California ISO

EDAM
EXTENDED DAY-AHEAD MARKET

FINAL PROPOSAL

December 7, 2022

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I. Introduction & Executive Summary

A. Introduction

This final proposal for the Extended Day-Ahead Market (EDAM) initiative reflects significant stakeholder input and design changes across the initial April 28, 2022 straw proposal, the August 16, 2022 revised straw proposal, and the October 31, 2022 draft final proposal. The proposed 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 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 $2.9 billion in benefits to its participants.[1] In 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 more extensive 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 California.

The EDAM design will also support the rapidly evolving Western resource adequacy landscape. Recognizing there are differences in how the various programs ensure resource adequacy within their jurisdictions, EDAM is designed to 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.

The final proposal is a result of continued extensive, open and collaborative stakeholder engagement, including more than 500 pages of stakeholder comments on each of the proposal iterations and stakeholder discussions during the numerous stakeholders meetings this year. The EDAM design, represented in this final proposal, will be presented to the ISO Board of Governors and the WEIM Governing Body for decision during the joint session meeting on February 1st, 2022. The ISO will continue to actively engage stakeholders during the tariff development process, which is the next stage of the stakeholder process in preparation for a filing of the EDAM design with the Federal Energy Regulatory Commission (FERC).

B. Design Changes from the Draft Final Proposal

In this final proposal, the ISO has endeavored to synthesize the valuable significant stakeholder input and build upon the initial EDAM design reflected in the prior iterations of the proposal by providing incremental enhancements and additional details, descriptions, and examples regarding the various EDAM design elements. Several design changes from the October 31, 2022 draft final proposal are summarized as follows:

[1] *Western Energy Imbalance Market Benefits Report Third Quarter 2022*, October 31, 2022. Link

- ***EDAM Participation Model –*** The final proposal clarifies, in response to stakeholder comments, the transmission requirement for resource participation in the market. In particular, the final proposal clarifies that a resource must be a designated network resource under the terms of the Open Access Transmission Tariff (OATT), have reserved firm point-to-point transmission (of any duration), or have a legacy transmission contract. If transmission has not been reserved, the resource would nevertheless be able to participate in the market and the EDAM entity transmission provider would assess a charge for using transmission based on the rate for the lowest duration of firm point to point transmission service established by the OATT.

- ***Transmission Availability in EDAM –*** The final proposal introduces two enhancement to the transmission availability design. First, it enables eligibility for historical revenue recovery associated with historical sales of monthly firm and non-firm point, in addition to the already eligible weekly, daily and hourly transmission products. Second, it clarifies the treatment of, and the ability to exercise, transmission rights between an EDAM balancing area and a non-EDAM balancing area to support continued service to load and meeting obligations under existing or emerging programs around the West.

- ***EDAM Resource Sufficiency Evaluation (RSE) –*** The final proposal provides enhancements and clarifications to select elements of the design. The proposal clarifies the provisions regarding demand response participation to ensure demand response participation is accurately captured and tracked. The proposal provides additional detail on how generation–only balancing areas will be treated in the EDAM resource sufficiency evaluation. The proposal also retains the consequence design for failing the resource sufficiency evaluation, but provides clarifications in response to stakeholder comments on the surcharge application the proposed cost and revenue allocations associated with the accrual and distribution of the surcharges for failing the resource sufficiency evaluation.

- ***Convergence Bidding –*** The final proposal modifies the design by allowing an EDAM entity to elect whether to enable convergence bidding within their balancing area at the onset of participation without a mandatory transition to convergence bidding after one year of participation. The ISO will further evaluate and derive a more permanent EDAM convergence bidding policy leading up to the two year anniversary of EDAM operation. The stakeholder process will permit for consideration of EDAM operational experience and EDAM entity readiness in deriving the convergence bidding policy design.

- ***Greenhouse Gas (GHG) Accounting and Reporting*** – The final proposal includes three changes from the draft final proposal. First, it clarifies and updates the counterfactual that would roll over from EDAM to the WEIM as the difference between the day-ahead energy award and the day-ahead GHG award to align with the approach taken in the WEIM. Second, the final proposal clarifies three aspects of the GHG net export constraint which was developed to limit secondary dispatch: the proposal retains the optionality to have the constraint as a static or dynamic constraint and to the extent implementation requires a static constraint, it will be based on the optimal net transfer of the previous market run; the constraint will be turned off for all non-GHG regulation area BAAs for any hours a BAA that overlaps with a GHG regulation area fails the RSE; and it

identifies exceptions for resource adequacy capacity. Third, the final proposal explains that the GHG settlement value will be represented as a positive value. This last clarification is necessary when there are multiple GHG regulation areas, but it does not change the settlement payment to resources that receive an attribution to serve demand in a GHG regulation area.

C. Executive Summary

A day-ahead market can deliver significant economic, reliability, and environmental benefits to balancing authority areas in the West. The EDAM design described in this draft final proposal provides for efficient integration and optimized commitment of diverse resources and transmission capability to serve load reliably and economically across a wide Western footprint.

The day-ahead market will optimally commit diverse supply and enable energy transfers between EDAM balancing areas to serve load throughout the EDAM footprint, producing reliability and economic benefits for the participating entities and their customers. The day-ahead market will also efficiently procure supply – imbalance reserves – to meet the uncertainty requirements for the broad footprint associated with changes in conditions between day ahead and real time. In the real-time market, the day ahead resource commitment and energy transfers are re-optimized, if necessary, to reflect the expected conditions on the grid. In stressed system conditions, the real-time market will seek to resolve these conditions through re-dispatch of the broad pool of supply and deployment of imbalance reserves, along with other mechanisms, to help maintain grid reliability in an individual EDAM balancing area and the broader footprint.

Underlying the EDAM design is a voluntary participation framework, with ease of entry and exit whereby WEIM entities can extend their market participation to the EDAM. Further, the EDAM structure maintains an equitable rate design framework for EDAM onboarding and participation fees, resulting in fair and reasonable rates for market participants.

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

This final proposal is divided 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 at 10:00 a.m., an EDAM entity will identify the amount of transmission available to the market and organize its supply portfolio to meet its expected system needs.

Transmission Availability: Transmission availability to the EDAM is essential to support energy transfers across interties between participating balancing areas and to realize the full benefits of the market. The EDAM transmission availability design seeks to maximize the amount of transmission available, supporting robust transfers between participating balancing areas while respecting existing transmission rights and providing different pathways for making transmission available to EDAM. The design also provides the opportunity for transmission customers to exercise and indicate a later expected use of these transmission rights to support

wheeling through or exporting from an EDAM balancing area to a non-EDAM balancing area to meet their obligations. First, transmission customers and transmission providers will make available to the market high-quality transmission - firm and conditional firm point to point and network integration transmission service - to enable transfers of optimally committed supply between participating balancing areas. Transmission rights associated with delivering supply to meet the resource sufficiency evaluation across interties between participating balancing areas, *i.e.*, bucket one transmission, are made available to the market and may accrue transfer revenue that is allocated to the EDAM entity. Second, transmission rights held by transmission customers that are not used to support delivery of supply meeting the resource sufficiency evaluation can also be made available to the EDAM *i.e.*, bucket two transmission. This approach is comparable to a transmission customer's use of transmission customer held rights under the OATT. Transmission customers have the option to (1) utilize their transmission rights ahead of the day-ahead market (10:00 a.m. day ahead), (2) voluntarily release the transmission rights to the EDAM to optimize transfers, and in return receive a direct settlement from the ISO for any accrued transfer revenues associated with the released transmission, or (3) leave their transmission rights unscheduled by 10:00 a.m., in which case the market will utilize them to optimize transfers and transmission customers can seek to exercise them after the scheduling deadline consistent with their ability to do so under the OATT. Third, transmission providers also make available to the market unsold firm transmission capacity to support transfers, *i.e.*, bucket three transmission. Finally, the proposal provides a framework to enable transmission providers to recover historical transmission revenues to account for, in part, potential reduced sales of certain transmission products. Transmission revenues recoverable through the EDAM would include (1) historical revenues associated with sales of non-firm and short-term firm point-to-point transmission services (wheeling access charge revenues for the ISO), (2) revenues attributable to similar transmission services on new-build transmission facilities that increase transfer capability between EDAM balancing areas, and (3) revenues associated with transfers wheeling through an EDAM entity's transmission system in excess of its EDAM imports and exports.

Day-Ahead Resource Sufficiency Evaluation (RSE): Leading up to the day-ahead market, each EDAM entity, including the ISO, must have sufficient supply and reserves to meet forecasted demand and uncertainty that may materialize between the day ahead and real time. Supply procured under different resource adequacy and resource planning programs will be tested under a common day ahead sufficiency evaluation, ensuring equitable participation in the optimized resource commitment. The resource sufficiency evaluation design allows EDAM balancing areas to test resource sufficiency on an advisory basis before the day-ahead market run and to cure any deficiencies before the day-ahead market run at 10:00 a.m. Furthermore, the design allows delivered firm energy contracts, which are prevalent across the West and have been historically reliable, to count toward meeting the resource sufficiency evaluation. Entities failing to meet the evaluation requirements are subject to a consequence framework that incentivizes forward procurement to meet the daily resource sufficiency evaluation. The final proposal modifies the resource sufficiency evaluation failure consequence framework to provide for a tiered consequence structure. Smaller failures within the first tolerance band do not constitute a resource sufficiency evaluation failure, but failures above the tolerance band are subject to scaled financial administrative surcharges for two additional bands. The proposed administrative surcharge is based on a 16-hour energy block product and accounts for both the severity of resource insufficiency and the potential for repeated failures of a participating balancing area to enter into the EDAM sufficiently resourced. Balancing areas that pass the EDAM resource sufficiency evaluation will be tested for the WEIM resource sufficiency

evaluation together as a pool, rather than individually, which enables the diversity benefit of imbalance reserve procurement and decreases the overall WEIM resource sufficiency obligation for the pooled entities.

2. Day-Ahead Market Processes and Features

The day-ahead market processes and inputs enable the efficient commitment of resources across the EDAM footprint, identifying energy transfers that are supported by high-quality transmission made available to the market.

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 commitment schedules and market transfers. The RUC process runs after the IFM and procures 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, and the proposal retains them as part of the EDAM market design. The proposal continues to require all energy offered into the day-ahead market, including energy offered in excess of resource sufficiency evaluation needs, 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. The 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*[2] initiative, which the ISO is conducting in parallel with development of the EDAM. Enhancements adopted in that initiative will also inform the evolution of the EDAM market power mitigation structure.

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. The proposal has evolved to provide each EDAM entity with the option, at the onset of their participation in EDAM, to elect whether to implement convergence bidding within their balancing area. To the extent an EDAM entity elects not to implement convergence bidding, there is not an explicit transition period that would require convergence bidding implementation by a particular date. Providing the EDAM entities with the option to elect whether or not implement convergence bidding allows entities to gain market experience before introducing convergence bidding. However, leading up to the two-year anniversary of EDAM operations, the ISO will launch an initiative to more holistically evaluate the convergence bidding policy design in the EDAM informed by the market experience, readiness of entities to introduce convergence bidding and other factors identified through the process. Convergence bidding will continue to be supported in the ISO balancing area. The ISO will monitor the market's performance and evaluate any unintended adverse consequences, and it will stand ready to engage with stakeholders to adjust this framework as necessary.

