market produces resource commitments and EDAM transfers that ultimately are settled, and it provides information that supports compliance with regulatory requirements.

Transfer Revenue and Congestion Revenue Allocation: Transfer revenue is the settlement difference between the revenue paid to the import transfers and the cost charged to the export transfers. The proposal puts forward a generally applicable 50:50 sharing of transfer revenues for bucket 1, 2 and 3 transmission supporting transfers between EDAM entities bringing transmission to the interface. In these instances, the ISO will allocate transfer revenue to the applicable EDAM entity. In instances where a transmission customer voluntarily releases its transmission for EDAM optimization, the ISO will allocate the transfer revenue associated with these transmission rights directly to the transmission customer. In the situations where an intertie transmission constraint (ITC) becomes binding, however, the internal congestion revenue accruing from that constraint will be allocated to the EDAM entity in whose BAA the constraint is modeled. This approach differs from how these revenues are allocated in the WEIM today, but the WEIM would be modified to adopt the allocation method.

Settlements: The ISO calculates settlement charges and payments based on market and transmission outcomes. The day-ahead market commits supply across the wider footprint and settles based on the market results. The EDAM will extend the existing day-ahead market settlement practices and timelines and develop some new settlement practices for participating BAAs and market participants. This revised straw proposal describes in additional detail the settlement implications of various EDAM design components and the different settlement charges and credits that may apply. The settlement design will continue to evolve as the EDAM policy design evolves.

Greenhouse Gas (GHG) Accounting and Reporting: The EDAM design intends to account for the costs and reporting requirements arising from state GHG accounting policies, similar to the WEIM. The proposal is to extend the WEIM GHG accounting framework – the resource specific approach – to the EDAM with some enhancements and improvements. This design uses resource specific GHG bid adders that reflect the cost of compliance and reflects the willingness of resources to be dispatched and serve demand in a GHG regulation area. This is a reasonable, known, and currently-in place GHG accounting framework that can support an initial GHG accounting design for the launch of EDAM. Nevertheless, two alternate approaches presented by stakeholders continue to be considered: (1) a zonal approach, and (2) an approach proposed by LADWP, which is an extension of the resource-specific proposal with the same constraints in place and a few key changes. We remain committed to considering alternative GHG accounting design frameworks compatible with the regulatory framework.

D. EDAM Benefits

The economic benefits of a day-ahead market across the Western Interconnection are estimated to range between \$95 and \$400 million annually, in addition to those seen in the WEIM.⁴ An EDAM will provide opportunities to build upon the financial, environmental, and reliability benefits of the WEIM through increased coordination and collaboration across the footprint.

Further, through the optimized commitment of diverse supply brought to the EDAM, along with the associated optimization of transmission across BAAs, the EDAM will position the footprint to meet its demand needs more cost-effectively. The EDAM will also enhance reliability across the footprint, and confidence in the market results through a robust resource sufficiency evaluation and an imbalance reserve product that accounts for a level of uncertainty that may materialize in between the day-ahead and real-time. Working in unison, these features will allow the market the flexibility to re-optimize the resource fleet to respond to changes in system conditions and limit the instances of stressed system conditions elevating to emergency conditions.

E. EDAM Interdependency with Existing Initiatives

Due to the breadth of the EDAM design, there are interdependencies between the EDAM initiative and other on-going initiatives. As the designs in these initiatives and the EDAM initiative evolve, it is important to consider the interplay amongst the initiatives to ensure a holistic and consistent market design.

⁴ *Extended Day-Ahead Market: Feasibility Assessment Update from EIM Entities* (2019), [Link](#); *The State-Led Market Study*, Energy Strategies, July 30, 2021. [Link](#); *Economic Benefits of an Extended Day-Ahead Market* (2022), conducted by Energy Strategies LLC. The Energy Strategies study results may have under accounted for diversity benefits and incorporated a transfer hurdle that is no longer being proposed as part of the EDAM design.

*Day-Ahead Market Enhancements (DAME) Initiative*⁵: The DAME initiative evaluates the design of an imbalance reserve product that will address ramping needs between intervals and the uncertainty that can occur between the day-ahead and real-time markets. The imbalance reserve product is an important element of the overall EDAM design because the ISO will procure it to meet any uncertainty that materializes across the EDAM footprint, leveraging the diversity benefit and reducing each EDAM entity's forward procurement obligations. The imbalance reserve product will play a critical role in supporting EDAM transfers when uncertainty materializes between day-ahead and real-time, increasing the degree of confidence that these transfers can serve load reliably.

*Transmission Service and Market Scheduling Priorities Initiative*⁶: This initiative evaluates the design for a process to establish wheeling through scheduling priority across the ISO transmission system. In particular, the initiative introduces a framework for calculating Available Transfer Capability (ATC) across the ISO interties and allowing wheeling through customers to access and reserve the ATC in advance. This will allow the wheeling through customer to establish a scheduling priority equal to load. EDAM entities seeking to utilize supply that wheels through the ISO system to support their RSE demonstrations would acquire high wheeling through scheduling priority across the ISO system to bring bucket 1 transmission to the EDAM.

*WEIM Resource Sufficiency Evaluation Enhancements*⁷: This initiative evaluates enhancements to improve the accuracy of the WEIM RSE. As stakeholders and the ISO design the EDAM RSE and consider aspects of the pooled WEIM RSE and allocation of the uncertainty diversity benefit, it is important to evaluate the interplay with the evolving WEIM RSE design and ensure proper incentives remain in place across the day-ahead and real-time markets.

*Price Formation Enhancements*⁸: This initiative evaluates several topics related to price formation, including scarcity pricing enhancements, fast-start pricing, and potential market power mitigation enhancements. The design emerging from this initiative will affect the day-ahead market and consequently the EDAM. The EDAM straw proposal moved consideration of market power mitigation enhancements to the *Price Formation Initiative* and, any changes made in that initiative would thus affect the day-ahead market, including the EDAM.

II. EDAM Market Structure

A. Threshold Issues

1. Voluntary Participation Model

Defining a comprehensive participation model is critical to the EDAM design. The straw proposal described a voluntary participation framework for a WEIM entity considering participation in the EDAM: voluntary entry and voluntary exit with a six-month notice period and no exit fees. The proposal also recognized the need for transition measures to provide protections for the ISO and EDAM entities and to mitigate adverse reliability or market outcomes resulting from EDAM participation, particularly during implementation of the market and the onboarding of individual EDAM entities.

⁵ *Day-Ahead Market Enhancement (DAME) Initiative*, web page - [Link](#).

⁶ *Transmission Service and Market Scheduling Priorities Phase 2 Initiative*, web page - [Link](#).

⁷ *WEIM Resource Sufficiency Evaluation Enhancements*, web page - [Link](#).

⁸ *Price Formation Enhancements Initiative*, web page - [Link](#).

Stakeholders expressed broad support for a voluntary participation framework that provides for ease of entry and exit at an EDAM entity level, *i.e.*, at a BAA level, because it allows an entity to evaluate benefits without a lengthy commitment. Numerous stakeholder comments requested additional information regarding the transitional measures and protections that may be established to limit unintended or adverse consequences, whether reliability or financial, during initial EDAM implementation, onboarding of new entrants, and ongoing EDAM participation. Stakeholders also sought additional information and clarity on the participation model applicable to individual resources in the EDAM and how it compares to the WEIM resource participation. Some stakeholders sought further clarity on whether the EDAM would support the concept of “base scheduling” that is a feature of the WEIM.

a) Voluntary Participation Model and Transitional Measures

Stakeholders broadly supported the concept of voluntary participation in the EDAM, namely, that a WEIM entity can choose to participate in the EDAM or continue to participate solely in the WEIM. Stakeholders also expressed support for ease of exit through a six month notice period to cease participation in the EDAM with no exit fees. Stakeholders generally expressed that six months was the appropriate timeframe to provide notice to exit the EDAM.

This proposal continues to extend the WEIM voluntary participation and responsibility model to the EDAM. In the EDAM, as in the WEIM, each participating entity would continue to retain key roles and functions that the ISO would not take on as the market operator, including: (1) resource planning; (2) transmission planning; (3) BAA operations and reliability; and (4) compliance with the associated standards. Retaining these important functions empowers participating entities to continue their long-term and short-term reliability planning and operations as they do today, while at the same time supporting their participation in the EDAM and enhancing regional coordination and reliability among participants.

WEIM entities are not compelled or required to participate in the EDAM. A WEIM entity can elect to participate only in the WEIM and not participate in the EDAM. However, WEIM participation is a pre-requisite for participation in the EDAM. In other words, a BAA cannot only participate in the EDAM; it must be a participating WEIM entity to participate in the EDAM. Also, it is possible an entity not currently in the WEIM can join the WEIM and EDAM simultaneously. Day-ahead market participation requires real-time market participation because it would be inequitable to make payments to, or charge, a participant for day-ahead market schedules without corresponding real-time market payments or charges for deviations from day-ahead market schedules based on actual production or usage.

The timeline for onboarding new EDAM entities will be similar to the timeline for onboarding WEIM entities.⁹ The onboarding process will include steps similar to the WEIM onboarding activities; although, there may be some elements that are not required for EDAM onboarding because they are already in place given an entity’s WEIM participation.¹⁰ Section II(D)(3) describes the onboarding commitment and the associated fee. The next iteration of the EDAM proposal will include additional detail on the scope of EDAM onboarding activities.¹¹

⁹ ISO Tariff, section 29.2(b)(3). Note this timing applies to WEIM entities that have joined since start-up of the WEIM, and the timing for EDAM entity participation at start-up may vary.

¹⁰ ISO Tariff, section 29.2(b)(3). An example would include the network model related tasks.

¹¹ ISO Tariff, section 29.2(b)(4)-(7). Note that the ISO established a detailed but less formal process for onboarding WEIM sub-entities. See ISO Tariff, section 29.4(c).

This proposal continues to include a voluntary exit framework from the EDAM with no exit fees and a six month notice period to exit from EDAM. This framework is consistent with the WEIM exit provisions: no exit fees and a six month (180-day) notice period.¹² Ease of entry and exit are key design concepts that allow an EDAM entity to evaluate the impacts and benefits of participation and enable the entity to cease participation if those impacts and benefits do not meet expectations. An entity exiting EDAM can still continue to participate in the WEIM. Exiting the EDAM does not affect WEIM participation.¹³

b) Transitional Protective Measures

The straw proposal described a series of transitional measures intended to protect EDAM entities if there are adverse reliability or market outcomes. Stakeholders supported the need for protective measures, including the ability to interrupt participation in the EDAM temporarily, and the comments sought additional information and background on these measures. This section describes in more detail the proposed EDAM transitional protective measures and their application. These are largely protective measures that are part of WEIM onboarding and ongoing WEIM participation.

The table below lists the transitional protective measures in the WEIM and the transitional protective measures proposed for the EDAM. The transitional protective measures are designed to protect individual EDAM entities, including the ISO as a participating entity, to the extent there are adverse reliability or market outcomes in a particular BAA or the EDAM footprint more broadly.

WEIM Protective Measures	EDAM Protective Measures
Onboarding measure: implementation date change	Onboarding measure: implementation date change
Initial participation measure: temporary suspension of WEIM participation	Initial participation measure: temporary suspension of EDAM participation
Initial participation measure: extended price correction authority	Initial participation measure: extended price correction authority
Initial participation measure: transition period pricing	On-going measure: EDAM disruption and interruption of participation in the market.
On-going measure: WEIM disruption and interruption of participation in market	Commitment to expedited market rule changes and procedures to address unintended consequences or urgent and critical enhancements.

Table 1 - comparison of WEIM transitional measures in place today, and proposed measures for EDAM that build on the WEIM measures.

Implementation Date Change: Prior to implementation, each WEIM entity joining the EDAM will be able to request a change in its implementation date if it determines it cannot proceed on that date.¹⁴ Several WEIM entities have exercised their right to change their implementation date due to lack of readiness or other factors. This is an important measure that recognizes the importance of readiness to participate in the market. The proposal is to extend this WEIM

¹² ISO Tariff, section 29.4(b)(4).

¹³ An entity choosing to exit the WEIM would independently have to exercise its decision to exit the WEIM. Having the same notice period for WEIM and EDAM will facilitate concurrent withdrawal if that is the EDAM entity's decision.

¹⁴ ISO Tariff section 29.2(b)(6)(B).

transitional protective measure to the EDAM so entities joining the EDAM can change their implementation date due to readiness concerns. Changing the EDAM implementation date would simply require the ISO to post an updated implementation timeline, including an update to any readiness notifications to inform FERC of the delay, the reasons for the delay, a new implementation date if it can be determined, and an explanation of whether the entity will need to reissue a portion or all of the readiness certification.¹⁵

Temporary Suspension of EDAM Participation: Recognizing the importance of the onboarding process and readiness to participate in the market, under the WEIM the ISO may, within 60-days following the implementation date, temporarily suspend participation of the WEIM entity for a period not to exceed 60-days.¹⁶ The ISO coordinates this temporary WEIM entity suspension with the WEIM entity. Typically this would occur in response to an unexpected market or system operational issue arising at the onset of the WEIM entity's participation. This transitional protective measure is proposed for EDAM as it will be critical during the early onboarding period to ensure that from a market, systems, and operational perspective the onboarding has not caused unexpected issues or impacts. Although this protective measure can be invoked only during the first 60-day period, if it is invoked, the period can be extended if the matter is not resolved during the 60-day resolution period.

Extended Price Correction Authority: Transition period pricing is another important transitional measure in place today in the WEIM. For a period of six-months following the implementation date, the ISO will not apply certain transmission constraints and will relax certain transmission and/or power balance constraints.¹⁷ In these circumstances, the ISO determines prices consistent with other provisions of its tariff, effectively substituting the last economic bid for what would otherwise be a parameter price. This period can be extended beyond six-months, but an extension requires FERC approval. The ISO implemented these provisions primarily to ensure the WEIM area was properly modeled, and to allow some time to monitor and adjust the model during the first six months of participation. A WEIM entity joining the EDAM will already be modeled, and potential modeling inaccuracies will already have been addressed during the first six months of WEIM participation, mitigating the risk of incorrect pricing. Thus, there is no need for a new six month transition period pricing triggered by EDAM participation. If, however, if a new entity simultaneously joins the WEIM and EDAM, the six-month transition period pricing measure would apply to its participation in both the WEIM and EDAM.

Another important WEIM transitional measure will also apply that extends the ISO's day-ahead price correction authority from five business days to 10 business days for a three month period following implementation.¹⁸ The ISO corrects prices when it determines that prices were not calculated accurately, consistent with the provisions of the ISO tariff. Extending the window for the ISO to assess and implement EDAM price corrections will help facilitate resolution of implementation-related issues associated with a new EDAM entity's participation. This protective measure has been a valuable tool in the WEIM, and extending to EDAM should provide similar value to the ISO and protection for EDAM entities.

EDAM disruption and interruption of participation in the market: The transitional measures discussed above would apply only during a limited period associated with an EDAM Entity's

¹⁵ The formal requirements are based on the current WEIM readiness process, and the ISO has requested comment on the appropriate formalities associated with EDAM readiness determinations.

¹⁶ ISO Tariff section 29.1(d); BPM for the Western Energy Imbalance Market, sections 11.4 and 11.5.

¹⁷ ISO Tariff, section 29.27.

¹⁸ ISO Tariff, section 29.35.

initial participation. There is another measure that applies beyond a WEIM entity's initial participation that the proposal seeks to apply to EDAM. Specifically, the ISO may interrupt a WEIM entity's participation in the real-time market when, in the ISO's judgment, operational circumstances have caused or are likely to cause abnormal system conditions that require immediate action to maintain system reliability or there is a communication failure that prevents access to ISO systems.¹⁹ In these instances, the ISO coordinates closely with the WEIM entity regarding the circumstances and the need for interrupting WEIM entity participation in the real-time market. For example, in limited circumstances the ISO has interrupted WEIM entity participation due to transmission outages that electrically separated two participating WEIM entities completely. In these instances, based upon coordination with the entities, interruption was necessary to ensure reliable operation of the grid. These WEIM provisions are similar to provisions the ISO can implement within its own BAA to address short-term disruptions that require a brief interruption of the market.

In the example above, if due to a particular transmission outage there is complete electrical separation between EDAM BAAs, it may be necessary to suspend participation of an EDAM entity temporarily to ensure reliable operation of its system. The ISO would not exercise this transitional measure in isolation. Rather, the ISO would closely coordinate with the EDAM entity as it does in the WEIM today. The ISO could also exercise this measure to interrupt its own participation in the EDAM by isolating its BAA from the rest of the EDAM footprint and running the day-ahead market within its own BAA separate from the rest of the EDAM footprint. This transitional measure is an important measure in limited circumstances to allow separation from the market to maintain system reliability.

Commitment to Expedited Changes Where Necessary: Participation in the day-ahead market is new to WEIM entities electing to participate in the EDAM. As the EDAM implementation progresses with its inherent system and technology complexities, the ISO will monitor potential impacts of both technology and market design. The ISO commits to expediting technology fixes and market design changes to promptly resolve issues that may arise. If the EDAM is not yielding the expected benefits or there are unexpected reliability or other significant impacts resulting from the implementation of the EDAM, the ISO would convene EDAM entities and stakeholders immediately to discuss appropriate actions to address the situation. With the voluntary entry and exit framework and the transitional measures described above, the ISO believes the overall participation framework provides sufficient measures to address and mitigate promptly any unexpected consequences that may arise through EDAM participation.

c) Resource Participation Model

Stakeholders also expressed the need for additional clarity regarding resource participation in the EDAM, and particularly on whether EDAM resources can elect designation as a participating or non-participating resource as in the WEIM, or whether all resources in the EDAM BAA will be required to participate and be represented in the market. In EDAM, all resources within the BAA will participate in the market.

In the WEIM, resources within the BAA can elect to be participating or non-participating.²⁰ A WEIM participating resource executes a participating resource agreement, which ensures that it can meet certain requirements described in section 29 of the ISO tariff for participation in the real-time market. The resource participates through a WEIM participating resource scheduling

¹⁹ ISO Tariff, section 29.7(j).

²⁰ See ISO Tariff, Appendix A – Master Definition Supplement for definition of EIM Participating Resource.

coordinator, responsible for representing it in the market. The resource's operating characteristics are known because they are registered and modeled in the market and the optimization can ensure the market respects these characteristics. A participating resource's economic bids and imbalance energy are cleared and settled in the market.

In contrast, a non-participating WEIM resource within the BAA is one that has elected not to participate in the market. Such a resource does not execute an agreement with the ISO and is not registered as available to the real-time market. The WEIM entity, working in coordination with the appropriate parties, submits a base schedule²¹ for the non-participating resource so the real-time market can account for the resource in various aspects of WEIM operation, including the overall market optimization and dispatch and considering the resource's supply in the RSE. These base schedules for non-participating resources, similar to participating resources, are not directly settled through the market – only imbalances from base schedules are settled. A WEIM entity that does not join the EDAM will continue to be subject to the current WEIM rules regarding resource participation, including the concept of base scheduling and the differentiation between participating and non-participating resources.

As noted, in the EDAM, all resources within the associated BAA will participate in the market – both day-ahead and real-time – by submitting either economic bids or self-schedules. The EDAM will not support base scheduling of resources as in the WEIM today and all resources will be settled through the market.

d) Concept of “Base Scheduling” and the EDAM

Some stakeholders requested further clarification on whether the EDAM design will extend the WEIM concept of base scheduling to the EDAM. If not, they inquired whether there are other market mechanisms in EDAM that might approximate base scheduling. They noted that base schedules submitted to the WEIM real-time market allow a participant to exclude the planned output of resources and the corresponding load it serves from real-time market dispatch and settlement and maintained that base schedule functionality would be useful in the EDAM.

Base schedules are needed for the WEIM real-time market because the WEIM is only an incremental market with incremental settlement, *i.e.*, the settlement is for deviations from base schedules, or from ISO day-ahead market schedules for the ISO BAA. Base schedules represent the WEIM entity's planned operation of its system for which the costs have already been covered. In the WEIM, base schedules are treated equal to ISO day-ahead market schedules.

Base schedules are not appropriate in the day-ahead market, however, because they can result in undue cost-shifting to other market participants. In addition, they are unnecessary because self-scheduling and the exercise of existing transmission rights can achieve a similar result to base scheduling. Base schedules in the EDAM would shift costs to other EDAM participants because they would not be settled in the day-ahead market and, consequently, would not be charged for congestion and losses. This would cause other market participants to incur inappropriate uplift charges.

²¹ An “EIM Base Schedule” is defined as “an hourly forward Energy Schedule that does not take into account Dispatches from Real-Time Market and is submitted by an EIM Entity Scheduling Coordinator, EIM Sub-Entity Scheduling Coordinator, or EIM Participating Resource Scheduling Coordinator for use in the Real-Time Market.” See ISO Tariff, Appendix A – Master Definition Supplement.

The WEIM real-time market roughly accounts for congestion costs caused by real-time base schedules by allocating congestion costs to the BAA in which they are incurred. This results in the congestion costs being allocated to the EIM entity responsible for the base schedules. These costs do not necessarily reflect all of the congestion base schedules cause. Base schedules can cause congestion and resulting redispatch costs ultimately allocated to other BAAs. This cost shifting has been accepted in the WEIM because the overall real-time redispatch is relatively small compared to the overall energy production. This cost shifting, however, would be significant in the EDAM because the day-ahead market is not an incremental market, it is based on the full amount of supply and demand scheduled for the next day.

Similarly, day-ahead market base schedules would interfere with the day-ahead market's settlement of losses, again shifting costs. Losses for WEIM real-time market base schedules are accounted for by the WEIM RSE's balancing test that accounts for losses in determining whether a BAA's supply and demand schedules are balanced. The loss rate used is the BAA's loss rate that is used for the BAA's own settlement, outside of the ISO market, representing the arrangements for their planned operation reflected as base schedules. This loss rate is presumably based on average loss, *i.e.*, based on overall losses, and not marginal losses. The WEIM's settlement is only incremental to these base schedules. However, the day-ahead market is based on the full amount of supply and demand to be scheduled for the next day, and the price for losses is based on the marginal loss rate. Thus, significant cost shifting could incur if losses for base schedules are not settled in the day-ahead market.

The EDAM will permit an end result similar to base scheduling through self-scheduling of supply and the exercise of existing transmission rights, but the resources' will be directly settled through the market with the ISO. A self-schedule in the market indicates that the resource does not have an economic offer expressing a willingness for the market to optimize and commit it. Self-scheduled resources are price-takers that want their output to flow irrespective of market prices. As discussed below, transmission customers can also utilize their transmission rights and associate or pair their transmission rights with a self-schedule. This reflects that the participant submitting a generation self-schedule wants the resource's output to flow and that it has existing transmission rights – whether under the OATT or legacy arrangements – to deliver that generation. This pairing of existing transmission rights and a self-schedule ensures through settlements that the participant exercising these rights is not charged for transmission and is held harmless for the congestion component between source and sink.

If a load serving entity wants to continue paying the same contract price for generation that it paid prior to EDAM and not be subject to fluctuations in price driven by market efficiency, it can consider adjustments to the contract to capture a “contract for differences.” A contract for differences allows supply and load to agree on an energy price and then make side payments outside of the centralized market to keep each other whole to that price. If the market price is above the agreed price, then the supplier pays the load serving entity the difference, and if the market price is below the agreed price, the load serving entity pays the supplier the shortfall.

Thus, a combination of self-scheduling of supply and the exercise of existing transmission rights, along with a contract for differences, can achieve a result similar base scheduling, with

the understanding that full settlement will occur through the market to avoid the inefficient and adverse market impacts noted above.²²

Finally, it is unnecessary for EDAM participants to submit base schedules to the real-time WEIM because EDAM participants will have day-ahead market schedules. Also, they could result in adverse market incentives. The day-ahead and real-time markets work together and proper functioning of the markets relies on balanced incentives between the markets. For example, exposure to potentially high real-time market prices provides a valuable incentive to schedule demand close to forecast in the day-ahead market. Allowing day-ahead market participants to avoid exposure to real-time market prices by submitting real-time market base schedules would undermine this incentive. If an EDAM entity requires documentation demonstrating its ability to serve or deliver energy akin to base scheduling, the design can include processes for creating that documentation, including tracking of e-tags or schedules in the market.

2. Confidence in Market Transfers

Establishing confidence in market transfers is a critical design component of the overall EDAM framework. Load serving entities and BAAs rely on bilateral procurement of supply and transmission to deliver supply reliably to serve load. In the EDAM, these same load serving entities and BAAs will make resources and transmission available to the market, which will derive an optimal solution for serving load across the EDAM footprint by optimally scheduling transfers between EDAM BAAs. The EDAM design should build collective confidence in transfers emerging out of the market and enhance the capability of the EDAM entity and the market to respond to stressed system conditions.

The straw proposal described different elements of the design that contribute to the confidence in transfers. Transfers are scheduled optimally in the market after self-schedules, which are price-takers. A transfer can only be scheduled if there is sufficient available supply in the source EDAM BAA, and the economics and scheduling limits allow it. If the sink EDAM BAA has passed the EDAM RSE, meaning it has sufficient supply capacity bids in the market to meet all of its requirements, energy transfer imports will economically displace supply capacity that can then be used to support export transfers of imbalance reserve in the IFM or reliability capacity in the RUC. This results in the most efficient solution where economic resources are scheduled for energy, and more expensive resources are scheduled for capacity services.

Stakeholders largely supported the notion that ensuring confidence in EDAM transfers is a critical element of the overall design because entities will depend upon these transfers to serve load, and there should be confidence that these will materialize as expected. Stakeholders also largely supported the concept of “equal priority” between load and transfers in stressed conditions. At the same time, stakeholders requested additional information and examples on how this “equal priority” will be effectuated both in the market and operationally, while ensuring each EDAM BAA continues to retain operator discretion and the ability to perform its function as the balancing authority. A few stakeholders expressed concern with the perception that the ISO – as market operator – would assume a reliability management role, and they sought clarification on the roles and responsibilities of the various entities, particularly in the operational timeframe. One stakeholder raised concerns about how the equal priority may be effectuated

²² We recognize that there may be unique circumstances requiring a demonstration that absent the market the entity was ready and capable of serving load and meeting its obligations; e.g., statutory or regulatory requirements. Nonetheless we believe that a self-schedule of generation, paired with exercise of existing transmission rights, can provide a demonstration that particular generating resources are operational and deliverable to meet load needs.

by an EDAM entity in relation to the operational tools already provided for under the OATT construct.

a) EDAM Design and Market Elements Building Confidence in Transfers

Several design elements, described further in this proposal, help build confidence in EDAM transfer schedules.

- *Resource Sufficiency Evaluation (RSE)* - Each EDAM BAA is expected to have sufficient supply bids in the market to meet their own demand, ancillary services, and uncertainty requirements. This is enforced by a multi-pass RSE that incentivizes performance through various consequences for failure. This in turn allows economic scheduling of energy and capacity transfers while meeting all supply requirements.
- *Market optimization through IFM and RUC* - All supply capacity bid into the IFM is also bid into the RUC. Transfers scheduled in the IFM and RUC constitute firm schedules, and they must be tagged similar to all import and export schedules. The day-ahead market optimization will ensure forecasted demand, including reasonable uncertainty, can be met by scheduled supply while also serving EDAM transfers out of the BAA. Transfers are only scheduled out of an EDAM BAA if the scheduled load and uncertainty can be feasibly met with scheduled supply and imbalance reserve awards.
- *Robust transmission availability* - All intertie transmission capacity used for transfers in the IFM and the RUC remains available in the WEIM. This enables capacity transfers that counter flow on energy transfers in the EDAM, allowing them to be scheduled optimally as energy transfers in the WEIM to meet uncertainty that actually materializes.
- *Imbalance reserves* – The IFM will efficiently commit and procure imbalance reserves across the EDAM footprint to cover uncertainty that may materialize in real-time. All imbalance reserve and reliability capacity awards in the EDAM have a must offer obligation in the WEIM. Thus, all of these capacity awards are available for optimal dispatch in the WEIM, potentially counter flowing on day-ahead energy transfers to address real-time needs such as materialized uncertainty.
- *Market parameters preventing propagation of shortfalls* – the proposal is to include a BAA power balance constraint that, during stressed conditions, and after the market has done all it can to remedy a reliability event, will isolate the supply shortfall in the BAA that caused the shortfall without relaxing the constraint in other BAAs, thus avoiding propagation of the shortfall and reliability implications.

The aforementioned design elements contribute to the collective confidence in market transfers; *i.e.*, that in stressed system conditions the market will be able to respond effectively by leveraging these design elements along within a robust supply pool and imbalance reserve product to avoid stressed conditions from becoming emergency conditions. Once the market has exhausted all available options, *i.e.*, exhausted available supply to resolve stressed conditions in one or more BAAs, each EDAM BAA may rely on its own operational tools at their disposal to manage grid conditions to maintain reliability and avoid load shed within its BAA.

This proposal continues to afford EDAM transfers a priority equal to load throughout stressed, “edge” or “corner” case conditions, when neither the market nor operational tools have adequately resolved the reliability conditions, and the EDAM BAA faces the prospect of load

shed. This priority would remain subject to operational coordination with neighboring BAAs and operational discretion, which are integral parts of responding to reliability events and meeting the reliability obligations that remain the responsibility of each individual EDAM entity.

b) Effectuating confidence in transfers through the market – equal priority to load

If a BAA has insufficient supply capacity to meet its demand in the WEIM, import energy transfers will be scheduled optimally from other BAAs to serve the supply shortfall. If import transfers are restricted by scheduling limits or the available supply capacity in other WEIM BAAs is exhausted, and there is still unserved demand, the power balance constraint in the BAA that is short will be relaxed at a penalty price. However, the insufficiency will be restricted to short BAAs; it will not relax the power balance constraint in other BAAs. This occurs because the ISO has implemented a special constraint in the WEIM that does not allow simultaneous relaxation of the power balance constraint and a net export transfer above the base net transfer.²³ As a result, the net export transfer will be reduced to the net base transfer before the power balance constraint is relaxed.

The proposal is to implement a similar constraint in the EDAM, not only for energy transfers, but also for capacity transfers. The constraint for energy in the IFM will not allow simultaneous relaxation of the power balance constraint and a net export transfer above what can be exported on bucket 1 energy transfers. The constraint for imbalance reserves in the IFM will not allow the simultaneous relaxation of the imbalance reserve procurement constraint in the imbalance reserve deployment scenarios or a net imbalance reserve export transfer above what can be exported on bucket 1 imbalance reserve transfers. The constraint for reliability capacity in the RUC will not allow the simultaneous relaxation of the reliability capacity procurement constraint and a net reliability capacity export transfer. These constraints will collectively ensure that a BAA will first meet its own requirements before it will export energy or capacity to other BAAs.

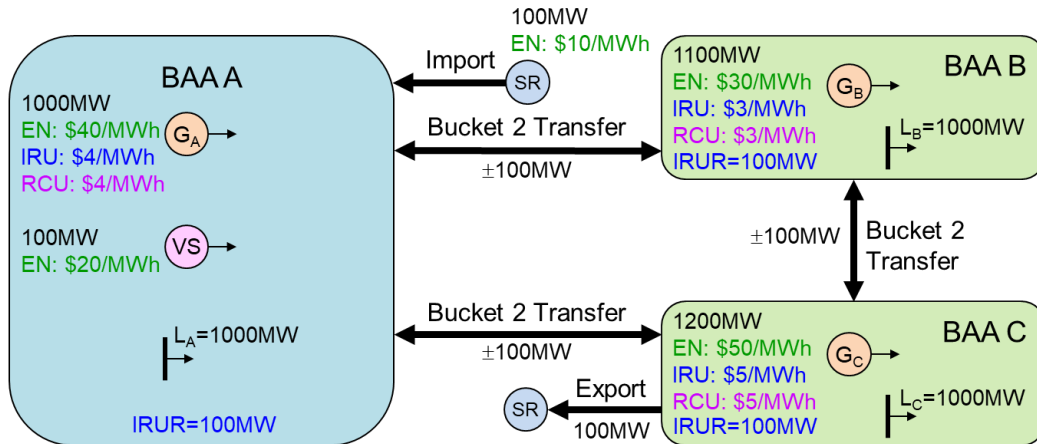
In stressed system conditions, after the WEIM has exhausted available supply, it will signal infeasibility by relaxing the power balance constraint in the BAA with insufficient supply. Under these circumstances, day-ahead and base transfers will be afforded apriority equal to load, subject to operational coordination and good utility practice.

The following examples illustrate the use of transfers in the EDAM and continuing in the WEIM under various scenarios, including scarcity conditions as an “edge” case. These examples illustrate how the market relies upon the different design components, including power balance constraint relaxation, to manage stressed conditions and afford equal priority to transfers and load within the market.

²³ The formulation of the constraint is illustrated in Appendix 3 of the document.

The examples are based on the following setup of three EDAM BAAs:

EDAM Transfer Example Setup



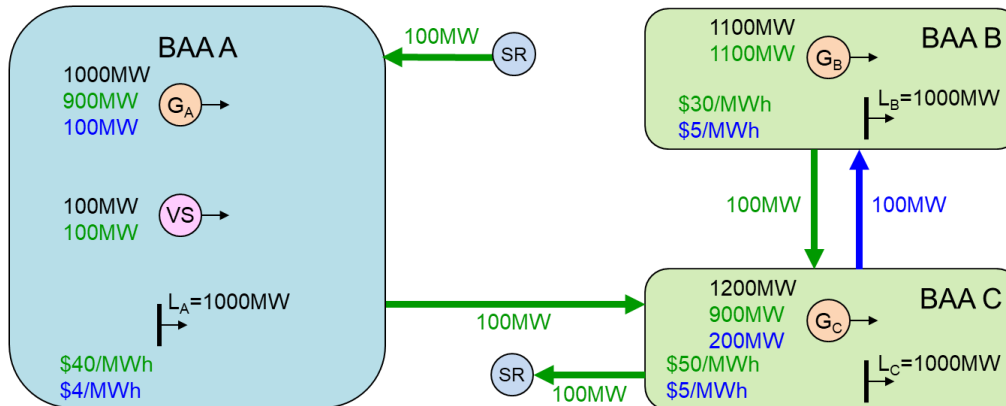
There are 100MW bi-directional bucket 2 transfers between each BAA pair. Transmission losses, ancillary services, imbalance reserve down, and reliability capacity down are ignored for simplicity. Each BAA has a 1000MW self-scheduled load, which is equal to the respective demand forecast, and a 100MW imbalance reserve up requirement (IRUR).

- BAA A has a generating resource (GA) with a 1000MW bid for energy (EN) at \$40/MWh, imbalance reserve up (IRU) at \$4/MWh, and reliability capacity up (RCU) at \$4/MWh. There is also a virtual supply bid (VS) for 100MW at \$20/MWh and an import bid (SR) from a non-EDAM BAA for 100MW at \$10/MWh.
- BAA B has a generating resource GB with an 1100MW bid for energy at \$30/MWh, imbalance reserve up at \$3/MWh, and reliability capacity up at \$3/MWh.
- BAA C has a generating resource (GC) with a 1200MW bid for energy at \$50/MWh, imbalance reserve up at \$5/MWh, and reliability capacity up at \$5/MWh. There is also an export self-schedule (SR) to a non-EDAM BAA for 100MW.

All three BAAs pass the RSE because they have sufficient supply in the market to meet their demand forecast and imbalance reserve up requirement.