[2] *Price Formation Enhancements Initiative* web page - Link.

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 participating and non-participating balancing areas. This final 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 an EDAM entity (or a load serving entity located within the balancing area) can continue to be self-scheduled at the EDAM footprint boundary interties. The final proposal permits off-system network resources designated under an EDAM entity's OATT to economically bid at the EDAM entity's interties. The designation of a source specific network resource under the OATT, that is modeled in the ISO master file, ensures deliverability. The framework does not permit non-specific source supply to submit economic intertie bids. The proposal continues to provide for full intertie bidding – from both source-specific and non-source specific supply – at the interties between the ISO balancing area and other balancing areas not participating in EDAM. This 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. As EDAM entities gain experience with and confidence in the market, the ISO and stakeholders can consider expansion of the external resource participation design.

Greenhouse Gas (GHG) Accounting and Reporting: The EDAM design will account for the costs and reporting requirements arising from state GHG accounting and regulation policies. The final proposal extends the WEIM GHG accounting framework – the resource specific approach – to the EDAM with enhancements that seek to balance market efficiency, with the goal of limiting secondary dispatch. This design uses resource-specific GHG bid adders that reflect both the cost of compliance and the willingness of resources to be dispatched and serve demand in a GHG regulation area. This is a reasonable, known, and currently functioning GHG accounting framework that can support an initial GHG accounting design for the launch of EDAM. The final proposal also provides additional details and analysis on various components of the GHG design, including updating the approach for the counterfactual from EDAM to the WEIM to align with the WEIM, clarifying aspects of the net export constraint, and explaining that the settlement value for GHG will be a positive value. The ISO commits to evaluate GHG design after the first year of EDAM implementation and work collaboratively with regulatory agencies to align market design with applicable regulations. If necessary, the ISO will work with stakeholders and regulatory agencies to consider design improvements and regulatory changes, including considering different design approaches identified and considered in the EDAM stakeholder process.

3. Post-Day-Ahead Market Outputs

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

Transfer Revenue and Congestion Revenue Allocation: As transmission is made available to the EDAM to support energy transfers across interties between EDAM balancing areas, transfer revenue may accrue to the extent the transmission scheduling limit is reached at the intertie between EDAM balancing areas, *i.e.,* binds in the market. Transfer revenue represents the separation in the marginal energy costs between two participating balancing areas when the scheduling limit is reached. The proposed design continues to reflect 50:50

sharing of transfer revenues accruing at the interfaces between participating balancing areas, including the ISO. Congestion revenue accrues when internal transmission path constraints or limits are reached, creating a separation in the marginal congestion component of the locational marginal price (LMP). Internal transmission constraints are modeled in the market and vary across the system; with some constraints becoming binding based on import flows across different interties. The proposal continues to allocate congestion revenue that accrues when internal transmission system constraints bind, including modeled intertie constraints, solely to the participating balancing areas where the constraint originated. This balancing area is ultimately responsible for responding to and resolving the constraint and should be allocated the associated revenue to offset the associated costs. In WEIM there is limited modeling of constraints in the market because entities seek to resolve them outside of the market. However, in the EDAM entities will want to ensure all constraints are visible to and respected by the market because all load and resources are participating in the market, and accrued congestion revenues will be allocated fully to the EDAM entity where the constraint binds.

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 balancing areas and market participants. This final proposal describes the settlement implications of various EDAM design components including the resource sufficiency evaluation failure consequences, settlement of EDAM transmission congestion revenues, and transfer revenue distribution details.

D. EDAM Benefits

The economic benefits of a day-ahead market across the Western Interconnection are estimated to range between $119 million and $1.2 billion annually, in addition to those seen in the WEIM.[3] An EDAM will provide additional opportunities to build upon the financial, environmental, and reliability benefits of the WEIM through increased coordination and collaboration across the footprint.

Through the optimized commitment of diverse supply through the day-ahead market, along with the associated optimization of transmission across balancing areas, 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 and transparent resource sufficiency evaluation and an imbalance reserve product that accounts for a level of uncertainty that may materialize between the day-ahead and real-time, allowing the market to effectively respond in stressed system conditions. The EDAM also provides environmental benefits by better optimizing and reducing curtailment of renewable generation. Working in unison, these features afford market flexibility to re-optimize the resource fleet to respond to changes in system conditions and limit the instances of stressed conditions elevating to emergency status.

[3] *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 (2021),* conducted by Energy Strategies LLC. Link; *CAISO EDAM Benefits Study: Estimating Savings for California and the West Under EDAM Market Scenarios (2022)*, conducted by Energy Strategies LLC. Link; This most recent Energy Strategies LLC study quantified capacity savings of $652 million annually in addition to operational savings of $543 million. The EIM Entities study (2019) quantified operational savings but did not attempt to quantify capacity savings.

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 between them to ensure a holistic and consistent market design.

Day-Ahead Market Enhancements (DAME) Initiative:[4] 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 overall daily sufficiency requirement. 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:[5] This initiative evaluates the design for a process to establish wheeling through scheduling priorities 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 one transmission to the EDAM in most instances. Establishing a wheeling-through scheduling priority may not be required in all instances, particularly if it is associated with a delivered firm energy product where title to the energy is taken at the sink EDAM BAA intertie.

WEIM Resource Sufficiency Evaluation Enhancements:[6] This initiative evaluates enhancements to improve the accuracy of the WEIM resource sufficiency evaluation. The EDAM design must consider the interplay between the pooled WEIM RSE and the allocation of the uncertainty diversity benefit and to ensure proper incentives remain across the day-ahead and real-time markets to ensure EDAM entities provide sufficient resources. This initiative considers modifications to the consequences for failing the WEIM RSE, including financial consequences to cure undersupply conditions. The different EDAM and WEIM design elements should complement each other to send the appropriate signals and incentives.

Price Formation Enhancements:[7] 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, changes made in that initiative would thus affect the day-ahead market, including the EDAM. The initiative also considers scarcity pricing enhancements and fast-start pricing policies that, if adopted, could apply in the day-ahead market across the EDAM footprint.

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[4] *Day-Ahead Market Enhancement (DAME) Initiative*, web page - Link.
[5] *Transmission Service and Market Scheduling Priorities Phase 2 Initiative,* web page - Link.
[6] *WEIM Resource Sufficiency Evaluation Enhancements,* web page - Link.
[7] *Price Formation Enhancements Initiative,* web page - Link.

F. Interoperability between EDAM and Western Resource Adequacy Program (WRAP)

Interoperability between the EDAM and the WRAP and the need for continued coordination between the two programs is important given that entities may participate in both programs. The WRAP implements (1) a forward resource adequacy showing framework where entities demonstrate their ability to meet seasonal reliability metrics on a monthly basis, and (2) an operational program where participants with surplus capacity can be obligated to assist participants that may be deficient in the operational timeframe. WRAP's value proposition relies on participants having access to their demonstrated (forward contracted and owned) resources and confidence in the sharing of resources within the WRAP footprint to safely lower the regional planning reserve margin. The EDAM provides a market platform for optimizing commitment and dispatch of resources across the EDAM footprint to serve load efficiently and economically. As WEIM has demonstrated, resource adequacy and resource planning programs can integrate with organized markets to provide robust benefits.

Entities that participate in both the WRAP and the EDAM will ultimately be responsible for managing their participation in each; however, harmonizing both designs on an ongoing basis to ensure the success of both programs in providing the intended value proposition is important. Based on preliminary review of program timelines and technical implementation, there appear to be pathways to ensuring interoperability. The WRAP requires that entities procure or build adequate firm resources and transmission from a long-term resource planning and adequacy perspective to meet their expected needs during the summer and the winter months. In the day ahead timeframe, prior to 10:00 a.m., WRAP participants will know whether they have a "hold back" obligation as a surplus entity or whether they are deficit relative to the assumptions in the forward procurement window and can access firm supply from other WRAP members. The EDAM's resource sufficiency evaluation ensures that entities in different RA programs (or no centralized RA program) all bring adequate resources in the market such that they can rely on the day ahead energy transfers. A participating WRAP member, who is also an EDAM participant, can offer the same supply it relied on to meet its WRAP showing obligations to demonstrate its day-ahead resource sufficiency, including any supply it may have secured through the operational program.

As both EDAM and WRAP evolve, continued coordination is necessary to ensure the two programs complement each other and are interoperable when implemented. This will maximize the value the programs provide for their participants. The ISO is committed to continued engagement with EDAM participants and WRAP representatives to test aspects of the design, conduct scenario analyses, and identify and implement any potential design enhancements that are necessary to ensure continued interoperability. The EDAM will strive to ensure interoperability between the programs through both its initial design and future evolution.

II. EDAM Market Structure

A. Threshold Issues

1. Voluntary Participation Model

Defining a comprehensive participation model is an important element of the EDAM design. The draft final 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. This participation model design is consistent with the WEIM and allows for coordinated participation in and exit from both markets. The draft final proposal also introduced several transitional measures, largely consistent with the transitional measures present in the WEIM and the ISO tariff that would be extended under the EDAM. These transitional protection measures limit and mitigate adverse reliability and market outcomes resulting from EDAM participation, particularly during initial stages of market implementation and the onboarding of individual EDAM entities.

Stakeholders continued to express 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. Stakeholders also appreciated the additional clarifications in the draft final proposal regarding roles and responsibilities of the market operator and EDAM entity regarding the transitional measures. The final proposal retains the voluntary participation design and the proposed transitional measures.

a) Voluntary Participation Model and Transitional Measures

Stakeholders continued to broadly support the concept of voluntary participation in the EDAM, namely, that a WEIM entity can elect to participate in the EDAM or continue to participate only in the WEIM. Stakeholders also continued to express support for ease of exit through a six-month notice period to cease participation in the EDAM with no exit fees.

The final proposal retains the proposed framework from prior proposals 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 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.[8] 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

[8] 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.

because they are already in place given an entity's WEIM participation.[9] Section II.E describes the onboarding commitment and the associated fee.

The final 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.[10] 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.[11]

b) Transitional Protective Measures

The draft final proposal described transitional measures intended to protect EDAM entities from adverse reliability or market outcomes. Stakeholders commenting on the transitional measures continued to generally expressed support for extending the WEIM transitional measures to the EDAM particularly for existing WEIM entities that currently benefit from these measures.

Below, the final proposal describes both the WEIM transitional measures that apply during the onboarding period and more WEIM permanent measures that provide safeguards to market participation. These measures will similarly protect individual EDAM entities, including the ISO, to the extent there are adverse reliability or market outcomes in a particular BAA or in the broader EDAM footprint.

Implementation Date Change: Prior to implementation, each entity joining the EDAM can request a change in its implementation date if it determines it cannot proceed on that date.[12] Over the years, WEIM entities have exercised their right to change their implementation date during WEIM implementation due to lack of readiness or other factors. This measure recognizes the importance of readiness to participate in the market. The proposal is to extend this WEIM 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.[13]

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.[14] Although the ISO, as market operator, institutes the suspension, the ISO will coordinate the temporary suspension with the WEIM entity and grant deference to the WEIM entity. Typically this would occur in response to an unexpected market

[9] ISO Tariff, section 29.2(b)(3). An example would include the network model related tasks.
[10] ISO Tariff, section 29.4(b)(4).
[11] An entity choosing to exit the EDAM 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.
[12] ISO Tariff section 29.2(b)(6)(B).
[13] 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.
[14] ISO Tariff section 29.1(d); BPM for the Western Energy Imbalance Market, sections 11.4 and 11.5.

or system operational issue arising at the onset of the WEIM entity's participation. This transitional protective measure will be critical during the early EDAM onboarding period to ensure that from a market, systems, and operational perspective the onboarding does not cause 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.