The optimal solution in the IFM is as follows:

IFM Solution



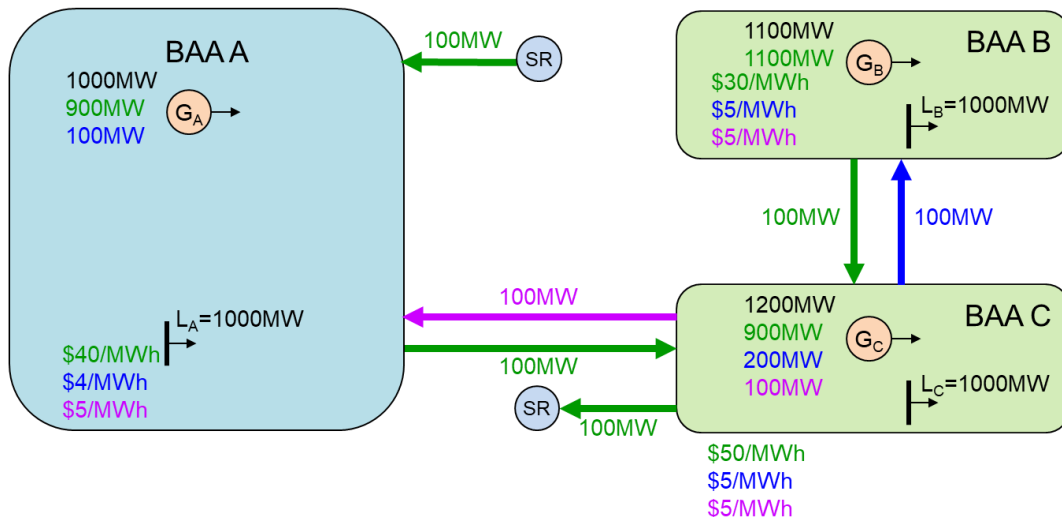
The supply cost is lowest in BAA B and highest in BAA C; therefore, the optimal solution is to maximize the energy transfers (green) from BAA A to BAA C, and from BAA B to BAA C, scheduled at their scheduling limit of 100MW. The import and the virtual supply are fully scheduled in BAA A, whereas the generating resource G_A is marginal at 900MW setting the LMP in BAA A at \$40/MWh. The generating resource G_B in BAA B sets the LMP in BAA B at \$30/MWh (assumes the availability of additional supply). Finally, the export is fully scheduled and the generating resource G_C in BAA C is marginal at 900MW setting the LMP in BAA C at \$50/MWh. There is energy price separation among the three BAAs because the energy transfers between them are scheduled at their scheduling limit.

In the IRU deployment scenario, the generating resource G_A in BAA A is awarded 100MW imbalance reserve up satisfying the imbalance reserve up requirement and setting the imbalance reserve up price in BAA A at \$4/MWh. In BAA B, there is no available generating capacity; hence, the imbalance reserve up requirement is met by the generating resource G_C in BAA C via an imbalance reserve up transfer (blue) of 100MW. The generating resource G_C is awarded 200MW imbalance reserve meeting the imbalance reserve requirements of both BAAs B and C, setting the imbalance reserve up price in these BAAs to \$5/MWh. There is no price separation for imbalance reserve up between BAAs B and C because in the deployment scenario the net transfer between them is zero because the 100MW deployed imbalance reserve up transfer from BAA C to BAA B counters the energy transfer from BAA B to BAA C.

Note that when BAA B exports 100MW of energy to BAA C, it becomes short in meeting its own imbalance reserve up requirement. However, that 100MW import transfer into BAA C displaces 100MW of more expensive generating capacity from G_C , which is then used to serve the imbalance reserve up requirement in BAA B via an imbalance reserve up transfer countering the energy transfer import. This is the most efficient solution where energy and imbalance reserve are co-optimized.

The optimal solution in the RUC is as follows:

RUC Solution

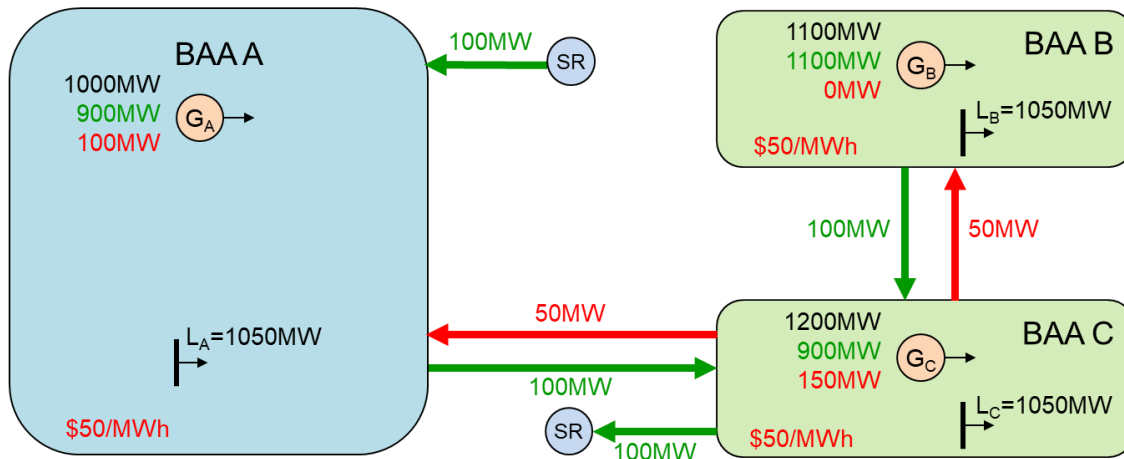


Because the load self-schedules are equal to the demand forecast in each BAA and they clear the IFM, there are no reliability capacity requirements in BAAs B and C. However, in BAA A, there is a 100MW reliability capacity up requirement to substitute for the 100MW virtual supply VS schedule that cleared the IFM. There is no available supply in BAA A. When BAA A exports 100MW of energy to BAA C, it becomes short in meeting its own reliability capacity up requirement. Nevertheless, that 100MW import transfer into BAA C displaces 100MW of more expensive generating capacity from GC, which is then used to serve the reliability capacity up requirement in BAA A via a reliability capacity up transfer (purple) countering the energy transfer import. The generating resource GC in BAA C is awarded 100MW reliability capacity up setting the reliability capacity price for all BAAs at \$5/MWh. There is no price separation for reliability capacity up between BAAs A and C because in the RUC the net transfer between them is zero as the 100MW deployed reliability capacity up transfer from BAA C to BAA A counters the energy transfer from BAA A to BAA C.

In the next three scenarios we consider the different levels of uncertainty materialize that materialize in the WIEM. All imbalance reserve and reliability capacity awards from the EDAM have a must offer obligation, and they are available for dispatch in the WEIM, assuming at the same energy bids as in the EDAM. The 100MW bidirectional transfer capacity between the three BAAs is also available in the WEIM.

In the first scenario, 50MW of upward uncertainty materializes in each BAA:

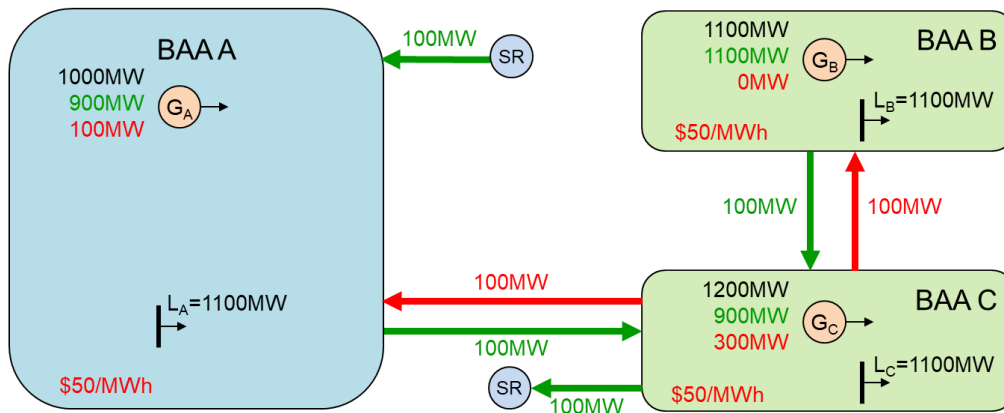
WEIM Solution 50MW Uncertainty Materialized



The demand forecast in each BAA is now 1050MW. The optimal solution for imbalance energy (red) is shown as a positive deviation on the EDAM solution (green). In BAA A, the generating resource G_A is dispatched up 100MW to its full capacity, yet BAA A is short by 50MW, considering its 100MW day-ahead export transfer commitment to BAA C. The generating resource G_B in BAA B is at full capacity; thus, BAA B is also short 50MW considering its 100MW day-ahead export transfer commitment to BAA C. However, the generating resource G_C in BAA C has 300MW of available capacity; therefore, it is dispatched up 150MW to meet the uncertainty in its own BAA C and also in BAAs A and B via dynamic export transfers of 50MW that counter flow on the day-ahead transfer imports. G_C sets the real-time LMP at \$50/MWh in all BAAs.

In the next scenario, all of the 100MW of upward uncertainty that was the EDAM requirement materializes in each BAA:

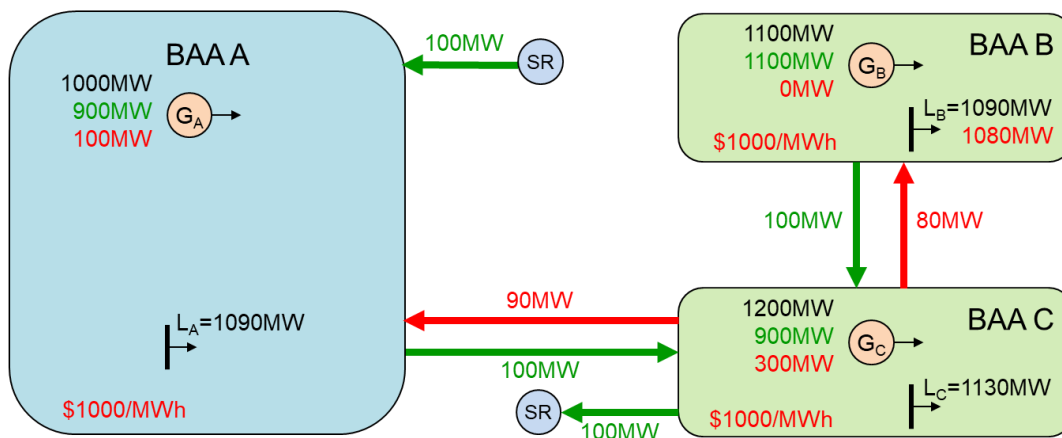
WEIM Solution 100MW Uncertainty Materialized



The demand forecast in each BAA is now 1100MW. The generating resource GC in BAA C is now dispatched up 300MW to its full capacity to meet the uncertainty in its own BAA C and also in BAAs A and B via dynamic export transfers of 100MW that fully reverse the day-ahead transfer imports. GC sets the real-time LMP at \$50/MWh in all BAAs.

In the third and last scenario, we examine an edge case where a total of 310MW of upward uncertainty materializes in the WEIM, *i.e.*, 10MW more than the imbalance reserve requirement in EDAM. Assume that the distribution of the materialized uncertainty is 130MW in BAA C and 90MW in each of the BAAs A and B. The optimal solution in the WEIM is as follows:

WEIM Solution 90/90/130MW Uncertainty Materialized



The demand forecast is now 1130MW in BAA C and 1090MW in BAAs A and B. The generating resource GC in BAA C is dispatched again up 300MW to its full capacity to meet the uncertainty in its own BAA C and also in BAAs A and B via dynamic export transfers totaling 170MW that partially reverse the day-ahead transfer imports. Nevertheless, the materialized uncertainty in BAAs A and B totals 180MW; thus, the market footprint is short by a 10MW supply. Consequently, the WEIM will relax the power balance constraint in either BAA A or BAA B (same penalty cost) to resolve the infeasibility. In the example, the power balance constraint in BAA B is relaxed by 10MW, effectively reducing the served load to 1080MW. The real-time LMP is \$1000/MWh in all BAAs, set by the power balance constraint relaxation penalty price.

Note that affording priority to day-ahead energy schedules results in the WEIM making full use of all available supply and transmission capacity to resolve the infeasibility before resorting to a power balance constraint relaxation. Note further that the power balance constraint in BAA C will not be relaxed while BAA C has a net export transfer above its day-ahead reference (-200MW). This suggests that BAA B should not cut the day-ahead transfer export of 100MW to BAA C because that would only reduce the counter flow dynamic transfer import (80MW) from BAA C. If there is at least 10MW of available balancing capacity up in BAA B, the WEIM will dispatch that to avoid a power balance constraint violation.

The result in the final example may not seem intuitive because the power balance constraint is relaxed in either BAA A or BAA B, while the outlier quantity of uncertainty materialized in BAA C. However, this is an appropriate result considering both the priority being proposed for EDAM energy transfers, as well as uncertainty being procured for the EDAM footprint as a whole following allocation of the diversity benefit. The core issue illustrated in this example is the failure of the footprint as a whole to procure sufficient imbalance reserves, rather than the locational nature of where the uncertainty materializes in real-time. Isolating the power balance infeasibility to the EDAM BAA in which it occurred would require not offering priority to EDAM transfers, which undermines confidence in the market results itself and, in turn, creates more uncertainty for each EDAM BAA moving into real-time. We request stakeholder feedback on the appropriateness of the outcomes of all three examples.

c) Effectuating Confidence in Transfers in the Operational Timeframe – Equal Priority to Load

It is important to acknowledge that the EDAM does not establish a unified BAA as an ISO/RTO would. Rather, each EDAM entity continues to be responsible for managing operational reliability within its own BAA. Similarly, neither is the ISO as market operator responsible for or otherwise directing transmission operation or balancing supply and demand in individual EDAM BAAs, up to and including curtailments and potential load shed, as these functions remain the responsibility of each individual BAA. As illustrated in the examples above, in stressed system conditions, the market will utilize the tools available at its disposal to resolve the reliability event whether driven by higher level of uncertainty materializing, or loss of transmission and/or generation. In certain edge cases, the market may not be able to resolve the reliability event and the EDAM BAA may need to fall back on its operational tool set to manage reliability much as it does today.

In those edge cases where uncertainty materializes higher than what the market dispatched or committed as available supply and imbalance reserves, the EDAM BAA will revert to its operational tools to maintain and manage grid reliability. If for example, the market infeasibility may have been isolated within the EDAM BAA that is facing a shortfall, the BAA would revert to

manual action to manage insufficiency. The operational tools available to each BAA may vary, but generally include:

- Excess supply that may have been retained in the BAA to call upon in emergency conditions;
- Emergency assistance from neighboring BAAs;
- Reserve sharing groups;
- Curtailment of lower priority transactions on the system;
- Emergency supply programs such as demand response and other generation; and
- Deployment of operating reserves and arming firm load.

In an imminent load shed situation, as the EDAM BAA operators will coordinate with neighboring BAAs pursuant to good utility practice prior to curtailing transfers out of its BAA to another EDAM BAA and shedding load, the BAA facing the reliability event could coordinate with the EDAM BAA depending upon the transfer to determine whether curtailment of the transfer would place that BAA into a reliability event. If curtailing a transfer schedule to the receiving EDAM BAA would not place that BAA into an emergency condition, the EDAM BAAs could coordinate such that the BAA facing the emergency condition may curtail the transfer schedule ahead of load to avoid load shed. In footprint-wide stressed conditions where curtailment of a transfer would likely place the receiving BAA in an emergency condition, however, the proposal is that the equal priority be honored. In those situations, transfers would be curtailed by the EDAM entity proportional to its load shed. This approach promotes confidence in transfers through the concept of equal priority between market transfers and load, while providing flexibility for operational coordination and discretion to ensure reliable operation in each BAA and the grid as a whole.

d) Priority of Transfers to EDAM BAA not Passing the RSE

The straw proposal introduced the question of whether market transfers to an EDAM BAA that failed the day-ahead RSE should have a lower priority than load, *i.e.*, a lower priority than transfers among EDAM BAAs that passed the day-ahead RSE. Most stakeholders that commented on this topic indicated that a lower priority should be attributed to transfers to an EDAM BAA that did not pass the RSE. The rationale was primarily an equity concern that an EDAM BAA could come into the day-ahead not fully sufficient and benefit from equal priority in transfers along with EDAM BAAs that made the investments in supply to pass the RSE.

The proposal is that EDAM BAAs have the operational discretion to afford a lower priority – akin to a conditional firm concept in the OATT²⁴ – to transfers sinking into an EDAM BAA that failed to pass the day-ahead RSE. The market would continue to take action as described in the transfer examples above but, if there ultimately is an infeasibility and the sourcing EDAM BAA has exercised its operational tools, it would have the operational discretion to curtail the transfer schedule ahead of its load to prevent load shed. In this situation, as the source and sink BAA are coordinating, the source BAA may also choose to afford the transfer equal priority to load recognizing the impacts that curtailment of the transfer schedule would have on the receiving BAA. Supporting operational discretion in EDAM, particularly in stressed system conditions, and providing flexibility in how BAAs exercise that discretion will help maintain reliability and

²⁴ The priority afforded here is slightly lower than high priority, where in a load shed situation the transfer to the EDAM BAA that failed the RSE can be curtailed ahead of load based on the operational discretion and coordination of the EDAM BAA.

mitigate propagating reliability conditions across the EDAM footprint. At the same time, this will help instill confidence in the underlying transfers that are vital to realizing the benefits of EDAM participation.

B. Pre-Market Processes

Leading up to the day-ahead market start at 10:00 a.m. the day prior to the operating day, the ISO and EDAM entities will continue to perform the same critical tasks they do today – organizing their supply portfolio to meet the expected needs on their system and ensuring there is sufficient transmission to meet these needs. These activities, which are an essential part of each BAA’s existing processes, will support the evaluation of each EDAM entity’s resource sufficiency in the day-ahead market. This section discusses the processes associated with the resource sufficiency evaluation and the steps of making transmission available in the EDAM to support transfers among participating BAAs.

1. Transmission Commitment in EDAM

Transmission availability in the EDAM, both internal to a participating BAA and on interties between participating BAAs, is foundational to achieving a well-functioning, efficient, and reliable day-ahead market. As the day-ahead market optimally commits resources, availability of transmission to the market is critical to identifying efficient transfers of supply across the EDAM footprint to meet load obligations reliably. As discussed earlier, in the EDAM, transmission service providers continue to maintain their Open Access Transmission Tariff (OATT) and, while in EDAM, continue to administer sales of transmission service under their OATT. The proposed EDAM design attempts to maximize the amount of transmission made available under different transmission structures, while accommodating both the ISO’s organized market transmission design and the OATT framework. Maximizing the availability of high quality transmission to the EDAM allows all participating EDAM entities to derive robust benefits.

The straw proposal introduced the concept of transmission “buckets” that outlined how transmission customers with transmission rights at interfaces between EDAM BAAs make these transmission rights available to the market and how transmission providers make unsold transmission available. We asked whether transmission customers should make their transmission rights – bucket 2 transmission – available under a voluntary framework, or whether transmission that is unscheduled by the start of the day-ahead market run should automatically be made available to the EDAM to optimize transfers between areas. Additionally, we considered whether (1) the transmission provider’s unsold transmission – firm available transmission capacity (ATC) – should be made available to the market at hurdle rates that are considered within the market optimization or (2) the transmission costs should not be considered in the optimization and the costs of transmission recovered after the fact. More broadly, we indicated it was leaning toward a design under which historical transmission revenue requirement shortfalls associated with specific transmission products would be recoverable through the EDAM, thus keeping the EDAM entity whole from a historical transmission revenue requirement perspective.

Stakeholder comments provided thorough, yet divided, perspectives on the different elements of the proposed design and options identified. Generally, stakeholders were divided on whether transmission rights held by transmission customers should voluntarily be made available to the market or whether unscheduled transmission automatically be made available to the market. Some stakeholders stated that a voluntary framework for making transmission rights available to

the market would preserve the value of those rights and such transmission rights should be made available to the market only at a hurdle rate. On the other hand, some stakeholders expressed market efficiency concerns with the voluntary framework and withholding of transmission. They expressed a desire that unscheduled transmission automatically be offered into the market to support robust transfers and benefits. Regarding the availability of unsold transmission to the market, most stakeholders (1) supported moving away from hurdle rates in the optimization due to market efficiency impacts and (2) favored developing a mechanism to ensure historical transmission revenue recovery to account for potentially foregone short-term firm and non-firm transmission sales under the OATT.

This proposal continues to support the transmission “buckets” framework as a simple way to distinguish characteristics and attributes of how transmission is made available to the market. Under this framework, the ISO identifies different ways transmission rights can be exercised and made available ahead of the market run, and how transmission rights not scheduled by 10 a.m. are made available to the market to optimize as transfers. The proposal also includes a more detailed design where (1) transmission providers make unsold transmission, *i.e.*, unsold firm ATC, available to the market hurdle-free and (2) still allows them to be kept whole from a transmission revenue requirement perspective by accounting for potential foregone revenues resulting from their participation in the EDAM.

The following sub-sections describe in more detail the proposed design and associated rationale and provide a more detailed view into the stakeholder comments.

a) Transmission at Interfaces Between EDAM Areas – Supporting Transfers

Prior to the day-ahead market run, each EDAM entity will identify the transmission capacity that can be available to the day-ahead market at the interfaces between EDAM BAAs to support transfers. The straw proposal focused on the concept of transmission “buckets” to define how entities can make transmission capacity available for transfers. The three transmission buckets are discussed below, including multiple potential options for the third bucket to address inefficiencies associated with potential rate pancaking. We use the “bucket” framework to differentiate between transmission purchased to support resource sufficiency, transmission purchased by transmission customers but not needed for resource sufficiency, and unsold transmission by the transmission provider. The figure below graphically illustrates some of the attributes and characteristics of the different transmission buckets that will be discussed in more detail below.

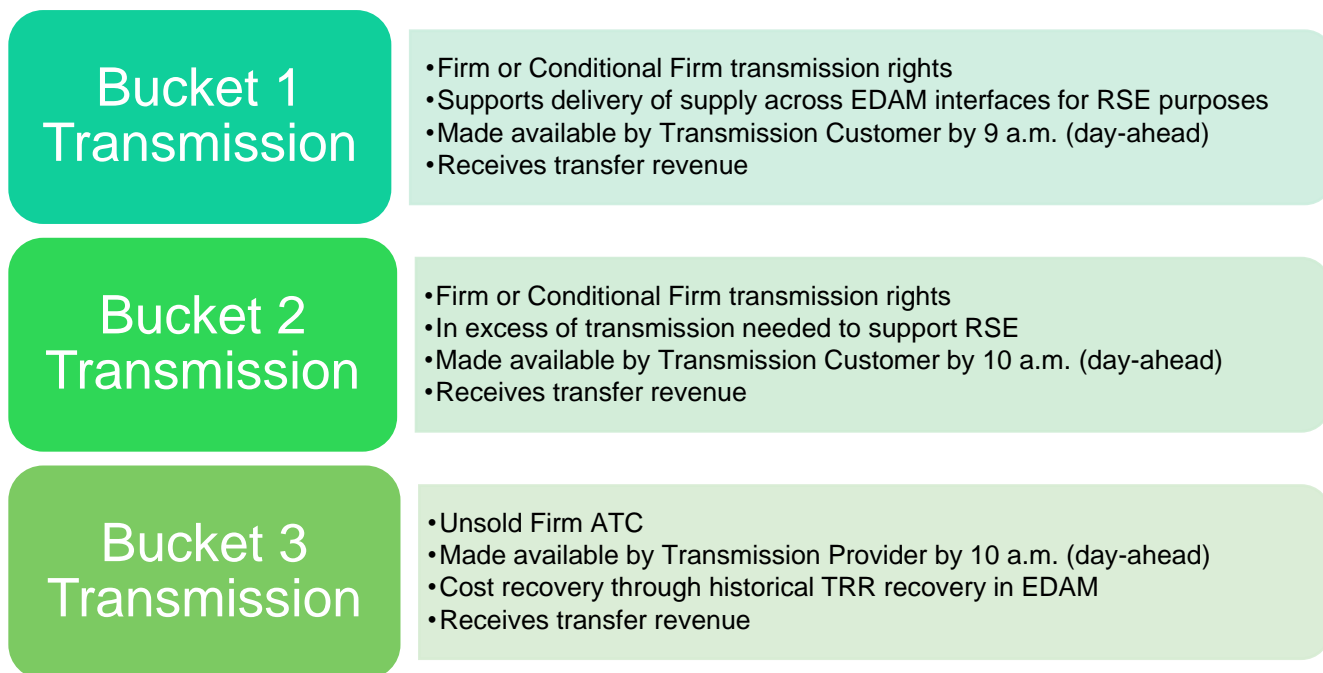


Figure 1: Description of the transmission buckets framework.

Although these buckets largely merge from an operational standpoint, the bucket labels are helpful to differentiate the compensation options, who is making the transmission available, and cost recovery mechanisms.

(1) Bucket 1: Transmission to Support Resource Sufficiency

Stakeholder comments regarding bucket 1 transmission largely agreed it is foundational to the EDAM RSE. As EDAM entities demonstrate resource sufficiency, *i.e.*, that they have sufficient supply to meet next day forecasted load for the next day plus uncertainty, the ability to deliver resources that count towards meeting the RSE and serving load is a key component of the EDAM design.

This revised straw proposal maintains the bucket 1 transmission framework whereby each BAA must make bucket 1 transmission available to the market to support resource sufficiency plans across an intertie with an adjoining EDAM BAA. As such, bucket 1 would consist of transmission rights held by transmission customers of the EDAM entity or other transmission service providers within the EDAM BAA that have contractual agreements for energy or capacity transfers used for RSE accounting purposes in the day-ahead timeframe. In other words, if EDAM entity A relies on a resource located in the adjacent EDAM entity B area, EDAM entity A would need to bring bucket 1 transmission to deliver that resource across the interface.

Bucket 1 transmission must be firm or conditional firm for the market to have confidence in reliable transfers. Because the transmission service provider is already compensated for such capacity through transmission reservations and contracts, or transmission access charges as is the case for the ISO, no additional transmission recovery provisions are required for bucket 1 transmission. Transfer revenues would be allocated by the ISO either directly to the transmission customer directly or to the EDAM entity as further discussed within the context of bucket 2 transmission, in the section below, depending upon whether the existing transmission rights were exercised or made available to the market in advance.

(2) Bucket 2: Transmission Rights Held by Transmission Customers, But Not Used to Support Resource Sufficiency Needs

Bucket 2 transmission refers to a transmission customer's firm and conditional firm point-to-point transmission rights that are not utilized to support the day-ahead resource sufficiency evaluation. For example, these could be transmission rights that the transmission customer does not plan to utilize and are in excess of its need. The straw proposal presented stakeholders two options for how these transmission rights could be made available to the ISO: (1) a voluntary framework where a transmission customer decides whether or not to make its excess transmission rights available to the market; or (2) if the transmission remains unscheduled by 10 a.m. of the day-ahead, the transmission rights automatically become available to the market, but the transmission customer can utilize these firm rights between day-ahead and real-time.

Stakeholder comments were generally divided on the framework of bucket 2 transmission. Some stakeholders supported a voluntary approach to making bucket 2 transmission available, which would allow the transmission customer to value its transmission. Those supporting the voluntary framework also suggested that transfer revenue is an insufficient incentive to make transmission available. They suggested inserting a hurdle rate that the transmission customer could identify and would be the basis for compensation. These stakeholders viewed a framework where unscheduled transmission automatically becomes available to EDAM as devaluing rights and exposing the transmission customer to potential congestion price difference between real time and day ahead. On the other hand, some stakeholders preferred automatically making transmission not scheduled by 10 a.m. the day-ahead available to EDAM for optimization, thus increasing the transmission available to EDAM and mutual benefits. These stakeholders expressed concern that a voluntary approach to transmission could lead to withholding, inappropriate day-ahead congestion, inefficiencies, and adverse price impacts in the market.

We agree with stakeholder concerns regarding a purely voluntary approach to making transmission available to the market at possible hurdle rates determined by the transmission customer. A voluntary framework could lead to withholding of transmission and day-ahead congestion across interfaces between EDAM BAAs that does not materialize in real-time, artificially increasing congestion costs and creating cost shifts between entities.

Moreover, as stakeholders indicated in the context of bucket 3 transmission comments, hurdle rates in the market optimization stifle the efficiency of the market solution and limit transfers. Because the proposal is to move away from a hurdle rate approach for bucket 3 transmission (unsold firm ATC) due to the inefficiencies and the pancaking of rates that could limit transfers and the efficiency of the market solution, a purely voluntary framework for bucket 2 would not support an efficient initial market design. A framework where unscheduled transmission is made available to the market improves transfer optimization, increases transmission availability to support transfers, and reduces the risk of withholding and inappropriate congestion.

The proposal is to maximize the amount of transmission rights made available to the market by including all transmission rights that are not scheduled by the time of the day-ahead market run (10am) in return for allocation of transfer revenues. Under the framework where unscheduled transmission rights are available to support optimized transfers in the EDAM, there are three options available to transmission customers to utilize their transmission rights in the day-ahead timeframe:

1. **Pathway 1** – Schedule use of the transmission rights by 10 a.m., *i.e.*, prior to the start of the day ahead market processes. The transmission customer would be eligible for an allocation of transfer revenue from the EDAM entity if a transfer constraint binds.
2. **Pathway 2** – Release the transmission rights to the EDAM before the day-ahead processes, *i.e.*, by 6 a.m. of the day-ahead. The transmission customer would be eligible for an allocation of transfer revenue directly from the ISO if a transfer constraint binds. The transmission customer could not self-schedule use of the transmission rights in real time, but it could continue to submit a self-schedule or economically bid into the market just like any other user of the system.
3. **Pathway 3** – If the transmission customer does not schedule use of the transmission rights by the start of the day ahead market processes at 10 a.m., the unscheduled transmission rights would be made available to support optimized transfers. If a transfer constraint binds, transfer revenue associated with the unscheduled transmission would accrue and would be allocated to the EDAM entity. The transmission customer may exercise their previously unscheduled transmission rights between day ahead and real time, but this may cause the accrual of uplifts to the EDAM entity due to difference in the price of congestion between real time and day ahead. The EDAM entity would allocate day ahead transfer revenue accrued to the transmission customer, net of uplifts that may have been caused by the transmission customer exercise of previously unscheduled transmission rights between day ahead and real time. Exercising previously unscheduled transmission rights between day-ahead and real time can be accommodated if feasible, and grid conditions permit, but the self-schedule exercising those rights will have a lower priority.

(a) Pathway 1 – Exercising Transmission Rights Ahead of the Day Ahead Market (10 a.m.)

Pathway 1 describes implications if a transmission customer holding firm or conditional firm point to point transmission rights at an interface between two EDAM BAAs chooses to exercise those transmission rights. A transmission customer would exercise those transmission rights in the market by submitting a self-schedule associated with the rights.²⁵ Consequently, the market will see the submitted self-schedule and exercise of transmission rights as supply that is eligible to count for the EDAM RSE. Exercising these transmission rights indicates to the market that the associated transmission is not available for optimization.

There are several attributes to pathway 1 for the transmission customer to consider:

- *Transfer revenue allocation directly from the EDAM entity.* The transmission is eligible to receive transfer revenue if the transfer constraint binds, in which case the accrued transfer revenue would be allocated by the EDAM entity directly to the transmission customer.²⁶

²⁵ These transmission rights are registered in the ISO Masterfile which provides a contract reference number (CRN) that is utilized during bid submission to indicate exercise of existing transmission rights.

²⁶ The ISO would settle and allocate the appropriate transfer revenue to the EDAM entity who would then allocate these to the transmission customer exercising the rights ahead of 10 a.m.

- *High priority schedule* – exercising transmission rights in the day-ahead market before, the day-ahead market starts at 10 a.m., supports the market producing feasible day ahead schedules. If conditions change between day-ahead and real-time (e.g., a transmission facility derate), the day-ahead self-schedule of those transmission rights would have a high scheduling priority in the market, equal to load.

(b) Pathway 2 – Releasing Transmission Rights to EDAM in Advance

Pathway 2 allows a transmission customer to release transmission rights to the market in advance of the day ahead market run, by 6 a.m. and receive day-ahead transfer revenues. The released transmission would be made available to optimize transfers, and the ISO would settle any accrued transfer revenue directly with the transmission customer directly. Once the transmission rights are released to the market, the transmission customer could not self-schedule use of the transmission rights in real-time, but could continue to submit a self-schedule or economically bid into the market as any other user of the system. .

Pathway 2 allows a transmission customer to release transmission rights to the market in advance of the day ahead market run, by 6 a.m. and receive day-ahead transfer revenues. The released transmission would be made available to optimize transfers, and the ISO would settle any accrued transfer revenue directly with the transmission customer directly. Once the transmission rights are released to the market, the transmission customer could not self-schedule use of the transmission rights in real-time, but could continue to submit a self-schedule or economically bid into the market as any other user of the system. .

There are several attributes of pathway 2 for the transmission customer to consider:

- *Transmission rights release timeline* – transmission rights must be released to the market by 6 a.m. of the day-ahead. This provides advance notice and certainty to the market regarding the transmission rights.
- *Eligible transmission rights to be designated and released to EDAM* – transmission rights eligible to be released to the EDAM in advance initially would be limited to those held under a long-term firm and monthly firm point to point reservation.²⁷ These are longer duration transmission rights that can be registered in the ISO systems to facilitate their designation and release to the market. The transmission customer could determine, on a daily basis whether to make the full amount or only a portion of its transmission rights available to the EDAM for the day or a longer timeframe. In addition, we are considering supporting the ability to release the transmission rights shaped in hourly increments across a 24-hour horizon. The EDAM entity would have to modify its OATT to permit release of these transmission rights to the EDAM.
- *Transfer revenue allocation directly from the ISO* – as transmission rights are released to the EDAM in advance, the ISO would allocate transfer revenues that accrue directly to the transmission customer as opposed to allocating these to the EDAM entity. Releasing the transmission rights to the EDAM in advance provides certainty to the market that the transmission will be available without the risk of these rights becoming

²⁷ Hourly, daily, and weekly firm point to point transmission rights would not be eligible at the onset but may be eligible in the future based on experience.

unavailable in real-time. It also limits potential uplift costs that may result from exercising these rights between day-ahead and real-time.

Transmission customers voluntarily releasing transmission rights to the EDAM will have an incentive to plan their transmission use in advance because they will receive transfer revenues directly from the ISO. As described further below, pathway 2 provides several advantages over pathway 3; although, pathway 3 may provide for more flexibility in how transmission rights are utilized after day-ahead.

(c) Pathway 3 – Unscheduled Transmission Rights Becoming Available to the EDAM

Under Pathway 3, firm and conditional firm transmission rights not scheduled by the day ahead market (10 a.m.) can be made available to the EDAM to optimize transfers. Transmission customers that did not choose pathways 1 or 2 and thus hold unscheduled transmission rights at 10 a.m. can exercise those transmission rights between day-ahead and real-time. However, exercising these transmission rights then may create uplifts, primarily caused by differences in congestion prices between the day-ahead and real-time. These uplifts would be allocated to the EDAM entity. The transmission customer would be eligible for an allocation of transfer revenues, by the EDAM entity, up to the day ahead accrued transfer revenue. However, if the transmission customer exercises the previously unscheduled transmission rights after the day ahead market, the EDAM entity may be allocated uplifts based upon the difference between real time and day ahead congestion/transfer prices. The EDAM entity may ultimately reallocate transfer revenues to that transmission customer up to the day ahead transfer revenues, net of any uplifts caused by the exercise of those previously unscheduled transmission rights, in accordance with the EDAM entity's OATT(which would describe the allocation process).

There are several attributes of pathway 3 for transmission customers to consider:

- *Unscheduled transmission released to the market* –if the transmission customer does not exercise its transmission rights before the day ahead market (pathway 1) or release the transmission rights to the EDAM in advance (pathway 2), the transmission customer's unscheduled transmission at the by the day ahead market (10 a.m.) will become available to the market for optimization. As discussed in the Transmission Commitment stakeholder working group, under the pro-forma OATT framework, firm point-to-point transmission schedules are submitted no later than 10:00 a.m. the day prior to commencement of service, and transmission providers accommodate schedules submitted after 10:00 a.m. if practicable. Transmission service providers can make these unscheduled firm transmission rights available to the EDAM by 10:00 a.m. for the market to consider in efficiently committing generation across the EDAM footprint and supporting robust transfers.
- *Exercise of transmission rights after the day ahead market* – the transmission customer can come back and exercise its transmission rights after the day-ahead market and into real-time. This would be done through the submission of a self-schedule and identification of the contract reference number (CRN) associated with the transmission rights, which indicates to the market that the transmission rights are being utilized. However, exercise of these rights would be accommodated if feasible (no market infeasibility), and uplifts may result, such as differences in the congestion price between day ahead in real time, that accrue as a results of the exercise of those rights.