Transitional pricing measures: 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.[15] 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 transitional pricing period can be extended beyond six-months, but an extension requires FERC approval.

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.[16] 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.

Based on stakeholder requests in prior iterations of the proposal, the ISO will also extend the timeline for price correction timeline, based on the last economic bid, from three to six months to mitigate unintended consequences from merging the flow based and market scheduling paradigms. This proposal also protects against unintended consequences and potential modeling inaccuracies when an entity joins the EDAM.

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 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.[17] In these instances, although the ISO makes the ultimate decision, the ISO will coordinate closely with the WEIM entity regarding the need for interrupting WEIM entity participation in the real-time market and will grant deference to the WEIM entity. For example, in limited circumstances the ISO has interrupted WEIM entity participation due to transmission outages that electrically separated two participating WEIM BAAs. 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.

[15] ISO Tariff, section 29.27.
[16] ISO Tariff, section 29.35.
[17] ISO Tariff, section 29.7(j).

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

The draft final proposal continued to describe the resource participation model in the EDAM and compared it to the resource participation model in the WEIM. The proposal explained that in the EDAM all resources within the EDAM BAA, including pseudo-tied resources, are expected to participate in the market and be settled through the market. More specifically, if resources plan on being operational, they must submit a self-schedule or an economic bid into the market to provide visibility of all grid injections across the footprint. The revised and draft final proposals also described how entities can manage their market participation through self-scheduling and exercising their transmission rights in a manner that allows them to transact service similar to base scheduling in the WEIM (while being subject to full settlement through the market).

Additionally, the draft final proposal introduced a requirement that resources within an EDAM balancing area be associated with a transmission reservation, whether transmission is reserved by the load serving entity when designating the generation as a network resource under the OATT, or the transmission the resource reserves as point to point transmission service on the host balancing area's system. This addition was introduced in response to stakeholder comments and concerns that resources, particularly newly interconnected resources, potentially could avoid paying the costs of the transmission system if they participate in the market without a transmission reservation. Participation without a reservation would shift costs to other transmission customers paying for the transmission system and cause transmission planning and other challenges.

Stakeholders commenting on this aspect of the proposal generally appreciated the clarification regarding the treatment of resources participating in the market, although some sought clarification regarding existing contractual relationships to minimize the need to potentially modify the arrangements in support of market participation. The final proposal clarifies why contractual modifications may not be necessary. Separately, stakeholders largely supported introducing a transmission requirement, although many sought clarification of, or changes, to

the requirement recognizing the limited availability of firm transmission. They suggested lowering the barriers to resource participation by finding ways of ensuring there is contribution to the cost of the system and allowing shorter term transmission to support the requirement. These stakeholders suggested allowing the transmission provider to impose a charge for transmission if the resource has otherwise not reserved transmission service. During the November 14th EDAM stakeholder meeting, the ISO introduced modifications to this transmission requirement design, and stakeholder comments supported the overall direction of that design.

The final proposal discusses below the design clarifications and enhancements in response to stakeholder comments.

(1) Resource Participation Structure

In the WEIM, resources within the BAA can elect to be participating or non-participating.[18] A WEIM participating resource executes a participating resource agreement, which ensures 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 coordinator who represents it in the market. The resource's operating characteristics are known because they are registered and modeled in the market, and the optimization can thus 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 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 represents non-participating resources and, working in coordination with the appropriate parties, submits a base schedule[19] for the non-participating resource so the real-time market can account for the resource in various aspects of WEIM operation, including the market optimization and dispatch and consideration of 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.

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 occurs in the WEIM today, and all resources will be settled through the market. This means non-participating resources currently represented by a WEIM entity scheduling coordinator can either establish a direct scheduling coordinator relationship with the ISO under EDAM or be represented by the EDAM entity scheduling coordinator. The ISO's relationship with scheduling coordinators will support either approach under EDAM, so long as the resources in an EDAM BAA are represented by a scheduling coordinator and are identified in a participating resource agreement. Beyond this requirement for scheduling coordinator representation and contract identification, the EDAM entity and its

[18] See ISO Tariff, Appendix A – Master Definition Supplement for definition of EIM Participating Resource.
[19] 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.

customers can determine whether third party resources in the BAA would be represented and identified separately or by the EDAM entity.

(2) Concept of "Base Scheduling" and the EDAM

Base schedules are needed for the WEIM real-time market because the WEIM is only an imbalance market with imbalance 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 inappropriate in the day-ahead market, however, because they can cause 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.

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. Thus, congestion costs are allocated to the WEIM entity responsible for the base schedules. These costs do not necessarily reflect all of the congestion base schedules cause because base schedules can cause congestion and result in re-dispatch costs above and beyond the congestion costs. Supporting base schedules in the EDAM would shift significant costs to other EDAM participants because they would not be included in the day-ahead market settlement and, consequently, would not be charged for congestion and losses. This would inappropriately cause other market participants to incur these costs through uplift charges. This cost shifting has been accepted in the WEIM because the overall real-time re-dispatch 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 applied is the loss rate for the BAA's own settlement, outside of the ISO market, representing the arrangements for their planned operation as reflected in their base schedules. This loss rate is presumably based on average loss, *i.e.*, based on overall losses, 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 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 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 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 supply it paid prior to EDAM and not be subject to fluctuations in price driven by market efficiency, the market provides avenues to do that without the need for contractual modifications. If the entity holding the supply contract is the scheduling coordinator and the entity serving its load with the resource, the ISO will settle with the scheduling coordinator any energy payments emerging from the market. The scheduling coordinator can then manage redistribution of those payments in accordance with the terms of its contract to ensure the contract price is covered. This treatment can continue to support PURPA resources subject to regulatory must take requirements, or with special contractual provisions regulated by state commissions without the need for contractual changes. This treatment can also apply more broadly to other power purchase agreements where the scheduling coordinator bidding in the resource in the market is also the contract holder for the supply. Thus, this mechanism should apply in the vast majority of instances because the scheduling coordinator will likely be the same entity holding the contract for supply. However, to the extent that is not the case, parties can consider a "contract for differences" which 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 on the agreed to price. If the market price is above the agreed price, 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.[20]

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 create 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.

(3) Transmission Requirement

In comments to the revised straw proposal, numerous stakeholder comments requested that the EDAM design consider requiring resources in an EDAM BAA operating under the OATT to secure transmission from the EDAM entity in order to participate in the market. These stakeholders argued that not requiring a supplier to hold a transmission reservation on the

[20] 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.

system supporting their EDAM participation potentially could shift transmission costs to load serving EDAM participants or transmission providers within the EDAM BAA, particularly those associated with newly interconnected resources that may not have reserved transmission service at the time of their interconnection. Other stakeholders argued that lack of a transmission requirement could encourage free-riding on the transmission system of the EDAM entity or other transmission providers within the EDAM entity area.

In response to the concerns expressed by these stakeholders, subsequently the draft final proposal introduced the requirement that generation have transmission service associated with their supply in order to participate in the EDAM, whether that transmission is reserved by the resource owner or the load serving entity seeking to utilize the supply to serve its load. The proposal provided that this transmission requirement could be satisfied through one of the following mechanisms:

- The resource must be a designated network resource under the terms of the EDAM entity OATT; or
- The resource must reserve firm point to point transmission service of at least one month in duration to the EDAM entity border under the terms of the EDAM entity OATT, or must otherwise hold a legacy (pre-OATT) transmission contract.

Numerous stakeholders argued in their comments on the draft final proposal that requiring the resource to reserve firm point to point transmission of at least a monthly duration (long-term or monthly firm point to point), to the border of the balancing area, is overly restrictive. They noted that such a requirement would limit a resources' ability to participate in the market if they do not meet the transmission requirements because firm service of any duration is scarce and may not be available, long-term or monthly firm point to point transmission service is difficult to secure under the OATT. Moreover, stakeholders noted that even weekly or daily firm point to point service, while more prevalent, may not always be readily available. Stakeholders acknowledged the intent behind the transmission requirement, and they expressed openness to considering alternative ways for ensuring generators continue to contribute to the costs of the transmission system if they cannot reserve transmission service, *e.g.*, by paying for transmission to the extent resources are committed or dispatched to reflect their use of the host EDAM entity transmission system.

Based on this stakeholder feedback, this final proposal modifies the transmission requirement to reflect the discussions regarding this issue during the November 14th stakeholder meeting by introducing a new mechanism to compensate the transmission provider if a resource cannot reserve transmission service. With this change, the transmission requirement for a generator can now be satisfied through one of the following mechanisms:

- The resource is a designated network resource under the terms of the EDAM entity OATT;
- The resource has reserved firm point to point transmission service of any duration, long-term or short-term, under the terms of the EDAM entity OATT, or otherwise holds a legacy (pre-OATT) transmission contract; or
- If neither of the requirements above are met, the EDAM entity transmission service provider will assess a transmission charge based on the transmission rate for the lowest duration of firm transmission service offered under its OATT, recognizing that some transmission providers may offer daily firm service and others may offer hourly firm

service. If the transmission provider offers daily firm point to point transmission service as the lowest granularity firm service, the transmission charge would be evaluated based on the single highest hour real-time dispatch of the resource across the day for the amount in excess of reserved transmission service. If the transmission provider offers hourly firm point to point transmission service as the lowest granularity of firm service, the transmission charge would be evaluated based on each individual hourly real-time dispatch of the resource for the day. If the real-time dispatch, for any hour across the daily horizon, is above the reserved transmission, the transmission provider will assess the hourly transmission charge as described above. The transmission service provider is in the best position to evaluate and validate whether transmission has been reserved and can assess the aforementioned transmission charge.

The proposed design recognizes that designation of a generator as a network resource by the load serving entity provides for transmission service and contributes to the costs of the transmission system because the load is paying for transmission. Similarly, a resources' reservation of firm point to point service of any duration contributes to the costs of the transmission system. Thus, requiring a transmission reservations to the border of the balancing area is unnecessary.

If a resource does not reserve transmission service in advance, the design provides another avenue for the transmission provider to recover transmission costs from the resource. The transmission provider thus recovers the costs associated with the use of its system, and resources have an incentive to reserve transmission in advance for longer duration because, under most rate structures, it is more economic to reserve long-term or monthly transmission service than to pay for transmission at the daily or hourly firm point to point transmission rate for the same period of time.

Many factors support the proposal. Under the EDAM design, participating EDAM entities retain key functions and responsibilities – resource planning, transmission planning, and reliability. Each EDAM entity remains responsible for managing its resource planning programs. Furthermore, each EDAM entity retains its transmission planning responsibility to plan the reliability of its system, which is informed in part by requests for transmission service under the OATT. The EDAM entity also retains its reliability function, namely the responsibility to operate its grid reliably and comply with applicable FERC, NERC, and WECC standards. The EDAM entity will carry out these responsibilities and obligations through administration of its OATT, which will remain in effect in the EDAM. The transmission provider function of each EDAM entity will continue to sell transmission service under the terms and conditions of the OATT. The ISO, as the operator of the day-ahead market, does not assume those obligations in the EDAM.

The EDAM design seeks to harmonize the bilateral and OATT process for accessing the grid with the organized market structure for how the market utilizes transmission, recognizing that each EDAM entity will continue to administer and provide transmission service under the terms of its OATT. Absent a requirement that generators in the EDAM entity BAA reserve transmission or be a designated network resource, a generator interconnecting to the grid potentially could avoid paying for transmission, shifting the costs of the transmission system to load, while deriving the benefits of market participation. A new generator interconnection does not convey transmission rights or deliverability of a generator's output across the grid. Under the OATT, an interconnecting generator must reserve transmission service to deliver energy across the grid. The transmission provider evaluates requests for service to determine the availability of transmission to support the request.

A transmission requirement for suppliers that are not designated resources under the OATT enables the EDAM entity transmission provider and other transmission providers within the EDAM entity footprint to plan and expand the transmission system more effectively to meet reliability and changing needs of its transmission customers. Absent a requirement to reserve transmission service, a supplier in an EDAM BAA that is not a designated network resource may free ride on the system, shifting costs to load and significantly affecting the transmission provider's ability to meet its transmission planning responsibilities under the OATT. In EDAM BAAs with OATTs, transmission service reservations, particularly long term reservations, drive transmission system upgrades and overall expansion to accommodate the changing needs of a transmission provider's customers. The lack of a requirement to reserve transmission service, while maintaining the OATT, could stifle transmission system planning and expansion putting system reliability at risk.

In approving the WEIM design and subsequent enhancements, FERC did not require a transmission reservation for generators to participate in the WEIM.[21] The EDAM, however, will involve a significantly larger volume of transactions compared to the WEIM because the entire load of an EDAM BAA will be represented in the market and all operational resources will be offering their supply into the market, whether economically bid or self-scheduled. The WEIM represents a low volume of all real-time transaction because it is primarily designed to cover only the hour to hour imbalance needs of its participants. Thus, the risk of cost shifts and free riding occurring in WEIM BAAs with an OATT is limited, and the prospect of foregone transmission revenue low. In EDAM if a supplier in an OATT BAA is not required to reserve transmission service or be a designated network resource, there could be a sizable cost shift risk and free riding concerns, which can significantly affect the transmission provider and its customers.

Requiring transmission service reservations or network designations will provide the EDAM participating transmission provider with revenues to avoid or limit undue cost shifts, support continued transmission planning, avoid free riding, and allow for generation to participate in the market.[22] It is important to recognize the vast majority of generators if not all of them, with the exception of interconnecting or newly interconnected generation, meet the requirement today as they have reserved transmission service under the OATT. Also, the ISO's discussions with some other market operators indicate they require transmission service or network designations to participate in the market. This proposed design supports the EDAM entity's administration of its OATT under EDAM.

d) Demand Participation in EDAM

The day-ahead market, through its integrated forward market (IFM) function, clears supply and demand bids. In the EDAM, participating entities will be able to self-schedule or economically bid their demand in the day-ahead market. As a starting point, the EDAM entity will be responsible for bidding and self-scheduling the demand within its BAA into the day-ahead market. Having the EDAM entity be the scheduling coordinator for all load serving entities in its

[21] *See PacifiCorp*, 147 FERC ¶ 61,227 (2014) at pp. 144-149 (rejecting PacifiCorp's proposal to charge incremental network and point-to-point transmission customers for WEIM transmission service when the dispatch operating point exceeds the transmission customer's reserved capacity).
[22] Transmission providers under the OATT may also continue to impose unreserved use charges on entities utilize the transmission system without a reservation.

BAA supports the coordination required for forecasting and the reliable and efficient submission of demand bids into the day-ahead market.

The ISO can also enable individual load serving entities within the EDAM BAA to represent their demand in the market separately from the rest of the BAA's load. The individual load serving entity would need to work with the EDAM entity and the ISO through the implementation process to model its load separately. Separating individual load serving entities within an EDAM BAA will require separate metering that satisfies the standards of the EDAM entity and the ISO. Additionally, the load serving entities would need a scheduling coordinator to represent its demand in the market and submit additional information, including meter data, to enable settlements. As each EDAM entity moves through the implementation process, the ISO will coordinate with the EDAM entity and interested load serving entities to enable individual load bidding in the day-ahead market.[23]

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 energy 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 draft final proposal continued to carry forward and describe different components of the EDAM 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. The availability of imbalance reserves across the footprint and introduction of a power balance constraint to limit the propagation of the shortfalls across other BAAs contributes to the confidence in transfers and reliability benefits of the EDAM. This results in the most efficient solution where economic resources are scheduled for energy, and more expensive resources are scheduled for capacity services. At the same time, the resource sufficiency evaluation accounts for diverse sources of supply and accommodates different resource adequacy regimes.

In stressed system conditions where the market utilizes all available resources to optimally respond to the circumstances, each EDAM entity will rely on its operational tools to manage grid conditions within its BAA. If the stressed conditions persist and there is a risk of load shedding, all EDAM entities would afford market transfers sourcing from its BAA equal priority to its load, to be curtailed on a pro-rata basis, subject to operational discretion and coordination. Establishing this equal priority is central to overall confidence in transfers.

[23] In WEIM, the scheduling coordinator of the load resource is responsible for submitting the load meter vales and any uninstructed imbalance energy settlement calculated when comparing the load meter to day ahead load schedule.

Stakeholder comments generally continued to support the overall concept described in prior iterations of the proposal, including the draft final proposal, *i.e.*, that confidence in transfers is a critical component of the EDAM design and contributes to maintaining reliability in the BAA. Furthermore, stakeholders continued to support affording equal priority to market transfers and load during edge case stressed system conditions and the clarifications regarding the roles of the EDAM entity effectuating the priority and the market operator in edge case scenarios.

The final proposal retains the confidence in transfers design, *i.e.,* it provides for equal priority between market transfers and load in edge case stressed system conditions. Also, the final proposal continues to further describes the different design components that instill confidence in market outcomes and the resulting transfers supporting reliability across the footprint.

a) EDAM Design and Market Elements Building Confidence in Transfers

The proposed design for equitably establishing confidence in transfers for all EDAM participants has evolved in response to stakeholder comments and additional workshops. The initial straw proposal introduced the concept of equal priority between transfers and load in more stressed conditions, and the revised straw and draft final proposals built on stakeholder feedback and described in greater detail how key components of the overall design help mitigate stressed conditions through the market (and through BAA operations if the market cannot resolve the conditions). This section describes more comprehensively how the EDAM design supports reliability across the EDAM footprint, promotes responsive and efficient resolution of stressed system conditions, and ultimately provides a high degree of confidence in market transfers, all while continuing to recognize that the EDAM entity ultimately is responsible for the reliability function within its BAA.

As a starting point, the EDAM introduces a resource sufficiency evaluation that evaluates each BAA and determines whether it has sufficient supply to meet its forecasted demand, uncertainty requirement, and ancillary services requirements. This supply is then made available to the market and optimally committed day ahead, resulting in transfers between EDAM BAAs. If conditions change between day-ahead and real time, the day ahead schedules and any additional supply made available to the real-time market will be utilized and optimally re-dispatched to respond to changing grid conditions. This treatment will honor day-ahead schedules while recognizing updated forecast, topology, and supply availably to derive an optimal real-time solution.

Incenting EDAM entities to pass the RSE is critical. Absent a fair, equitable, robust, and stable RSE structure that creates effective consequences for failing the RSE, participating EDAM entities may not have the confidence necessary to offer surplus supply into the market, instead choosing to retain their surplus supply for managing reliability conditions. They may be concerned that if they offer surplus supply into the market, such supply simply will be committed to support transfers to deficient BAAs, creating a disincentive for such BAAs to become resource sufficient in favor of leaning on the surplus supply of others in the market.

The draft final and this final proposal refine the policy design regarding the consequences for failing the EDAM RSE to strengthen the incentive for EDAM entities consistently to enter the market sufficient through practices that support forward procurement sufficient to pass the RSE. The design introduces tiered financial consequences for RSE failure. Another related, but non-financial, consequence is that an EDAM entity that fails the RSE when the market is unable to cure the insufficiency will be evaluated individually for the WEIM RSE rather than being

evaluated jointly, as part of the pool, along with the passing EDAM BAAs. The proposed consequence structure will incentivize individual EDAM entities to undertake forward procurement of supply so they pass the RSE and enter the day-ahead market resource sufficient, rather than depending on the market to cure an insufficiency.

The diverse supply utilized to evaluate and pass the EDAM RSE is available to the day-ahead market. Energy transfer schedules emerging from the day-ahead market are feasible according to conditions at that time and considered firm. The schedules are feasible because the day-ahead market optimization ensures that forecasted demand and the uncertainty for the each BAA can be met, while also supporting EDAM transfers between EDAM BAA's. In other words, the market will only schedule EDAM transfers out of an EDAM BAA if the scheduled load and uncertainty within the BAA can be met with scheduled supply and imbalance reserve awards. This provides confidence that the scheduled transfers, which are accounted for through e-tags, are feasible and the load in the BAA can be served.

The day-ahead market will seek to commit and procure imbalance reserves efficiently across the entire 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 optimization in the WEIM, including the potential for providing counter flow on day-ahead energy transfers to address real time needs such as materialized uncertainty. If conditions change between day ahead and real time, the imbalance reserve capacity can be dispatched by the market to resolve the contingency, particular condition, or uncertainty that materialized, thus enabling transfers even in stressed conditions.

The design recognizes that EDAM entities can reserve supply in excess of their RSE obligation to manage and respond to reliability conditions within their BAA because each EDAM entity retains its reliability function and obligations. The design further introduces a *net EDAM export transfer constraint* that permits the EDAM entity to manage the amount of internal supply that can support EDAM export transfers out of the BAA. This is an additional tool available to the BAA to manage grid reliability. As EDAM entities gain experience with and confidence in the market, the need for the constraint may steadily phase out.

Shifting from day-ahead to real time, as conditions across the grid evolve, the WEIM will seek to re-optimize and re-dispatch the supply pool to respond to changing grid conditions. The scheduled transfers from the day-ahead market remain firm and fixed, but dynamic transfers are scheduled optimally, potentially in the counter flow direction of day-ahead transfers, as resources are re-dispatched to accommodate changing grid conditions. The WEIM's ability to re-optimize and dispatch supply in response to changing grid conditions across the entire footprint further mitigates the impact of stressed system conditions, instilling confidence in both the market design and the firm day-ahead energy transfers.

The design recognizes a constraint in the WEIM that prevents simultaneous relaxation of the power balance constraint and a net export transfer above the base net transfer. This constraint will be modified to consider EDAM energy and capacity schedules as part of the base transfer. When the constraint triggers, the net export transfer will be reduced to the net base transfer before the power balance constraint is relaxed. Triggering the constraint prevents propagation of a BAA's shortfall and consequential reliability challenges to other EDAM BAAs. This constraint is discussed in more detail in section the subsection below.

In more stressed system conditions, where the market has exhausted all of its tools but the reliability conditions cannot be fully resolved, the EDAM entity may need to rely on its operational tools to manage grid reliability and respond to the reliability event. Each EDAM entity retains its BAA reliability function. In these conditions, the BAA can rely on its individual operational tools to resolve the reliability event. If exercising such reliability tools does not resolve the reliability event and the risk of load shed remains, the EDAM BAA would afford market transfers and load equal priority subject to operational discretion and coordination, consistent with good utility practice. This means that load and transfers will be curtailed on a pro-rata basis. Operationalization of this priority will be discussed further below.