- *Transfer revenue allocation to the EDAM entity* – the ISO would allocate accrued transfer revenue to the EDAM entity, which can allocate excess revenue back to the transmission customers whose unscheduled transmission was utilized by the market according to the terms of its OATT, informed by discussions described earlier.
- *Market priority implication* – the market may be unable to accommodate all transmission uses of unscheduled transmission rights that are subsequently exercised between day-ahead and real-time. There may be derates to transmission facilities or other factors on the grid that limit the market’s ability to accommodate such use and avoid a market infeasibility. Thus, the proposal is that such later exercise of transmission rights (through a self-schedule) would have a priority lower than a day-ahead schedule that rolls into real-time, but a priority higher than new real-time self-schedules not exercising existing transmission rights. The market may not fully be able to accommodate a later use of those transmission rights based on changes in conditions and market infeasibility.

The proposed framework for pathway 2 (release of transmission rights to EDAM) and pathway 3 (unscheduled transmission available to market) would require OATT changes and is a shift in how unscheduled transmission is treated today under the OATT.²⁸ Nevertheless, a framework where all firm and conditional firm transmission is made available to the market will help maximum benefits from a day ahead market, while mitigating the market risks associated with a completely voluntary framework.

The ISO believes the identified pathways provide transmission customers a range of options to consider regarding the use of their transmission rights, without impinging on their ability to exercise such transmission rights. A transmission customer who must exercise those transmission rights independent of the market can do so under pathway 1. A transmission customer that does not plan on exercising its transmission rights can pursue pathway 2 to derive a benefit from them by receiving transfer revenues directly from the ISO. A transmission customer that is uncertain or wants to retain the ability to exercise those transmission rights later real time can pursue pathway 3. Under that pathway, the customer would be able to use those rights just as it can under the OATT, subject to conditions on the grid allowing the exercise of such transmission rights.

We seek stakeholder feedback on the proposed transmission availability approach, particularly on bucket 2 where effectively all firm and conditional firm point to point transmission is available to the market to maximize transfers and benefits the EDAM footprint as a whole.

(d) Treatment of Legacy Transmission Rights

Legacy transmission contracts may warrant different treatment because these arrangements have unique terms and conditions. Legacy transmission contracts refer to transmission agreements not governed by the OATT or pre-OATT. For the ISO, the term refers to existing transmission contracts (ETC) that are pre-tariff and outside of tariff transmission rights. These transmission rights can be made available to the market depending on terms and conditions of the agreement. The proposal is to leave it to the transmission provider and legacy transmission

²⁸ Under the OATT framework, unscheduled firm transmission in the day-ahead is released as non-firm transmission for sale, and the transmission customer holding the firm rights can come back later and utilize its firm rights up to 20 minutes prior to flow (or another timeframe as dictated by applicable requirements and practices). To the extent there are more schedules across a path than the limit of the path, the transmission provider may need to curtail non-firm schedules to accommodate the firm use.

customer, based on the transmission contract, to decide how these rights are made available to the market, if at all.

For transmission customers with legacy transmission rights where the source and sink are in different BAAs, there may be two potential approaches based on the terms of the agreement:

- *Pathway 1* – Transmission rights are scheduled by 10 a.m. - The unscheduled transmission is carved out of the energy transfer system resource (ETSR) and not made available to the market. If these transmission rights are utilized in real-time, differences in congestion pricing would be allocated to the EDAM entity who can derive, based on terms of contract, the best way to allocate those differences, which may include socializing them those to load or as otherwise described in its OATT.
- *Pathway 2* – Transmission rights not scheduled by 10 a.m. could be designated and released to the EDAM in advance of 6 a.m. The ISO would settle transfer revenue/congestion revenues directly with the transmission customer. However, this may be a viable pathway only if the customer's ability to release those transmission rights to the EDAM is consistent with the terms of the legacy agreement.

(3) Bucket 3: Unsold Firm Transmission Made Available by Transmission Service Provider

The straw proposal indicated that Bucket 3 transmission consist of unsold firm available transfer capability (ATC) made available by the EDAM entity, in its transmission service provider function, to support transfers at internal interties between EDAM BAAs. The EDAM entity would make available all remaining unsold firm ATC at an intertie with an adjoining EDAM BAA by 10:00 a.m. in the day-ahead market and stop OATT sales of firm ATC at that intertie between 10:00 a.m. and 1:00 p.m., while the day-ahead market is running. Then, after publication of the day-ahead market results at 1:00 p.m., the transmission provider can resume firm ATC sales. Bucket 3 transmission that remains unutilized by the market would revert back to the EDAM entity for continued sales under the OATT.²⁹

The straw proposal presented three approaches to framing bucket 3 transmission:

- **Approach 1:** EDAM entities would make bucket 3 transmission available to the market for optimization at a hurdle rate (*i.e.*, the published tariff rate).
- **Approach 2:** EDAM entities would make bucket 3 transmission available to the market hurdle-free through a reciprocity framework, similar to the WEIM.
- **Approach 3:** Various frameworks that allow EDAM entities to make bucket 3 to the market hurdle-free, while considering alternative methods for cost recovery outside of the market to support efficient optimization of transfers between BAAs and allowing for transmission cost recovery.

Stakeholders raised significant concerns with a hurdle rate approach because it adversely affects market efficiency due to consideration of pancaked transmission hurdles in the optimization. Stakeholders largely saw no merit in a voluntary reciprocity framework for making unsold Firm ATC available to the market and not being compensated at all for the unsold

²⁹ The day-ahead market publication occasionally is delayed beyond 1:00 p.m. due to processing issues, in which case this timeline would be adjusted so that the results are known prior to the release of the transmission back to the EDAM entity.

transmission. Stakeholders indicated support for removing hurdles from the optimization and finding a pathway toward recovering foregone bucket 3 revenues through after-the-fact uplifts, thus contributing to transmission revenue recovery.

The proposal is that bucket 3 transmission be made available to the EDAM hurdle free. Eliminating the hurdle rate will increase market efficiency and the overall benefits resulting from potentially higher transfer volumes. As discussed in section II(B)(1)(c), the proposal is also that EDAM provide for transmission revenue recovery as discussed in the subsequent section. As part of this transmission recovery, foregone revenues with bucket 3 transmission – short term firm ATC – would be included within the calculation. The next section discusses this framework for historical transmission revenue recovery.

Similar to bucket 1 and 2 transmission, bucket 3 transmission would also receive transfer revenue associated with the transmission being available to the market. To the extent the transfer revenues accrue, the ISO would allocate those to the EDAM entity. In turn, the EDAM entity can propose in its tariff process how to utilize those transfer revenues, whether to pool them to offset uplifts that may be borne by load or re-allocate to their transmission customers, or some other approach under their own tariff.

b) ISO Transmission Availability in the EDAM

Prior sections describe how EDAM entities make transmission available under the OATT framework for the different transmission buckets. This section describes how ISO transmission is made available across interfaces with other EDAM entities, as well as how EDAM entities relying on wheels through or exports from the ISO for purposes of the RSE would meet the transmission bucket 1 requirements.

Bucket 1 transmission for the ISO is transmission supporting the resource sufficiency showings of the ISO LSEs that is imported and delivered into the ISO across interfaces with other EDAM BAAs. Entities depending upon resources that are wheeled through the ISO or export from the ISO to meet the EDAM RSE would have the following pathways to do so:

- Wheeling through the ISO system – entities would demonstrate establishment of a wheeling through priority (equal to load) across the ISO system and bring Bucket 1 transmission to the EDAM across the interface, based upon the process in place for establishing scheduling priority³⁰.
- Exports from the ISO system – entities would demonstrate establishment of high priority export status to export supply (non-resource adequacy supply) from the ISO and meet Bucket 1 transmission requirements. The WAC charges would be assessed for the period that the high priority export is being shown for the RSE³¹.

Bucket 2 transmission on the ISO system is primarily associated with legacy contracts (“ETCs/TORs”) which could be made available to the market based upon the terms of the agreement and the two pathways described in section II(B)(1)(a)(2)(d). Under pathway 1, the rights holder could schedule use of those rights, but unscheduled transmission would not be made available to the market because these entities are able to exercise rights generally into

³⁰ The ISO is currently undertaking the *Transmission Service and Market Scheduling Priorities* initiative which is seeking to develop a new, and durable, process for establishing wheeling through priorities.

³¹ Payment of the WAC is consistent with the payment of transmission charges today for a high priority exports which are self-scheduled.

real time. This is consistent with the rights that legacy transmission rights holders across the ISO system have today and how they exercise them. Pathway 2 allows the legacy transmission rights holder to make those rights available to the market in the day ahead timeframe and collect transfer revenue/congestion revenues.

The remaining transmission on the ISO system is effectively Bucket 3 transmission, unreserved and unsold transmission, available to the day ahead market to optimize and support transfers across interfaces with EDAM entities. The historical TRR recovery proposal described above would allow for the recovery of the TRR shortfall associated with historical WAC revenues.

c) Providing for Historical Transmission Revenue Requirement (TRR) Recovery Through EDAM

In order to facilitate an organized day-ahead market, EDAM entity transmission providers may face the potential risk of foregone transmission revenues based upon decreased sales of short-term transmission. Also, the ISO may potentially experience reduced wheeling access revenues under the EDAM. Providing a mechanism in EDAM for transmission providers to recover potentially foregone revenues is an important element of the overall design to limit or avoid cost shifts between EDAM entity transmission customers. This section describes the proposed design to enable a transmission provider to recover its historical transmission revenue requirement (TRR).

The proposed design allows for the recovery of an “EDAM recoverable TRR” that consists of:

- Revenues associated with the short-term firm and non-firm point-to-point products, and for the ISO, foregone reduction in wheeling access charge (WAC) revenues;
- Revenues attributed to short-term firm and non-firm point to point transmission service on approved³² new transmission builds that increase transfer capability between EDAM BAAs; and
- Revenues for wheeling-through volumes for EDAM BAAs that exceed the total imports/exports from the EDAM entity BAA.

Each EDAM entity would forecast its EDAM recoverable TRR on an annual basis, with the exception of the wheeling through component, which would be included for months where the conditions trigger. The EDAM recoverable TRR amounts would then be allocated to gross load across the EDAM footprint, with the caveat that each EDAM entity would not be allocated its own EDAM recoverable TRR. There would be an annual true-up to support actual revenue recovery.

This proposal further describes each one of these components below.

(1) Determining the Revenues Recoverable Through EDAM

The EDAM recoverable TRR is comprised of three components that represent the recoverable revenues through the EDAM. The intent of the design is to keep each EDAM entity whole from a historical TRR perspective.

³² For new transmission to be incorporated into the EDAM recoverable TRR, transmission must have been approved through an applicable regulatory process.

(a) Component 1: Short-Term Firm and Non-Firm Point to Point Transmission & Wheeling Access Charge (WAC) Revenues

An EDAM entity operating under the OATT framework may face potential reduced transmission revenues, associated with limited transmission products, resulting from EDAM participation. These may be non-firm point to point revenues arising from the proposed bucket 2 transmission design where unscheduled firm and conditional firm transmission becomes made available to the EDAM. Today, unscheduled firm point to point transmission is automatically released as non-firm transmission for sale by the transmission provider. In the EDAM, as the unscheduled firm or conditional firm point to point transmission is made available to the EDAM, the transmission provider may experience reduced non-firm transmission sales because some unscheduled firm transmission will be available for supporting EDAM transfers. The proposal is that the EDAM recoverable revenues be only those associated with historical transmission sales to third parties, not sales to the EDAM entity's merchant function. The following non-firm point to point transmission products, which may have lower sales volumes, would also be eligible for historical TRR recovery and be included in the EDAM recoverable TRR recoverable through the EDAM:³³

An EDAM entity operating under the OATT framework may face potential reduced transmission revenues, associated with limited transmission products, resulting from EDAM participation. These may be non-firm point to point revenues arising from the proposed bucket 2 transmission design where unscheduled firm and conditional firm transmission becomes made available to the EDAM. Today, unscheduled firm point to point transmission is automatically released as non-firm transmission for sale by the transmission provider. In the EDAM, as the unscheduled firm or conditional firm point to point transmission is made available to the EDAM, the transmission provider may experience reduced non-firm transmission sales because some unscheduled firm transmission will be available for supporting EDAM transfers. The proposal is that the EDAM recoverable revenues be only those associated with historical transmission sales to third parties, not sales to the EDAM entity's merchant function. The following non-firm point to point transmission products, which may have lower sales volumes, would also be eligible for historical TRR recovery and be included in the EDAM recoverable TRR recoverable through the EDAM:³⁴

- Hourly non-firm point to point
- Daily non-firm point to point
- Weekly non-firm

Similarly, the EDAM entity would make bucket 3 transmission – unsold firm ATC - available to the EDAM to support transfers. Because the proposal is that such transmission be made available to the EDAM hurdle free, outside of the optimization, the transmission that is made available to the EDAM would be represented as foregone revenue along with other short-term

³³ Revenues from monthly non-firm point to point service would not be included at the onset because this is a longer duration product that may not be directly affected by the EDAM. However, EDAM entities should monitor the impacts on these revenues and they may be considered for inclusion at a later date if warranted.

³⁴ Revenues from monthly non-firm point to point service would not be included at the onset because this is a longer duration product that may not be directly affected by the EDAM. However, EDAM entities should monitor the impacts on these revenues and they may be considered for inclusion at a later date if warranted.

firm products that may see decreased sales. The proposal is that the EDAM recoverable revenues be only those associated with historical transmission sales to third parties, not sales to the EDAM entity’s merchant function. The following short-term firm point to point transmission products would also be eligible for historical TRR recovery and be included in the EDAM recoverable TRR recoverable through the EDAM.

- Hourly firm point to point (if product is offered by the transmission provider)
- Daily firm point to point
- Weekly firm point to point

The ISO may also face foregone revenues associated with the WAC paid by non-participating transmission owners. These are revenues associated with third parties wheeling through or exports from the ISO BAA. The proposal is that foregone WAC revenues associated with third-party wheels through or exports from the ISO be eligible for historical TRR recovery and be included in the EDAM recoverable TRR recoverable through the EDAM.

(i) Calculating the EDAM Recoverable TRR and the TRR Shortfall Recoverable Through EDAM

The EDAM recoverable TRR represents the total historical revenue at risk associated with certain transmission products, which would be eligible for recovery through the EDAM. For EDAM entities operating under the OATT, the EDAM recoverable TRR is the historical transmission revenue requirement for short-term firm point to point (hourly, daily, weekly) and non-firm point to point transmission (hourly, daily, weekly) associated with sales to third parties (non-merchant). Generally, non-firm and short term point to point transmission sales to third parties, represent less than 10% of the total TRR of the transmission provider but it may vary. For the ISO, the EDAM recoverable TRR is the total historical WAC revenues associated with third parties. For the ISO, WAC revenues associated with third parties represent 2-3% of the total TRR. The table below is a simple example of the gross at risk TRR calculation.

	Total TRR	Non-Firm TRR (3 rd party)	Short-term Firm TRR (3 rd parties)	EDAM Recoverable TRR (for EDAM)	Ratio (EDAM recoverable TRR / Total TRR)
EDAM Entity (OATT)	\$100 Million	\$3 million	\$4 million	\$7 million	7%

Table 2: Identification of the EDAM recoverable TRR and ratio of recoverable revenues to total revenue requirement.

There are two key questions regarding calculation of the EDAM recoverable TRR: (a) across what time period is the gross at risk TRR derived; and (b) how often is the gross at risk TRR value updated.

- *Timeframe for deriving gross at risk TRR:* The proposal is that each EDAM BAA transmission provider calculate their BAA’s EDAM recoverable TRR based on the transmission provider’s average FERC-approved (or applicable regulatory authority-approved) transmission revenue requirement for non-firm and short-term firm point to point transmission services for the most recent three years. In addition, the proposal is to calculate the ISO total BAA’s EDAM recoverable TRR as the sum of ISO participating transmission operators (PTO) EDAM recoverable TRR amount. The ISO PTO EDAM recoverable TRR amount shall be equal to the average FERC-approved transmission revenue balance account adjustment from wheeling third party transactions or the most

recent three years. Considering only the most recent year’s data may be too small of a sample and not reflect the EDAM recoverable TRR going forward. A longer duration sample size is needed. Three years represents a reasonable time period that should provide a more stable and reasonable representation of revenue requirement associated with the transmission products eligible for recovery through the EDAM. However, we seek stakeholder feedback whether a longer period may be more representative of the more stable EDAM recoverable TRR.

- *Updating the EDAM recoverable TRR number:* The proposal is that the EDAM recoverable TRR be reviewed and updated after two-years of participating in the EDAM. This may be on the shorter end, but it is important to provide an opportunity to update these values relatively soon after participation commences to evaluate patterns in transmission usage change and reflect such current values. Locking in the period of the EDAM recoverable TRR for a longer period may be overly restrictive and lock the values for too long without providing an opportunity to account for changed conditions.

The EDAM recoverable TRR represents the utmost upper bound of transmission revenue recovery associated with the transmission products identified. However, the amount that would actually be recovered through the EDAM is expected to be much smaller offset by ongoing transmission sales throughout the year. EDAM entities and the ISO will continue to administer their respective tariffs and continue to sell the transmission products noted above and derive WAC revenues. Those sales would reduce the amount needed to be recovered through the EDAM – the “TRR shortfall” to support historical revenue recovery.³⁵

The total revenues recoverable through the EDAM consist of the difference between the EDAM recoverable TRR, which is based on historical values and the actual transmission revenues collected through transmission sales of the products eligible for recovery.

$$\text{TRR Shortfall} = \text{EDAM Recoverable TRR (historical)} - \text{Actual transmission revenues}$$

Table 3 below illustrates further the example of the TRR shortfall recoverable through the EDAM.

	EDAM Recoverable TRR	NF PTP Actual Sales	STF PTP Actual Sales	TRR Shortfall
EDAM Entity	\$7 million	\$2 million	\$3 million	\$2 million

Table 3: Deriving the TRR shortfall.

As indicated in the table above, although the EDAM recoverable TRR associated with non-firm and short-term firm point to point is \$7 million, the EDAM entity continued to make sales through its OATT that derived \$5 million in revenues. Thus, the TRR shortfall recoverable through the EDAM would be only \$2 million.

³⁵ For the ISO, WAC revenues would continue to accrue for exports to non-EDAM BAAs, wheels through the ISO, and exports to EDAM BAAs that would pay the WAC, as discussed in section II(B)(1)(b) of this proposal.

(ii) Consideration of a Bound to the EDAM Recoverable TRR

We seek stakeholder feedback on the consideration of a bound, or limit, to the gross TRR recoverable through the EDAM based upon the EDAM transfer flows as compared to the total exports, EDAM and non-EDAM, of a BAA. Such a bound would avoid shifting of costs to the EDAM disproportionately compared to the use of the EDAM entity system to support EDAM transfers. The EDAM TRR upper bound attempts to limit the EDAM recoverable TRR by comparing EDAM transfer exports (energy transferred) out of the EDAM BAA and total exports (energy exported to EDAM and non-EDAM BAAs). The formula is identified below.

$$TRR\ Bound = \frac{EDAM\ Transfer\ Use\ (MWh)}{Total\ Exports\ (MWh)} \times EDAM\ Recoverable\ TRR$$

If this type of a bound is appropriate, the ISO would need to consider the bound potentially on a monthly basis based on the prior month's transfer use and exports to derive a recoverable limit. After gathering longer-term data, it could be applied on a longer term basis – possibly across a full year of data to derive the ratio of EDAM transfer use total exports.

On the other hand, the overall design described earlier provides a natural bound by considering the EDAM recoverable TRR and as OATT sales are made, the EDAM recoverable TRR is reduced. This resulting amount becomes the TRR shortfall amount that is ultimately recoverable through the EDAM and is net of OATT transmission sales.

We seek stakeholder feedback on the need for such a bound in light of the design described above.

(b) Component 2: Percentage of New Transmission Build Revenue Requirement

The second component eligible for transmission revenue recovery through the EDAM is associated with new transmission construction approved via applicable regulatory processes. New transmission facility upgrades that increase the transfer capability between EDAM BAAs creating the potential for additional transfers. New transmission builds raise the potential some foregone transmission revenues associated with non-firm and short-term firm transmission will materialize. This foregone revenue risk also should be considered.

The amount of new transmission upgrade revenue requirement that would be recoverable to the EDAM is limited to the ratio of the non-firm and short-term firm point to point revenue requirement, associated with third-party sales on the new upgrade, to the total EDAM entity TRR.

Table 2 above can be used to illustrate this. In that prior example showing derivation of the EDAM recoverable TRR, the non-firm and short term firm point to point revenue requirement makes upon \$7 million of a total \$100 million, *i.e.*, it is 7% of the total TRR. This percentage would be applied to the revenue requirement of the new transmission upgrade that increase transfer capability between EDAM BAAs. If the upgrade adds \$50 million to the total TRR, then the amount recoverable through the EDAM is 7% of that amount, a total of \$3.5 million.

(c) Component 3: Recovery of Transmission Costs Associated With EDAM Wheeling Through Volumes Net of Imports/Exports

The third component that is eligible for transmission revenue recovery through the EDAM is associated with wheels through an EDAM entity's transmission system in excess of the total net imports/exports transfers of the EDAM entity. Some WEIM entities have experienced this situation during certain times of the year. In those situations, the WEIM entity's transmission system supported robust wheels through its system benefitting other WEIM participants, and these wheel through transactions exceeded its own WEIM imports to serve load and exports to other WEIM entities. This scenario could occur in the EDAM as well.

The proposal is that in those limited periods where this net difference occurs, the EDAM entity be compensated for the excess transmission use supporting net wheels through its system. The wheels through the EDAM entity system created benefits for other EDAM BAAs but not for that entity. In those instances, the excess wheels through the system should be considered foregone revenue for the EDAM entity.

The volume of net wheels through the EDAM entity transmission system, net of EDAM transfer imports/exports, would be compensated at the EDAM entity's filed and approved non-firm hourly point to point transmission rate.

(2) Allocating TRR Shortfall in the EDAM

The prior sections focused primarily on the inputs into the EDAM recoverable TRR and what revenues would be subject to recovery through the EDAM. This section describes a design to ensure each EDAM entity can recover the necessary revenues to cover its actual TRR shortfall and provides a true-up opportunity at the end of the year. Additionally, this section discusses allocation of the transfer revenues. The intent of the design is to cover actual revenue shortfalls as much as possible.

The proposal is that each EDAM entity estimate its annual TRR shortfall, which will form the basis for the amount it needs to recover over the year. This amount can also be converted from an annual amount to a monthly amount for each entity across the year.

Once the estimated TRR shortfall is identified, a rate that allows for recovery of the estimated TRR shortfall across the footprint would be derived. The proposal is to apply this as an uplift rate that it would assess either to gross load across the footprint or to demand plus supply across the footprint. In allocating this uplift charge, the proposal is not to allocate an EDAM entity its own TRR revenue shortfall so its metered demand does not have to pay for its TRR cost recovery.

(a) Allocation Method 1 - TRR Shortfall Allocated to Gross Demand in EDAM Footprint

The ISO could derive an annual EDAM entity-specific rate (which excludes its own TRR shortfall amount), that would be applied against the gross load (MWh) in the EDAM footprint. This rate would be derived by (1) allocating each BAA's TRR shortfall to the other BAAs in proportion to that BAA's gross load divided by the total EDAM gross load less gross load of the BAA whose TRR shortfall is being distributed, (2) calculating the total BAA TRR shortfall allocation, and then (3) dividing the total BAA TRR shortfall allocation by the BAA gross load. The proposal can

consider whether the gross load amount should be based on the average of multiple years. The tables below illustrates the resulting rate for individual BAAs based upon this methodology.

BAA	TRR shortfall (\$ in Millions)	Gross Load (MWh in Millions)
BAA1	\$6	211
BAA 2	\$2	18
BAA 3	\$3	39
BAA 4	\$4	70
Total	\$15	338

BAA	TRR shortfall Allocation (\$ in Millions)					BAA Specific Rate ³⁶
	BAA1	BAA 2	BAA3	BAA 4	Total	
BAA 1	\$0.0	\$1.3	\$2.1	\$3.1	\$6.6	\$0.03 per MWh
BAA 2	\$0.9	\$0.0	\$0.2	\$0.3	\$1.3	\$0.07 per MWh
BAA 3	\$1.8	\$0.2	\$0.0	\$0.6	\$2.7	\$0.07 per MWh
BAA 4	\$3.3	\$0.4	\$0.7	\$0.0	\$4.4	\$0.06 per MWh
Total	\$6.0	\$2.0	\$3.0	\$4.0	\$15.0	

Table 4: deriving a BAA-specific rate based on a gross load allocation.

The TRR shortfall amounts would be settled monthly. So in the example above, BAA 1 would be assessed \$0.03 per MW across its gross load for the month that would go toward ensuring the recovery of the forecasted TRR shortfall for BAAs 2, 3 and 4. These values are realistic as a starting point for TRR shortfall recovery because entities will continue to make OATT sales and the ISO will continue to collect the WAC. The numbers presented in the table 4 represent approximations of real gross load values of market participants and the resulting rates are representative of the rate range to the extent there were four EDAM participants. Appendix 2 provides additional illustrations of the resulting rate, with different TRR shortfall values to provide a range of possible BAA specific rates.

(b) Allocation Method 2 - TRR Shortfall Allocated to Gross Demand Plus Supply

The ISO could derive an annual BAA-specific rate based upon historical gross demand plus supply, which would provide a larger denominator across which to recover the forecasted TRR shortfall. The rationale supporting this approach is that both demand and supply benefit in an EDAM and thus should bear the costs associated with TRR recovery. Table 5 below illustrates the resulting BAA-specific rate by using the same forecasted TRR shortfall and the gross demand plus supply realistic value based on the size of the entities.

³⁶ BAA specific rate is calculated as the sum of BAA TRR shortfall allocations from other BAAs' TRR shortfalls divided by the gross load of BAA in which the TRR shortfalls were allocated. For example, in calculating the BAA specific rate for BAA 1, consideration is only given to the costs of BAAs 2, 3, and 4 divided by the proportion of BAA 1's gross load to the gross load of those three BAAs.

BAA	TRR shortfall (\$ in Millions)	Gross Demand and Supply (MWh in Millions)
BAA1	\$6	460
BAA 2	\$2	35
BAA 3	\$3	82
BAA 4	\$4	177
Total	\$15	754

BAA	TRR shortfall Allocation (\$ in Millions)					BAA Specific Rate ³⁷
	BAA1	BAA 2	BAA3	BAA 4	Total	
BAA 1	\$0.0	\$1.3	\$2.1	\$3.2	\$6.5	\$0.01 per MWh
BAA 2	\$0.7	\$0.0	\$0.2	\$0.2	\$1.1	\$0.03 per MWh
BAA 3	\$1.7	\$0.2	\$0.0	\$0.6	\$2.5	\$0.03 per MWh
BAA 4	\$3.6	\$0.5	\$0.8	\$0.0	\$4.9	\$0.03 per MWh
Total	\$6.0	\$2.0	\$3.0	\$4.0	\$15.0	

Table 5: deriving a BAA specific rate based on a demand + supply allocation.

Under this approach, the resulting rate would be applied as an uplift to both demand and supply on a monthly basis, and the revenue would contribute toward meeting the TRR shortfall.

(3) Truing Up the Forecasted TRR Shortfall with Actual Shortfall

Throughout the year, each EDAM entity will collect revenues toward its forecasted TRR shortfall. At the end of the year, each EDAM entity will also know its actual TRR shortfall based on the OATT sales conducted throughout the year, which would go towards reducing the TRR shortfall. Based on the actual TRR shortfall and the amount of revenue collected by each EDAM entity (based on one of the rate methods above), there may be a recovery surplus or a shortfall at the end of the year.

This proposal offers two options for addressing any surplus or shortfall: (1) a year end true-up where the surpluses and shortfalls are settled; or (2) carrying over the shortfall or surplus into the following year's calculation of the forecasted TRR requirement, which would affect the BAA-specific rate calculated. Under the first approach, shortfalls not recovered by an EDAM entity would be allocated based either upon the gross load ratio share (excluding the short entity) or the proportional share based upon demand plus supply (if that is the allocation method chosen). Under approach 2, any shortfalls or surpluses are carried forward into next year's forecasted TRR shortfall assessment (and either increase or decrease that value). The ISO commits to monitoring the process closely and work with stakeholders to adjust these processes if necessary.

³⁷ BAA specific rate is calculated as the sum of BAA TRR shortfall allocations from other BAAs' TRR shortfalls divided by the gross demand plus supply of BAA in which the TRR shortfalls were allocated. For example, in calculating the BAA specific rate for BAA 1, consideration is only given to the costs of BAAs 2, 3, and 4 divided by the proportion of BAA 1 gross demand and supply to the gross demand and supply of those three BAAs.

d) Internal Transmission in EDAM and Registering, Exercising Transmission Rights

The proposal is to maintain the straw proposal's treatment and processes regarding transmission internal to an EDAM BAA. Internal transmission system flow capability will be made available to the EDAM for optimization, as in the WEIM today, to support transfers and the derivation of benefits. The day ahead market, in coordination with each EDAM entity, will have visibility into the system conditions, transmission constraints, and transmission outages to be able to identify optimal transfers.

It is necessary to ensure transmission customers holding existing transmission rights, whether under the OATT or under legacy pre-OATT agreements, can exercise them independent of EDAM. Transmission customers holding transmission rights from an EDAM transmission provider would work together with the transmission provider to register transmission rights through the submission of Transmission Rights and Transmission Curtailment (TRTC) instructions that define the nature of the transmission rights, priority and any other nuances while acting as a validation that the transmission rights exist. These rights are then assigned a contract reference number (CRN) that identifies the transmission rights, and the number is utilized when exercising those transmission rights. The CRN also provides an indication to settlements not to assess transmission charges with the exercise of these rights. The ISO can work with EDAM entities to simplify the processes of registering these transmission rights and potentially creating aggregations of these transmission rights to support ease of scheduling and use to support transfers. Although transmission rights are registered in the ISO Masterfile, the process may take multiple days. It is also necessary to develop a registration system for transmission rights that are short-term in duration (weekly, daily). The transmission customer would register both transmission rights across interfaces between EDAM BAAs, but also transmission rights that are internal to the system that they plan to exercise these.

The registration of these transmission rights will support exercise of those rights through submission of self-schedules and utilization of the CRN, along with the accrual of transfer revenues and congestion revenues.

Each EDAM entity will determine its transmission limits across its interfaces available for the day-ahead market. EDAM can optimize transmission not exercised via the aforementioned processes for existing rights. Transmission customers can use their internal transmission rights by self-scheduling generation associated with the use of the transmission.

2. Day-Ahead Resource Sufficiency Evaluation

The EDAM resource sufficiency evaluation (EDAM RSE) ensures the ISO and EDAM entities can meet their BAA obligations prior to participating in the EDAM through a test that determines whether each participating BAA has sufficient supply and reserves to meet forecasted demand and uncertainty. The EDAM RSE ensures each BAA has sufficient capacity and flexibility prior to EDAM participation and imposes consequences for an EDAM BAA that fails the evaluation. Passing the EDAM RSE ensures that all resulting EDAM transfers facilitate beneficial economic displacement, meaning that the EDAM transfer allows a BAA to access more economic energy than it would have without access to the EDAM.

a) Conducting the EDAM RSE

The proposal is to conduct a binding EDAM RSE at 10:00 a.m., prior to running the day-ahead market. This proposal also includes the ability to conduct advisory EDAM RSE runs at 6:00 a.m. and 9:00 a.m., with results available on demand to each EDAM entity. In response to extensive stakeholder feedback in the EDAM RSE technical workshops held in the spring of 2022, we propose to offer an on demand application.

The demand forecast and variable energy supply forecast used in advisory runs will be taken from the last valid forecast either: (a) created by the ISO's forecasting system; or (b) submitted to the ISO by the EDAM entity. The proposal is to lock all forecasts used in the EDAM RSE at 9:00 a.m. on the day before the trading day. This will provide EDAM BAAs a fixed obligation towards which they can schedule prior to the final binding EDAM RSE.

The proposal is to calculate imbalance reserve requirements³⁸ using a modified version of its balancing area ramp requirement (BARR) application, which will run at 6:00 a.m. and 9:00 a.m. The results obtained in the 6:00 a.m. advisory run can be used in all on-demand advisory runs by an EDAM entity prior to 9:00 a.m. The results at 9:00 a.m. will provide an updated uncertainty requirement that the ISO will use in the 9:00 a.m. advisory run and the final binding EDAM RSE run shortly after the day-ahead market submission process closes at 10:00 a.m., but immediately prior to running the day-ahead market.

b) Optimization Tool

The EDAM RSE application will optimally determine if an EDAM BAA can achieve a feasible operating schedule given its obligations using submitted bids. As currently formulated, the application will not reflect a full security constrained economic dispatch because it does not include transmission constraints or calculate resultant power flows.³⁹ The application will model all of an EDAM BAA's load and supply on a single bus; then it will perform a unit commitment optimization using all of the existing ISO resource models. The proposal is to set the optimal function of the application to minimize the total cost, as a means to determine the most efficient usages of the varying resources types and capabilities made available to the EDAM. The results will be reflected as the quantity of insufficiency across the day-ahead horizon. The application will be set to minimize the requirement shortfall across the entire 24-hour optimization horizon. The EDAM RSE application accomplishes this by minimizing the total cost utilizing the EDAM BAA's available resources across the day, irrespective of that BAA's ability to pass the EDAM RSE in any particular interval. Effectively minimizing cost in this manner likely will spread the requirement shortfall across multiple intervals. The results of this optimization will inform an EDAM BAA's ability to cure the shortfall through the EDAM RSE as described in section II(B)(2)(c)(3).

c) Resource deliverability in the EDAM RSE

Stakeholders commented that resources shown in the EDAM RSE ultimately may be unavailable for dispatch within the market application because transmission constraints may not be considered within the RSE, but they exist in the market optimization. Underlying this concern is the potential that insufficient resources will be available to clear the day-ahead market. Although this is a reasonable concern, for reasons discussed below, this proposal does not put

³⁸ This proposal is being considered in the Day-Ahead Market Enhancements (DAME) initiative.

³⁹ The optimal solution will be subject to all constraints defined in Appendix 1.

forth the requirement that transmission elements and constraints within the EDAM RSE. Doing so will not increase the accuracy of the test sufficient to justify the significant effort and complexity.

Including transmission elements in the EDAM RSE would require using the ISO's full network model (FNM), which in turn would require integration with many additional market applications.⁴⁰ Functionally, the application would become a proxy run of the ISO's existing day-ahead market. Given the computational time required to run the application in this configuration, the on-demand functionality could not reasonably be supported, and the number and frequency of advisory runs prior to the final binding EDAM RSE would become a function of the accuracy trade-offs within the application itself. Further, all solutions from this configuration of the application necessarily must be determined using direct current (DC) power flow, which by default eliminates consideration of marginal loss factors in the test. In addition, if the design were to include transmission elements in the EDAM RSE, we would need to resolve several important questions:

- Do the shift factor matrices need to reflect the topology at the timing of every advisory run?
- What volume of transmission constraints would be tested for in the market run?
- Would remedial action schemes (RAS's) or nomograms need to be considered?
- What consideration should be given to intertie bids at the ISO's BAA border?

Beyond these accuracy trade-offs, we would also need to consider networked transmission effects to determine actual deliverability. This includes the power flow results of the optimal unit commitment in neighboring EDAM BAAs, assumed dispatch in non-EDAM BAAs, and the potential for market constraints in those BAA's to effect networked power flow. If an insufficiency is identified, we would need to develop a methodology to attribute the cause of this insufficiency accurately. For example, should a BAA's capacity be disqualified because the market optimally dispatched resources in neighboring BAAs that resulted in some shown generation being unavailable due to congestion? We request comment on these open policy questions.

Given the additional complications created by including transmission elements in the EDAM RSE, the proposal is not to include transmission constraints within the RSE at the onset of EDAM, and instead to monitor the results of the EDAM RSE to assess whether capacity that is regularly shown is stranded and undeliverable. The ISO will do this by comparing the EDAM RSE showing with IFM and RUC awards during instances when the RUC process is infeasible. This will allow the ISO to assess the level of supply shown for purposes of passing the EDAM RSE that is stranded and undeliverable because the supply would have neither an IFM nor a RUC award. If monitoring highlights concerning volumes or repeated showings of supply that was ultimately undeliverable, the ISO would work with stakeholders to evaluate revisions to deliverability rules within the RSE.