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 system conditions becoming emergency conditions. After the market has exhausted all available options, *i.e.,* exhausted available supply to resolve stressed system conditions in one or more BAAs, each EDAM BAA can rely on its own operational tools at its disposal to manage grid conditions to maintain reliability and avoid load shed within its BAA.

This proposed design continues to afford EDAM transfers a priority equal to load throughout stressed, "edge" or "corner" case conditions, *i.e.,* conditions where 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 features of responding to reliability events and meeting each BAA's reliability obligations

b) Effectuating Confidence in Transfers through the Market

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; *i.e.*, the power balance constraint will not be relaxed 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.[24] As a result, the net export transfer will be reduced to the net base transfer before the power balance constraint is relaxed.

The final proposal continues 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.[25] 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

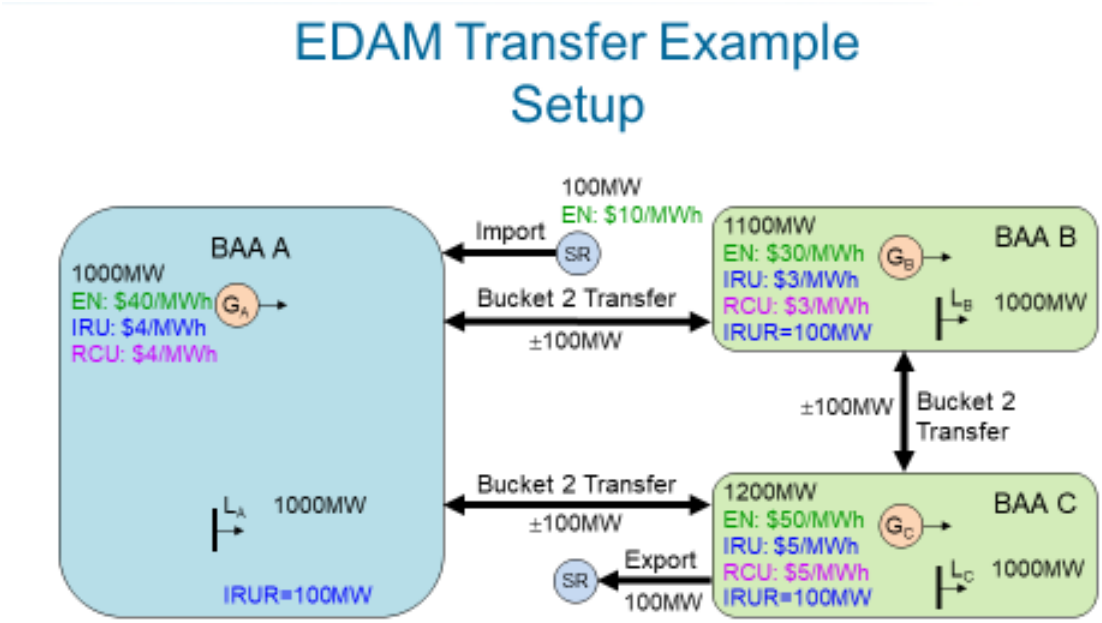
[24] The formulation of the constraint is illustrated in Appendix 3 of the document.
[25] Bucket 1 transmission consists of transmission rights held by transmission customers of the EDAM entity transmission service provider or other transmission service providers within the EDAM BAA that supports transfers used for RSE accounting purposes in the day-ahead timeframe.

procurement constraint and a net reliability capacity export transfer. These constraints will collectively ensure a BAA will first meets its own requirements before it exports energy or capacity to other BAAs.

In stressed system conditions, after the WEIM has exhausted available supply, the WEIM 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 a priority 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 the power balance constraint relaxation, to manage stressed system conditions and afford equal priority to transfers and load within the market.

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

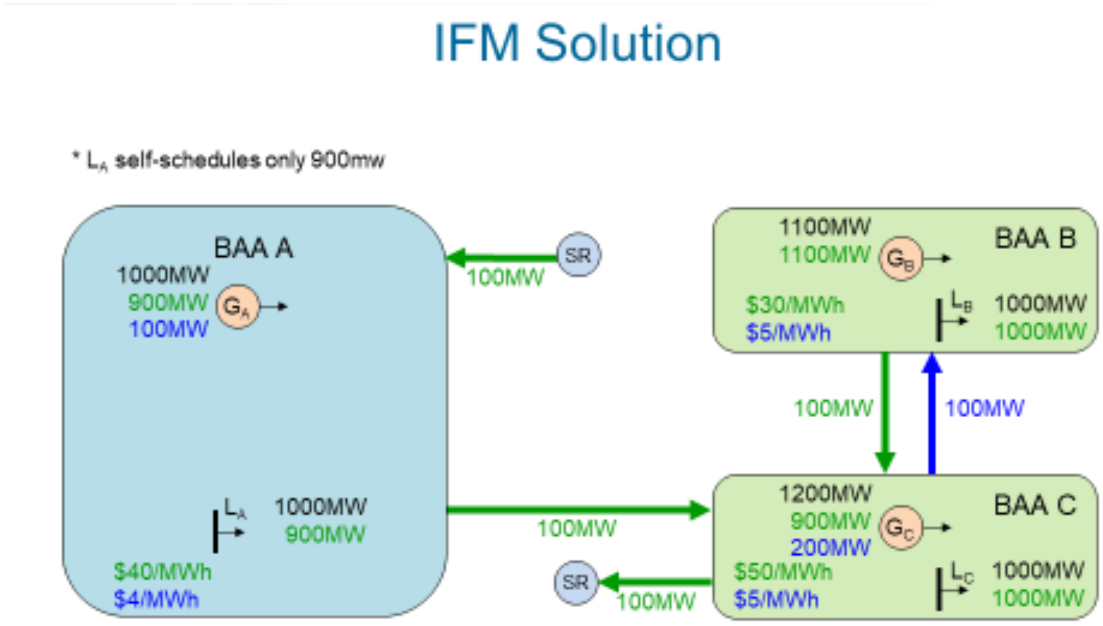


There are 100MW bi-directional bucket 2 transfers between each BAA pair. Transmission losses, ancillary services, imbalance reserve down, and reliability capacity down are ignored for simplicity. Each BAA has a 1000MW demand forecast, and a 100MW imbalance reserve up requirement (IRUR).

- BAA A has a generating resource (G_A) 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 an import bid (SR) from a non-EDAM BAA for 100MW at $10/MWh.
- BAA B has a generating resource G_B 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 (G_C) 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:



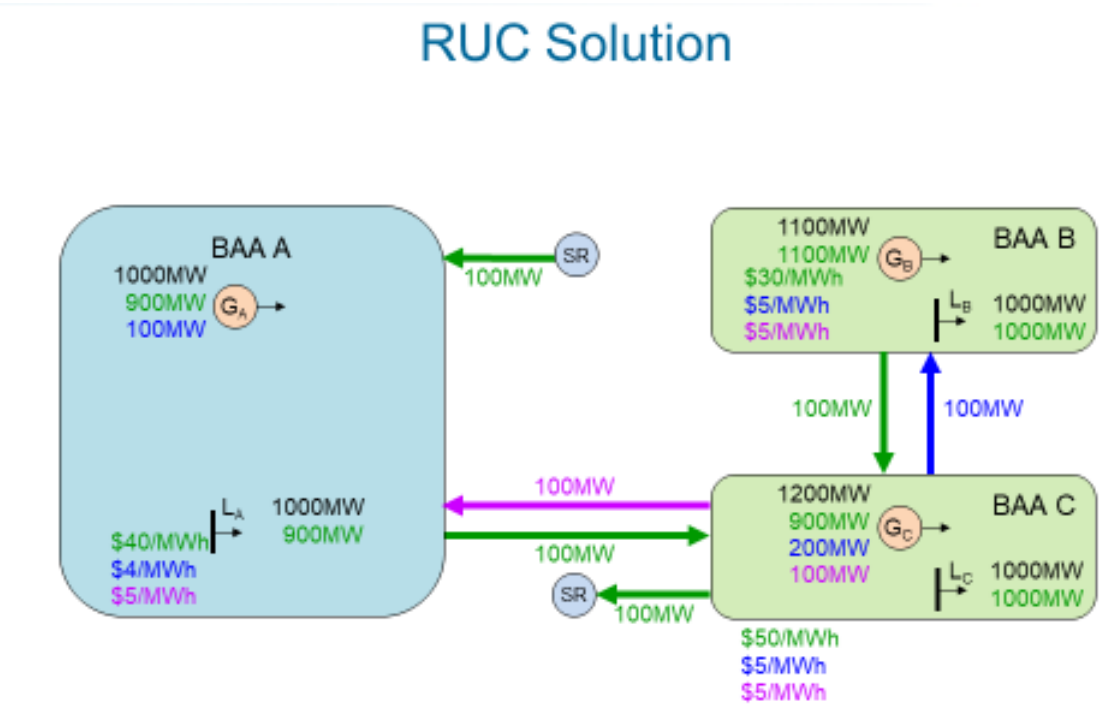
The load in BAA A submits a self-schedule at 900MW, *i.e.*, 100MW below the demand forecast, whereas the loads in BAAs B and C are self-scheduled at 1000MW, which is the demand forecast in these BAAs. The supply cost is lowest in BAA B and highest in BAA C; therefore, the optimal solution is to maximize the energy transfers (green) from BAA A to BAA C, and from BAA B to BAA C, scheduled at their scheduling limit of 100MW. In BAA A, the import is fully scheduled and the generating resource G_A is marginal at 900MW setting the LMP at $40/MWh. In BAA B, the generating resource G_B sets the LMP at $30/MWh (assuming the availability of marginal additional supply). Finally, in BAA C, the export is fully scheduled and the generating resource G_C is marginal at 900MW setting the LMP 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 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 fully 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.

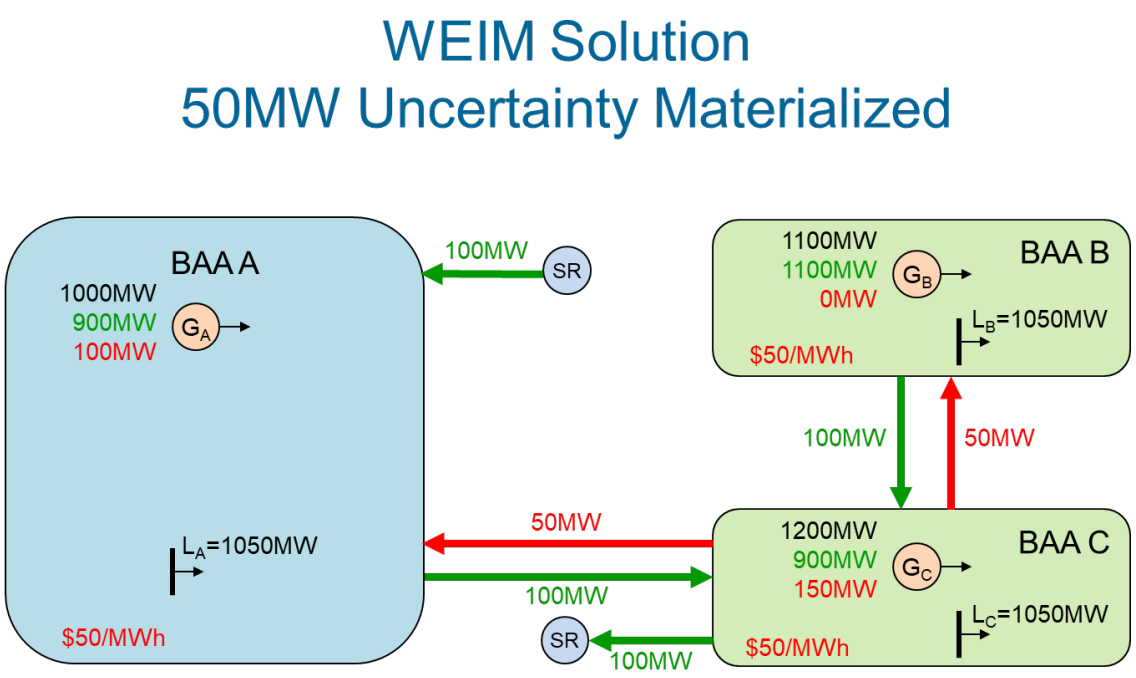
The optimal solution in the RUC is as follows:



Because the scheduled load equals the demand forecast in BAAs B and C, there are no reliability capacity requirements in these BAAs. However, in BAA A, there is a 100MW reliability capacity up requirement to substitute for the 100MW load under-scheduling below the demand forecast. 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 G_C, 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 G_C 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.

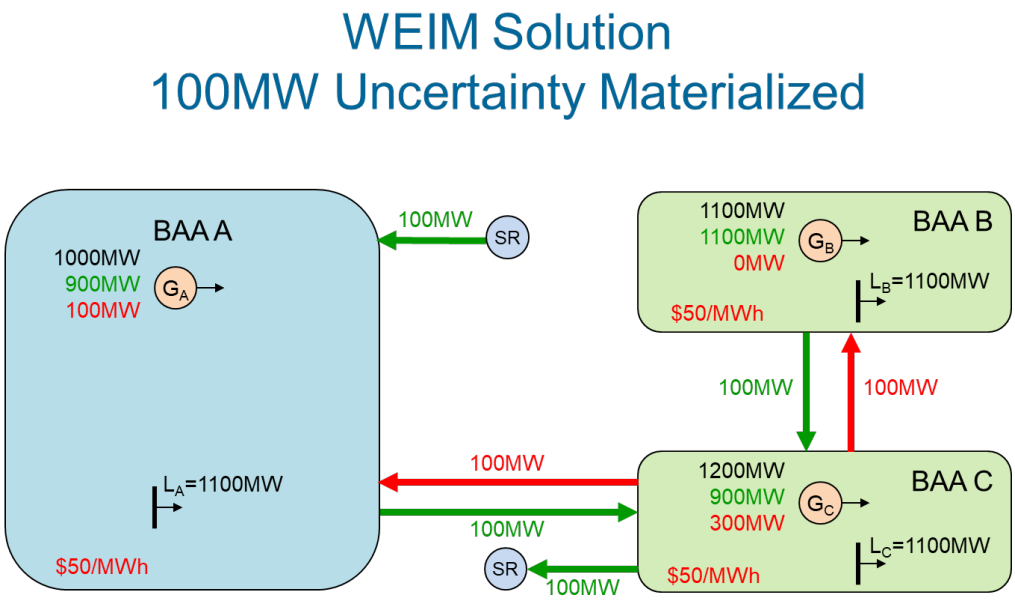
The next three scenarios consider three different levels of uncertainty that materialize in the WIEM. All imbalance reserve and reliability capacity awards from the EDAM have a must offer obligation, thus they are available for dispatch in the WEIM, assuming at the same energy bids as in the EDAM. The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

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



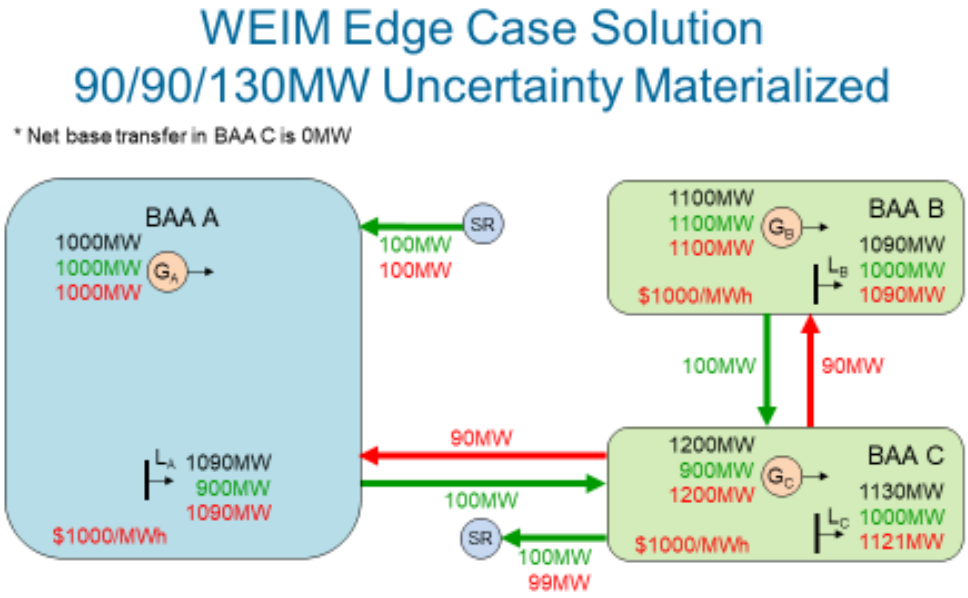
The demand forecast in each BAA is now 1050MW. The optimal solution for imbalance energy (red) is shown as a positive deviation on the EDAM solution (green). In BAA A, the generating resource G_A is dispatched up 100MW to its full capacity, yet BAA A is short by 50MW, considering its 100MW day-ahead 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:



The demand forecast in each BAA is now 1100MW. The generating resource G_C 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. G_C sets the real time LMP at $50/MWh in all BAAs.

The third and last scenario, 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:



The demand forecast is now 1130MW in BAA C and 1090MW in BAAs A and B. The generating resource G_C in BAA C is dispatched again up 300MW to its full capacity because of the 310MW uncertainty that materialized in BAAs A, B, and C. BAA C has committed in the EDAM to provide 100MW of imbalance reserve up to BAA B and 100MW of reliability capacity up to BAA A. Therefore, the materialized uncertainty in BAAs A and B is met via 90MW dynamic export transfers from BAAC to each of these BAAs that partially reverse the day-ahead energy transfer imports. However, the materialized uncertainty in BAA C is 130MW; thus, BAA C is short by a 10MW supply. Consequently, the WEIM will relax the power balance constraint in BAA C by 10MW to resolve the infeasibility. The real time LMP is $1000/MWh in all BAAs, set by the power balance constraint relaxation penalty price. In the example, the BAA C operator resolves the infeasibility by applying a pro rata curtailment between the load and the firm export (the export schedule must be an integer).

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 (net base transfer), which is 0MW, considering all day-ahead energy and capacity transfers. In the solution, BAA C has a net transfer of –20MW; thus, its power balance constraint is relaxed. If additional uncertainty materializes in BAAs A and B, the power balance constraint in BAA C may be further relaxed by another 20MW, after which the power balance constraint in another BAA will be relaxed. Also, it is important to note that if there is at least 10MW of available balancing capacity up in BAA C, the WEIM will dispatch that to avoid the power balance constraint relaxation.

Some stakeholders expressed concern that using convergence bidding in an EDAM BAA may adversely affect other EDAM BAAs that are not allowing convergence bidding because virtual supply could offset physical supply called upon by market, thus reducing the amount of physical supply available. Although virtual bids can economically displace physical bids in the IFM, virtual bids are not used in the RSE or in RUC. Therefore, a BAA with virtual bids is still required to meet its RSE requirements with available physical capacity. If a portion of that physical capacity is economically displaced in the IFM by virtual bids, that capacity is available to receive reliability capacity awards in the RUC, which essentially replaces virtual schedules in the WEIM. Any export transfers scheduled in the IFM and sourced from virtual supply remain firm in the WEIM because the virtual supply is replaced by reliability capacity awards. Consequently, there is no adverse reliability risk from convergence bidding.

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

It is important to acknowledge that the EDAM does not establish a unified single BAA as an ISO/RTO would. Rather, each EDAM entity continues to be responsible for managing operational reliability within its own BAA. Similarly, the ISO, as market operator, is not responsible for directing transmission operations, balancing supply and demand in individual EDAM BAAs, or directing specific curtailments and potential load shed. 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 a higher level of uncertainty materializing, or loss of transmission and/or generation. In certain edge cases, the market may be unable 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 is 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/schedules on the system;
- Emergency supply programs such as demand response and other generation; or
- Deployment of operating reserves and arming firm load.

In an imminent load shed situation, EDAM BAA operators will coordinate with neighboring BAAs pursuant to good utility practice prior to curtailing transfers out of the 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 so the BAA facing the emergency condition might curtail the transfer schedule ahead of load to avoid load shed. The proposal is that in footprint-wide stressed conditions, where curtailing transfers likely would place the receiving BAA in an emergency condition, equal priority will 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. In exercising its operational discretion under these corner infeasible solutions, the EDAM entity transmission service provider retains discretion how it administers resolution of the infeasibility relative to its load and other transactional obligations not associated with EDAM transfers.

In prior comments, stakeholders sought clarification regarding (1) the role of the market operator and the EDAM BAA in effectuating the priority and curtailment of transfers relative to load, and (2) whether the BAA retains the ability to take reliability actions on e-tags. The EDAM BAA retains its role and function of managing reliability within its BAA and complying with relevant NERC and WECC standards, *i.e.,* the market operator does not take on those obligations for each BAA in the EDAM footprint. Consequently, each EDAM BAA is responsible for curtailing transfers by communicating with the market operator, and it remains solely responsible for managing and directing load shed. The ISO, as market operator, does not identify, manage, or direct load shed in an EDAM BAA. Similarly, an EDAM BAA, consistent with its reliability function and practices in the WEIM today, retains the authority to approve and take reliability actions on e-tags that affect its BAA.

d) Priority of Transfers to an EDAM BAA that Fails the RSE

Earlier iterations of the proposal explored the priority of transfers to an EDAM BAA that failed to meet its day ahead resource sufficiency evaluation. Informed by stakeholder feedback, the draft final proposal proposed that a lower priority for transfers to an EDAM BAA for failing the RSE should not be a consequence, at least at the onset of the EDAM. Further, the draft final proposal recognized that the overall RSE failure consequence design provides meaningful consequences and these would be monitored for effectiveness, and additional or different more physical consequences could be considered in the future as the EDAM evolves. Stakeholder comments generally supported excluding a lower priority framework design due to the practical difficulty of implementing such a design in stressed conditions and differentiating between different priority transfers. The final proposal does not alter the approach from the draft final proposal and does not introduce the concept of lower priority transfers if there is a RSE failure.

Introducing the added complexity of different transfer priorities in the operational horizon in stressed system conditions, when load is at risk, outweighs the benefits at this initial stage of EDAM. In these stressed conditions with dynamic operational conditions, a BAA's ability to differentiate between high and lower priority transfers is limited, particularly if only a small MW amount is associated with lower priority transfers.