(1) EDAM RSE Requirements

The EDAM RSE ensures that each participating BAA is separately able to meet its obligation prior to participating in the EDAM. The EDAM RSE will test an EDAM entity's ability to meet its

⁴⁰ Additional integration would be necessary with the ISO's webOMS, Enterprise Model Management System (EMMS) and potentially with applications that are utilized to determine available transmission capacity (ATC) across scheduling paths.

BAA requirements in each of the 24 hours of the day-ahead market run and the flexibility to ramp between the requirements in each hour. The following summarizes elements of the EDAM RSE:

- (1) **Forecasted Demand:** Each EDAM BAA's ability to meet its forecasted demand requirement ensures sufficient supply is available to meet forecasted energy usage and prevent leaning on the capacity or flexibility of other participating EDAM BAAs. The ISO will offer a demand forecast for each EDAM BAA. If an EDAM entity chooses not to utilize the ISO forecast, it can submit its own forecast with the understanding that referencing the most accurate forecast is the objective. The proposal is that the forecast contain the average loss factors as defined by each EDAM entity in its OATT. We request stakeholder feedback on whether a mechanism to incentivize accurate forecasting is needed.
- (2) **Imbalance Reserves:** The proposal is that each EDAM BAA possess sufficient supply and flexibility necessary to meet its imbalance reserve obligations. Procuring sufficient imbalance reserves will increase the reliability of EDAM transfers, thus maximizing the chances each EDAM BAA will have sufficient reserves to cover its upward and downward uncertainty requirements.⁴¹
- (3) **Flexibility Requirement:** The EDAM will create an optimal schedule across 24 hours. An EDAM BAA's ability to meet forecasted ramping requirements across the 24-hour period is an integral component of being resource sufficient. The EDAM RSE application indirectly will assess this ramping capability by testing whether an EDAM BAA has a feasible schedule, ramping between hourly requirements across this same time period.
- (4) **Ancillary Service Requirements:** Each EDAM BAA will define its ancillary service requirements consistent with its reliability requirements. The EDAM RSE will then test and validate whether an EDAM BAA has self-provided sufficient capacity to meet its requirements that does not overlap with supply made available to the EDAM. The EDAM will accommodate ancillary service requirements that are satisfied through participation in a reserve sharing group. If multiple EDAM BAAs participate in a reserve sharing group, the proposal is to require them to identify the transmission that will be utilized to ensure delivery of the shown reserve capacity, consistent with existing practices the entities may have in place today for delivery of the reserves.
- (5) **Reliability Capacity Bidding:** The proposal is that all entities participating in EDAM that submit a day-ahead energy bid into the Integrated Forward Market (IFM) also submit a bid for a matching quantity of reliability capacity in the RUC process of the day-ahead market. This will ensure RUC has sufficient capacity to clear against its forecasted obligations.⁴²

⁴¹ The confidence level created by the imbalance reserve product will be predicated on allocation of the diversity benefit discussed in section II(B)(2)(c)(4), while the imbalance reserve product is discussed in section II(C)(2)(c).

⁴² RUC is further discussed in section II(C)(3).

(2) EDAM RSE Inputs

The EDAM RSE application will utilize energy bids and self-schedules to determine feasible operating schedules. The test will assume all owned and contracted resources are available for the next day. The EDAM RSE will count third party resources⁴³ located within the ISO BAA that are bidding into the EDAM but are not otherwise forward contracted.⁴⁴

(a) Resource specific energy bids – Gas Optimization

Gas nominations for the following day typically occur prior to 11:30 a.m., but the results of the day-ahead market post at around 01:00 p.m. This can result in market participants having to make decisions regarding day-ahead gas nominations without the benefit of resource schedules for the next day. Further, it could require them to engage in additional intra-day gas trading. Notwithstanding this complication, an entity is expected to perform in real-time consistent with its day-ahead market awards. Entities currently participating in the ISO's day-ahead market have successfully navigated similar challenges caused by these different timelines through internal procedural adjustments. In addition, the ISO allows entities to reflect changes in fuel cost through the reference level change request process.⁴⁵ This helps mitigate risk.

To aid entities participating in EDAM in their gas procurement planning, the proposal is to share advisory D+2 market results. The information provided in these advisory D+2 results is an estimation based on the robustness of the bids available at the time, and the resulting dispatch can inform gas procurement decisions prior to the D+1 market run. The proposal is to share the advisory D+2 market results with EDAM entities that request the information for their specific gas generators no later than 05:00 of the day-ahead market run; *i.e.*, 05:00 on D+1. We request stakeholder input on additional features to increase the accuracy of this market run and better inform gas procurement planning.

(i) Resource specific energy bids – Hydro Operation

Hydro resources often face limits on their production due to constraints imposed by water delivery requirements, environmental requirements, and other factors that can affect the energy available from the resource. The ISO will allow EDAM BAAs to manage their hydro resources through daily energy limits, which set a limitation on the total discharge of individual resources, and hourly energy bids, which inform minimum discharge obligations and availability to discharge. Participants can use these constraints in combination to meet a hydro project's underlying requirements and efficiently schedule their resource through the day-ahead market process. In addition, the ISO will facilitate hydro resource modeling that allows multiple related resources comprising an aggregated resource to function as a single resource in the market.⁴⁶

⁴³ Resources participating within the ISO BAA operate under a participating generator agreement (PGA), which references performance obligations in the ISO tariff.

⁴⁴ Additional discussion regarding the counting of intertie bids made at the ISO border with a non-EDAM BAA are discussed in section II(B)(c)(2)(a)(iv).

⁴⁵ [ISO BPM – Market Instruments](#) (see Attachment O)

⁴⁶ Under this paradigm, the EDAM entity must demonstrate the reasonableness of the proposed aggregation and preserve the security of the underlying transmission by its operation of the hydro aggregation.

*(ii) Variable Energy Resource (VER)
Supply Bids*

In developing its day-ahead supply plan, an EDAM BAA may rely on the forecasted output of VERs. The financial nature of a day-ahead market does not always incentivize VER scheduling coordinators to bid up to the full quantity of the VER forecast due to the inherent uncertainty in that day-ahead forecast. This decision generally is made because the uncertainty inherent in day-ahead forecast decreases confidence in the upper and lower bounds of the forecast. The ISO has observed that the difference between forecast and bid in VER supply typically is backfilled by convergence supply bids, which allows the existing day-ahead market to clear; adjustments are then made in the RUC run to account for the difference in forecast and bid in supply. To ensure VER supply is appropriately reflected in the EDAM RSE the proposal is to create default supply bids for the difference between the bid in and forecast quantity for use in the EDAM RSE only. The day-ahead market will then utilize the bid in supply and, convergence bids as applicable, within its optimal clearing process. Further, to ensure there are sufficient bids to clear RUC, the proposal is to require the scheduling coordinator for each VER to submit RUC availability bids up to its variable energy forecast.⁴⁷ This will reasonably ensure the day-ahead results can reliably meet forecasted real-time conditions.

(iii) Non-resource specific resources

EDAM BAA day-ahead supply plans are comprised of resource or load modification programs that cannot explicitly be modeled in in the EDAM. This circumstance generally arises when the source or transmission is unknown in the day-ahead timeframe or the load modification program does not conform to existing demand response models developed by the ISO. The proposal is to account for these resources in the EDAM RSE as described below.

*(iv) WSPP-C and ISO RA Imports (Firm
Energy Contracts)*

Firm energy contracts, commonly executed through WSPP Schedule C arrangements, are widely considered reliable and dependable, and they generally include liquidated damages provisions or other performance incentives. For these types of firm energy contracts, while the delivery point to BAA is known, the source and transmission path may not be known in time for the day ahead market close (10 a.m.) when bids are submitted into the market. WEIM entities depend upon these arrangements to varying degrees in their resource portfolios, and this dependence may also vary seasonally. Similarly, California load serving entities (LSE) rely upon WSPP Schedule C arrangements to secure imports as part of meeting their resource adequacy program obligations. Stakeholder comments emphasized the dependence on these arrangements across the west, their historical reliability in performance, and the need for these arrangements to count toward the RSE. Nevertheless, given the potential lack of resource and transmission specificity by the time of day ahead market close, both the ISO and stakeholders have raised concerns regarding the potential for these contracts to be double counted. To the extent WSPP-C contracts between EDAM BAA's are modeled in the market and included in congestion management, the contracts will implicitly receive equal priority to other transfers

⁴⁷ DAME proposes to create an additional market power mitigation run within the RUC to test for market power with the reliability capacity product. Accurately representing forecasted VER production is necessary to ensure the accuracy and effectiveness of that market run.

using potentially limited transmission between EDAM BAAs in the day-ahead market. Further, depending on how non-resource specific contracts are modeled, the accuracy of the day-ahead market results and validity of the underlying pricing may be affected. Discussion during stakeholder technical workshops after the publication of the straw proposal suggested that additional information regarding the transmission or source specificity may be available at the time the EDAM is run. The availability of this additional information may support options to address these concerns that the straw proposal did not consider, which we discuss below.

The proposal is to count firm energy contracts in the EDAM RSE, including WSPP-C, ISO resource adequacy imports, and similar forward contracted supply. To the extent forward contracted supply is offered to the ISO through an intertie bid, the ISO will provide functionality to associate that intertie bid with a forward contract for purposes of counting in the EDAM RSE.⁴⁸

All source-specific forward contracted supply will count towards the EDAM RSE and can be modeled in the EDAM. When the source cannot be identified, assumptions must be made regarding the source of the supply. These assumptions will affect the power flow of the day-ahead market and, ultimately the pricing of the day-ahead market. To minimize the inaccuracy in market results inherent to non-source specific supply contracts, the proposal is that all forward supply contracts considered in the EDAM RSE, at a minimum, identify the source BAA prior to running the day-ahead market. This should provide transparency regarding the potential double counting of resources and enable more accurate modeling of these resources types. Stakeholder discussions within the technical workshops indicate that this information is either known or can be reasonably inferred by this time based on discussions with supplier or based on experience and other factors.

Below we discuss a potential approach assuming that the source BAA is declared prior to the EDAM, depending upon where the source BAA is located.

Sourced from an EDAM BAA

- Count the supply for the sink EDAM BAA and do not adjust the source EDAM BAA's requirements because the source BAA may not always be the party making the transaction with the sink BAA.
- Validate that the source EDAM BAA retains sufficient generation to meet its load, uncertainty, and this expected export obligation. If sufficient residual supply is present within the source BAA, the ISO will model the transaction as a bucket 1 transfer between the source and sink BAA. If the EDAM BAA does not possess sufficient supply, subject to implementation feasibility, the proposal is to model the residual supply as sourced from a zonal distributed generation aggregation point (DGAP). The ISO would create DGAPs for the Desert Southwest and Pacific Northwest. Modeling the supply zonally rather than on a BAA or resource specific level will limit market participant's ability selectively to choose where the supply is sourced from as a means to influence market results, ultimately limiting market manipulation opportunities that can arise due to unvalidated contracts. In addition the proposal is to publish instances where the EDAM BAA whose supply is attributed to support a contract has not made sufficient offers into the day-ahead market to clear against the contracted schedule.

⁴⁸ Additional discussion regarding the external resource participation can be found in section II(C)(6).

Sourced from an non-EDAM BAA

- Require transmission designation at the injection point of the EDAM footprint
- Model the injection to the DGAP of the non-EDAM footprint

Separately, the proposal is that all non-source specific forward supply contracts be tagged within three hours following publication of the day-ahead market results.⁴⁹ This will increase confidence that this non-source specific forward supply will be delivered in real-time because submitting a tag requires resource and transmission identification. The ISO will publish an EDAM BAA's quantity of import supply that does not have a day-ahead e-tag for situational awareness of BAAs that participate in the EDAM.

For the remaining schedules that lack a valid day-ahead e-tag within the timeframe above, the EDAM entity will have until the start of the short term unit commitment horizon (STUC),⁵⁰ *i.e.*, the final four intervals which correspond to the trade hour, either to submit e-tags and/or replace the capacity with other firm schedules or physical resources. If the EDAM BAA does not tag the outstanding schedules prior to the start of the STUC run, the proposal is to remove the BAA from the pooled WEIM RSE approach.⁵¹

The EDAM BAA that fails to cure its untagged supply will not be a party to the shared uncertainty requirement or incremental imbalance reserves procured above the upward uncertainty requirement for the EDAM footprint as a whole. The failed EDAM BAA will instead receive a pro-rata credit for the imbalance reserves that were optimally procured from elsewhere in the footprint for purposes of passing the WEIM RSE. This proposal also provides that the STUC run assume transfers into the EDAM BAA that did not pass the RSE be limited for the final four intervals, thus allowing the market to start additional resources available to that EDAM BAA and resolve the shortfall in the real-time market.

If supply without a supporting valid e-tag causes the EDAM BAA to fail the WEIM RSE, the EDAM import/export transfers to/from the failed BAA would nonetheless be supported through the market optimization. If real-time conditions necessitate manual curtailment of load in the EDAM BAA, imports into the failed BAA could be curtailed prior to load, but exports out of the BAA would be honored before serving deficient BAA load. This differs from the equal priority otherwise accorded EDAM BAA load and EDAM export transfers in the EDAM.⁵²

The proposal is that the ISO Department of Market Monitoring report monthly on the volume of day-ahead non-resource specific schedules that fail to submit valid e-tags prior to conclusion of the WEIM RSE. This monthly reporting would build on the existing reporting the Department of Market Monitoring already conducts for the WEIM.

(v) Day-Ahead Inertie Bids at ISO Interties

Stakeholders raised concerns regarding how non-resource specific inertie bids submitted at the ISO BAA border are counted in the EDAM RSE. Specifically, they expressed concern that

⁴⁹ The ISO day ahead market results are published at 1pm. To the extent publication is delayed, the tagging requirement is within three hours following publication of the results.

⁵⁰ The short term unit commitment run is part of the ISO's real-time market. It runs hours for the upcoming 18 15-minute intervals resulting in binding unit commitments for resources who otherwise are unable to be started by the real-time unit commitment process.

⁵¹ The proposed consequences for not passing the EDAM RSE are discussed in section II(B)(2)(c)(3).

⁵² Section II(A)(2) includes discussion regarding the confidence in EDAM transfers.

these bids may inequitably advantage the ISO BAA compared to other EDAM BAAs in the EDAM RSE. Stakeholders also raised concerns that this supply type potentially is less reliable and dependable compared with forward contracted imports of physical resources because it cannot be dispatched intra-day to meet real-time needs. This limitation is an inherent feature of intertie bidding participation in the day-ahead market and only occurs in the ISO BAA.

The proposal is to count economic supply offers in the EDAM RSE at ISO interties with non-EDAM BAAs (*i.e.*, “intertie bidding”), if those supply offers are associated with a forward contract⁵³ with a LSE within the ISO BAA or otherwise have a reasonable expectation of delivery. The proposal is to count an intertie bid should it meets any of the following criteria:

- Intertie bids associated with a resource adequacy contract.
- Intertie bids associated with a forward contract, but not otherwise shown as part of a resource adequacy supply plan.
- Intertie bids originating from resources that are pseudo tied with the ISO BAA – these resources have their output telemetered into the ISO and deemed produced in the ISO BAA under the terms of a contract with the ISO under the tariff.⁵⁴
- Intertie bids originating from dynamically scheduled resources into the ISO BAA – these resources provide telemetered readings of their intertie schedules and have an agreement with the ISO (with scheduling coordinator and host balancing authority area) under the tariff that sets out operating requirements.⁵⁵
- Intertie bids originating from a *non-dynamic resource –specific system resource* – these are source specific external resources that have an executed agreement with the ISO that sets out performance and operating requirements.⁵⁶ In practice, these resources have a contractual relationship with ISO LSEs so they also can be considered as contracted supply.

Each of these transaction types indicates a supplier’s intent to sell energy to the ISO BAA in the day-ahead market. This, combined with the observed performance of intertie supply, demonstrates confidence that these supply offers will deliver in real-time, satisfying their obligations under the ISO tariff. The ISO tariff includes an under/over delivery charge that assesses penalties for intertie resource deviations from their market schedules.⁵⁷ These obligations should be sufficient to count ISO intertie bids as proposed herein; nevertheless, the ISO will continue to monitor deliveries from these supply resources and evaluate enhancements to address any identified concerns. We request stakeholder feedback on this proposal to count ISO intertie supply for purposes of passing the EDAM RSE.

⁵³ The ISO will provide a means for LSEs to link intertie bids with a forward contract

⁵⁴ ISO Tariff, *Pseudo-Tie Participating Generator Agreement*, Appendix B.16.

⁵⁵ ISO Tariff, *Dynamic Scheduling Host Balancing Authority Operating Agreement*, Appendix B.9; *Dynamic Scheduling Agreement for Scheduling Coordinators*, B.5.

⁵⁶ ISO Tariff, *Resource-Specific System Resource Agreement*, Appendix B.13.

⁵⁷ In addition, as part of the *Price Formation Enhancements* the ISO is actively considering adopting different energy market bid caps between the day-ahead and real-time markets. This could discourage speculative intertie supply bids in its day-ahead process by potentially increasing the financial exposure of the scheduling coordinator moving into the real-time market.

(vi) *Load Modification/Demand Response Programs*

The ISO currently offers two demand response models that allow load modification programs to participate in the market as load curtailment. These models allow supply side demand response to offer supply bids into the market as either price responsive or reliability triggered load curtailment, and they include metering and telemetry requirements. EDAM entities may have their own demand response programs that may not align with these existing market models.

Because such load modification programs may be part of an EDAM BAA's day-ahead plans, the proposal is to allow EDAM BAAs to represent them through a demand forecast adjustment similar to that used in the WEIM.⁵⁸ The demand forecast adjustment represents an expectation the EDAM BAA will utilize these programs in real-time. The proposal is to limit the volume of load that can be bid into the EDAM to the load forecast minus the demand response adjustments. This will help prevent an entity from manipulating the EDAM RSE requirements for purposes of passing the test, while procuring excess supply in the EDAM to avoid using the demand response programs.

The existing rules regarding use of the ISO's reliability demand response resource (RDRR) place limitations on these resources' ability to participate in the day-ahead market. If advisory EDAM RSE results indicate a potential inability for the ISO BAA to meet its next day obligations, the ISO could modify its forecast in the extended day-ahead market and the RUC. This will result in the market not procuring energy, imbalance reserves, or reliability capacity up to its full day-ahead forecast; but it would allow the ISO BAA to pass the EDAM RSE and fully participate in the day-ahead market. If the requisite conditions materialize in the real-time market, the ISO BAA could then exercise its RDRR program by releasing the supply into the real-time market.

We seek comment on this framework, including whether the load modifications mentioned earlier should be limited in quantity, and if so what the limit should be.

(vii) *Bid range trading platform*

The proposal is that RSE requirements can be traded between EDAM BAA's through a platform provided by the ISO. On an hourly granularity, EDAM BAA's can make residual supply and bucket 1 transmission available for usage by any neighboring EDAM BAA for a preset price. These trades will be effectuated by offsetting obligations in the EDAM RSE.

	BAA 1	BAA 2	BAA 3
BAA IRU Up Requirement	1000	150	400
BAA1 – BAA 2 Trade	-50	50	-
BAA1 – BAA 3 Trade	-200	-	200
BAA2 – BAA 3 Trade	-	-	-
Final IRU Requirements	750	200	600

Table 6: Illustration of bid range trading.

The proposed on-demand EDAM RSE combined with this platform will allow the EDAM BAA's to work together to cure deficiencies for a duration shorter than currently possible through existing bilateral market products. The capacity offsets would be at prices agreed upon by both parties, while still leveraging the market for settlement. Curing potential EDAM deficiency through this process allows the seller to retain all of the revenue generated from the transaction

⁵⁸ See ISO tariff section 29.34(l)(2)(D).

unlike the administrative surcharge to cure deficiencies through the market clearing process as proposed below.

(3) Failure to Pass the EDAM RSE

The straw proposal suggested establishing different consequences for failing the EDAM RSE during stressed and non-stressed conditions. Having differing consequences based on varying conditions attracted some support from stakeholders, but it highlighted that significant additional policy development is required to define stressed system conditions and draw a bright line between the associated consequences. Numerous of stakeholders disagreed with this approach entirely and preferred imposing the same consequences during all system conditions. Further, many stakeholders expressed a strong desire that EDAM not serve as a mechanism for entities to avoid forward procurement.⁵⁹ In response to these comments, this proposal aims to present a balanced approach to cure deficiencies through the EDAM during all periods, while not creating a mechanism that can be utilized to avoid sufficient forward procurement.

(a) Consequences of failure

The proposal is that capacity shortfalls identified in the EDAM RSE be cured, if possible, by the EDAM market through a surcharge. The shortfall would be cured through surplus supply offers that have been willingly bid into the EDAM. The surcharge would be based on the maximum hourly deficiency as determined by the EDAM RSE application. The EDAM RSE will minimize the capacity deficiency across the 24-hour horizon resulting in optimally calculated schedules that may contain a supply deficiency in any of the 24-hours. Using the maximum hourly supply deficiency, the EDAM application will calculate an administrative surcharge using the maximum of the Mid-C or Palo Verde day-ahead hub price for an on-peak block of energy, for the entire multi-hour block, for each MW the BAA has been identified as being short. The proposal is to base the administrative surcharge on a 16-hour block product, which is the most common on-peak block sold bilaterally. Table 7 below provides an example. To prevent a double charge for that quantity of supply, the ISO will deduct from the administrative surcharge the load weighted average LMP from the deficient BAA for the MW quantity cured in each hour the EDAM BAA was deficient, with backstop rule to ensure the credit does not exceed the original administrative charge.

Hour	Shortfall (MW)	Mid-C Price (\$/MWh)	Palo Verde Price (\$/MWh)
1	0	200	225
2	0	200	225
3	15	200	225
4	0	200	225
Hour Ending 3 LMP in the failed BAA = 300			
Administrative Surcharge = (15*225*16) – (15*300) = \$ 49500			

Table 7: Example of Administrative surcharge to cure supply deficiency through the EDAM.

If the IFM can fully resolve the deficiency and cure the EDAM BAA through the market optimization, the EDAM BAA would be treated as a member of the pool of passing BAAs as the EDAM results are used in the WEIM RSE. The proposal is that if the market is unable to resolve the entire deficiency, the EDAM BAA would retain the ability to participate in the pool of

⁵⁹ EDAM BAA’s currently can cure next day supply deficiencies through the existing bilateral market. Comments highlighted concerns that EDAM could be positioned as an alternative to curing under the existing day-ahead construct.

passing BAAs if, by the STUC horizon ending in the hour of their shortage, it can backfill the deficiency with supply. This affords the EDAM BAA an opportunity to participate in pooled WEIM RSE, while also benefitting the passing group if the failed EDAM BAA is able to cure given its imbalance reserve requirement was calculated assuming the participation of the deficient EDAM BAA. We request comment on this approach.

By indexing the surcharge to the major bilateral hub prices, the surcharge will automatically scale with varying system conditions. This eliminates the challenge of defining stressed and unstressed system conditions, while providing a viable option for an EDAM BAA to cure a deficiency. Although concerns have been raised regarding the ongoing liquidity of the bilateral hubs following implementation of EDAM, this a reasonable starting point and we will monitor these reference prices as part of its ongoing EDAM administration efforts. If it is determined the hub prices no longer represent a reasonable reference price, we would consider whether to revise the EDAM surcharge through a subsequent initiative.

(b) Allocating surcharge revenue

The proposal is to allocate the revenues associated with the surcharge to cure a deficiency of an EDAM BAA's failure to pass the EDAM RSE based on the net EDAM export transfer, including its transfers of energy, imbalance reserves, and reliability capacity. Because these products overlap, considering the optimal procurement of imbalance reserves beyond an EDAM BAA's pro-rata obligation is appropriate because the market may limit energy exports in lieu of procuring imbalance reserves for the footprint from within that EDAM BAA. Allocating the revenues to net-EDAM exporters and entities that procure imbalance reserves beyond their obligation appropriately rewards BAAs whose supply and flexibility is used for economic displacement and, in this case, ultimately curing the supply deficiency.

(c) Funding of the surcharge revenue

The proposal is that each EDAM BAA will remain responsible for determining how any resultant surcharges will be allocated to customers within its service area.

The proposal is to use a two-tiered approach to allocate any potential surcharge for the ISO BAA. To ensure the funding of the surcharge is made under the principles of cost causation, the ISO will (1) review availability of resource adequacy capacity to allocate any surcharge to LSEs whose failure to meet their obligations lead to the failure and (2) allocate any remaining funding requirements to LSEs pro-rata based on their load share within the ISO BAA. This approach ensures that an LSE's failure to meet its resource adequacy obligation is not borne by the entire BAA, while also ensuring outlier events beyond the planning standards contemplated by the resource adequacy program are equally shared by load within the ISO BAA.

(d) Monitoring and additional administrative penalties

Certain stakeholders expressed concerns that EDAM entities may rely on the aforementioned failure consequences in lieu of forward procurement. The proposed financial consequences are a reasonable proxy for the prices an EDAM BAA would face if it sought to cure any deficiency through the existing day-ahead bilateral market. As long as the day-ahead bilateral market exists as a mechanism to cure next day supply deficiencies, curing such deficiencies in the EDAM market in the same timeframe is a reasonable alternative. The proposal is to monitor EDAM BAA's use of EDAM to cure deficiencies so it has information necessary to ensure that

the financial consequences are correctly set and do not incent EDAM entities to avoid sufficient forward procurement

(e) Linkages to the WEIM RSE

Stakeholders and the ISO are currently exploring the concept of creating financial consequences to cure undersupply conditions in the WEIM RSE. We are considering to cure supply deficiencies by allowing incremental transfers once prices in the deficient BAA rise to the bid cap. This design would allow a WEIM entity to cure supply deficiencies on an hourly basis and would settle the entire volume of load in the deficient BAA at the bid cap. For an EDAM BAA deficiency, settling the entire volume of real-time demand at prices near the bid cap for an hour may sufficiently incent the EDAM BAA to instead procure incremental shortfall quantities in the day-ahead time frame. We request comment on whether additional rules are needed to ensure day-ahead procurement for resource sufficiency.

(f) Additional considerations

Some stakeholders questioned if financial consequences are necessary if an EDAM BAA's RSE failure falls within the bound of its uncertainty obligations, or if failure within the uncertainty requirement should be priced differently. We seek comments on whether failures of the EDAM RSE within the high confidence contemplated under the *day-ahead market enhancements* initiative be treated similar to supply deficiencies to meet demand, and if so, what consequences would apply for failures within this band.

(g) ISO BAA curing of advisory RSE failure

Because the ISO BAA is comprised of many LSEs operating under varying forward procurement rules, additional coordination may be required to cure EDAM RSE deficiencies within the ISO BAA. The ISO currently relies largely on the RA program for meeting the RSE, but there are additional tools such as exceptional dispatch, its capacity procurement mechanism (CPM) and reliability must run (RMR) authority to resolve supply shortfalls. Many LSEs also may have additional supply under contract that can be made available if necessary, following requests from the ISO. It is necessary to consider what additional mechanisms may be necessary to ensure the ISO BAA can cure deficiencies in the advisory period. We seek feedback on formalization of mechanism entities believe is required to cure within the advisory EDAM RSE process.

(4) EDAM Entities Pooled WEIM RSE

Testing as a pool in the WEIM all parties who pass the EDAM RSE creates an opportunity both to allocate a diversity benefit on the uncertainty that may arise between the day-ahead and real-time and potentially enhance the reliability of the EDAM footprint in the real-time market.

(a) Diversity Benefit and Linkages to WEIM RSE

Calculating a pro-rata diversity benefit⁶⁰ for the imbalance reserve requirements can reduce each participating EDAM BAA's forward procurement obligation because the uncertainty in the

⁶⁰ Calculating a diversity benefit for all EDAM participants can be considered as part of the EDAM design. The ISO would calculate the imbalance reserves requirements for each BAA independently and for the

overall EDAM footprint will be less than the sum of individual BAA's uncertainty. This lower requirement, however, effectively reduces the confidence level to which imbalance reserves are procured on an EDAM BAA by EDAM BAA basis. The reduction in imbalance reserves increases the risk of WEIM RSE failure to the extent higher levels of uncertainty materialize. The diversity benefit for each BAA will be limited by the BAA's import and export capability based on transmission made available to the EDAM.

The proposal is to test the EDAM footprint for WEIM resource sufficiency considering all day-ahead awards, imbalance reserves, and reliability capacity prior to determining if it needs to test an individual EDAM BAA for WEIM resource sufficiency. Each participating BAA is expected to address any intra-day outages that render any of the capacity used to back EDAM schedules prior to the running of the WEIM RSE. Testing in a pooled manner is a straightforward way to ensure the energy, imbalance reserves, and reliability capacity awards from the EDAM are able to be leveraged to provide high levels of confidence against uncertainty materializing in the WEIM.⁶¹

(b) Hybrid diversity benefit and pooled WEIM RSE

The proposal is to test the EDAM footprint in the WEIM using a hybrid pooled methodology. Under this methodology, a portion of the diversity benefit will not be allocated; instead it will be reflected as additional global procurement of imbalance reserves for the footprint to use as a whole. The proposal is the ISO can configure this quantity to provide the EDAM BAAs a collective mechanism to adjust imbalance reserve requirements dynamically. Although this will reduce economic benefits due to increased EDAM RSE showing requirements, it will provide additional reserves for the EDAM while the EDAM BAA's familiarize themselves with a centrally cleared, multiple BAA, day-ahead market.

(c) Failure of the EDAM footprint using a pooled approach

Procuring imbalance reserves to a high confidence level, combined with the additional procurement of a pre-set quantity of imbalance reserves, should limit occurrences in which EDAM schedules are insufficient to pass the WEIM RSE. If the footprint fails the WEIM RSE the ISO sees two potential options:

(d) Pooled EDAM footprint through the WEIM RSE

The pooled EDAM footprint as a whole remains responsible for curing any shortfall in the WEIM RSE. Intertie bids made at the ISO border would be credited towards meeting the needs of the footprint as a whole. If that curing is not accomplished, the footprint would be able to access assistance energy through the WEIM. This would result in prices in the EDAM footprint rising to the bid-cap, which is appropriate because the EDAM footprint does not have sufficient supply to meet its obligations. If this does not resolve the infeasibility, the real-time market would isolate

EDAM footprint as a whole. The ISO would then distribute the diversity benefits pro-rata based on the reduction between the summed individual BAA requirement and the EDAM footprint requirement.

⁶¹ The EDAM technical workshops held on July 15th, 2022⁶¹ provide detailed examples of how the pooled WEIM RSE approach would work considering the diversity benefit, some of which are included in the confidence in transfers discussion in section II(A)(2).

the power balance infeasibility in the BAA that caused the shortfall, and manual operator actions to mitigate the supply deficiency would follow.

(e) Dissolve EDAM footprint following failure of the WEIM RSE

Following the failure of the EDAM footprint, the footprint would be broken up, and each BAA would be tested individually in the EDAM. Ultimately the BAA that caused the insufficiency would be identified and would fail the WEIM RSE. However given the lower procurement of imbalance reserves on an EDAM BAA by EDAM BAA basis, additional BAAs would be exposed to potential WEIM RSE failure to the extent that high levels of uncertainty materialize in their BAA.

d) Management of Supply in Excess of RSE Requirements and Consideration of EDAM Transfer Export Limits – Potential Mechanisms

During the working groups and workshops, we discussed an EDAM entity's ability to retain an amount of excess supply above what is needed to pass the RSE. This retained capacity could then be used by the balancing authority for reliability management purposes. Although there are financial incentives to make all excess supply available to the market, some stakeholders have argued that it may be beneficial to retain excess capacity from the market during stressed conditions to protect against unanticipated reliability needs that may not be covered by the day-ahead market. This designated capacity would be deployed by the BAA to support reliable operations in case conditions exceed the amount of collective uncertainty available. This is another potential reliability tool in the operational toolbox.

ISO LSEs expressed the need to consider how resource adequacy capacity, procured by LSEs to serve their load reliably, can remain available to ensure grid reliability if intra-day contingencies arise during stressed system conditions that are not covered by operating reserves, imbalance reserves, or reliability capacity. Under the current ISO BAA resource adequacy program, supply under a resource adequacy contract has a must offer obligation into the day-ahead and real-time markets. As such, all supply is offered into the market even if it exceeds the ISO's RSE obligation. In the EDAM, the excess resource adequacy supply may be committed economically to support transfers without remaining available to help respond to potential reliability events between day-ahead and real-time. On the other hand, EDAM entities may have their own resource adequacy or resource planning regulatory programs, and may have the option to determine whether to retain supply above their RSE obligations in anticipation of stressed conditions and not offer it into the EDAM or offer such excess supply to derive further benefits).

The ISO recognizes there is an apparent incongruence in the ISO processes that may make all resource adequacy supply, including supply in excess of the ISO's RSE, automatically available to the market without the opportunity for an LSE to consider whether to hold back some of the capacity to respond to reliability conditions that may materialize between day-ahead and real-time. As such, the ISO introduces two potential mechanisms for consideration as to how supply above what is needed to meet the ISO RSE, could remain available to the ISO to help ensure the reliability of the ISO grid in stressed system conditions.

One approach is to implement a mechanism like the available balancing capacity used in the WEIM in the EDAM. Under this concept, ISO LSEs would be able to identify prior to the day-ahead market run whether any excess RA capacity not needed to pass the RSE should be

offered into the IFM or held-back from the day-ahead market, thus allowing the capacity to remain available for exceptional dispatch to manage reliability risk for contingency events that occur between the day-ahead and real-time markets.

A second approach is to introduce a net EDAM export transfer limit that would permit EDAM entities to identify a limit on the amount of EDAM net export transfers in the day-ahead market during a defined period. These mechanisms are discussed below and the ISO seeks stakeholder feedback on the concepts, their viability, and their implications from a market design participant perspective.

(1) Mechanism 1: Reserving Day-Ahead Supply in Excess of RSE Requirements

Under California's resource adequacy program, all supply shown on a LSE's monthly resource adequacy plan has a must-offer obligation into the day-ahead and real-time markets.⁶² California LSEs do not have a mechanism to identify in the market resource adequacy capacity in excess of what is need to pass the ISO's RSE obligation and is procured to address ISO reliability challenges. Under this proposed mechanism, LSEs would have the ability to offer resource adequacy supply into the market and indicate whether any supply in excess of what the ISO needs to meet its RSE obligation should be kept out of the IFM. Such capacity would then be available for exceptional dispatch in case conditions exceed the amount of collective uncertainty that may materialize between day-ahead and real-time that are is not covered by operating reserves, imbalance reserves, or reliability capacity. If needed, ISO operators could dispatch this supply and make it available in the real-time market. The reserved capacity that is not needed in response to a contingency would be released back to the scheduling coordinator to bid (or not bid) into the real-time market in accordance with the applicable must offer obligation.

The ISO envisions the default option would be to carry forward into the IFM any bid for resource adequacy capacity unless the scheduling coordinator indicates through a checkbox in the bid not to not carry the bid into the IFM if the EDAM RSE result indicates the supply exceeds what the ISO needs to pass RSE. This design would grant each LSE discretion to identify whether resource adequacy supply in excess of what is needed to pass the RSE should be made available to the IFM to support additional transfers or be held back to respond to reliability events between day-ahead and real-time. This option would be available only for resource adequacy supply that is subject to an offer obligation and is capable of being exceptionally dispatched.

The ISO expects that under normal conditions, LSEs would continue to offer into the market any excess supply that is under a resource adequacy contract to derive the benefits of the market and support robust EDAM transfers from the ISO system. In stressed system conditions, the ISO expects there may be limited or no excess resource adequacy capacity above what is needed for the ISO to pass the EDAM RSE. If there is excess capacity, it can be held back for potential exceptional dispatch in response to a reliability event.

⁶² The California resource adequacy obligation dictates the procurement of sufficient supply, shown in annual and monthly increments, to meet the forecasted peak load and a planning reserve margin. It also includes a must offer obligation, which the ISO would need to evaluate for potential changes if this proposal is adopted.