The RSE failure consequences discussed in section II.B.2(g) have evolved since the initial straw proposal. The proposal introduces consequences that impose sizable financial administrative surcharges with increasing consequences for repeated failures. Moreover, by failing the day ahead RSE or failing to tag an import (or resupply by identified timeframes), an EDAM entity will be tested for the WEIM RSE individually and not jointly, as part of a pool, with the EDAM entities that passed the day ahead RSE. Thus, it will lose the diversity benefit of the imbalance reserve requirement to meet its uncertainty obligation. Adding a further consequence, *i.e.*, imposing a lower priority on transfers to an EDAM BAA that failed the RSE, could have a reliability impact for the failing BAA, particularly in emergency conditions if day ahead energy transfers are at higher risk of curtailment.

Under this design, all market transfers between EDAM BAAs are afforded equal priority to load, instilling collective confidence that the energy will be provided under stressed conditions subject to operational discretion and coordination. An EDAM BAA that fails the day ahead RSE and incurs the financial and diversity benefit consequences can continue to rely on cleared transfers sinking in its BAA having equal priority to the source BAA's load. Likewise, the failing BAA would afford transfers to other EDAM BAAs equal priority to its load under stressed conditions. This framework at the onset of EDAM is preferable to raising a potential reliability risk, particularly given the changed consequences for failing the RSE.

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 Availability in EDAM

Transmission availability in the EDAM is foundational to achieving a well-functioning, efficient, and reliable day-ahead market. This includes transmission both internal to a participating BAA and on interties between participating BAAs. As the day-ahead market optimally commits resources, availability of transmission to the market is critical for efficient transfers of supply across the EDAM footprint to serve load and maintain grid reliability.

In the EDAM, transmission service providers will continue to maintain their OATTs and administer sales of transmission service under them. The proposed transmission availability within the EDAM design seeks to maximize the amount of transmission capability made available to the market under different transmission service arrangements while accommodating both the ISO's organized market transmission design and the OATT framework. Maximizing the availability of high quality transmission to the EDAM increases the benefits participating EDAM entities and their customers will derive from the day-ahead market.

The draft final proposal described the concept of transmission "buckets" and discussed how transmission customers with transmission rights at interfaces between EDAM BAAs make such rights available to the market and how transmission providers make unsold transmission available. The proposal also described three different pathways a transmission customer with transmission rights under the OATT can take to utilize its transmission rights or make them available to the EDAM. In particular, the proposal clarified the treatment of unscheduled transmission rights (pathway 3) and the ability of the rights holder to exercise previously unscheduled transmission rights after the day-ahead market run and not be assessed costs as the market re-dispatches supply to respond to changing grid conditions. The draft final proposal also described a detailed design for historical transmission revenue recovery for EDAM entity transmission providers recognizing they might face reduced sales of short-term transmission as a result of EDAM.[26] The intent of the revenue recovery mechanism is to mitigate the EDAM entity's potential under-recovery of transmission revenues following EDAM participation.

Some stakeholders expressed concern that the availability of transmission under EDAM may not align with a specific limitation providing that FERC has no authority under the Federal Power Act to require an electric utility or person in the Pacific Northwest to convert involuntarily firm transmission rights that existed in 2005 through contract or transmission ownership to tradable or financial rights. The ISO understands this concern and the importance of ensuring the proposal falls outside of this limitation and maximizes the future potential of EDAM. Although neither FERC nor the courts have interpreted this statutory protection of Pacific Northwest transmission rights since it was enacted in 2005, the ISO has carefully considered this statutory provision and believes its current proposal will ensure that FERC acceptance of EDAM would not be contrary to this limitation. First, the EDAM proposal does not require the conversion of firm physical transmission rights to tradeable or financial rights such as CRRs. As such, the EDAM proposal will not ask FERC to require such a conversion. In addition, the ISO believes the voluntary nature of participation in EDAM fundamentally ensures the opportunity for interested entities to work with their transmission customers and the ISO to mitigate any concerns related to the continued right to exercise firm transmission rights that may linger beyond the final proposal. The ISO also clarified in the draft final proposal that the transmission rights, whether legacy rights or firm OATT rights, remain eligible for scheduling after the close of

[26] Besides recognition of reduced sales of short-term firm and non-firm transmission, the design provides for cost recovery of a percentage of new builds and transmission costs associated with supporting wheel through transfers in excess of import/export transfer levels.

the day-ahead market just as they would be today under the *pro forma* OATT, thereby preserving the physical right through the real-time market where WEIM scheduling practices would apply. The use of unscheduled capacity in EDAM after 10:00 a.m. does not change this outcome; rather, the physical rights would be accommodated through re-dispatch as required. Further, the rights holders in coordination with their transmission provider may register their rights with the ISO and receive a contract reference number for scheduling purposes, which as explained elsewhere results in accrued congestion costs associated with use of the transmission rights netting out in settlements. This ensures the transmission customer may continue to use its rights without direct financial consequence. There will similarly not be any direct assignment of re-dispatch costs to the transmission customer by the ISO. The EDAM entity will have the opportunity to work with its transmission customers and load serving entities to determine an equitable allocation of any shortfall or excess from the pool of congestion revenues and re-dispatch costs. This overall approach represents a reasonable starting point for EDAM and does not constitute involuntary conversion of firm transmission rights to tradable or financial rights.

The final proposal retains the design from the draft final proposal, with smaller clarifications in response to stakeholder comments. The following sub-sections describe in more detail the proposed design and associated rationale and offer a more detailed view into the associated stakeholder comments.

a) Internal Transmission Availability in EDAM

The availability of transmission internal to participating BAAs is an important aspect of facilitating optimized unit commitment by the market throughout the EDAM footprint. In the WEIM, internal transmission supports optimized dispatch based upon the flow capability of the transmission network in real time. Through its full network model, the ISO models the internal transmission system of each WEIM entity and utilizes flow based congestion management that respects intra-BAA physical transmission constraints, BAA specific power balance constraints, and intertie constraints between BAAs (both physical limits and scheduling limits). This enables the WEIM to function in a multi-BAA environment compatible with and complementary to OATT-regulated transmission and a bilateral energy market that co-exists with the WEIM, while still respecting the transmission rights of third parties and scheduled transactions in the bilateral market.

Similar to the WEIM, the EDAM will model internal transmission flow capability within each participating BAA, and it will support optimized commitment of supply in the day-ahead market. Through the full network model, the day-ahead market will have visibility into transmission system topology, outages, and overall flow capability. In identifying resource commitment and transfers between EDAM BAAs, the market will co-optimize the entire internal transmission network while respecting the use of internal firm transmission rights to the extent transmission customers seek to exercise those by submitting energy self-schedules. To the extent derates arise on the internal transmission network, the market will know these conditions in the day-ahead timeframe.

Transmission customers with internal EDAM BAA transmission rights can economically bid or self-schedule supply to serve internal load, whether the supporting resources are internal to the EDAM BAA or located in another BAA. Transmission customers with internal EDAM BAA firm transmission rights, whether point-to-point service (PTP) or network integration transmission service (NITS), can exercise their firm transmission rights by submitting balanced supply and demand self-schedules associated with existing firm transmission rights. A self-schedule is a

price-taking bid scheduled in the market; for generating resources, a self-schedule also indicates self-commitment. Self-schedules associated with transmission rights may also have a higher scheduling priority compared to other self-schedules not associated with transmission rights. Self-schedules supported by transmission rights may be afforded a hedge against marginal congestion differences between the network locations of their sources (supply) and their sinks (demand), which would mitigate potential exposure to congestion price differences, either positive or negative, between the source and the sink. Through this framework, the EDAM will optimize resource commitment in the day-ahead market while respecting the exercise of transmission rights.

In addition to legacy (pre-OATT) contract rights and third party transmission ownership rights, firm OATT transmission rights held by customers within an EDAM BAA that do not support transfers between EDAM BAAs[27] will be afforded scheduling and settlement similar to firm transmission rights between EDAM BAAs and that the accrued internal congestion revenues will be settled with the EDAM entity. To receive this treatment, which the ISO has referred to as "ETC/TOR treatment," internal firm OATT transmission service customers must follow the same scheduling timelines associated with pathway 1, described further below, *i.e.,* they should schedule these transmission rights in the day-ahead market by 10:00 a.m. or ultimately exercising them at a later time. Legacy (pre-OATT) contract rights and third party transmission ownership rights would retain the scheduling rights and priorities provided under their contract or ownership arrangements, which EDAM would honor. The mechanism for how these transmission rights will be made known to the market and subsequently afforded the associated settlement treatment is further discussed in section II.B.1(e) below.

EDAM entities will continue to provide transmission service under the OATT, selling firm and non-firm transmission across the internal transmission network. Under the OATT, transmission providers sell non-firm transmission on an as-available basis, and it has a lower curtailment priority than firm transmission. In the EDAM, transmission customers holding non-firm transmission on the internal network to deliver generation from source to sink can submit economic bids or self-schedules into the market. The market will not establish different levels of priorities of market schedules based on different types of non-firm transmission rights, but the EDAM entity transmission provider will continue to be the arbiter of these transmission rights, and it will retain the authority to curtail internal schedules supported by non-firm transmission as it does today, consistent with its OATT. Consistent with the practices in the WEIM, the transmission service provider administers those curtailments, and in the WEIM the market may need to re-dispatch around those curtailments of non-firm transmission associated with the source of the generation.

b) Transmission Availability at Interties between EDAM Areas

Transmission capability at and across interties between EDAM BAAs supports optimized energy transfers identified through the day-ahead market. These EDAM transfers are important to provide benefits across the EDAM footprint. Prior to the day-ahead market run, each EDAM entity will identify the transmission capacity it can make available to the day-ahead market at the interfaces between EDAM BAAs to support transfers. Building on the revised straw proposal, the draft final proposal continued to described how transmission customers with firm and

[27] EDAM BAA internal transmission rights include firm rights from (a) a source to sink within an EDAM BAA, (b) a source to an intertie location with a non-EDAM BAA, (c) an intertie location with a non-EDAM BAA to an sink, and (d) a wheel through an EDAM BAA from an intertie location with a non-EDAM BAA to another intertie location with a non-EDAM BAA.

conditional firm transmission rights could make their transmission available and how the transmission provider would make unsold firm transmission available to the market to support transfers; *i.e.*, the "transmission buckets" framework. The draft final proposal further described the pathways for how transmission customers holding firm and conditional firm transmission rights under the OATT could exercise them or otherwise make them available to the EDAM for optimization, including how unscheduled transmission rights are utilized by the EDAM and how the transmission customer can exercise these rights after the day-ahead market run. This final proposal retains the same design, with smaller clarifications in response to stakeholder comments.

(1) Transmission "Buckets" Framework for Transmission Customer and Transmission Provider Transmission Availability in EDAM

The final proposal retains (1) the "transmission buckets" framework to represent how transmission is made available to the market by transmission customers and the transmission provider, and (2) the associated accrual of transfer revenues from the availability of that transmission. This framework was originally introduced by WEIM entities and was further discussed in various working groups and workshops. An important element of the design is that high quality transmission is made available to support transfers between EDAM BAAs, and this transmission is eligible for accrual of transfer revenues. Figure 1 below illustrates the qualities of each one of the three transmission buckets.