The ISO believes this approach is consistent with the resource adequacy design because entities will be showing and making available to the market all resource adequacy supply in the first instance. Only if there is resource adequacy supply above what is needed for the ISO to meet its RSE obligation would such capacity be held back from the IFM. Further, such capacity eventually would be released to the LSE to bid into the real-time market consistent with the capacity’s must offer obligation, and it would support the ISO’s ability to meet the WEIM resource sufficiency evaluation.

LSEs would work with their local regulatory authorities to establish criteria for when they would release excess RA supply from the IFM.

Finally, the proposal is to make this mechanism available to all EDAM BAAs. The ISO requests stakeholder feedback on this mechanism for managing supply in excess of the RSE, its function, potential implications on contracting, and any other implications based on the holistic EDAM design presented in this proposal.

(2) Mechanism 2: Net EDAM Export Transfer Limit

Another potential mechanism to address the concerns described above would be to introduce a net EDAM export transfer limit as a constraint in the market. The net EDAM export transfer limit is a mechanism that would limit net export transfers out of an EDAM BAA to the difference between RSE countable capacity and the RSE requirement of an EDAM BAA. The EDAM entity would have the discretion to increase the limit applicable in its BAA. Furthermore, a net EDAM export transfer limit could further contribute to confidence that EDAM transfers are supported by robust RSE countable supply.

$$\text{Net EDAM Transfer Export Constraint (BAA)} = \text{RSE Countable Capacity (BAA)} - \text{RSE Requirement (BAA)}$$

RSE countable capacity consists of consists of (a) supply that an EDAM BAA has available that is eligible to count for RSE, excluding supply that may support exports to non-EDAM BAAs and (b) volume of supply located within the EDAM BAA that other EDAM entities are relying on for RSE purposes. The difference between the RSE countable capacity and the RSE requirement represents the high limit on the amount of net EDAM transfers that could potentially be supported out of an EDAM BAA.

	RSE Countable Capacity	RSE Requirement	Net EDAM Export Limit
Example 1	Available: 3000 MW Export RSE: 200 MW Total: 3200 MW	2500 MW	700 MW
Example 2	Available: 3000 MW Export RSE: 200 Total: 3200 MW	3000 MW	200 MW

Table 8: Examples illustrating the Net EDAM export limit derivation.

As illustrated in the table above, the net EDAM export transfer limit varies based upon grid conditions which drive the RSE requirement. In lower load days, *i.e.*, under more normal or less stressed conditions, the limit would inherently be higher, but in more stressed conditions, when the RSE requirement is higher or the available countable RSE capacity is lower, the limit would inherently be lower. As such, the net EDAM export limit may be more relevant in stressed

conditions, and leaving it to the discretion of the EDAM entity when to consider instituting the limit would be based on the equation discussed above.

The net EDAM transfer export limit mechanism could provide for similar protection as the mechanism for managing supply in excess of the RSE because it would enable the EDAM entity to manage how much of its internal capacity can support transfers out of its BAA. The net EDAM export limit would not limit exports from an EDAM BAA to non-EDAM BAAs; rather, those exports constitute lower priority exports (except for those identified as supporting a high priority export) under the ISO tariff and, as such, would have a greater curtailment risk in real-time to maintain reliability of the EDAM footprint. In the context of the ISO, the net EDAM transfer export limit would not limit exports to non-EDAM balancing authority areas – whether the exports are high or low priority. Management of non-EDAM export priorities will be subject to the existing high and low export priorities relative to ISO load self-schedule or power balance priorities.

We seek feedback from stakeholders on the value and need for this type of a net EDAM transfer export limit as another reliability function mechanism and further building confidence in transfers. We also seek feedback as to whether the export limit is needed in addition to (or could be used in lieu of) the mechanism to hold back capacity in excess of what is needed to pass the RSE.

C. Extended Day-Ahead Market Processes

The day-ahead market processes primarily include the integrated forward market (IFM), residual unit commitment (RUC), and market power mitigation (MPM) processes. The day-ahead market runs from 10:00 a.m. to 1:00 p.m. and optimizes resource commitments and schedules across the EDAM footprint. This section also covers convergence bidding, external resource participation, and other important day-ahead market considerations.

1. Day-Ahead Market Overview

The day-ahead market takes into account a number of inputs to produce feasible and efficient market results. For example:

- *Bids* – scheduling coordinators submit bids to let the market know how much energy or capacity they are willing to sell or purchase in the day-ahead market.
- *Forecasts* – forecasts include demand forecasts and renewables forecasts to provide insight into the needs for the next day and the potential quantity of renewables that may be available.
- *Full Network Model* – a computer-based model that provides the market all of the options for flowing the supply to meet the demand, including any transmission limits.
- *Outages* – reductions in capacity (planned or forced) that impact the amount of supply that can flow from resources or across transmission lines.
- *Master File* – a database that contains the attributes of the resources in the market (e.g., start-up times, ramp rates, maximum capacity, fuel type).

Each of these components helps the day-ahead market produce schedules to meet the demand at least cost while maintaining system reliability.

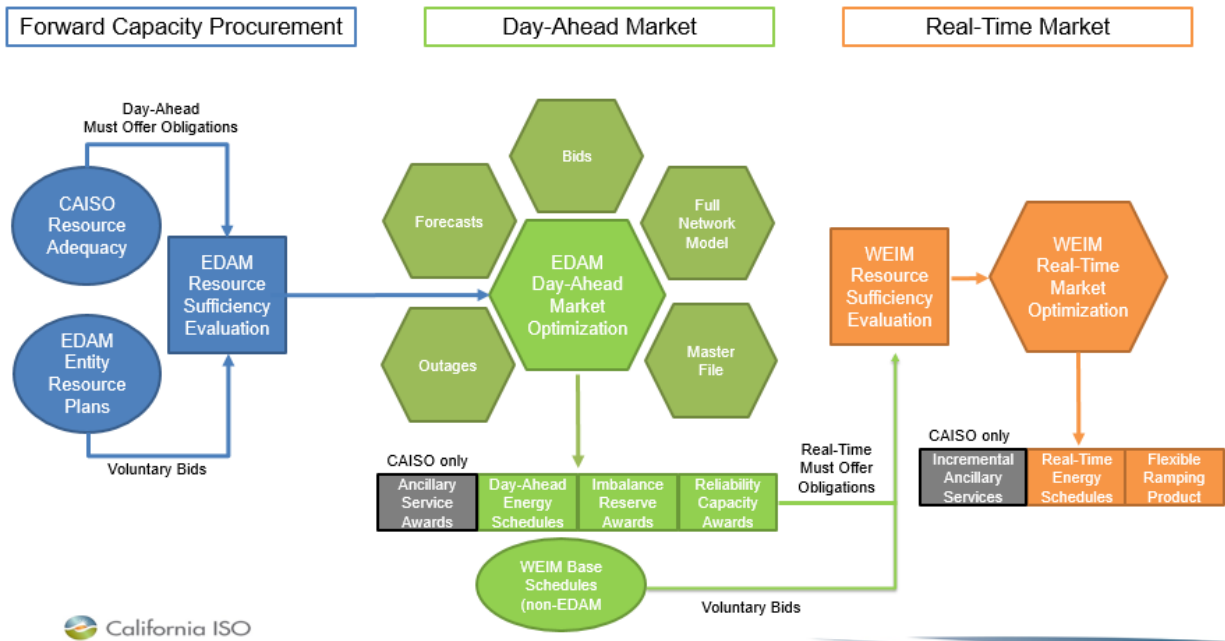


Figure 2: illustration of day ahead market processes, inputs and outputs.

2. Integrated Forward Market (IFM)

The IFM balances supply and demand, produces hourly unit commitment and energy schedules, and procures hourly ancillary services for entities within the ISO BAA. Thus, it is an integral part of the EDAM design. Under EDAM, scheduling coordinators will participate in the IFM by submitting hourly bids (self-schedules or economic bids) for supply and demand resources and for imports and exports at interties between external BAAs and EDAM BAAs or the ISO. All participating resources within the EDAM footprint and at the ISO interties can submit energy bids. To simplify initial EDAM implementation, we propose that the IFM will not co-optimize ancillary services with energy across the EDAM footprint.⁶³ We propose, however, to procure imbalance reserves based on economic bids throughout all BAAs participating in EDAM.

In contrast to WEIM, EDAM BAAs will not have base schedules. An EDAM resource’s entire day-ahead energy schedule will be settled in the day-ahead market, and it will serve as the reference for measuring and settling imbalance energy in the WEIM.

a) IFM Unit Commitment

As part of EDAM, generating resources may have startup and minimum load bids, and registered unit commitment constraints such as minimum up/down times and maximum number of daily startups. The IFM will calculate an hourly optimal unit commitment status (on/off) for these resources considering their initial commitment status before the start of the trading day, their startup and minimum load bids, and their inter-temporal unit commitment constraints. Additionally, the IFM will enforce all applicable resource constraints and limitations.

The EDAM will include functionality currently in the ISO day-ahead market to support optimal unit commitment and dispatch for various types of resources based on their particular operating characteristics. For example, the existing markets have special functionality for pumped-hydro

⁶³ ISO and stakeholders may consider this element as an enhancement to the EDAM in a later phase.

resources and resources with multiple operating configurations, such as combined cycle generators. If revenues earned from providing energy and capacity do not cover costs associated with unit commitment, the resource is eligible for a “make whole” payment known as bid cost recovery (BCR).

b) Energy Schedules

In EDAM, the IFM will produce hourly day-ahead energy schedules for all resources with energy bids and self-schedules, including load resources, as well as virtual supply and demand. Generating resources that are not committed in the IFM will have 0 MW energy schedules in the relevant hour. The IFM uses energy bids screened by the EDAM market power mitigation (MPM) process. The ISO will settle energy schedules at the applicable locational marginal price (LMP).

Scheduling coordinators for physical resources with day-ahead energy schedules must bid the awarded MW quantity into the real-time market. If the scheduling coordinator does not submit an energy bid in the real-time market for these quantities, the ISO will insert a commensurate self-schedule. Scheduling coordinators may also submit an energy bid in the real-time market with a range above and/or below the day-ahead energy schedule. The difference between the fifteen-minute market (FMM) dispatch and the day-ahead energy schedule constitutes an energy imbalance deviation that the ISO will settle at the applicable FMM LMP for energy.

Resources can also submit self-schedules for a given hour. The energy schedule will reflect the self-schedule or a higher range if the scheduling coordinator for the resource submits an economic energy bid above the self-schedule and the bid clears the IFM. Scheduling coordinators may not submit an energy bid in an operating range below a self-schedule.

c) Imbalance Reserves

Stakeholders and the ISO are developing an imbalance reserve product as part of the Day-Ahead Market Enhancements (DAME) initiative.⁶⁴ The proposal is to procure imbalance reserves across the EDAM footprint. Imbalance reserves will provide upward and downward ramp capacity in the day-ahead market to meet uncertainty in the net load forecast (load minus wind/solar) between the day-ahead and real-time markets. The market will procure imbalance reserves in the IFM co-optimized with energy and ancillary services. Imbalance reserves will be a biddable product in both the upward and downward direction. Resources can provide imbalance reserves if they are dispatchable on a 15-minute basis. An imbalance reserve award comes with a must-offer obligation to provide economic energy bids in the fifteen-minute market for the amount of the award. The ISO will procure imbalance reserves respecting transmission constraints to ensure the capacity is deliverable, resulting in imbalance reserve LMPs.

The ISO will procure imbalance reserves based on an hourly uncertainty requirement. The hourly uncertainty requirement will be based on historical forecast deviations between the day-ahead and real-time markets. The proposal is to reduce the uncertainty requirement (and thus the quantity of imbalance reserves procured) in each BAA by a pro rata allocation of an *EDAM diversity benefit*.⁶⁵ The ISO will calculate the diversity benefit as the positive difference between the sum of the uncertainty requirements of all individual BAAs in EDAM and the uncertainty

⁶⁴ For more discussion regarding the imbalance reserve product see the Day-Ahead Market Enhancements (DAME) initiative ([Link](#))

⁶⁵ The uncertainty requirement and diversity benefit are discussed further in the EDAM RSE section II(B)(2)(c)(4).

requirement for the entire EDAM footprint. The ISO will allocate the EDAM diversity benefit based on each EDAM BAA's original unreduced uncertainty requirement.

This proposal takes advantage of the geographical diversity of the EDAM footprint and enables EDAM BAAs to save on day-ahead procurement by recognizing high levels of uncertainty are unlikely to materialize simultaneously in all EDAM BAAs. Thus, the diversity benefit that occurs from "pooling" multiple BAAs reduces the overall amount of capacity needed to meet net load across the EDAM footprint in real-time. Access to resources across the larger EDAM footprint will enable procurement of more efficient, lower cost capacity. Additionally, imbalance reserves will provide revenue opportunities to BAAs with more efficient and flexible resources.

In comments to the straw proposal, stakeholders generally supported the concept of imbalance reserves. Many stakeholders feel that imbalance reserves would be a valuable addition to the day-ahead market to procure flexible capacity to address net load uncertainty between the day-ahead and real-time markets. However, there are some substantive design issues with imbalance reserves that need to be resolved. These issues include the potential for duplicative payments, application of local market power mitigation, the appropriate uncertainty threshold used in the requirement (*i.e.*, the 2.5 and 97.5 percentile), and the imbalance reserve graduated penalty prices. The ISO is working with stakeholders on these issues in the DAME initiative and will address these issues in an upcoming DAME proposal.

d) IFM Transfers

EDAM transfers constitute energy or capacity exchanges between BAAs in the EDAM footprint. Transfers between BAAs are defined differently depending on their direction at a particular intertie (*i.e.*, transfers in or transfers out). There are also different transfers for different commodities (*i.e.*, energy, imbalance reserves, reliability capacity).

Optimizing the transfer of either energy or imbalance reserves in the IFM is the primary mechanism for producing EDAM benefits. Benefits are realized when higher energy or imbalance reserve bids in a BAA are economically displaced by lower energy or imbalance reserve bids from another BAA.

Transfers are classified by the type of underlying intertie transmission capacity released by EDAM BAAs and the ISO for use in the market. Transmission capacity released for transfers in EDAM must be highly reliable and remain available for re-optimization in the WEIM. The net transfer of a BAA in the EDAM footprint for a given commodity and the associated transmission bucket is the sum of export transfers minus import transfers over all interties of that BAA.

In EDAM, the IFM will support various transactions between participating BAAs, including transferring demand obligations, imbalance reserve up/down, and ancillary services requirements. The IFM will optimize energy associated with transmission made available to the market, and it will respect energy transfers associated with physical and/or financial rights. In the IFM, the market would enforce the scheduling limit for each transfer.

3. Residual Unit Commitment (RUC)

The residual unit commitment (RUC) process runs after the IFM produces energy schedules and ancillary service awards. The RUC process will procure incremental or decremental capacity (called reliability capacity up and reliability capacity down, respectively) based on the amount of physical energy that clears the IFM in relation to each EDAM BAA's load forecast.

RUC is a backstop to the IFM to ensure there is sufficient physical supply available to serve load in real-time.

The proposal continues to require that the RUC process be part of the EDAM. Stakeholders supported this and agreed that RUC is an integral component of the day-ahead market.

RUC transfers will facilitate the procurement of reliability capacity in the EDAM footprint at least cost. RUC will use transfer capacity that remains unscheduled after the IFM or counter-flow on energy transfers that clear the IFM.

Resources participate in the RUC process by providing reliability capacity bids. This proposal continues to require that all resources offering energy bids in the IFM must submit bids for reliability capacity in the RUC at the same quantity as their energy bid plus ancillary service self-provision. This ensures all resources shown in the EDAM RSE are fully available for use in RUC, including excess supply that participants offered above their RSE requirements.

Stakeholders generally supported this aspect of the proposal in their comments. However, some stakeholders noted the importance of EDAM BAAs holding back supply from the market to support their reliability obligations. This proposal would not infringe on EDAM entities ability to hold back supply from the market. The requirement to bid in RUC only extends to capacity shown in the resource sufficiency evaluation (and by extension to the IFM) and not to all resources in the EDAM BAA.

Reliability capacity up or down bids that clear the market result in reliability capacity up or down awards. These awards obligate the resource to provide economic energy bids to the real-time market. This ensures the ISO can re-dispatch these resources in the real-time market if system conditions change.

The RUC optimization will consider transmission constraints when scheduling reliability capacity, resulting in locational marginal prices (LMP). The ISO will pay all resources receiving a reliability capacity up or down award the locational marginal price for reliability capacity up or down, respectively. A resource may receive a reliability capacity award for an hour in only one direction, up or down. The net of all reliability capacity awards in an EDAM BAA will be in the direction of the total RUC requirement. However, based on network constraints and different RUC requirements across the BAAs in EDAM, there can be both reliability capacity up and down awards within a participating BAA.

The RUC process awards reliability capacity up either as an incremental dispatch on a resource already committed in the day-ahead market or by committing additional resources. RUC issues binding start-up instructions for resources with a startup time longer than six hours and advisory start-up instructions for all other resources. In addition, RUC may adjust the commitment of multi-stage generators (MSG) by transitioning them to a different configuration, either higher or lower, than the configuration that cleared the IFM. Any commitment costs due to binding commitment decisions in RUC are eligible for BCR subject to certain eligibility requirements.

Another important feature of RUC is its ability to look out multiple days. The RUC optimization horizon is up to 72 hours. The 72-hour horizon allows RUC to calculate advisory energy schedules to meet the demand forecast beyond the trade date and to commit extra-long-start resources that have a startup time longer than 18 hours. In addition, RUC provides information for future days that is useful for reliability studies and outage coordination efforts.

Imports from non-EDAM BAAs can provide reliability capacity up and down at ISO interties. The corresponding intertie schedule must be tagged after RUC with a transmission profile equal

to the sum of the day-ahead energy schedule, plus the reliability capacity award, if any. Exports to non-EDAM BAAs can also provide reliability capacity up at ISO interties, with the obligation to provide a decremental energy bid to dispatch down the export schedule in the FMM if needed.

4. Market Power Mitigation

The Straw Proposal recommended extending the WEIM market power mitigation framework to the EDAM. The proposal also noted that broader market power mitigation design enhancements, beyond extending the WEIM market power mitigation, be considered within the *Price Formation Enhancements* initiative being conducted in parallel with EDAM. Stakeholder comments largely supported the proposal that broader market power mitigation changes be considered in the *Price Formation Enhancements* initiative. In light of that feedback, the proposal continues to be to extend the market power mitigation practices in the WEIM to the EDAM and to discuss any necessary adjustments to those practices in the *Price Formation Enhancements* initiative.

In the balance of this section briefly summarizes the existing WEIM market power mitigation processes.

Market power mitigation is a standard element of energy market design. The ISO market has automated processes to mitigate the potential exercise of market power resulting from transmission constraints that create isolated load pockets. When only a few resources can serve load in those constrained areas, they can exercise market power and raise their market offers above a competitive level. The ISO's market power mitigation process addresses that concern by substituting suppliers' offers with cost-based bids when market conditions otherwise would allow resources to exercise local market power.

In the existing day-ahead market, the ISO performs a dynamic competitive path assessment (DCPA) to determine if resources can exercise market power. The DCPA tests if three or fewer generators can provide pivotal supply (counter flow) to a binding transmission constraint and arbitrarily affect prices. The binding constraint is considered uncompetitive if supply counter flow from the three largest pivotal suppliers is required to satisfy it. In this case, energy bids for resources that provide counter-flow are subject to mitigation. The ISO mitigates energy bids for these resources above the competitive LMP to the lower of their submitted bid or the respective ISO generated default energy bid (DEB).⁶⁶ In the day-ahead, the ISO runs two market passes. The first, is the MPM pass that uses unadjusted bids, and the second is the IFM pass that uses mitigated bids.

In the context of the WEIM, the ISO performs a DCPA to test if the supply in an individual WEIM BAA can meet the demand competitively or provide counter-flow on congested transmission constraints within the BAA. Where the binding constraint is the BAA power balance constraint, then all supply resources provide supply counter-flow. The ISO only performs the test when there are binding transfer limits in the import direction to that BAA that restrict external resources from meeting internal demand. This method assumes that the ISO BAA is competitive. When this test fails, the energy bids of all supply resources in the respective WEIM BAA are mitigated.⁶⁷

⁶⁶ DEBs represent an approximation of the resource's nominal marginal cost, and they can include fuel costs, opportunity costs, and other costs. The competitive LMP is the LMP at the resource location as calculated in the MPM run, excluding marginal congestion contributions from uncompetitive constraints.

⁶⁷ The competitive LMP used in this mitigation is the power balance constraint shadow price of the ISO BAA.

5. Convergence Bidding

The ISO day-ahead market enables participation by convergence bidding entities. Convergence bidding entities can submit convergence bids, which are financial bids that do not represent physical supply or demand. Instead, convergence bidding provides market participants an opportunity to arbitrage price differences between the day-ahead market and the real-time market. The purpose of convergence bidding is to converge energy prices between the day-ahead market and the real-time market, improve market liquidity, and increase competition.⁶⁸ Convergence bids are referred to as *virtual supply* or *virtual demand*.⁶⁹ Cleared virtual supply in the day-ahead market is paid the day-ahead energy price and charged the FMM energy prices for the corresponding hour. Cleared virtual demand in the day-ahead market is charged the day-ahead energy price and paid the FMM energy price for the corresponding hour.

The straw proposal explained that a transition period for convergence bidding may be prudent to protect against any potential for unintended financial impacts and arbitrage opportunities as the EDAM is first implemented. A transition period would also allow EDAM entities to familiarize themselves with market participation before enabling convergence bidding in their BAAs. Stakeholders generally supported a convergence bidding transition period in their comments on the straw proposal.

The proposal continues to provide for a transition period to convergence bidding for EDAM entrants.⁷⁰ At the onset of the EDAM, the proposal provides for a one year transition period without convergence bidding for the EDAM entrants to allow opportunity to gain experience in the market. After the first year, EDAM entities will have the option either to adopt convergence bidding in their area, or elect for an additional transition year, after which they would transition to convergence bidding. Throughout this two year period, the ISO will monitor and evaluate the market's performance with and without convergence bidding in various parts of the footprint. Also, the ISO will work with EDAM entities to ensure they are ready to proceed with convergence bidding in their area as the transition periods ensue. If this approach presents unintended, adverse consequences, the ISO will engage stakeholders to modify it as necessary. Entities that enter EDAM after this transitional period will have the option to start their participation with convergence bidding enabled, or they can opt for a one year transition period prior to enabling convergence bidding as they gain experience in the market.

Convergence bidding applied to EDAM BAAs would mimic the existing implementation and functionality of convergence bidding in the ISO. Convergence bidding would be allowed at eligible internal nodes, trading hubs, and load aggregation points in each EDAM BAA, but it would be prohibited at intertie locations between EDAM BAAs and between EDAM and non-EDAM BAAs.

Some entities commented that convergence bidding should be activated within an EDAM BAA only at the discretion of the EDAM entity itself following the transition period. Convergence bidding is a fundamental feature of day-ahead markets as it reduces the incentive to over- or under-schedule demand, increases market liquidity, and decreases the potential for the exercise of market power. Once the EDAM has been implemented and EDAM entities gain some

⁶⁸ See, e.g., Federal Energy Regulatory Commission, ENERGY PRIMER: A HANDBOOK FOR ENERGY MARKET BASICS at p. 68 (April 2020), available at [Link](#).

⁶⁹ The term "convergence bidding" is unique to the ISO. "Virtual bidding" is the common industry term.

⁷⁰ Convergence bidding would persist in the ISO BAA.

operational experience and acclimate themselves with day-ahead market participation, it is appropriate to apply convergence bidding universally across the EDAM footprint.

The straw proposal stated that interim bidding requirements in EDAM BAAs without convergence bidding may be required during the transition period to prevent inefficient market outcomes. One interim bidding requirement the ISO considered was a measure to prevent load under-scheduling. In the absence of convergence bidding during MRTU implementation, FERC required the ISO to include interim provisions to offset LSEs' incentive to under-schedule in the day-ahead market. In response, the ISO implemented "interim scheduling charges" with \$/MWh penalties for persistent and excessive load under-scheduling.

This revised straw proposal does not consider interim provisions to prevent load under-scheduling necessary for EDAM. The incentive to under-schedule load in the EDAM is not analogous to the MRTU transition period. In the latter, LSEs were divested from much of their generation and were large net buyers in the market. This is not the case with the WEIM entities that might join the EDAM. Although EDAM LSEs are not expected to face the same incentives to under-schedule load, the ISO will monitor whether entities engage in excessive or persistent load under-scheduling, and will be prepared to file implementation of under-scheduling penalties at FERC if the need arises. We seek stakeholder feedback on this issue or other potential measures to mitigate the absence of convergence bidding.

The absence of convergence bidding does, however, necessitate different treatment in the resource sufficiency evaluation. In EDAM BAAs without convergence bidding, resource sufficiency evaluation will consider variable energy resources (e.g., wind and solar) (VERs) at their energy bids and not at their energy forecast. There is ample evidence that virtual supply "backfills" for VERs that underbid in the day-ahead market relative to their forecasted output.⁷¹ Entities without convergence bidding cannot rely on virtual supply to make up the shortfall in VER energy bids compared to their forecasted output. Therefore, the resource sufficiency evaluation will only consider VERs using their energy bids during the transition period.

Today the ISO has tariff authority to suspend or limit virtual bidding if necessary for system reliability.⁷² The ISO can exercise this authority at specific eligible nodes or at all eligible nodes. Some stakeholders questioned whether each EDAM entity will have the ability to suspend convergence bidding in their BAA if operational challenges arise. It is appropriate for the ISO, as the market operator, to maintain the authority to suspend or limit virtual bidding. However, it is also equally necessary that EDAM participants can communicate with ISO operators if they believe it is necessary to suspend convergence bidding in their BAA. The EDAM design will include a process similar to processes outlined in the WEIM market disruption operating procedure,⁷³ to allow EDAM entities to recommend and justify suspending convergence bidding in their BAA. The ISO will evaluate the request and make the ultimate decision.

Some stakeholders expressed concern about the impact of having convergence bidding enabled in the ISO but not enabled in other EDAM BAAs during the transition period. For example, some stakeholders questioned whether the settlement process could prevent cost shifting with RUC costs and uplift allocations. This is a valid concern the ISO will consider when

⁷¹ For the ISO, see pages 50-53 of the 2019 ISO Energy Markets Price Performance Report ([Link](#)). For ISO-NE, see page 158 of the 2020 Annual Markets Report ([Link](#)). For MISO, see pages 54-55 of the 2021 State of the Market Report ([Link](#))

⁷² See ISO Tariff section 7.9.

⁷³ See [Link](#)

designing the relevant cost allocation rules. The next iteration of the proposal will provide more detail regarding settlement in this context. Other stakeholders expressed general concern about potential unforeseen consequences. At this point, there are no apparent reasons to believe convergence bidding applied in some EDAM areas and not in others will cause detrimental market impacts.⁷⁴

6. External Resource Participation

External resource participation in EDAM refers to the opportunity for resources physically located outside of the EDAM footprint, *i.e.*, resources located in a non-EDAM BAA (including WEIM BAAs) to participate in the day-ahead market operating in the EDAM footprint. The interties between EDAM BAAs will be considered internal EDAM interties that function as transfer points between EDAM BAAs and support EDAM transfers. The interties between EDAM BAAs and non-EDAM BAAs will be considered external EDAM interties that do not function as EDAM interties and will not support EDAM transfers. If an EDAM external intertie is within a WEIM BAA, the intertie will continue to function as a transfer point in the WEIM and support WEIM transfers between the EDAM BAA and the WEIM BAA.

There are different methods by which external resources can participate in EDAM, including pseudo-ties, dynamic scheduling, self-scheduling, and economic bidding. The straw proposal indicated a leaning toward extending the current WEIM external resource participation framework to the EDAM, which limits participation to pseudo-tied, dynamically scheduled, and self-scheduled supply, while committing to continue evaluation of this framework as the EDAM evolves.

Based on stakeholders' comments, this revised proposal continues to extend the WEIM framework for external resource participation in EDAM. This framework would support pseudo-tied resources, dynamic scheduled resources, and self-scheduled resources, while precluding economic, non-source specific intertie bids at all external EDAM BAA interties except ISO external interties.⁷⁵

a) External Resource Participation at EDAM Entity Interties

Stakeholders, particularly WEIM entities, supported extending the WEIM framework for external resource participation to the EDAM. These stakeholders expressed concern that allowing non-contracted, non-source-specific resources to submit economic bids at their interties in the day-ahead timeframe might adversely affect reliability by displacing internal generation incapable of commitment in real-time horizon if the external supply ultimately is not delivered. In tight system conditions this would create operational uncertainty, which these stakeholders believe outweighs any benefit of increasing the potential pool of economic supply. These stakeholders also expressed concern for potential free riding on the EDAM entity's transmission system. This could occur if economic bids from non-source specific, non-contracted, supply at their interties flowed without first acquiring transmission rights under the EDAM entity OATT.⁷⁶ These

⁷⁴ The ISO's Department of Market Monitoring (DMM) conducts monitoring, as part of its function, of convergences bidding practices including in the EDAM. The ISO will also engage the Market Surveillance Committee on this issue, and it commits to assessing this matter closely during the market simulation phase of EDAM implementation.

⁷⁵ An ISO external intertie can coexist with an EDAM internal intertie when multiple BAAs interconnect at that location, similar to the WEIM. See ISO tariff section 29.17(f)(5).

⁷⁶ Transmission service and the associated cost recovery under the ISO tariff is fundamentally different from transmission service cost recover under an OATT and does not raise these concerns.

stakeholders suggested that economic bids from non-source specific supply at the interties may dis-incent participation in the EDAM by allowing external entities to derive the benefits of market participation without joining the EDAM and making the investment necessary to enable EDAM participation in their BAA. Other stakeholders that supported extending the WEIM framework highlighted the need to re-evaluate the external resource participation framework in the future after EDAM entities gain experience with the market. A few stakeholders opposed the proposed EDAM external resource participation model arguing that economic intertie bidding should be a day one feature of the EDAM if the source is specified. They noted this would address the reliability risk associated with unknown sources of supply. They argued that the design as proposed will limit liquidity.

Certain stakeholders expressed reliability concerns, particularly the WEIM entities as they would be the primary EDAM participants and are responsible for reliability in their BAA. Because co-optimized ancillary service procurement is not a day one feature of the EDAM design, an EDAM BAA may have difficulty planning for the procurement of contingency reserves and other ancillary services to mitigate the risk associated with unknown volumes of non-source specific intertie bids on their interties. Moreover, it is possible that non-source specific economic intertie bids could displace internal generation, and if the underlying supply is not deliverable or the resource does not perform, it may make it difficult for the EDAM BAA to maintain reliability. Some stakeholders also expressed concern with unknown deliverability and performance risk to the extent a non-source specific supply is not under contract.

The reliability based concerns discussed in the straw proposal and reinforced by the WEIM entities in their comments warrant, at the onset of EDAM, extending the WEIM external resource participation model described above. It will be necessary to work with stakeholders to assess and re-evaluate the merits of implementing more comprehensive intertie bidding after EDAM has been in place a period of time. This will provide EDAM entities an opportunity to gain experience in the market and allow the ISO to consider the matter in conjunction with possible co-optimization of energy and ancillary services in the EDAM as a potential enhancement. Co-optimization and procurement of ancillary services through the market may mitigate some of the reliability concerns. Also, supply structures across the West may evolve in a manner that further mitigates the reliability concerns expressed.

The table below describes the different types of external resources – resources located physically outside of the EDAM BAAs - and their ability to offer into the market at the ISO non-EDAM footprint interties; *i.e.*, external EDAM interties.

Type of External Resource	Market Offers
Source Specific: Pseudo Tied Resource	Economically bid and self-schedule into market
Source Specific: Dynamically Scheduled Resource	Economically bid and self-schedule into market
Contracted Supply	Self-scheduled into market at EDAM footprint interties.
Non-Source Specific Non-Contracted Supply	Cannot self-schedule or economically bid into the market at the EDAM footprint interties.

Table 9: Summary of external resource participation framework in WEIM and EDAM.

Pseudo-tied and dynamically scheduled resources are source-specific supply located outside of an EDAM BAA that are treated and/or otherwise deemed to be located within that EDAM BAA through modeling and telemetry. This means that the EDAM BAA provides balancing authority services and takes on other obligations for the resource, particularly for pseudo-tied resources.

These arrangements and obligations are captured in tariffs and under contractual provisions between the EDM BAA and the resource owner, and they establish obligations related to performance, delivery, and other operational requirements. As such, these resources can continue to self-schedule and submit economic bids at the EDAM external interties consistent with their ability to do so today in the WEIM. Similarly, source specific supply that is otherwise not pseudo-tied or dynamically scheduled, but is owned or under contract to serve load within the EDAM BAA, can be self-scheduled or economically bid at EDAM external interties because these resources have a contractual relationship with the EDAM entity or another LSE within the EDAM BAA.

If non-source specific import supply is under contract, such as firm energy contracts where the source of the generation is not known ahead of the 10 a.m. day-ahead market close (e.g., WSPP Schedule C arrangements), it can be self-scheduled. These supply arrangements impose certain performance and delivery requirements that instill greater confidence regarding their performance and delivery. Moreover, the EDAM BAA can better account for these from a reliability perspective by considering them when defining the level of ancillary services procurement to the extent necessary. Accordingly, contracted non-source specific supply may participate in EDAM through self-schedules.

Non-source specific supply that is not under contract cannot participate at EDAM external interties; *i.e.*, these supply sources would not be able to offer supply at EDAM entity external interties, either by self-scheduling or economic bidding. This exclusion is limited to non-specific supply resources at EDAM external interties with EDAM entity BAAs, *i.e.*, not the ISO external interties, and is premised upon the reliability implications noted by the WEIM entities.⁷⁷

b) External Resource Participation at ISO Interties

A majority of stakeholders supported continuing to allow economic bidding at the ISO external interties because this historically has provided an opportunity to derive value for excess supply that may be bid into the day-ahead market. They recognize the value the ISO BAA derives from excess supply offered economically into the day-ahead market. Some stakeholders expressed equity concerns if economic intertie bidding is allowed at the ISO external interties but is not allowed to the same extent at the external interties of other EDAM BAAs. This revised straw continues to propose to retain in EDAM its existing practice, which allows external resources to submit economic bids at the ISO external interties. This allows source specific and non-source specific resources to bid economically into the day-ahead market consistent with current practice where the ISO retains full intertie bidding capability at its external interties.

Within its BAA, the ISO co-optimizes energy and ancillary services procurement through the market and, as such, can better manage potential risks associated with economic bidding at its external interties. Moreover, economic bidding at the ISO external interties has been a longstanding and beneficial feature of the ISO market, providing suppliers an opportunity to offer excess supply into the market, enabling the ISO to serve demand more economically. The ISO is committed to working closely with prospective EDAM entities and other market participants to evaluate the external resource participation model and evolve the design as entities gain experience in the market

⁷⁷ This type of external resource supply is similarly not able to participate in the WEIM.

Similarly, the proposal is to continue allowing pseudo-tied and dynamically scheduled resources to self-schedule or economically bid into the market at its external interties between the ISO BAA and non-EDAM BAAs.

c) Exports from the EDAM Footprint

As indicated in the straw proposal, this revised straw proposal continues to extend to EDAM the WEIM framework for supporting exports out of the EDAM footprint. Under the WEIM framework, the WEIM entity facilitates exports from its BAA through the submission of base schedules. This process ensures that the export schedules secure and pay for the necessary transmission rights under the EDAM entity's OATT. Under the proposed framework, an export out of the EDAM footprint must secure transmission under the respective EDAM entity's OATT or utilize existing transmission rights to support the export. This approach will compensate the EDAM entity for the use of its system, and it will require the exporter to work with the appropriate EDAM entity to submit an export self-schedule out of the EDAM footprint. Extending the WEIM framework to the EDAM acknowledges EDAM entities (transmission provide function) will continue administering their OATTs and sell transmission. With respect to the ISO BAA, exports out of the EDAM footprint to non-EDAM BAAs will be similarly supported under the existing export design.

7. Greenhouse Gas (GHG) Accounting and Reporting

The EDAM design will account for the costs and reporting requirements arising from state GHG pricing policies. This includes factoring in GHG emission costs incurred by sellers of power, reflecting those costs in the ISO's security constrained least cost dispatch, and facilitating any required GHG reporting and verification process. Each option presented herein strives to meet the GHG design principles discussed and refined in the working group.⁷⁸

The straw proposal introduced two approaches for GHG accounting design, the resource specific approach and the zonal approach. Stakeholder comments were either neutral or split between support for the resource specific approach and the zonal approach. Regarding the resource specific approach, stakeholders recommended the ISO include transmission constraints in the GHG counterfactual for a more accurate baseline to inform GHG attributions. Stakeholders also expressed concern regarding the optimization's attribution process and requested greater transparency. Further, we received questions on the scalability and adaptability of the resource specific proposal.

Feedback on the zonal approach included requests for additional information on its overall design, hurdle rate design (now referred to as a "toll"), and the identity of the entity responsible for compliance and reporting to state regulatory programs. Some stakeholders voiced their concerns regarding the potential for emissions leakage and lack of comparable treatment of resources. Stakeholders supporting the zonal approach cited the lack of compliance or reporting obligations for entities within non-GHG regulation areas as a benefit of this design.

⁷⁸ The working group discussed these principles and design objectives at the January 6 and January 11, 2022 working group meetings.

In comments, stakeholders provided several specific suggestions. Some requested that we model or provide examples to compare the approaches⁷⁹ and to provide more information on geographic boundary modeling, the GHG pseudo tie design, and the data that could be provided to support compliance and clean energy program reporting. Stakeholders also requested feedback from state air regulators on whether the resource-specific approach and/or zonal approach comply with state regulatory requirements.⁸⁰In this revised straw proposal, the ISO's GHG design for EDAM continues to evaluate the two approaches discussed in the straw, and it introduces a third approach. These three approaches are: (1) the resource-specific approach, (2) the zonal approach, and (3) the Los Angeles Department of Water and Power (LADWP) approach. As discussed later in this section, the proposal is to adopt the resource-specific approach at the outset of EDAM because it is an extension of the WEIM and is the most defined option. Thus, it will require fewer regulatory changes compared to the other proposals. Also, stakeholders are familiar with the design, and it requires the least amount of implementation changes. Thus, it will not delay EDAM implementation. Lastly, it can evolve into a different approach (e.g., zonal or LADWP) if state regulatory programs change. In contrast, both the zonal and LADWP approaches propose fundamental changes to current state regulations regarding the first jurisdictional deliverer and the compliance and reporting requirements for resource specific and unspecified imports. Until state air regulators update their rules, it is premature to adopt either the zonal or the LADWP proposal.

a) Background

(1) The Western EIM and GHG today

Because California has the only currently active GHG accounting program among states participating in the WEIM, today's WEIM design focuses on reflecting the cost of compliance with the California Air Resource Board's (CARB) cap-and-trade program. Currently, when offering output to serve California demand, scheduling coordinators for resources located in BAAs outside of California submit bid adders consisting of a GHG bid capacity (MW) quantity and a price (\$/MWh) that reflects the participating resource's costs to comply with California's GHG regulations.⁸¹ The ISO utilizes these bid adders to allocate transfers to participating resources serving California demand in a least cost manner. If a resource does not submit a bid adder or the GHG bid capacity is zero MW, the ISO will not dispatch the resource to serve California demand. Resources internal to California include the cost of GHG compliance in their energy bid.

This design accounts for WEIM transfers serving California demand. In connection with these imports, the ISO, CARB, and stakeholders recognized the phenomena of secondary dispatch in which higher-emitting resources backfill to serve demand outside of California when the optimization attributes lower emitting resources to serve serving California demand. The ISO has implemented market rules to mitigate the potential for secondary dispatch.

⁷⁹ The ISO has developed simplified models to compare the resource specific approach, zonal approach, LADWP approach, and a modeling only-approach referred to as the hybrid approach. This model and a recording of the modeling webinar are available on ISO's website at: [Link](#)

⁸⁰ In recognition of stakeholder comments, we have attempted to highlight throughout the paper what issues the ISO anticipates will require state air regulatory approval. We seek feedback from state air regulators on whether the ISO has accurately captured these issues and what their perspectives on them are.

⁸¹ See *generally* ISO Tariff section 29.32.

Secondary dispatch emissions are identified in CARB’s outstanding emissions calculation by subtracting total California WEIM emissions from emissions of WEIM participating resources outside of California that the market optimization attributes as supporting California demand. CARB then addresses WEIM outstanding emissions through the direct retirement of freely allocated allowances that CARB would otherwise allocate to electric distribution utilities within California.⁸²

(2) State Regulations

The GHG market design is intended to reflect state carbon pricing policies. Accordingly, the ISO’s market design must align with state regulations governing GHG reporting and reduction programs to reflect the costs of GHG emissions in the market. Current state regulatory programs include California’s cap-and-trade program and mandatory reporting regulation, and the Washington Department of Ecology’s cap-and-invest program and mandatory reporting rules (which have not been implemented yet).

b) GHG Approaches

To summarize the approaches prior to exploring the design elements, please refer to table 10 below.

⁸² In response to one stakeholder’s question, state regulators will need to address any outstanding emissions calculation necessitated by EDAM.

	Summary	Source Specific Pathway	Unspecified Pathway	Secondary Dispatch and Quantification	Settlement	First Jurisdictional Deliverer
Resource Specific	<p>An extension of the WEIM design that uses resources specific GHG bid adders to optimize GHG dispatch.</p> <p>The design requires compliance and reporting by non-GHG regulation areas if their resources are attributed.</p>	Opt in with either a GHG bid adder (if a non-GHG area serves a GHG area) or implicit in the bid (for resources in a GHG area).	Emissions that do not meet air regulators requirements for specified resources are reported as unspecified.	<p>Yes, secondary dispatch can arise as a result of higher emitting resources backfilling cleaner resources serving GHG regulation areas.</p> <p>Quantification: Comparing the GHG Reference Pass to dispatch</p> <p>Air regulators may choose to address this emissions leakage with regulatory tools. In WEIM this is addressed by CARB through the Outstanding Emissions Calculation</p>	Resource level for GHG/non-GHG regulation areas if there is a GHG obligation	Specified: source of emissions, <i>i.e.</i> Participating Resource Scheduling Coordinator
Zonal	<p>A combination of a source-specific pathway (resources are viewed as internal to the GHG area on a short term or long term basis) and otherwise a toll applies to transfers.</p> <p>The design does not include compliance and reporting by non-GHG regulation area resources.</p>	<p>Source specific with both a pseudo tie participating generator agreement and GHG pseudo-tie either:</p> <ul style="list-style-type: none"> -long term: registered in the Master File -short term: flagged in bidding 	Unspecified transfers are subject to a toll and only occur if they are economic. This toll applies to all resources that are not source-specific in the non-GHG regulatory area.	<p>Yes, secondary dispatch can arise if the toll is set too low.</p> <p>No GHG counterfactual.</p> <p>Air regulators may choose to address this emissions leakage with regulatory tools. In WEIM this is addressed by CARB through the Outstanding Emissions Calculation</p>	<p>Resource level for GHG pseudo-tie.</p> <p>Transfers to GHG regulation area will settle at relevant GHG toll, and ISO will use funds to purchase GHG emission allowances. The ISO would establish new settlement rules to maintain revenue neutrality.</p>	The ISO (admin function for purchasing/ retiring allowances & reporting)

LADWP	An extension of the resource-specific proposal with key changes: (1) non-GHG area resources would have their bids inserted by the ISO; (2) all imports would use load based accounting by GHG area LSEs; and (3) eliminates compliance and reporting by non-GHG regulation area resources.	Requires a self-schedule or a pseudo-tie; for reporting as specified imports to state GHG programs	The ISO inserts a bid for all non-GHG regulation area resources that do not opt out of serving a GHG regulation area.	Uses the resource-specific GHG Reference Pass Air regulators may choose to address this emissions leakage. In WEIM this is addressed by CARB through the Outstanding Emissions Calculation	Resource level within GHG regulation area Transfers to GHG regulation area will settle at relevant GHG prices, and ISO will use funds to allocate to GHG regulation area LSEs based on net import share ratio.	The ISO but the GHG regulation area LSEs purchase and retire allowances. GHG regulation area LSEs would be responsible for reporting.
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Table 10: Comparison of GHG Approach Design Elements

Geographic Boundary:

A common design element regardless of the proposal that is ultimately adopted is the concept of geographic boundaries. Today the ISO uses the BAA boundaries to represent GHG regulation areas. Recognizing state pricing policies do not align with BAA boundaries, the ISO in EDAM will define the GHG boundary based on the GHG regulation area (*i.e.*, state level boundary). This will allow ISO to reflect the dispatch costs associated with GHG pricing program compliance for resources within a state with such a program, but not reflect these costs in the dispatch of resources not subject to these programs.⁸³ This design change will affect the GHG design in the WEIM.

Using geographic boundary borders has implications for state compliance programs that use e-tags, which reflect intertie transactions between BAAs. In comments, CARB requested information on how e-tags would be used under the resource specific approach. Today e-tags serve to identify electricity imports into California. Under EDAM, the proposal is to identify net transfers into a GHG regulation area that will reflect geographic boundaries and not a BAA. In addition, transfers identified by the optimization (*i.e.*, day-ahead transfers that will rollover to real-time transfers) may replace imported electricity identified by e-tags. As a result, the market optimization results, not e-tags, will identify net transfers serving demand within a state geographic border.

- (1) Resource-Specific Approach
 - (a) Overview

The EDAM resource-specific proposal is an extension of the WEIM design, which uses resource specific GHG bid adders to optimize GHG dispatch. This revised straw proposal has two key changes to the straw proposal: (1) the GHG counterfactual (GHG Reference Pass) will include

⁸³ From an implementation perspective, the ISO will reflect boundary areas in its Master File with a new GHG regulation area field (*e.g.*, CA, WA, non-GHG) and associated nodes (Pnodes, Apnodes, and interties) and resources. We are planning on forecasting load based on EIM load aggregation points (ELAPs) which are at the BAA level and then distribute the demand to custom load aggregation points (CLAPs) using load distribution factors.

transmission constraints, and (2) GHG pseudo-tie design is not included because it is unnecessary for the resource specific proposal. In the following paragraphs, we discuss stakeholder comments and explain the bidding and attribution mechanics and transparency, the impact of ISO's efforts to limit secondary dispatch, the data and reporting the ISO will make available, and the scalability and adaptability of the resource-specific model.

(b) Bidding, Optimization, and Attribution

(i) Bidding Mechanics

The centralized markets use a least cost security constrained optimization. The ISO reflects the GHG costs of compliance through a bid adder submitted by participating resources outside GHG regulation areas. The ISO collects certain information for resources depending on where they are located and what GHG regulation area they plan to serve. This takes three forms: (1) to serve energy outside a GHG regulation area the optimization only considers resources' energy bids because they are not subject to any GHG regulation, (2) to serve energy inside a GHG regulation area (coming from outside the GHG regulation area) the optimization considers resources' energy bids + GHG bid adders, and (3) to serve energy inside a GHG regulation area (coming from inside the GHG regulation area), the optimization considers resources' energy bids, which include the cost of GHG compliance.

Submitting a bid adder is voluntary and reflects the willingness of an EDAM scheduling coordinator to serve demand in a GHG regulation area. The ISO will calculate a maximum bid adder for each resource on a daily basis and, like energy bids, participating resource scheduling coordinators will submit a bid adder in the day-ahead market for each operating hour they make their output available to serve demand in a GHG regulation area. A GHG bid of zero MW reflects the resource is unavailable for dispatch to serve load in a GHG regulation area. Additionally, any scheduling coordinator that submits an import bid or self-schedule at an intertie to a GHG regulation area is responsible for the GHG compliance costs stemming from imports that are ultimately delivered in real-time.

Currently, there is not linkage between Washington's cap-and-invest program and California's cap-and-trade program.⁸⁴ The ISO does not anticipate the two states will share a common GHG price at the outset of EDAM. This poses a challenge in determining how to treat transfers between jurisdictions with GHG compliance regulations because one GHG regulation area will not recognize the compliance instruments in another GHG regulation area. This may result in some electricity facing GHG compliance costs from both jurisdictions. State regulators should address this issue.

At this time, the revised straw proposal is to include a resource-specific bid adder for resources in one GHG regulation area to serve another GHG regulation area. Resources in a GHG regulation area will include their GHG costs in their energy bid and have a bid adder to serve demand in another state with a GHG pricing policy in place (*i.e.*, a bid adder to serve the other GHG regulation area: California or Washington). This approach would allow for resource-specific attribution of resources in a GHG regulation area for serving load in another GHG regulation area. For example, a resource in the state of Washington could submit a GHG bid adder to serve demand in California. Likewise, a resource in the state of California could submit a GHG bid adder to serve demand in Washington.

⁸⁴ Information on CARB's linkage requirements are available at: [Link](#) Washington also has a series of requirements and analytical steps that would need to be met before linkage could be approved.

(ii) Attribution Process

The optimization takes the total imports for a GHG regulation area and then attributes resources based on their composite energy and GHG bid lowest to highest. The marginal resource GHG bid adder sets the GHG price. The market attribution of transfers to resources based on their composite energy bid and GHG bid adder may result in the phenomena of higher-emitting (*i.e.*, more expensive) resources backfilling this attribution to serve load in other BAAs (*i.e.*, secondary dispatch). Attribution can occur either above or below the GHG Reference Pass. For example, in the WEIM, a resource can receive attribution when it receives an economic award above its base schedule, but it can also receive an attribution in cases when its economic award is less than its base schedule because of a reduction in load or economic displacement by other resources. Not all dispatch causes secondary dispatch, and there is no MW to MW relationship between transfers and secondary dispatch. For example, surplus power in a non-GHG regulation area that otherwise would not have operated can economically displace resources in the GHG regulation area. This same outcome can occur under the resource specific proposal in the EDAM.⁸⁵ Again, attributions are a result of taking total imports to California and then attributing resources based on their composite energy and GHG bid lowest to highest. As demonstrated in the graph below attributions are not solely occurring for non-emitting resources.

⁸⁵ As a future reference for market participants, the ISO publishes on a monthly basis in its Monthly Market Performance Reports total WEIM transfers by fuel type which is equivalent to GHG attributions by fuel type. [Link](#)

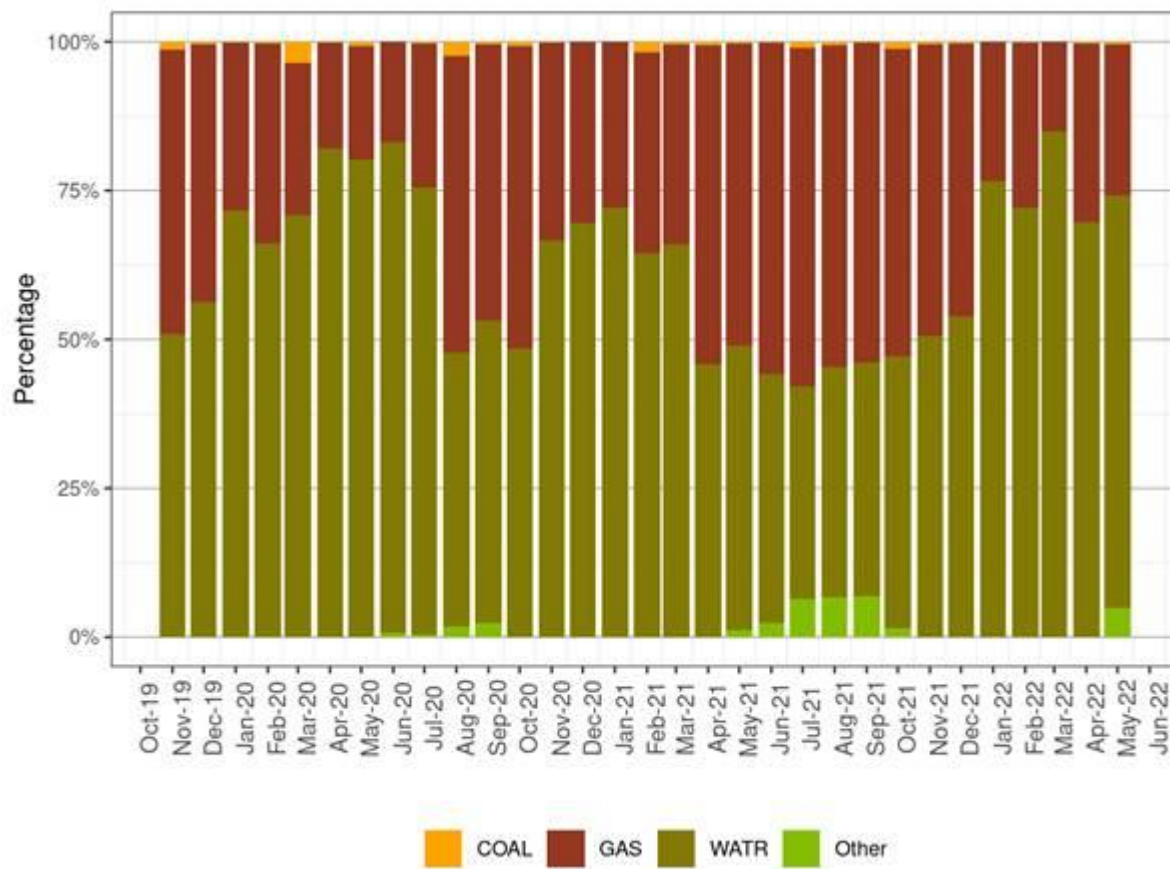


Figure 2: WEIM transfers into the ISO by fuel type.

(iii) Counterfactual

To quantify the overall GHG impact of the WEIM and EDAM, we compare actual dispatch to a counterfactual to mitigate the potential of secondary dispatch. The proposal is to follow a similar approach in EDAM. In the WEIM, the counterfactual is the self-submitted base schedules. The ISO limits GHG attributions to a MW quantity that reflects the difference between a resource’s base schedule and its upper economic limit. Because there are no base schedules in EDAM, the revised straw proposal is to leverage a special market run before the actual market run for the sole purpose of calculating a GHG counterfactual (“GHG reference pass”). The ISO would limit a resource’s hourly attribution to serve GHG regulation areas to a MW quantity that reflects the difference between a resource’s schedule in the GHG reference pass and its upper economic limit.

This market run will be identical to the IFM, but without GHG bids, hence, there will be no net GHG transfer imports into GHG regulation areas. This will approximate how the BAAs outside GHG regulation areas will meet their own load with their internal generation, similar to the concept of base schedules, which serve as the counterfactual/GHG reference in the WEIM today. However, in the GHG reference pass, transfers between BAAs outside GHG regulation areas will be optimally scheduled. Therefore, the optimal schedule from the GHG reference pass will reflect how supply resources can optimally serve demand in the EDAM footprint without net imports into GHG regulation areas and the associated GHG regulation cost. Any transfers between BAAs are optimally scheduled, and only the net GHG transfers are limited in

the import direction to GHG regulation areas. The proposal is to complete the GHG reference pass as the second of six market passes between 10:00 and 13:00, the first being the resource sufficiency pass.⁸⁶

During the technical working group meeting on July 26, 2022, stakeholders asked the ISO how the GHG reference pass avoids the issues with the prior WEIM two-pass solution. As background, the two-pass solution previously proposed allowed the separation of markets. First, using a self-submitted base schedule, the ISO would develop a counterfactual to determine what generation can sell into California. Second, there is a bid-based economic dispatch following rules like the existing WEIM, but with the added constraints from the first-stage results. This could incentivize a generator to create headroom for exports to California in the first stage by manipulating its base schedule.⁸⁷ Unlike the two-pass solution, the GHG reference pass does not reflect a self-submitted base schedule; rather, it reflects an optimized portfolio to meet the EDAM resource sufficiency tests optimizing transfers between BAAs. As a result, it will yield realistic schedules for EDAM Entities to serve their native load prior to making additional supply available to serve load in a GHG regulation area. Unlike the two-pass solution, in EDAM a resource outside GHG regulation areas would be disadvantaged compared to other resources if they tried to game the GHG Reference Pass in the RSE.

(iv) Secondary Dispatch Constraints

This revised straw proposes measures to mitigate the potential for secondary dispatch as part of its EDAM design. First, in the IFM, we propose to limit resource-specific attributions for serving demand in a GHG regulation area to the difference between a resource's upper economic limit and its GHG Reference Pass, as is currently done with WEIM base schedules. Second, based on stakeholder feedback, we plan to implement an hourly net export constraint for BAAs outside of GHG regulation areas. This constraint will not allow aggregate GHG attribution to GHG regulation areas above net BAA transfer exports or any attribution if the BAA is a net importer. In other words, if a net export transfer schedule from a BAA is 100 MW, GHG attributions to resources in that area could not exceed 100 MW. Additionally, if the BAA was a net importer, there would be no GHG attributions to resources in that BAA. This also has the effect of reducing GHG transfers. This measure will also apply to WEIM.

Stakeholders also requested information on the amount of secondary dispatch in EDAM using the resource specific approach, and CARB requested information regarding the extent the approach would minimize leakage as compared to the WEIM approach. Absent a live EDAM market to test the impact, the ISO has attempted to provide a proxy of the impact this enhancement might have by applying the constraints to the WEIM and measuring the reduction in attribution. This approach does not re-run the market; rather, it quantifies when attribution occurred above BAA transfer limits and when the BAA was a net importer as a means of quantifying the potential reduction in secondary dispatch.

⁸⁶ The six passes include: (1) Resource Sufficiency Evaluation (RSE) pass (single unit commitment for each BAA, in parallel); (2) GHG Reference pass (lock net GHG transfers in import direction to zero); (3) Market Power Mitigation (MPM) pass for the Integrated Forward Market (IFM) (unlock GHG transfers); (4) IFM; (5) MPM pass for Residual Unit Commitment (RUC); and (6) RUC.

⁸⁷ See description by William Hogan: [Link](#)

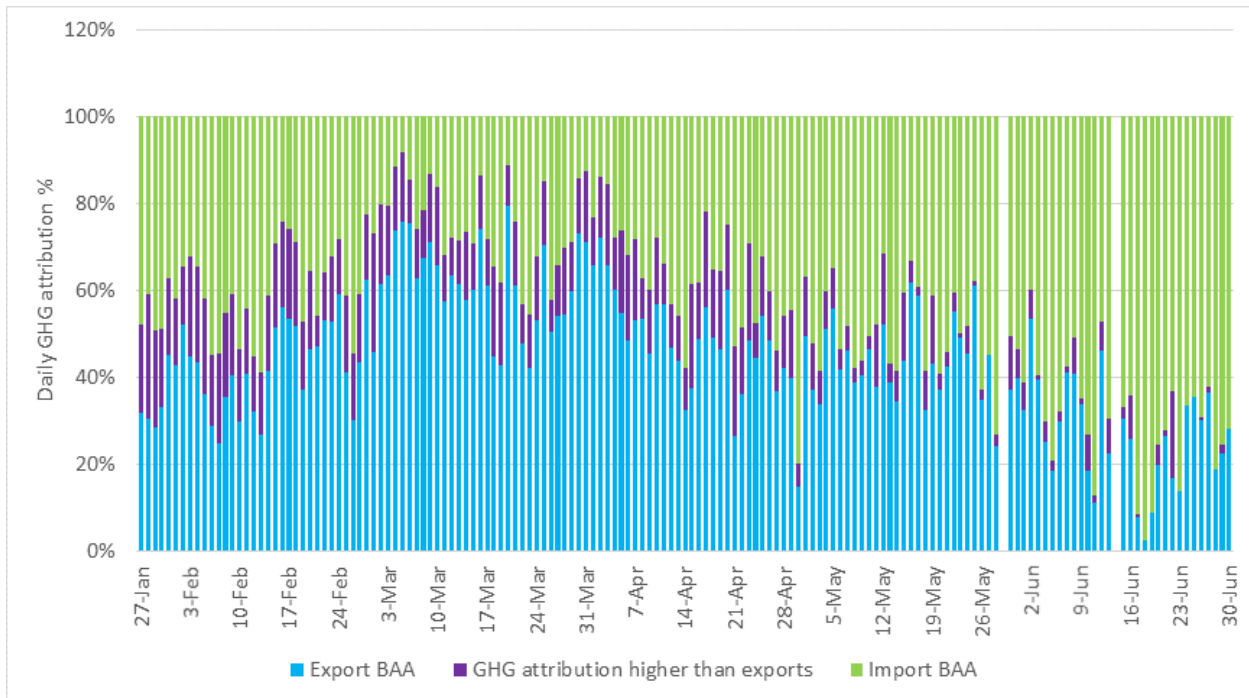


Table 11: EDAM secondary dispatch constraints applied to the WEIM on a percentage basis.

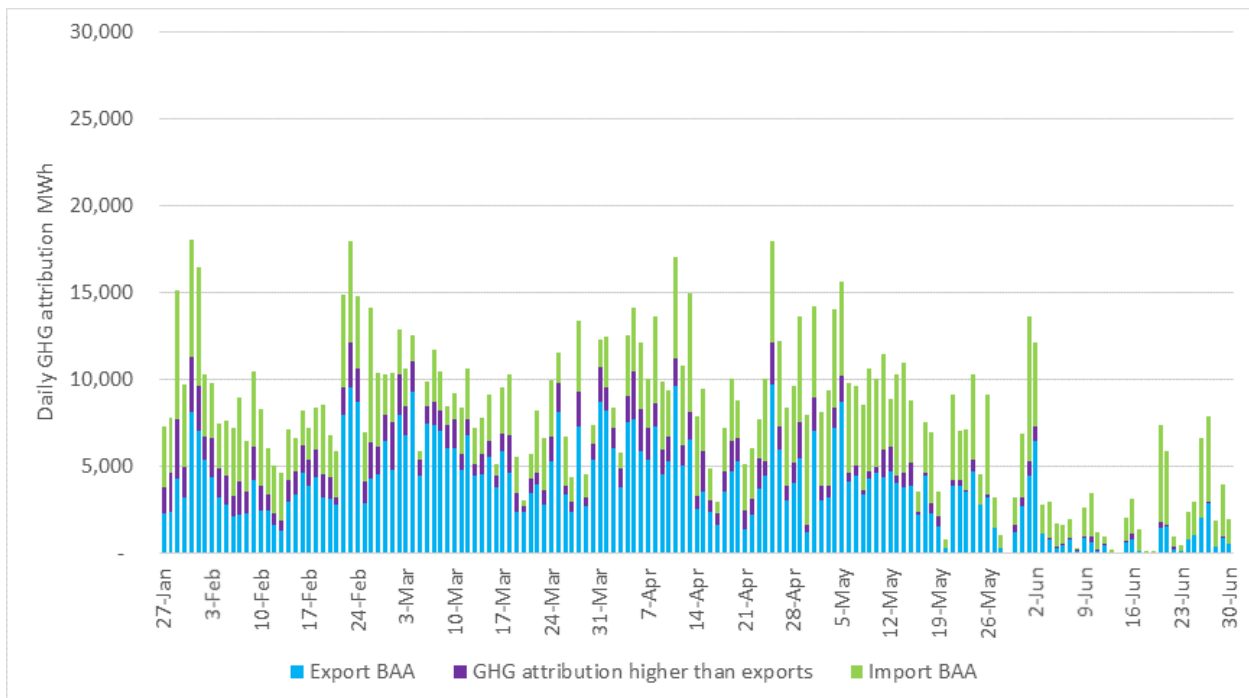


Table 12: EDAM secondary dispatch constraints applied to the WEIM on a volumetric basis.

This dataset from January 27, 2022 through June 30, 2022 demonstrates that a net transfer constraint reduces total attributions. Although this does not indicate the possible magnitude of

GHG attributions we could see in the EDAM, it does provide context to the possible impact of the constraints.⁸⁸

- **Import constraint:** The green bars reflect the percentage and volume of attribution that occurred when the BAA was a net importer. This dataset demonstrates that if the market optimization applied the import constraint, the reduction in GHG attribution would have varied by day and ranged between 0-95% or 0-7,000 MWh.
- **Export constraint:** The purple bars reflect when attributions occurred notwithstanding the BAA exporting beyond its physical transfer limits. This dataset demonstrates that if market optimization applied the export constraint, the reduction in GHG attribution would have varied by day and ranged between 0-30% or 0-4,000 MWh per day.

(v) *Transparency*

As described above, the optimization takes the total imports for a GHG regulation area and then attributes resources lowest to highest. The marginal resource (based on its composite energy and GHG bid) sets the GHG price. Only resources with GHG bids receive an attribution. The ISO publishes attribution data in various forms:

- For scheduling coordinators, the proposal is to make attribution data available on a resource-by-resource basis in the Customer Market Results Interface (CMRI) and through settlement statements. Participating resource scheduling coordinators could use data from the CMRI to report MWh imports, by source, to their respective GHG programs. This information can also be reviewed by third-party verifiers to confirm reported values. This revised straw also proposes to make resource specific data from the GHG Reference Pass solution available to the resource's resource scheduling coordinators.
- At the state level, today the ISO reports total and WEIM-entity level MWh GHG attributions to CARB pursuant to a subpoena. CARB also collects total MWh of tagged imports into California BAAs, which it uses to validate imports reported to CARB under its mandatory reporting regulation (MRR). Moving forward in EDAM, we will explore how best to provide total WEIM and EDAM transfers to states with GHG pricing programs.

(vi) *Settlement*

Under a resource-specific approach, resources that receive a day-ahead GHG attribution to support demand in a GHG regulation area will receive a payment for their GHG attribution at the IFM marginal GHG price. In the real-time market, scheduling coordinators for resources will receive a deviation settlement from the resource's day-ahead attribution quantity.⁸⁹ Deviation payments or charges will apply to the difference between day-ahead and real-time GHG attributions and the relevant real-time market marginal GHG price.

⁸⁸ The ISO received a request from another stakeholder to include a constraint to limit attribution to incremental dispatch above the counterfactual. The ISO evaluated this design through modeling exercises and found it can produce edge cases in which a participating resource's award is lower than its bid, thereby producing anomalous pricing and uplifts. As a result, the ISO does not plan to move forward with the proposed constraint.

⁸⁹ In response to one stakeholder comment, the ISO clarifies all settlement is real-time based on deviation from the day-ahead schedule.

State regulations reflect a “first jurisdictional deliverer” construct to identify who holds a GHG compliance obligation. They generally define this as the first entity to deliver the electricity to the given state’s grid. In California, this entity also holds the reporting obligation. In the context of WEIM, California has specifically defined the first jurisdictional deliverer as the EIM participating resource scheduling coordinator, which means the participating resource owner or operator or a third-party designated by the resource owner or operator that is certified by the ISO and enters into a WEIM participating resource scheduling coordinator agreement with the ISO. Washington has not developed a precise definition of the first jurisdictional deliverer in the context of WEIM, which leaves room for interpretation (*i.e.*, the WEIM participating resource scheduling coordinator or the WEIM Entity). To align with defined first jurisdictional deliverer programs, the resource-specific approach assumes the first jurisdictional deliverer will be the WEIM participating resource scheduling coordinator that puts the compliance and reporting obligation on that entity, as opposed to the WEIM entity.

For regulatory purposes, the ISO is willing to provide total WEIM and EDAM transfers to states with GHG pricing programs. For voluntary clean energy programs, with market enhancements, the ISO could also provide emissions intensity information for in-state generation and provide the total MW of BAA-level transfers. This effort will depend on the data set needed by states to assess how dispatch of resources in a centralized market informs the GHG intensity of power serving its demand.

For REC reporting and compliance, some states may view market dispatch as a claim on the REC. This revised straw proposal emphasizes that its markets do not create a claim on the REC. Some stakeholders have suggested improved data reporting to address concerns that some states view ISO dispatch as a claim on the REC. The Joint Commenters encouraged the ISO to work with WREGIS to develop a comprehensive tracking and reporting mechanism that covers all generating units operating in the Western Interconnection. Although this request arguably extends beyond the scope of an initial EDAM design, the ISO is open to this suggestion. If data sharing on dispatch could help, and if WREGIS moves to all generation tracking, the ISO could support data sharing of GHG attributions by EDAM entity. This data coupled with meter data may provide valuable inputs to WREGIS or a similar entity tracking the emission intensity of all resource in the Western Interconnection.⁹⁰ More discussion with stakeholders and WREGIS regarding any such effort would be necessary.

Second, some states require deliverability to the service territory of the purchasing utility. As a long-term recommendation, buyers and sellers should consider updating applicable contracts to unbundle RECs from energy deliveries to the service territory of the purchasing utility. If approved by applicable states, this approach could allow for market participation and still allow the purchasing utility to receive credit for the REC. For some states this may require changes to their Renewable Portfolio Standards.

⁹⁰ As background, today the ISO provides meter data to WREGIS for renewable resources when ISO has been selected as the Qualified Reporting Entity (QRE). For almost all resources, the ISO has been selected as the QRE and can provide that data. However, in the future if WREGIS moves to all generation reporting, the ISO recognizes it will not have data for all resources (e.g., distributed energy resources where the meter data management agent is the utility distribution company (UDC)).

The resource specific proposal is a design the ISO can implement at the start of EDAM. The resource specific proposal is an extension of the WEIM design, and the changes proposed will further mitigate the potential for secondary dispatch that can result when participating resources receive an attribution to support demand in a GHG regulation area. In addition, the resource-specific model allows for evolution to a zonal or LADWP approach if state regulators modify their regulations to allow for one of those approaches. Recognizing the comments of one stakeholder and recognizing that some states may move towards carbon reduction requirements rather than GHG pricing, the proposed resource-specific model is flexible enough to employ additional constraints at a GHG regulation area level (*i.e.*, not to allow resources with an emissions factor above a threshold or to exclude certain resource types). This would allow states like Oregon to specify or purchase lower or zero-emitting resources.

The proposed resource-specific design is also scalable if and when additional GHG pricing programs emerge in the west. Mechanically, any formally “linked” program could simply reflect GHG costs as a part of its energy bid rather than through a GHG bid adder. However, if or when programs are unlinked multiple GHG bid adders will be necessary.

(2) Zonal Approach

(a) Overview

The zonal approach allows choice between a source-specific pathway for individual resources or the use of a toll (formerly referred to as a “hurdle rate”) that resources must overcome to support transfers into a GHG regulation area. Changes to the zonal approach described in the straw proposal include: (1) the first jurisdictional deliverer could be the ISO for compliance, reporting, and as the entity responsible for the purchase and retirement of GHG allowances; and (2) a clarification that data would be reported by MWh transfers.

(b) Bidding and Optimization

Bidding in the zonal approach depends on whether the resource is inside or outside of a GHG regulation area. Inside a GHG regulation area, resources include their GHG costs in their offer prices as is done in the resource-specific approach. If a resource outside the GHG regulation area is offering into a GHG regulation area, there are two options: (1) a source-specific pathway, or (2) an unspecified pathway that would assign a default emissions rate and a toll that would need to be overcome for a transfer to occur.

Specified-source imports are transfers supported by specific resources to the GHG regulation area at a resource-specific GHG rate. Under the zonal approach, the market optimization would treat these resources as if they were internal to the GHG regulation area on either a long-term or short-term basis. For clarity, we refer to these as Path 1 or Path 2, respectively. Path 1 is used when the scheduling coordinator has a longer-term commitment to serve the GHG regulation area at a resource- or entity-specific GHG emission rate and reflects that commitment through a Master File flag. Path 2 is used when the scheduling coordinator has a shorter-term commitment to serve the GHG regulation area at a resource- or entity-specific GHG emission rate. Scheduling coordinators may elect this path on an hourly basis with the resource’s bid. In the optimization, the market would specify resources in tandem with scheduling a corresponding quantity of specified-source imports into the identified GHG regulation area.

With either of these options important considerations include identification of the specific resource (and its emissions rate) and verification that the specified resource supported an import into the GHG regulation area. States may have various requirements for specified imports. For example, California requires proof of direct delivery (e.g., an e-tag), meter data, and a written contract or ownership stake. As previously mentioned, e-tags will not always align with updated GHG regulation areas. Additionally, importers must register their specified resources each year and CARB calculates an emissions rate for each resource based on U.S. EPA and/or U.S. EIA data.

If a resource external to a GHG regulation area elects to use the source specific pathway in the zonal proposal, it will need to establish a pseudo-tie agreement with a BAA that overlaps with the GHG regulation area and GHG pseudo-tie construct so the market optimization can view the resource as internal to the GHG regulation area. Without a pseudo-tie agreement, we cannot view the resource as internal to a BAA from a network or market solution perspective—and without the GHG pseudo-tie, we cannot view the resource as internal to the GHG regulation area. In response to the straw proposal, CARB requested information on what data will be available to support identifying the point of receipt into California for resources considered internal to the GHG regulation area. The zonal proposal white paper⁹¹ outlines the following requirements for source specific treatment, which are interpreted as the potential requirements for using a GHG pseudo-tie:

- Identified generation resource;
- GHG emission rate for the resource (MTCO₂/MWh);
- Identified GHG zone to which the generation output will be delivered;
- Valid physical delivery path, including, for each segment: the Transmission Service Provider, Point of Delivery, Point of Receipt, transmission reservations / assignment reference number (AREF), transmission allocation (MW), and expected energy profile (MW); and
- Additional information as may be required by the applicable GHG-pricing program.

Unspecified imports are transfers that do not meet the applicable GHG program requirements for using the source-specific pathway. A toll (\$/MWh) would apply to these transfers, and they would not occur unless the market price inside the GHG regulation area (which includes GHG costs) is higher than the market price in the non-GHG regulation area (which does not include GHG costs) by at least the “toll”. If a transfer occurs, the ISO would not allocate that transfer to a participating resource as it does today in the WEIM. As result, the ISO would need to develop similar changes to the WEIM to implement this proposal.

The toll would be a product of a default GHG emissions rate (set by state air regulators for their GHG regulation area) and the cost of carbon. Proponents of the zonal approach have suggested a pre-defined toll that is static over the course of the day might apply. For the emissions rate, the zonal approach could use the state air regulator default emissions rate. California’s program applies a single emissions rate to unspecified imports based on historical information regarding the type of generation that tends to be marginal in the regulation area.

⁹¹ Powerex and Public Generating Pool. “Applying GHG-Pricing Programs In Western Organized Electricity Markets” June 2022. Attached to PGP’s EDAM Straw Proposal Comments and available at: [Link](#)

For the cost of carbon, an option may be to use recent carbon allowance auctions in the GHG regulation area.

Developing a rate that both avoids leakage (if the toll is too low, allowing higher emitting resources to use a lower emissions rate) and avoids discriminating against lower emitting resources (if the toll is too high, forcing lower emitting resources to use a higher emissions rate) is a potential challenge with the zonal approach. In its comments on the straw proposal CARB points out that importers of electricity from higher emission resources may be incentivized to use the toll, which may negatively affect the accurate reporting of specified source emissions to California and result in emissions leakage. There are significant challenges in developing an accurate toll. An administratively set static toll likely will result in periods of leakage and discrimination, depending on the toll and grid conditions. A dynamic toll could be developed, but it too will not be accurate for all periods or for all resources depending on grid conditions. In addition, a dynamic toll raises many implementation questions, including how often to calculate the toll and the data inputs used in the calculation. It would be necessary to design and implement additional system enhancements to implement a dynamic toll in the market optimization.

This zonal bidding approach also produces different treatment of similar resources. For example, a gas fired resource would be treated differently if it were in a GHG regulation area as opposed to a non-GHG regulation area using the toll. CARB comments that EDAM should facilitate the comparable treatment of in-state resources and all resources that meet CARB's specified source reporting requirements. CARB raises concerns that the zonal approach could create unequal treatment of similar resources. Another stakeholder included a similar comment that programs should strive to treat same fuel resources similarly.

Lastly, one stakeholder questioned how the zonal approach offers a path to meeting carbon reduction targets for Oregon's compliance based programs. Similar to the resource-specific proposal, the ISO could introduce constraints to identify certain carbon intensities and/or fuels from specified resources that the optimization could exclude from serving specified loads. However, for resources subject to the toll, the ISO would be unable to introduce a constraint to meet state requirements. Any proposal to allow imports using the toll, would likely also include fossil resources unless all resources subject to the toll were non-emitting.

(i) Linkage

For transfers between GHG regulation areas, modeling would differ depending on whether there is linkage between the programs. To accommodate non-linked programs, the ISO would model eligible resources as part of the GHG regulation areas using the Path 1 or Path 2 approach. For all other resources inside the GHG regulation area, the ISO would model a transfer using a toll. As a result, a resource within a GHG area would be subject to a resource specific GHG rate, and it also would need to overcome a toll to support demand in another GHG area. If GHG regulation areas are linked in the future, or if state air regulators recognized another GHG regulation area's GHG cost of compliance, there could be an opportunity for transfers to occur without a toll.

(c) Settlement

Specified resources will receive the LMP at their location plus the GHG "shadow price" in the relevant GHG regulation area.

Under a zonal approach, the GHG compliance cost will create price separation between GHG regulation area(s) and the non-GHG regulation area. This separation necessitates a different settlement of GHG compliance costs compared to the resource-specific approach. In the zonal approach, the ISO will calculate the IFM/RTD GHG transfer amount. The IFM GHG transfer amount equals the product of the IFM GHG transfer quantity (MWhs) and the toll associated with the GHG regulation area. The RTD GHG transfer amount equals the product of the imbalance between RTM GHG transfer quantity and IFM GHG transfer quantity (MWhs) and the toll associated with the GHG regulation area.

In the zonal approach, as the first jurisdictional deliverer, the ISO will maintain a GHG compliance account into which settlements will be allocated the IFM GHG transfer amount and RTM GHG transfer amount. The ISO will use the GHG compliance account to fund the purchase and retirement of GHG allowances in the GHG regions. As the first jurisdictional deliverer and revenue neutral corporation, the ISO will need to develop a neutrality true-up process if the GHG compliance funds collected and the GHG allowance purchases.

(d) Compliance & Reporting

(i) Compliance

Proponents of the zonal approach recommend the first jurisdictional deliverer for unspecified transfers should be the ISO. The rationale for this recommendation is that the market operator handles delivery and controls transmission assets. Accordingly, the ISO would be the first jurisdictional deliverer because it is the entity “responsible for delivering electricity”. This would only apply to compliance for unspecified imports in which the ISO would act as the compliance and reporting entity. The ISO would also use the revenue collected from load to purchase and retire carbon allowances. In contrast, reporting of specified imports would use a similar approach to CARB’s existing approach for bilateral markets, which recognizes specified sources of emissions.

Any changes to the first jurisdictional deliverer would require regulatory changes and approvals by state air regulatory agencies and boards. In addition, if the ISO were to act as the first jurisdictional deliverer, the ISO would need to consider any associated corporate implications and develop new business processes and new settlement systems. We would also need to develop cost allocation mechanisms for GHG neutrality if the revenue collected does not match the cost of purchasing carbon allowances.

(ii) Reporting

Under the zonal approach, the ISO would report net transfer volumes from unspecified sources into a GHG regulation area. Based on market results provided by the ISO, each market participant would be responsible for reporting and compliance of its source-specific transfers into a GHG regulation area. Although the zonal proposal suggested separating the quantity of imports by technology, source region, and importer, the ISO will not necessarily have this data.

(e) Implementation

There are three aspects to implementation to address in the zonal approach. First, from a design perspective, the ISO would find it helpful to have modeling examples for the zonal proposal. Second, from a regulatory perspective, the zonal approach would require state air regulator approval of: (1) the resource specific pathway, (2) the toll used, and (3) the ISO being the first jurisdictional deliverer. Third, from an implementation perspective, the ISO would need

to implement new settlement systems and business processes to support the first jurisdictional deliverer role. The ISO emphasizes that if state air regulators move to the zonal approach, the resource specific proposal could be adapted for the zonal approach. The ISO could leverage the resource specific pathway and the ISO could apply a toll to each resource subject to a toll.

(3) LADWP Approach

(a) Overview

The LADWP approach proposes a design, which is an extension of the resource-specific proposal with the same constraints in place and a few key changes. First, non-GHG regulation area resources that did not opt out from bidding into a GHG zone would have resource specific GHG bid adders inserted by the ISO for optimization purposes. Second, LADWP suggests moving to a load based accounting, meaning that GHG regulation area load serving entities would have the reporting obligation for transfers from non-GHG regulation areas to serve load in the GHG regulation area and would receive the GHG transfer revenue collected by the market operator. Third, LADWP's proposal suggests eliminating GHG compliance and reporting for Participating Resource Scheduling Coordinators in non-GHG regulation areas. Fourth, LADWP states that load based accounting allows flexibility to accommodate multiple GHG zones and different carbon prices.

In comments to the straw proposal, numerous stakeholders requested ISO further explore LADWPs approach after the proposal was presented at the May EDAM workshops.

(b) Bidding and Optimization

The bidding process for the LADWP approach builds off of the resource-specific approach and depends on whether a resource is inside or outside of a GHG regulation area. For resources in a GHG regulation area, the approach maintains the design of the resource-specific approach. Resources in the GHG regulation area would continue to include in their energy bid the cost of GHG compliance. For resources outside a GHG regulation area, LADWP proposes a new approach. First, resources can elect to opt out of serving a GHG regulation area (rather than opt in by submitting a bid adder as is done in the resource-specific approach). Second, the ISO would calculate a GHG bid adder for each resource that does not opt out and insert that bid adder into the optimization.

The bid adder inserted by the ISO would be the product of the emissions factor of the resource and the current cost of carbon. Although some resources currently have an emissions factor in ISO's master file, the ISO would need to establish a new requirement to have all resources that do not opt out provide their emissions factor as well as a procedure to validate these factors. The ISO could establish a process to verify that these emission factors are consistent with those utilized by state air regulators. The cost of carbon could reflect the current price in the secondary market, the carbon allowance auction price (e.g., average of last two auctions), or a new approach proposed by stakeholders.

The LADWP proposal is not constrained by the number of GHG areas. If linkage exists between GHG regulation areas, only one GHG bid adder would be needed for a non-GHG regulation area to serve multiple linked GHG regulation areas. However, when GHG regulation areas are not linked, the ISO would need to insert separate GHG bid adders for each applicable GHG regulation area for every resource that has not opted-out of serving the GHG regulation area.

LADWP's approach would recognize source-specific transfers into a GHG regulation area if the resources self-schedule or are pseudo-tied into the GHG regulation area. Both self-schedules and any resource pseudo-tied will be in the GHG Reference Pass. Resources dispatched above or below the optimal GHG Reference Pass to support the market transfer from the non-GHG zone to the GHG zone would also be identified as resource-specific by the market optimization. In the optimization, the treatment of specified source imports and allocation of resources would be done in the same way as the resource-specific proposal.

In response to the straw proposal, one stakeholder questioned how other proposals offer a path to meeting carbon reduction targets for compliance based programs like Oregon. Similar to the resource-specific proposal, the ISO could introduce constraints to identify certain carbon intensities and/or fuels from specified resources that the optimization could exclude from serving specified loads or simply opt out of being served by emitting resources.

(c) Settlement

LADWP's proposal would use the "as bid" total GHG cost, which is the sum of (MWh x GHG adder) for all resources that supported the transfer into the GHG zone, to calculate the credit to load. As the market operator, the ISO would calculate the net import into a GHG zone. If the GHG area aligns with the BAA boundary, then the GHG credit can be pro-rated to each GHG area (BAA) based on that area's net import. If the BAA wants to sub-allocate to respective LSEs within the GHG area, the LADWP proposal contemplates two approaches: (1) either the entity sub-allocates based on the LSEs net import, or (2) it continues to use a load ratio share.

LADWP also believes the net import can be calculated even when the GHG region does not align with the BAA, but it recognizes more detailed discussions are needed with the ISO and stakeholders.

(d) GHG Agency Compliance & Reporting:

(i) Compliance

For resources outside the GHG regulation area and their emissions, LADWP suggests that the ISO, as the entity responsible for dispatching the resources, would be treated as the first jurisdictional deliverer proxy for the electricity transferred to the grid in the GHG zone, with the GHG regulation area load serving entities (LSEs) acting as the ISO's agents. The ISO would collect the GHG transfer revenue and allocate it to GHG regulation area LSEs based on their net import ratio share, pending further discussions with the ISO and stakeholders as described above. GHG regulation area LSEs would be responsible for GHG emission reporting and retirement of allowances for the imported electricity. Any changes to the first jurisdictional deliverer would require regulatory changes and approvals by state air regulatory boards. LADWP notes that the definition of "first deliverer of electricity" under CARB's regulations includes a WEIM purchaser, which they suggest could provide a model for modifying the first jurisdictional deliverer under CARB's regulations. If the ISO were to act as the first jurisdictional deliverer and not have LSEs as ISO's agents, the ISO would need to develop new business processes and new settlement systems. LADWP proposes that the LSEs rather than the ISO be responsible for GHG emission reporting and compliance.

(ii) Reporting

LADWP proposes to shift reporting requirements for emission from EDAM transfers to GHG regulation area load. This approach would move the GHG reporting and compliance requirements, from resources in a non-GHG regulation area to load within a GHG regulation area. This topic is subject to approval by state air regulators and is outside the purview of the ISO's authority.

(e) Implementation

The LADWP approach includes incremental changes to the resource-specific approach. From a modeling perspective, LADWP's approach seeks to reflect the cost of compliance for each resource but shift compliance for and reporting of emissions to GHG regulation area LSEs. From a regulatory perspective, LADWP's proposal would require significant state regulatory changes and state air regulatory approval of (1) the calculation of emissions from EDAM imports (2) LSEs as the first jurisdictional deliverer, and (3) reporting and compliance requirements for EDAM imports. In addition, the ISO will require sufficient lead time to implement necessary technology changes for the non-GHG regulation area bid insertion, reporting functionality, and settlements.

D. Post-Day-Ahead Market Processes

Revenue allocation and settlement are essential post-day-ahead market processes. This section discusses these processes as they apply in the EDAM, along with the EDAM fees framework.

1. Transfer Revenue and Congestion Revenue Allocation

In the EDAM, the ISO will calculate transfer revenue for energy, imbalance reserve, and/or reliability capacity for those hours in which a participating BAA's transfer scheduling constraint binds. Although distribution of each of these transfer revenue types will be consistent, the following discussion focuses on the distribution of energy transfer revenue.

Under the WEIM, the marginal cost of congestion reflects both power balance constraint violations and transmission constraint violations. However, during the stakeholder process for the real-time settlement review initiative⁹², we identified an asymmetrical settlement for energy wheeling through the WEIM area when one of the WEIM BAAs has a power balance constraint violation. This issue can cause cost shifting both within the WEIM area and between WEIM and non-WEIM BAAs. This cost shifting was exacerbated when the ISO did not settle the schedule deviations of the base energy transfer system resources (ETSRs). As part of the initiative, the ISO also determined that in EDAM it would settle all ETSRs. This ISO settlement of ETSRs requires the ISO to distinguish between power balance constraint violations and transmission constraint violations.

In the EDAM, the proposal is to incorporate a power balance constraint in each participating BAA's marginal cost of energy (MEC) component of the LMP and retain the transmission constraint violation in the marginal cost of congestion price (MCC) component of the LMP. Specifically, the MEC in a BAA reflects the shadow price of the power balance constraint of that BAA. The MCC reflects the shadow price of a binding transmission constraint. Energy transfer

⁹² *Real Time Settlement Review Initiative*, October 21, 2020 [Link](#)

revenue is collected from price differences between the MEC component of the LMP across BAAs, which is caused by transfer schedules reaching their scheduling limits. Congestion revenue on the other hand is collected from price differences in the MCC of the LMP across nodes within a BAA or between intertie scheduling points at the boundary of an EDAM BAA and internal nodes, the latter of which is caused by binding scheduling limits at the intertie (*i.e.*, the ITC/ISL).

Under the WEIM, real-time congestion revenue accrues when either internal transmission constraints bind or transfer constraints bind. Today, the WEIM retains congestion associated with internal transmission constraints within the BAA in which the constraint is modelled. The WEIM distributes congestion transfer scheduling constraints among the BAAs associated with the transfer point. If the transfer point is between two WEIM BAAs, the congestion is distributed equally between the two BAAs, 50:50, except that across interfaces with the ISO the congestion revenue is allocated fully (100:0) to the WEIM BAA supporting the transfer.

The straw proposal extended the WEIM framework to the EDAM, while also distinguishing transfer revenue from congestion revenue and proposed to share transfer revenue between EDAM entities, 50:50 ratio, when both BAAs provide transmission from a transfer point halfway between the two BAAs. However, where an EDAM BAA provides transmission to a scheduling point of another BAA, and transfer revenue accrues as a result of binding transfer scheduling limit, the straw proposed to allocate 100 percent of the transfer revenue to the EDAM BAA providing the transmission. In addition, when congestion revenue accrues as a result of a binding internal transmission constraint, the straw proposed to allocate 100 percent of the congestion revenues to the EDAM entity in whose BAA the constraint was modeled.

Stakeholder comments generally supported a 50:50 sharing of transfer revenue while retaining the 100 percent congestion revenue distribution when an intertie or internal constraint binds. A few stakeholders supported extending the WEIM framework as a day one design of the EDAM, and a sizable number of stakeholders expressed the desire for additional information and examples to help them further understand the various revenue allocation concepts. In subsequent EDAM workshops the ISO walked through scenarios and examples and further discussed the concept of transfer revenue and congestion revenue allocation.⁹³

In response to stakeholder comments and workshop discussions, in this revised straw proposes to adopt a 50:50 sharing between EDAM BAAs of transfer revenues accruing for bucket 1, bucket 2, and bucket 3 transmission supporting EDAM transfers. The ISO would allocate those transfer revenues to the EDAM entities and transmission providers supporting the transfer. As discussed in section II(B)(1)(a)(2)(b), where the transmission customer releases its transmission rights for EDAM optimization in advance of the market run at 10 a.m., the ISO will allocate 100 percent of full transfer revenues associated with the released transmission rights directly to the respective transmission customer. In unique instances where a 50:50 sharing of transfer revenue does not align with the commercial arrangement for the transfer transmission (*i.e.*, specific contracts between entities), different transfer revenue sharing arrangements can be accommodated.

This revised straw proposes to retain the WEIM internal transmission constraint framework and, if there is a binding intertie transmission constraint/intertie scheduling limit constraint (ITC/ISL), the ISO will allocate 100 percent of the full (100:0) congestion revenue to the EDAM BAA where the constraint is modeled. This revised straw further proposes to extend the new EDAM

⁹³ *Technical Workshop: EDAM Transfer Revenue and Congestion Rent Allocation*, July 20, 2022, [Link](#)

framework to WEIM. WEIM transfer revenue will be shared equally between WEIM BAAs, but the congestion revenue will be retained in the WEIM BAA where it is modelled.

This revised straw also proposes to extend the transfer revenue distribution framework to imbalance energy transfer revenue and reliability transfer revenue. If the transfer scheduling limit binds so the market optimization cannot transfer lower cost imbalance reserve capacity between two EDAM BAAs, the imbalance reserve price between these EDAM BAAs will separate, resulting in imbalance reserve transfer revenue. The two BAAs will share the imbalance reserve transfer revenue equally. Similar to imbalance reserve, reliability capacity transfer revenue will accrue when the reliability capacity prices separate between two EDAM BAAs because the transfer scheduling constraint becomes binding in RUC. The two BAAs will share the reliability capacity transfer revenue equally in these circumstances.

This revised proposal was informed by stakeholder comments and workshop discussions, and it recognizes the shared value that results when two EDAM entities bring transmission to the transfer location; *i.e.*, it necessarily takes both EDAM entities' transmission to support transfers. Equally sharing the mutual benefit of the transfer is a fair and equitable solution. This approach also recognizes that internal congestion revenues associated with the internal constraints should flow to the EDAM BAA where the constraint is modeled. For example, in the context of the ISO, these congestion revenues are collected by the ISO to fund congestion revenue rights (CRR), and sharing these congestion revenues would cause an under-collection of revenue, undermining the ability to fund CRRs across the ISO system. These cases could also arise in other scenarios across the EDAM footprint, in which case the allocation would apply in the same manner. The following figure illustrates of the proposed this transfer revenue and congestion revenue framework. In this illustration, there are two EDAM BAAs with 300 MW transfer capability bi-directionally between them. At 10 a.m., BAA A and BAA B submit total available transmission capacity of 200 MWs. The IFM receives the following resource and transmission information, including bids and scheduling limits.

EDAM BID Data

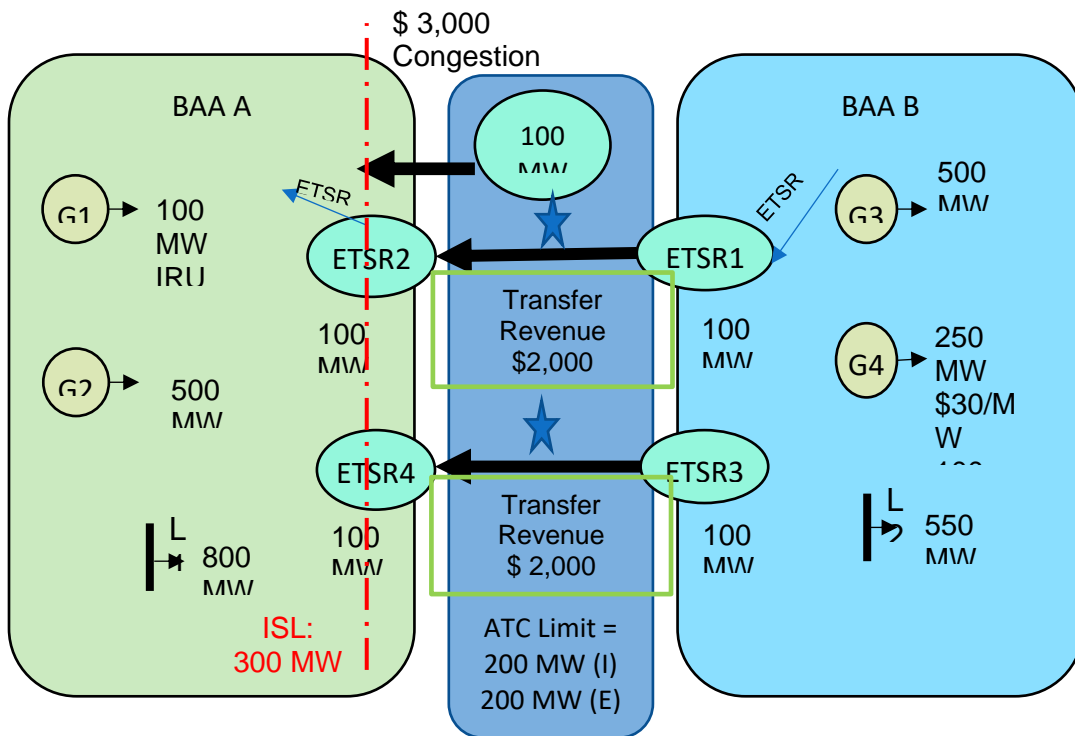
BAA	Resource	Pmax	Energy MW	Energy \$	IRU MW	IRU \$
A	SR		200	\$50		
A	G1	600	600	\$60	100	\$5
A	G2	500	500	\$40	100	\$4
A	L1	1000	800		100*	
B	G3	500	500	\$20	100	\$3
B	G4	500	500	\$30	100	\$2
B	L2	700	550		100*	
	ETSR1-2	100				
	ETSR3-4	100				
	ETSR5-6	100				
A	ISL	300				

*IRU Requirement of 100 MWs

Figure 3: Illustration of transfer and congestion revenue allocation.

The IFM optimization determines that the optimal solution should schedule Generator 4 and an additional 200 MW to facilitate a 200 MW transfer with between BAA B. The transfer is limited by the available transmission capacity (ATC) at the transfer location. Because the transfer limit is binding, the market had to schedule more expensive energy in BAA A to meet bid in demand. There is a \$30 price separation between the MEC in BAA A from MEC in BAA B.

In addition to the transfer scheduling limit binding, the market optimization could only schedule the system resource at 100 MW because competition between system resource bids and the optimal transfer schedules caused the intertie scheduling limit (ISL) to bind.



Because both the transfer scheduling limit and the ISL are binding, the ISO will calculate both transfer revenue and congestion revenue. The transfer revenue is \$4,000, and the congestion revenue is \$3,000. Based upon the new proposal, the transfer revenue would be distributed to both BAA A and BAA B at \$2,000 each, and the congestion revenue would be distributed to BAA A at \$3,000.

We seek stakeholder feedback on this proposed transfer revenue and congestion revenue allocation design.

2. Settlements

The ISO calculates settlement charges and payments based on market and transmission activities. The EDAM will extend some existing settlement practices and develop new settlement practices for participating BAAs and other EDAM market participants.

Stakeholder comments requested that we further clarify the settlement implications for BAAs and resources participating in EDAM. In addition, stakeholder comments encouraged that we standardize application of settlement principles and requirements applicable to all BAAs and their resources across the EDAM footprint. If standardization is not feasible, stakeholders requested that we provide clear settlement requirements distinguishing why one BAA is being treated differently from another.

This section describes the proposed settlement principles and requirements that would apply to resources and load that participate in EDAM by bidding into the Integrated Forward Market, Residual Unit Commitment process, and Real-Time Market.

a) IFM Resource Sufficiency Evaluation Settlement

As discussed above, if a BAA fails the EDAM RSE, the proposal is to assess an administrative surcharge to the failing EDAM entity. The settlement details are discussed in section II(B)(2)(c)(3). Day-Ahead Market Settlement

The day-ahead market primarily comprises the IFM, RUC, and the market power mitigation processes. The ISO will settle the results of the IFM and RUC processes as follows.

b) Integrated Forward Market (IFM)

The IFM process co-optimizes energy bids, convergence bids, imbalance reserve bids, and ancillary services bids. The IFM co-optimization will commit resources to start-up or to minimum load, as well produce hourly day-ahead energy schedules, convergence bid (virtual) schedules, ancillary service awards, and imbalance reserve awards. IFM will also produce hourly day ahead energy schedules. These day-ahead awards and schedules will have an explicit settlement, while IFM commitment costs will be considered in bid cost recovery calculations. The following sections describes the settlement of the day-ahead schedule and awards at a high level.

c) Day-Ahead Energy Schedule and Convergence Bid Settlement

Once the IFM clears the market, it produces hourly day-ahead energy schedules for all resources with energy bids and/or energy self-schedules. These day-ahead energy schedules include generation, import, export, load, and virtual supply and demand. The IFM will also produce hourly transfer energy schedules at transfer locations between BAAs in the EDAM footprint.

Generation that clears the day-ahead market is paid the LMP at the relevant pricing node location. An import schedule is paid the LMP at the relevant scheduling point-intertie pricing location. Virtual supply is paid the LMP at the relevant pricing node, trading hub, or aggregated pricing node location in which the virtual supply cleared the day-ahead market.

In contrast, load that clears the day-ahead market will be charged the LMP at the relevant load aggregation point (LAP). An export schedule will be charged the LMP at the relevant scheduling point-intertie pricing location. Virtual demand is charged the LMP at the relevant pricing node, trading hub, or aggregated pricing location, including load aggregation points in which the virtual demand cleared the day-ahead market.

In addition, because energy transfer schedules identify energy that is passing between two BAAs in the EDAM footprint, the energy transfer will settle both as an export energy transfer and import energy transfer. These import and export energy transfers will be paid and charged at the LMP at their relevant scheduling point-intertie locations.

d) Day-Ahead Greenhouse Gas (GHG) Settlement

Under the resource specific approach, resources in the non-GHG region can submit GHG specific bids to serve demand in a GHG region. The IFM optimizes and clears supply bids to meet demand. The IFM clearing can result with the scheduling of energy from a non-GHG region to meet demand in a GHG region, otherwise referred to as a GHG transfer schedule. The GHG transfer schedules represent the net energy transfer from a non-GHG region to GHG region.

Resources that receive a day-ahead GHG attribution to serve demand in a GHG region will receive a GHG payment. The GHG payment is the product of the IFM GHG obligation and the IFM marginal GHG price. The GHG region load being served by non-GHG supply will have its GHG charge settlement embedded within the overall load energy schedule settlement.

e) Day-Ahead Energy, Congestion, and Marginal Loss Offset Settlement

The ISO settlement procedures will ensure that an EDAM BAA's energy settlement is revenue neutral. To ensure neutrality, the settlements system will need to consider the energy settlement of each component of the LMP: marginal energy cost, marginal cost of congestion, marginal cost of losses, and marginal cost of GHG. The following sub-sections describe how ISO settlements will maintain EDAM BAA neutrality.

f) Day-Ahead Marginal Loss Offset

The ISO will calculate an hourly day-ahead marginal loss offset amount for each BAA. The hourly day-ahead marginal loss offset amount will equal the sum of the product of day-ahead energy schedules, including virtual schedules and transfer energy schedules, and the marginal cost of losses at their relevant pricing location. The ISO will allocate the hourly day-ahead marginal loss offset amount to the EDAM entity, which will re-allocate the amount per its OATT. For the ISO BAA, ISO settlements will allocate the hourly day-ahead marginal loss offset to measured demand in same manner as today.

g) Day-Ahead Greenhouse Gas Offset

The ISO will calculate an hourly day-ahead marginal GHG offset amount for the EDAM footprint in relationship to GHG region(s) vs the non-GHG region. The hourly day-ahead marginal GHG offset amount will equal the sum of the product of day-ahead energy schedules, including virtual schedules and transfer energy schedules, and the marginal cost of GHG. The ISO will allocate the hourly day-ahead marginal loss offset amount to a GHG region's metered demand. If more than one GHG region exists with different GHG accounting rules, this determination will require the ISO to calculate a separate GHG marginal offset amount for each GHG region.

h) Day-Ahead Marginal Congestion Offset

The ISO will calculate an hourly day-ahead marginal congestion offset amount for each EDAM BAA. The hourly day-ahead marginal congestion offset amount will equal the sum of the product of day-ahead energy schedules, including virtual schedules and transfer revenue, and the marginal cost of congestion contribution for each EDAM BAA at its relevant pricing location and considering relevant transmission constraints. The ISO will allocate the hourly day-ahead marginal congestion offset amount to each EDAM BAA for distribution based upon its OATT, or for the ISO BAA, distribution to CRRs and metered demand per the ISO tariff.

i) Day-Ahead Marginal Energy Offset

The ISO will calculate an hourly day-ahead marginal energy offset amount for each EDAM BAA. The BAA hourly day-ahead marginal congestion offset amount will equal the remainder of the hourly day-ahead energy settlement less the offset amounts attributed to BAA day-ahead marginal cost of losses, BAA day-ahead marginal cost of greenhouse gas, and the BAA day-ahead marginal cost of congestion. The ISO will allocate the hourly day-ahead marginal energy offset amount to the EDAM entity for distribution per its OATT or to the ISO BAA for distribution to metered demand.

j) Transfer Revenue

The proposal is to calculate transfer revenues for energy transfers, imbalance reserve transfers, and/or reliability capacity transfers for all participating BAAs when the transfer scheduling limit is binding.

Transfer revenue for energy occurs when the EDAM BAA net transfer scheduling limit binds as market clearing bid in supply against bid in demand. This binding constraint manifests as a separation of the marginal energy price of the binding EDAM BAA from the marginal energy price of neighboring EDAM BAAs. The proposal is to calculate an hourly transfer revenue for energy for each transfer point in which the transfer scheduling limits are binding. The transfer revenue is equal to the product of the transfer quantity and the difference between the transfer import MEC price and transfer export MEC price. The transfer revenue for energy is distributed to the EDAM BAAs, including the ISO BAA, at a default 50:50 ratio. EDAM BAA transfer revenue will be distributed to the EDAM entity for reallocation per its OATT. ISO BAA transfer revenue is further distributed to metered demand.

Transfer revenue for imbalance reserve up and imbalance reserve down (IRU/IRD) manifests when transfer scheduling limit binds while optimizing capacity to meet BAA uncertainty requirement. The binding constraint manifests as separation of imbalance reserve up price/imbalance reserve down price (IRUP/IRD) in the binding EDAM BAA from the IRUP/IRD. The proposal is to calculate an hourly transfer revenue for IRU/IRD for each transfer point in which the transfer scheduling limits is binding. The transfer revenue equals the product of the transfer quantity and the difference between the transfer import IRUP/IRD price and transfer export IRUP/IRD. The transfer revenue for energy is distributed to the EDAM BAAs including the ISO BAA at a 50:50 ratio. EDAM BAA transfer revenue will be distributed to the EDAM Entity for sub-allocation per its OATT. ISO BAA transfer revenue is further distributed to metered demand.

Transfer revenue for reliability capacity up and reliability capacity down (RCU/RCD) manifests when transfer scheduling limit binds in RUC. The binding constraint manifests as separation of reliability capacity up price/reliability capacity down price (RCUP/RCD) in the binding EDAM BAA from the RCUP/RCD. The proposal is to calculate an hourly transfer revenue for RCUP/RCD for each transfer point in which the transfer scheduling limits is binding. The transfer revenue equals the product of the transfer quantity and the difference between the transfer import RCUP/RCD and transfer export RCUP/RCD. The transfer revenue for energy is distributed to the EDAM BAAs including the ISO BAA at a 50:50 ratio. EDAM BAA transfer revenue will be distributed to the EDAM Entity for sub-allocation per its OATT. ISO BAA transfer revenue is further distributed to transmission rights holders, if applicable, or to scheduling coordinators in proportion to their metered demand compared to ISO total metered demand.

k) Imbalance Reserve Settlement

Resources that receive an imbalance reserve upward (IRU) capacity award will be paid the applicable nodal imbalance reserve upward price (IRUP). These resources will have a must offer obligation to bid the IRU capacity into the real-time market (RTM). If the resource does not meet its must offer obligation, the ISO will assess a non-compliance rescission charge for the 10-minute-ramp-capable portion not bid into the RTM. EDAM transfer resources that received an IRU capacity award will be charged the IRUP of the BAA out of which the capacity

requirement is transferring and be paid the IRUP of the BAA into which the capacity requirement is transferring.

Resources that receive an IRD capacity award will be paid the applicable nodal IRDP. These resources will have a must offer obligation to bid the IRD capacity into the RTM. If the resource does not meet its must offer obligation, the ISO will assess a non-compliance rescission charge for the 10-minute-ramp-capable portion not bid into the RTM. EDAM transfer resources that received an IRD capacity award will be charged the IRDP of the BAA out of which the capacity requirement is transferring and be paid the IRDP of the BAA into which the capacity requirement is transferring.

ISO Settlements will allocate each EDAM BAA's IRU and IRD costs through a two-tier allocation methodology, respectively. The two-tier allocation methodology is currently under development in the DAME initiative. We will update stakeholders regarding the allocation methodology when the DAME initiative concludes.

l) Ancillary Service Settlement

At the start of EDAM, EDAM BAAs will self-provide their entire ancillary service requirements. The IFM will initially co-optimize energy and imbalance reserve for each EDAM BAA and energy, ancillary services, and imbalance reserves for the ISO BAA. During this time, the ISO will settle ISO ancillary service awards and self-provisions associated with EDAM in same manner it does today.

After the ISO implements functionality to accept bids for ancillary services from resources in EDAM BAAs, scheduling coordinators for resources that receive a day-ahead ancillary service award will be paid the relevant day-ahead ancillary service marginal price. These day-ahead ancillary service awards will be subject to non-compliance rescission provisions. The ISO will allocate the ancillary service cost less the payment rescission to scheduling coordinators based upon ancillary service obligations netted against ancillary service self-provision.

m) IFM Bid Cost Recovery

IFM bid cost recovery (BCR) is the process by which the ISO ensures eligible resources can recover their commitment costs (start-up costs, minimum load costs, and transition costs) and bid costs (energy, ancillary service, and imbalance reserve), to the extent these costs are not sufficiently covered by IFM revenue from day-ahead energy settlement, day-ahead ancillary service award settlement, and imbalance reserve capacity settlement. The ISO will calculate bid cost recovery for each eligible resource. If the total day-ahead market revenues over a trading day do not exceed the resource's daily commitment and bid costs, the resource is eligible to recover its daily shortfall in the trade hours in which the resource was short in recovering its costs.

For each trading hour, the ISO will calculate the total IFM bid cost recovery amount (IFM BCR amount) for each EDAM BAA. For a BAA with net energy export transfer, the ISO will transfer a portion of the BAA's IFM BCR amount to BAAs receiving net import energy transfers. This IFM BCR transfer amount will equal the product of the hourly IFM BCR amount and the BAA net energy transfer net export divided by the sum of the BAA net energy transfer plus day-ahead load schedule and day-ahead export schedules. For EDAM BAAs, any remaining BAA IFM BCR amount will be allocated directly to the EDAM entity to reallocate in accordance with its OATT. For the ISO BAA, the ISO will reallocate any remaining IFM BCR amounts through the current two-tier IFM BCR allocation in the ISO tariff.

n) Residual Unit Commitment Settlement

As described earlier, the RUC process runs after the IFM. The RUC process procures incremental or decremental capacity (called reliability capacity up and reliability capacity down, respectively) to resolve differences between an EDAM BAA's IFM physical energy schedules and its load forecast. RUC is a backstop to the IFM to ensure there is sufficient physical supply available to serve load in real-time.

o) Reliability Capacity Settlement

Stakeholders and the ISO is currently developing a reliability capacity product as part of the DAME initiative. The proposal is to utilize the reliability capacity product throughout the EDAM footprint. The RUC process will procure reliability upward capacity and reliability downward capacity from resources that have submitted reliability capacity bids.

Resources that received a reliability capacity up (RCU) award will be paid the marginal reliability capacity up price. Resources that received a reliability capacity down (RCD) award will be paid the marginal reliability capacity down price. Like imbalance reserves, resources that receive a RCU award or RCD award have a real-time must offer obligation. Resources that do not submit RCU/RCD quantities in accordance with their RTM must offer obligation will be subject to a non-compliance charge.

The ISO will calculate the total BAA net reliability capacity up amount as the sum of the EDAM BAA resource reliability capacity up settlement, BAA resource reliability capacity up non-compliance amount, and the BAA reliability capacity up transfer amount. The ISO will calculate the total BAA net reliability capacity down capacity amount as the sum of the EDAM BAA resource reliability capacity down settlement, BAA resource reliability capacity down non-compliance amount, and the BAA reliability capacity down transfer amount. The total BAA net reliability capacity up capacity amount and the total BAA net reliability capacity down amount will be allocated according to the two-tier allocation being developed in the DAME initiative.

p) RUC Bid Cost Recovery

RUC bid cost recovery (BCR) is the process by which the ISO ensures eligible resources recover their commitment costs (start-up costs, minimum load costs, and transition costs) and reliability capacity bid costs to the extent these costs are not sufficiently covered by RUC revenue from reliability capacity settlement or excess real-time market revenue.

The ISO will calculate BCR for each eligible resource. The ISO will calculate the RUC shortfall and RUC surplus for each trading hour of trading day. In addition, the ISO will apply the BCR netting process between net RUC BCR shortfalls and RTM surpluses and net RUC surplus and RTM shortfalls. If the total net RUC surplus over a trading day does not exceed the resource's daily RUC shortfalls, the resource is eligible to recover the daily RUC shortfall in the trade hours in which the resource was short revenue.

For each Trading hour, the ISO will calculate the total BAA RUC bid cost recovery amount (RUC BCR net amount). The total BAA RUC BCR amount will be allocated to the appropriate BAA according the two-tier RUC allocation methodology being developed in DAME initiative.

q) Real-Time Market Settlement

The real-time market (RTM), including the WEIM, commits and dispatches resources to meet real-time demand forecast needs, flexible ramp uncertainty requirements, and ancillary service

requirements. The RTM is composed of the real-time resource sufficiency evaluation (WEIM RSE), hour-ahead scheduling process (HASP), short-term unit commitment process (STUC), fifteen minute market, and real-time dispatch process. The RTM co-optimizes energy bids, greenhouse gas bids, and ancillary service bids to meet demand forecast and uncertainty needs and real-time ancillary service requirements. For WEIM BAAs that join EDAM, the RTM settlement is mainly an imbalance settlement of energy, ancillary services, and flexible ramp product from day-ahead schedules and awards because base schedules no longer serve as the reference point.

r) RTM Resource Sufficiency Evaluation Settlement

The ISO will perform resource sufficiency evaluation tests for each BAA or the pooled group of EDAM BAAs that participate in RTM/WEIM. WEIM-only BAAs need to demonstrate: (i) the ability to balance EIM Demand and EIM Supply for the prospective EIM Entity's Balancing Authority Area; (ii) ability to pass the capacity test; and (iii) ability to pass the flexible ramping sufficiency test. EDAM BAAs need to demonstrate ability to pass the capacity test and ability to pass the flexible ramping sufficiency test.

s) WEIM RSE Failure Surcharge

Stakeholders and the ISO are currently developing an update to the WEIM market design in Phase 2 of the Resource Sufficiency Evaluation Enhancement initiative (RSEE Phase 2). This initiative proposes changes to enhance the accuracy of the WEIM resource sufficiency evaluation (RSE), while also exploring the potential to leverage the WEIM and increase reliability by creating an assistance energy product. This initiative will have some settlement implications for BAAs that fail the WEIM RSE and choose to cure their undersupply condition through the RTM.

t) Under-scheduling and Over-scheduling Charge

As previously discussed in the RSEE Phase 1 initiative, it would be inequitable to apply the balancing test to the real-time demand forecast for BAAs that participate in the IFM. As such, WEIM BAAs that join EDAM will no longer be subject to the over-scheduling/under scheduling charge, nor will they be eligible to receive any funds collected via the over-scheduling/under-scheduling charge structure in place for the WEIM. This structure is a mechanism to incent balanced schedules in the WEIM and is unnecessary for the EDAM, which relies on the day-ahead market to produce balanced schedules through its own incentive mechanisms.

u) Transmission Recovery Settlement

The transmission commitment section of this revised straw proposal describes a method for releasing bucket 3 transmission hurdle free. In exchange for releasing the bucket 3 transmission to the market hurdle free, the ISO is providing EDAM BAAs, including the ISO BAA, a mechanism to recover gross "at risk" TRR revenue, transmission revenue associated with certain transmission new-builds, and excess wheeling revenue.⁹⁴ This revised straw proposes to collect each BAA's TRR recovery amount from EDAM footprint metered load less the recovering EDAM BAA's metered load. The collected BAA TRR recovery amount will be paid to the EDAM entity or ISO's participating transmission owners as applicable. For example, if the EDAM is comprised of three EDAM BAAs: BAA1, BAA2, and BAA3, and the ISO

⁹⁴ Additional information about the TRR recovery proposal are outlined in the transmission commitment discussion in section II(B)(1)(c)x.

settlement system is collecting money to compensate BAA1 for a \$400K TRR. In this scenario, EDAM BAA1 should receive a payment for \$400K, and EDAM BAA2 and EDAM BAA3 should pay their portion of the \$400K based on their respective share of the sum of EDAM BAA2 and EDAM BAA3 metered load.

v) Real-Time Market Energy Settlement

The ISO settles imbalance energy for each resource within the WEIM/ISO BAA dispatched in Real-Time. There are four categories of imbalance energy: FMM instructed imbalance energy, RTD instructed imbalance energy, uninstructed imbalance energy, and unaccounted for imbalance energy. In addition, the ISO will account for any non-zero neutrality amounts which materialize from imbalance energy settlement.

w) Fifteen Minute Market Settlement

The fifteen minute market process (FMM) co-optimizes energy bids and ancillary service bids to resolve demand forecast changes, FMM uncertainty requirements, and real-time market ancillary service needs. The FMM commits/schedules energy to meet the fifteen minute demand forecast. The committed/scheduled resources are then settled as the difference between the FMM schedule and the day-ahead schedule, *i.e.*, FMM instructed imbalance energy (FMM IIE), multiplied by the FMM LMP of the applicable pricing location. For WEIM BAAs that join EDAM, the FMM IIE settlement will resemble their current FMM IIE settlement, except the reference point for FMM IIE settlement will be the resource's day-ahead schedule, not its real-time base schedule.

The EDAM proposal introduces some new RTM FMM settlement changes.

- Intertie schedules awarded an energy schedule in the day-ahead market that subsequently have an incremental/decremental FMM schedule change in the RTM, and did not submit an energy profile tag prior to HASP, will be subject to the HASP reversal rule applied through settlements.
- FMM energy transfer schedules will settle as FMM IIE at the LMP for the applicable scheduling point-ties between EDAM BAAs.

Because convergence bidding is an IFM mechanism, the difference between zero and the day-ahead virtual awards will settle at the FMM LMP at the applicable pricing location.

x) Real-Time Dispatch Settlement

The real-time dispatch process (RTD) will optimize energy bids to resolve load forecast changes and uncertainty requirement changes from the FMM. RTD commits /schedules energy to meet the RTD demand forecast. The RTD IIE quantity will settle at the RTD LMP of applicable pricing location. For WEIM BAAs that join EDAM, the RTD IIE settlement will resemble their current RTD IIE settlement.

The EDAM proposal also introduces a new RTM RTD settlement charge. RTD energy transfer schedules will settle as RTD IIE at the LMP of applicable scheduling point-tie(s) between EDAM BAAs.

y) Uninstructed Imbalance Energy Settlement

Uninstructed imbalance energy settlement is calculated as the difference between the resource's submitted meter and the final reference point schedule or dispatch. For generation,

import and export resources, including energy transfers, the reference point is the RTD dispatch. For load, the reference point is day-ahead energy schedule. For BAAs that join EDAM, the UIE will be the same as today. Resource specific UIE will settle at the RTD LMP, and load UIE will settle at the RTM hourly LMP.

z) Unaccounted for Energy Settlement

Unaccounted for energy settlement (UFE) is the difference between the net energy of the BAA or utility service area adjusted for transmission losses. UFE will settle at the hourly RTM LMP and will be allocated to relevant metered demand.

aa) RTM Greenhouse Gas Settlement

Similar to energy, RTM greenhouse gas (GHG) settlement is considered an imbalance settlement from day-ahead GHG settlement. The RTM will optimize and clear energy bids against the demand forecast. If the RTM dispatches energy from a non-GHG region with GHG region, this energy will be attributed to resources based upon their GHG bids and the least cost solution.

The FMM process will attribute GHG MWs to resources based upon the least cost solution and GHG bid. The GHG settlement for the resource will be an imbalance settlement from its day-ahead GHG attribution. The FMM GHG settlement will equal the product of the FMM GHG attribution less the day-ahead attribution and the FMM marginal cost of GHG. This can result in a payment or charge to the resource.

RTD GHG settlement is also an imbalance settlement, but the reference point is the FMM GHG attribution MWs. Similar to FMM GHG settlement, the RTD GHG settlement will equal the product of the RTD GHG attribution less FMM attribution and the RTD marginal cost of GHG.

bb) Real-Time Offsets

For BAAs that join EDAM, the BAA real-time marginal loss offset settlement and BAA real-time congestion offset settlement will remain unchanged. The ISO will calculate these offsets for each BAA based upon the nodal energy dispatch, the relevant FMM or RTD marginal cost of losses price, and the relevant FMM or RTD BAA marginal cost of congestion price. For EDAM BAAs, the ISO will allocate the BAA level offsets directly to the EDAM BAA for reallocation per its OATT, and the ISO will allocate RTM offsets for its BAA to measured demand.

The BAA real-time imbalance energy offset settlement includes two modifications from the EDAM straw proposal:

1. The ISO will remove the calculation for financial transfer amounts.
 - a. Financial transfers represent a non-binding settlement amount calculated to reflect the cost of energy to transfer out of a WEIM BAA and into another WEIM BAA.
 - b. The proposal is to remove this non-binding financial settlement because FMM/RTD transfers will be explicitly settled in the EDAM.
2. The ISO will develop a RTM GHG offset charge code. This charge code will mimic the day-ahead greenhouse gas offset calculations, except the RTM GHG region(s) and RTM non-GHG region(s) will incorporate the WEIM BAAs.

cc) Real-Time Ancillary Service Settlement:

The RTM co-optimizes energy and ancillary service bids. At the outset of EDAM, EDAM BAAs will provide the RTM with total ancillary service self-provision. This RTM self-provision should equal the day-ahead self-provision or day-ahead self-provision plus any incremental real-time self-provision if ancillary service requirements increase in the RTM. If EDAM BAAs are bidding ancillary services into the day-ahead market at some point in the future, the EDAM entity will be required to submit an RTM self-provision as either the day-ahead cleared ancillary service or day-ahead cleared ancillary service amount, plus any incremental self-provision. The resource should also submit ancillary service economic bids.

Resources that receive a RTM ancillary service award will be paid the RTM ancillary service marginal price. These RTM ancillary service awards will be subject to the same noncompliance provision as the day-ahead ancillary service awards. The ISO will allocate the ancillary service cost less the payment rescission to scheduling coordinators based upon ancillary service obligations netted against ancillary service self-provision.

dd) Intertie Deviation Settlement

The intertie deviation penalty (IDS) is a charge applied to intertie resources that receive an award in HASP and submit an after-the-fact tag that deviates from that HASP schedule. However, if the deviation results from a reliability curtailment, the resource's reliability curtailment is excluded from the penalty. The IDS penalty is calculated for each deviating intertie resource as the product the IDS deviation quantity, which is the difference between resource e-tag and HASP award, and the IDS price. The IDS price is 50% of the greater of the FMM LMP or RTD LMP for of that settlement interval. In addition, a 25% charge applies if the resource accepted the award but does not tag its accepted award. The IDS penalty is then allocated to the BAA measured demand.

ee) Flexible Ramp Settlement

(1) Forecasted Movement

Resources that receive a FMM forecasted movement award will receive a settlement charge or payment equal to the difference of the FMM forecasted movement from the day-ahead market forecasted movement and the price differential between relevant FMM flexible ramping up and FMM flexible ramping down prices, respectively. In addition, resources receiving a RTD forecasted movement award will receive a settlement charge or payment equal to the difference of the FMM forecasted movement from the day-ahead market forecasted movement and the price differential between relevant FMM flexible ramping up and FMM flexible ramping down prices. The sum of FMM and RTD forecasted movement settlement will be allocated to the relevant EDAM BAA(s) metered demand based upon the results of the flexible ramp resource sufficiency evaluation.

(2) Flexible Ramp Up/Down Uncertainty Settlement (FRU/FRD)

Because of the imbalance reserve product being developed as part of the DAME initiative, resources receiving a FMM FRU/FRD award will receive an imbalance settlement. The resource will settle the FRU/FRD award equal to the difference between the five minute ramp IRU/IRD award and the FMM FRU/FRD award multiplied by the FMM FRU/FRD LMP. The ISO

will calculate the RTD FRU/FRD award settlement as it does today. RTD FRU/FRD settlement will be the product of the difference between the FMM FRU/FRD award and the RTD FRU/FRD LMP.

The total flexible ramp up/down uncertainty award cost, which is the sum of FMM FRU/FRD settlement plus RTD FRU/FRD settlement, will be allocated to relevant BAA(s) and uncertainty movement categories. The FRU/FRD category costs are further allocated to resources based upon decremental/incremental uninstructed imbalance energy, respectively, plus uncertainty movement or operational adjustment.

3. EDAM Fees Framework

The ISO is committed to fiscal responsibility and fair and reasonable rates for its customers. The ISO would develop EDAM fees using the rate design model and activity-based costing (ABC) system used to determine existing rates for other cost-based services, including its grid management charge (GMC) rates, WEIM administrative fees, the reliability coordinator (RC) rate, and planning coordinator fees. The ISO model is based on six guiding ratemaking principles: cost causation, focus on the use of services, transparency, predictability and the ability to forecast, flexibility, and simplicity.

We will manage EDAM fees within the GMC revenue requirement. Using the ISO's existing rate design to establish the EDAM fees will ensure EDAM customers and existing ISO customers benefit from the stability and disciplined growth of our annual GMC revenue requirement.

Stakeholders generally supported the proposed cost causation based EDAM implementation and administrative fee structure and requested additional information regarding the implementation fees and administrative fees, which is provided below.

a) Implementation Fees Framework

Implementation Agreement: A WEIM entity seeking to participate in the EDAM must enter into an agreement with the ISO requiring the prospective EDAM entity to compensate the ISO for the costs incurred to integrate the WEIM entity into the EDAM. The agreement will establish the implementation date for entity's participation in the day-ahead market and will require the ISO to perform changes to its systems to allow the prospective EDAM entity to participate in the day-ahead market. These implementation activities include planning and project management, administrative management, full network modeling of resources, system integration and functional testing, metering and settlements, and operations readiness and training. The implementation process also includes system integration and functional testing, as well as training, market simulation and a period of parallel operations. The agreement will discuss how the deposits will be settled, including any refunds owed.

Entity Implementation Fee: The ISO's actual costs incurred to onboard the WEIM entity into EDAM will be recovered through an implementation fee, based on the ISO's cost of service. For projection purposes, the ISO used an hourly rate of \$200 for all onboarding activities. This fully burdened rate is calculated based on the most recently published triennial Grid Management Charge Update Cost of Service Study. For billing purposes, we will determine hourly rates for onboarding activity on an annual basis based on current aggregated and burdened labor rates. We do not project the hourly rates will exceed \$200 per hour for any activity. The majority of the onboarding costs will be labor costs; however, it is reasonable to assume some onboarding specific non-labor costs. Based on these factors, we estimate that the average cost to onboard an EDAM entity will be \$1,200,000. The actual onboarding costs per EDAM entity will vary

depending on the size and complexity of the onboarding. A \$300,000 deposit will be collected from prospective EDAM entities to cover the actual start-up costs incurred. If the deposit exceeds the actual cost incurred to provide onboarding services, the ISO will refund the excess amount including any interest accrued on the remaining deposit. If the actual cost of performing the service exceeds the deposit, additional deposits in \$300,000 increments will be required, which the EDAM entity must pay within thirty (30) calendar days. Any invoice payment past due will accrue interest, per annum, calculated in accordance with 5 C.F.R. 1315.10. If the EDAM entity fails to timely pay any undisputed costs, the ISO will not be obligated to continue performing onboarding activities unless and until the EDAM entity has paid all undisputed amounts.

After the entity has entered the EDAM, the ISO will provide a report that details deposit(s) received, actual costs incurred, and applicable interest earnings (on deposit balance) for each onboarding project. At the end of the onboarding project, the ISO will calculate the average interest earned on the deposit. The ISO will return any unused deposit remaining after onboarding, plus interest on the remaining deposit (based on the average interest rate earned), to the EDAM entity within ninety (90) calendar days after onboarding is completed and acknowledged by both the ISO and EDAM entity.

If either party or both parties terminate an implementation agreement after the prospective EDAM entity's onboarding has begun, the ISO will make every attempt to halt work and stop incurring costs on implementation as soon as practical. Any implementation-related costs the ISO incurs will be drawn against the deposit provided. The ISO will invoice the prospective EDAM entity for any amounts over the onboarding deposit. Invoices shall be due no later than thirty (30) days after the date of receipt. Any invoice payment past due will accrue interest, per annum, calculated in accordance with 5 C.F.R. 1315.10. The ISO will return any unused deposit to the EDAM entity within ninety (90) calendar days after the onboarding costs are reconciled.

This proposal is similar to the process the ISO implemented to evaluate material modification requests and other studies for generators interconnecting to the ISO controlled grid, and more recently for separating a WEIM sub-entity within a WEIM entity BAA. Following this existing process allows the ISO to account for its costs in performing onboarding activities accurately and efficiently.

b) Administrative Fees Framework

The ISO recovers its GMC revenue requirement through unbundled grid management charges and other fees that are developed using the most recent triennial cost of service results.⁹⁵ The cost of service study analyzes cost and time data provided through activity based costing to determine how much time and effort staff uses to support activities in the various cost categories and supplemental services. Through this process, the ISO aligns costs with services rendered and develops rates, like the EDAM administrative fees, that follow cost causation and other relevant ratemaking principles.

The EDAM administrative fees will consist of the existing market services charge and a new EDAM system operations charge, both volumetric charges. The market services charge represents fees for the real-time market and the day-ahead market services that EDAM offers, and applies to awarded MWh of energy and MW of capacity. The EDAM systems operations

⁹⁵ See the most recent triennial cost of service study, available on the ISO website. [Link](#)

charge will represent the fees for real-time dispatch services that EDAM offers, and it applies to metered flows in MWh of supply and demand. This is a similar assessment to the system operations charge. Assessing the EDAM systems operations charge in this manner is fair and reasonable because it represents the ISO's efforts to manage the day-ahead and real-time MWh. Once a WEIM entity begins participating in the EDAM, it will no longer pay WEIM administrative fees, only EDAM administrative fees.

The following steps provide interested parties a sense of what the pro-forma bundled EDAM administrative fees would be based:

- The annual GMC revenue requirement that assumes a certain number of eligible WEIM entities participate in the EDAM.
- A market services charge based on the following:
 - Calculate the market services portion of the annual GMC revenue requirement amount to collect based on the latest cost of service study results.
 - Divide the market services revenue requirement by the projected total day-ahead, 15-minute market, real-time dispatch, and instructed imbalance energy MWh volumes. Total volumes include the ISO and the WEIM entities expected to participate in EDAM.
- An EDAM system operations charge based on the following:
 - Calculate the EDAM system operations portion of the annual GMC revenue requirement amount to collect based on the latest cost of service study results.
 - Divide the EDAM system operations charge by the projected total generation, import, load, and export (gross meter) MWh volumes. Total volumes include the ISO and the WEIM entities expected to participate in EDAM.

Under this approach, all customers, including existing ISO customers, receiving market services will benefit from a lower market services rate once EDAM is operationally effective because the market service charge will be calculated using the incremental day-ahead MWh volumes from EDAM participants. Simply put, the more entities that participate in EDAM the more EDAM entities will benefit from lower rates.

III. Stakeholder Process and Board Approval

A. Stakeholder Engagement

1. Process to Date

Prior to launching the EDAM initiative and stakeholder process, the ISO published *the EDAM Common Design Principles and Concept* document,⁹⁶ which the ISO developed in collaboration with a subset of WEIM entities and California transmission owners. The document represented general, initial, design principles regarding several key EDAM design elements. These principles formed the basis for initial discussions and vetting through the stakeholder process. In November 2021, the ISO launched the EDAM stakeholder process with a workshop to re-introduce the region to the concept of an extended day-ahead market through discussion of the

⁹⁶ *Extended Day-Ahead Market (EDAM) Common Design Principles and Concepts*, October 18, 2021. [Link](#)

design principles, and to describe the stakeholder working group process that would further leverage stakeholder input and perspectives on key items.

On January 3, 2022 the ISO launched a rigorous stakeholder working group process focused on three key EDAM design areas: (1) supply commitment and resource sufficiency evaluation, (2) transmission commitment and congestion revenue allocation, and (3) GHG accounting and costs. Over an eleven week period, the three working groups met twice a week through an inclusive and transparent process to solicit stakeholder ideas and perspectives on the different design elements. For each working group, the ISO published a final summary report describing the different concepts, perspectives and ideas discussed.⁹⁷ The working group concepts and ideas helped inform and shape different elements of the straw proposal.

On April 28, the ISO published a comprehensive EDAM straw proposal describing a proposed market design framework, and provided an opportunity for stakeholders to submit written comments on the straw proposal. The ISO next held a series of collaborative workshops between July 11 and July 27 regarding various design elements described in the straw proposal, including the resource sufficiency evaluation, transmission availability in EDAM, confidence in transfers, and GHG accounting. Stakeholders' comments and the workshops informed development of this revised straw proposal.

2. Initiative Schedule

The following table describes the upcoming EDAM milestones and schedule.

Date	Milestone
Q2 2022	
April 28, 2022	Publication of straw proposal
May 25-26, 2022	Stakeholder meeting (in-person and virtual)
June 16, 2022	Comments due on straw proposal
July 11-27, 2022	Technical workshops
Q3 2022	
August 16, 2022	Publication of revised straw proposal
August 29, 2022	Stakeholder meeting (virtual)
September 7-8, 2022	Stakeholder meeting (in-person and virtual)
Week of September 12, 2022	Publication of draft tariff framework
September 20, 2022	Comments due on revised straw proposal
Q4 2022	
October 26, 2022	Publication of draft final proposal

⁹⁷ The final summary reports for each working group can be found on the EDAM initiative webpage by selecting the relevant working group. [Link](#)

November 2-3, 2022	Stakeholder meeting
November 7, 2022	Publication of draft tariff language
November 18, 2022	Comments due on draft final proposal
November 28, 2022	Comments due on draft tariff language
December 7, 2022	Publication of final proposal
December 14, 2022	Joint ISO Board of Governors and WEIM Governing Body meeting
Q2 2023	FERC filing
Q4 2023	Implementation
2024	EDAM go-live

Table 13: EDAM milestones schedule.

B. Decisional Classification for WEIM Governing Body

This initiative proposes a design for a day-ahead market that extends beyond the ISO footprint, and across participating WEIM BAAs. The currently effective delegation of authority does not provide the WEIM Governing Body with a decisional role for proposed changes to the day-ahead market. This initiative also proposes certain changes to real-time market rules, which would fall within the joint authority or advisory role of the WEIM Governing Body, however, these changes are only a part of the overall EDAM initiative.

This initiative involves creation of a new market paradigm, a unique situation that the decisional classification rules were not designed to address. The Board has thus considered whether to adjust the decisional classification for this initiative to enhance the WEIM Governing Body's role. Specifically, during its May 11, 2022 meeting, the Board of Governors proposed that the entire EDAM initiative fall under the joint authority of the WEIM Governing Body and the Board. The ISO seeks stakeholder comment on the proposed decisional classification.

APPENDIX

IV. Appendix 1: EDAM RSE Application formulation

I	Resource index	LEL/UEL	Lower/Upper economic limit
T	Time period index (0 for initial condition)	LOL/UOL	Lower/Upper operating/regulating limit
EN	Energy schedule	RRU/RRD	60min ramp rate up/down capability
IRU/IRD	Imbalance Reserve Up/Down award	E	Daily energy limit
RU/RD	Regulation Up/Down award	SOC	State of charge
CR	Contingency Reserve award	η	Charging efficiency
$ENP/IRUP/IRD$	Energy & imbalance reserve up/down bid price	$\bar{\quad}, \underline{\quad}$	Denotes upper/lower limit
$RUP/RDP/CRP$	Regulation up/down & contingency reserve bid price	$(+), (-)$	Denotes discharging/charging schedule
D	Demand forecast*	v, w	Upward/downward capability shortfall
$IRUR/IRDR$	Imbalance reserve up/down requirement*	u	Discharge binary variable
$RUR/RDR/CRR$	Regulation up/down & contingency reserve requirement*	α, β, δ	Shared ramp capability constraint coefficients
*adjusted for bucket-1 energy/imbalance reserve/regulation/contingency reserve transfers			

Table 14: Notation for EDAM RSE application

Power balance requirements: $\sum_i EN_{i,t} + v_t - w_t = D_t, \forall t$

Imbalance reserve requirements: $\{\sum_i IRU_{i,t} \geq IRUR_t, \sum_i IRD_{i,t} \geq IRDR_t\}, \forall t$

Ancillary Services requirements: $\{\sum_i RU_{i,t} \geq RUR_t, \sum_i RD_{i,t} \geq RDR_t, \sum_i CR_{i,t} \geq CRR_t\}, \forall t$

Capacity Constraints:

$$\begin{aligned}
 EN_{i,t} + IRU_{i,t} &\leq UEL_{i,t} \\
 EN_{i,t} - IRD_{i,t} &\geq LEL_{i,t} \\
 EN_{i,t} + IRU_{i,t} + CR_{i,t} + RU_{i,t} &\leq UOL_{i,t} \\
 EN_{i,t} - IRD_{i,t} - RD_{i,t} &\geq LOL_{i,t}
 \end{aligned}$$

$$\text{Ramping Capability Constraints: } \left. \begin{aligned} EN_{i,t} - EN_{i,t-1} &\leq RRU_i(EN_{i,t-1}) - \\ &\quad \alpha RU_{i,t} - \beta CR_{i,t} - 4 \delta IRU_{i,t} \\ EN_{i,t} - EN_{i,t-1} &\geq -RRD_i(EN_{i,t-1}) + \\ &\quad \alpha RD_{i,t} + 4 \delta IRD_{i,t} \end{aligned} \right\}$$

$$\text{Energy Constraints: } \underline{E}_i \leq \sum_t EN_{i,t} \leq \overline{E}_i, \forall i$$

$$\underline{SOC}_i \leq EN_{i,t} \leq \overline{SOC}_i, \forall i, t$$

$$\text{Energy Storage Model: } SOC_{i,t} = SOC_{i,t-1} - (EN_{i,t}^{(+)} + \eta_i EN_{i,t}^{(-)})$$

$$EN_{i,t} = EN_{i,t}^{(+)} + EN_{i,t}^{(-)}$$

$$0 \leq EN_{i,t}^{(+)} \leq u_{i,t} UEL_{i,t}$$

$$(1 - u_{i,t}) LEL_{i,t} \leq EN_{i,t}^{(-)} \leq 0$$

V. Appendix 2: EDAM TRR recovery data

This appendix shares additional illustrations of the BAA-specific rate for recovery of the forecasted TRR shortfall if allocated to gross load in the footprint or demand plus supply as discussed in section II(B)(1)(c). The BAA specific rate is derived by excluding both the forecasted TRR shortfall and the denominator (gross load or demand plus supply).

Method 1 - Gross Load Allocation, BAA-specific scenarios

Medium-end forecasted TRR shortfall scenario

BAA	TRR shortfall (\$ in Millions)	Gross Load (MWh in Millions)
BAA1	\$12	211
BAA 2	\$4	18
BAA 3	\$6	39
BAA 4	\$8	70
Total	\$30	338

BAA	TRR shortfall Allocation (\$ in Millions)					BAA Specific Rate ⁹⁸
	BAA1	BAA 2	BAA3	BAA 4	Total	
BAA 1	\$0.0	\$2.6	\$4.2	\$6.3	\$13.2	\$0.06 per MWh
BAA 2	\$1.7	\$0.0	\$0.4	\$0.5	\$2.6	\$0.14 per MWh
BAA 3	\$3.7	\$0.5	\$0.0	\$1.2	\$5.3	\$0.14 per MWh
BAA 4	\$6.6	\$0.9	\$1.4	\$0.0	\$8.9	\$0.13 per MWh
Total	\$12.0	\$4.0	\$6.0	\$8.0	\$30.0	

Table 15: deriving a BAA-specific rate based on a gross load allocation.

High-end forecasted TRR shortfall scenario

BAA	TRR shortfall (\$ in Millions)	Gross Load (MWh in Millions)
BAA1	\$20	211
BAA 2	\$10	18
BAA 3	\$12	39
BAA 4	\$16	70
Total	\$58	338

⁹⁸ Calculated as sum of BAA TRR shortfall allocation from other BAAs TRR shortfalls divided by the gross load the individual entity when identifying the specific rate applicable to that BAA gross load. For example, in calculating the BAA specific rate for BAA 1, consideration is only given to the costs of BAAs 2, 3, and 4 divided by the proportion of BAA 1 gross load to the gross load of those three BAAs.

BAA	TRR shortfall Allocation (\$ in Millions)					BAA Specific Rate ⁹⁹
	BAA1	BAA 2	BAA3	BAA 4	Total	
BAA 1	\$0.0	\$6.6	\$8.5	\$12.6	\$27.7	\$0.13 per MWh
BAA 2	\$2.8	\$0.0	\$0.7	\$1.1	\$4.6	\$0.26 per MWh
BAA 3	\$6.1	\$1.2	\$0.0	\$2.3	\$9.7	\$0.25 per MWh
BAA 4	\$11.0	\$2.2	\$2.8	\$0.0	\$16.0	\$0.23 per MWh
Total	\$20.0	\$10.0	\$12.0	\$16.0	\$58.0	

Table 16: deriving a BAA-specific rate based on a gross load allocation.

Method - Total Demand plus Supply, BAA-specific scenarios

Medium-end forecasted TRR shortfall scenario

BAA	TRR shortfall (\$ in Millions)	Gross Demand and Supply (MWh in Millions)
BAA1	\$12	460
BAA 2	\$4	35
BAA 3	\$6	82
BAA 4	\$8	177
Total	\$30	754

BAA	TRR shortfall Allocation (\$ in Millions)					BAA Specific Rate ¹⁰⁰
	BAA1	BAA 2	BAA3	BAA 4	Total	
BAA 1	\$0.0	\$2.6	\$4.1	\$6.4	\$13.0	\$0.03 per MWh
BAA 2	\$1.4	\$0.0	\$0.3	\$0.5	\$2.2	\$0.06 per MWh
BAA 3	\$3.3	\$0.5	\$0.0	\$1.1	\$4.9	\$0.06 per MWh
BAA 4	\$7.2	\$1.0	\$1.6	\$0.0	\$9.8	\$0.06 per MWh
Total	\$12.0	\$4.0	\$6.0	\$8.0	\$30.0	

Table 17: deriving a BAA specific rate based on a demand + supply allocation.

⁹⁹ Calculated as sum of BAA TRR shortfall allocation from other BAAs TRR shortfalls divided by the gross load the individual entity when identifying the specific rate applicable to that BAA gross load. For example, in calculating the BAA specific rate for BAA 1, consideration is only given to the costs of BAAs 2, 3, and 4 divided by the proportion of BAA 1 gross load to the gross load of those three BAAs.

¹⁰⁰ Calculated as sum of BAA TRR shortfall allocation from other BAAs TRR shortfalls divided by the gross load the individual entity when identifying the specific rate applicable to that BAA gross load. For example, in calculating the BAA specific rate for BAA 1, consideration is only given to the costs of BAAs 2, 3, and 4 divided by the proportion of BAA 1 gross load to the gross load of those three BAAs.

High-end forecasted TRR shortfall scenario

BAA	TRR shortfall (\$ in Millions)	Gross Demand and Supply (MWh in Millions)
BAA1	\$20	460
BAA 2	\$10	35
BAA 3	\$12	82
BAA 4	\$16	177
Total	\$58	754

BAA	TRR shortfall Allocation (\$ in Millions)					BAA Specific Rate ¹⁰¹
	BAA1	BAA 2	BAA3	BAA 4	Total	
BAA 1	\$0.0	\$6.4	\$8.2	\$12.8	\$27.4	\$0.06 per MWh
BAA 2	\$2.4	\$0.0	\$0.6	\$1.0	\$4.0	\$0.11 per MWh
BAA 3	\$5.6	\$1.1	\$0.0	\$2.3	\$9.0	\$0.11 per MWh
BAA 4	\$12.0	\$2.5	\$3.2	\$0.0	\$17.7	\$0.10 per MWh
Total	\$20.0	\$10.0	\$12.0	\$16.0	\$58.0	

Table 18: deriving a BAA specific rate based on a demand + supply allocation.

¹⁰¹ Calculated as sum of BAA TRR shortfall allocation from other BAAs TRR shortfalls divided by the gross load the individual entity when identifying the specific rate applicable to that BAA gross load. For example, in calculating the BAA specific rate for BAA 1, consideration is only given to the costs of BAAs 2, 3, and 4 divided by the proportion of BAA 1 gross load to the gross load of those three BAAs.

VI. Appendix 3: Formulation of EDAM Power Balance Constraint (Confidence in Transfers)

Mathematical Formulation

BAA Power balance constraint:

$$\sum_{i \in BAA_j} G_j - D_j - T_j + s_j^{(+)} - s_j^{(-)} = 0$$

BAA infeasibility constraint:

$$s_j^{(+)} (T_j - \bar{T}_j) \leq 0$$

$$s_j^{(-)} (T_j - \bar{T}_j) \geq 0$$

Notation

i	node index
j	BAA index
G	supply
D	demand
T	net transfer
\bar{T}	base net transfer (EDAM transfers)
$s^{(+)}$	under-generation surplus
$s^{(-)}$	over-generation surplus

- T represents the net EDAM transfers into and out of a BAA
- $T = (T_j - \bar{T}_j)$
 - The penalty price associated $s_j^{(+)}$ will control the net transfer T_j
- This ensures the base transfers can't be relaxed as a means to achieve power balance if it means the under-generation slack variable takes a positive value