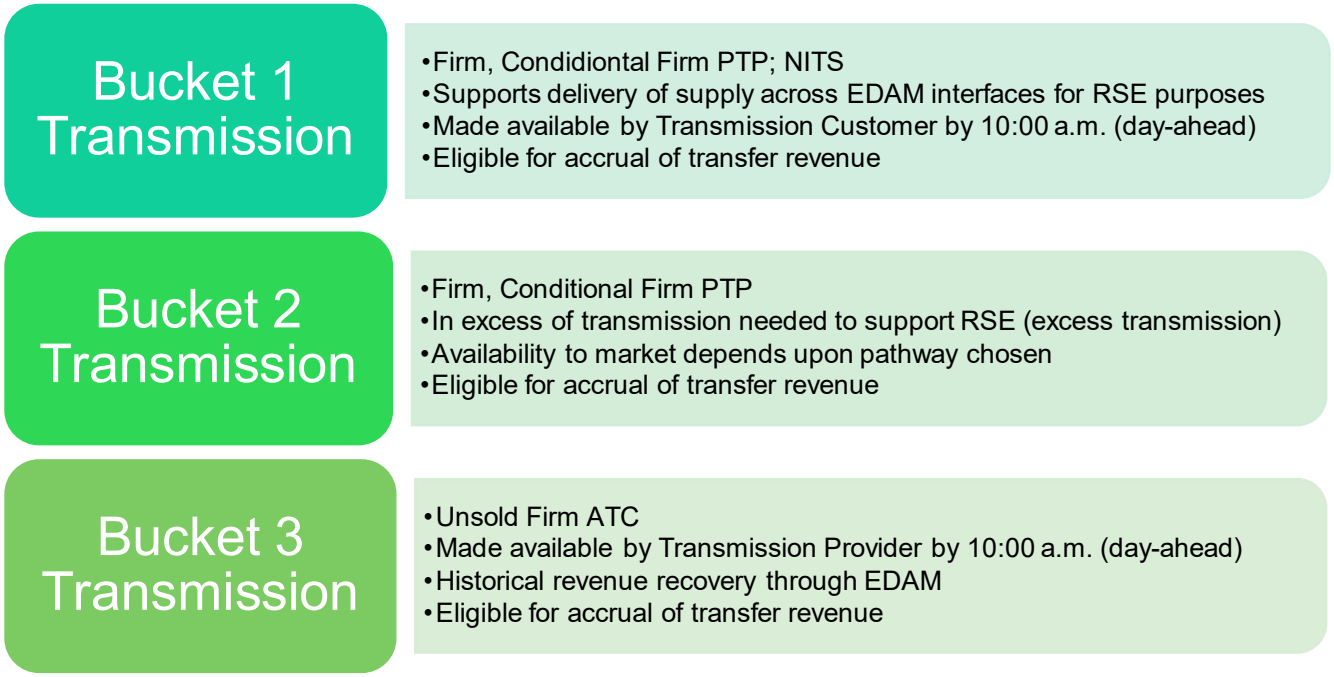


Figure 1: Description of the transmission buckets framework.

Although these transmission buckets largely merge from an operational standpoint, the labels are helpful to differentiate who is making the transmission available, the type of transmission being made available, and the disposition of transfer revenues that may accrue.

(a) Bucket 1: Transmission to Support Resource Sufficiency

This final proposal retains the bucket 1 transmission framework whereby each EDAM 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 consists of transmission rights held by transmission customers of the EDAM entity transmission service provider or other transmission service providers within the EDAM BAA associated with contractual agreements for delivery of energy at interties between EDAM BAAs used for meeting the RSE 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 make available bucket 1 transmission to deliver that resource across the interface between the two BAAs.

Bucket 1 transmission must be firm or conditional firm point to point transmission or network integration transmission service associated with a designated network resource. Firm and conditional firm point to point transmission service is highly reliable transmission that is made available across an interface between two EDAM BAAs, reserved under the terms of the OATT of each transmission provider. This is necessary to have transmission to and across the interface between the BAAs to support the transfers.

Network integration transmission service associated with delivering designated network resources can also qualify as bucket 1 transmission if the designated network resource is utilized to meet the EDAM entity's RSE obligation. If the EDAM entity relies on an off-system designated network resource to meet the RSE obligation and schedules the energy from the resource location to the intertie, it will have secured firm point-to-point transmission service across one system to an interface, and there will be NITS across the interface on the sink BAA system. The transmission across the interface between the BAAs is made available to support EDAM transfers as bucket 1 transmission.

In comments to prior proposals, some stakeholders sought clarification on the transmission expectations associated with delivered firm energy contracts, such as WSPP Schedule C arrangements where neither the source of the generation nor the transmission are generally known before the 10:00 a.m. day-ahead market run. As discussed further in the RSE section, firm energy contracts are delivered to the interface with the sink BAA where the purchaser (a load serving entity) takes title to the power at that interface. These products and similar contractual arrangements have been prevalent across the Western interconnection, and they have proven to be highly reliable. These arrangements qualify today as designated network resources under the OATT and support resource adequacy in California and other states. The transmission associated with the delivery of these arrangements will not be optimized by the market because it is unknown by the time of the day-ahead market run, but the contractual arrangement for firm energy will be able to support the day ahead RSE.

It is important to clarify that to the extent an EDAM entity relies on import supply delivered across an intertie with a non-EDAM BAA, the transmission is not considered bucket 1 transmission and is thus unavailable to the market to optimize transfers. Transmission made available under the buckets, including bucket 1, is intended only to support optimized energy transfers between two EDAM BAAs; transmission at an interface between an EDAM and a non-EDAM BAA will not be available to the market for optimization. Import supply delivered across an intertie with a non-EDAM BAA would be included in a WEIM base schedule as it is today.

Bucket 1 transmission should be identified and made available at the time of bid submission into the day-ahead market. As discussed in the RSE section, the RSE will include advisory runs, including a more comprehensive advisory run at 9:00 a.m., to help inform each BAA of its sufficiency going into the day-ahead market at 10:00 a.m. when the market runs. The accuracy of the 9:00 a.m. advisory RSE run output is only as good as the bids and bucket 1 transmission made available by that time and, thus, entities are encouraged to submit bids and bucket 1 transmission by 9:00 a.m. However, entities ultimately have until 10:00 a.m. to become resource sufficient, and some may need to submit additional bids, including bucket 1 transmission, after the 9:00 a.m. RSE advisory run to cure potential deficiencies ahead of the binding RSE run.

Because the transmission service provider is already compensated for the transmission 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. The ISO will allocate transfer revenues, when they accrue, to the EDAM entity to distribute under the terms of its OATT, as discussed further in this proposal. This is consistent with how the ISO allocates transfer and congestion revenues in the WEIM today - the settlement is directly with the WEIM entity to utilize as described under the terms of its OATT.

(b) Bucket 2: Transmission Rights Held by Transmission Customers Not Needed as Bucket 1 Transmission

Bucket 2 transmission consists of firm and conditional firm point to point transmission rights held by transmission customers that are not utilized as part of bucket 1 transmission to satisfy the resource sufficiency of an EDAM BAA. These can be transmission rights beyond what is needed to support the RSE demonstration or transmission rights that are not utilized by the time of the day-ahead market run. For example, a transmission customer with 100 MW of firm point to point transmission rights across an interface between two EDAM BAAs that bids 75 MW of import supply for the sink BAA RSE supported by 75 MW of its transmission rights as bucket 1 transmission, could make available the remaining 25 MW to the market as bucket 2 transmission

The draft final proposal continued putting forward a framework under which transmission customers with firm or conditional firm transmission rights could make excess transmission, not utilized to support the RSE as bucket 1 transmission, available to the EDAM as bucket 2 transmission. The design recognized the ability of transmission customers to (1) schedule use of their rights by 10:00 am, or (2) release the transmission to the market and receive transfer revenue as a result of making that transmission available to the market (like congestion revenue rights holders in the ISO). Alternatively, unscheduled transmission would be made available to the market, and the transmission customer could seek to exercise those rights after the day-ahead market run. These options are detailed below.

In comments on the draft final proposal, stakeholders largely continued to support or not oppose the bucket 2 transmission design where firm and conditional firm point to point transmission rights (whether affirmatively released to the market or unscheduled by the scheduling deadline) are included in the day-ahead market optimization. They stated this approach would maximize transmission availability, maximizing the benefits of EDAM participation. Some stakeholders continued to express concern with the design because it does not provide a pathway for transmission customers to withhold transmission from the market or otherwise be compensated for the market use of the transmission rights at a hurdle rate or something more definitive than transfer revenue.

The final proposal retains the design described in the draft final proposal. A purely voluntary framework for transmission customers to make transmission available to the market at a hurdle rate would stifle the efficiency of the market solution because beneficial transfers would be limited as they would have to overcome a hurdle rate in the market to be scheduled. Throughout the initiative, stakeholders largely supported the objective of avoiding transmission hurdle rates and the resulting rate pancaking that stifles market efficiency. Such a proposal can also create artificial and inappropriate congestion. A framework where transmission customers can voluntarily release transmission to the market in return for transfer revenue settlement from the ISO is preferable. Making unscheduled, un-utilized, transmission by the time of the day-ahead market available to the market improves transfer optimization, increases transmission availability to support transfers, and maximizes benefits for the footprint as a whole. As the benefits of the WEIM have demonstrated, overall benefits increase as connectivity across the WEIM footprint increases and additional transmission is made available to support transfers.[28] A similar result would be expected in the EDAM as more transmission is made available to support robust transfers.

The bucket 2 transmission made available to the market is limited to firm and conditional firm point to point transmission service; it does not include network integration transmission service because transmission capacity reserved as network integration transmission service and associated with a designated network resource is generally released for sale under the OATT un-designation terms to the extent the designated network resource will not be utilized to serve load during a particular hour or day. If the EDAM entity does not bid the designated network resource into the market (by submitting an economic bid or self-schedule) and thus it is not utilized for RSE purposes, the transmission capacity is released through the un-designation process and made available to the market. Additionally, network integration transmission service cannot be resold or assigned because it is only used for load service. In contrast, a firm point-to-point transmission customer can come back after 10:00 a.m. and seek to exercise its transmission rights.

The final proposal discusses further below the timing and availability of bucket 2 transmission to the market in the context of the three bucket 2 pathways or options for how transmission customers can utilize their transmission rights in EDAM or make them available to the market.

(i) Pathways for Transmission Rights Availability in EDAM

Bucket 2 consists of transmission customer firm and conditional firm point to point transmission rights that are otherwise not made available to support resource sufficiency (bucket 1). Effectively bucket 2 consists of excess transmission rights at interfaces between EDAM BAAs that may not be utilized by the time of the day-ahead market run (10:00 a.m.).

This proposal continues to introduce three different “pathways,” or options, for how transmission customers could exercise their transmission rights or otherwise make their rights available to support EDAM transfers.

1. ***Pathway 1*** – Transmission customer schedules explicit use of the transmission rights in the day-ahead market by submitting a self-schedule associated with existing transmission rights. The ISO would allocate accrued transfer revenue to the EDAM entity for re-allocation under the terms of its OATT.

[28] *Western Energy Imbalance Market Benefits Report Third Quarter 2022,* October 31, 2022. Link

2. **Pathway 2** – Transmission customer releases the transmission rights to the EDAM before the day-ahead market processes, by 9:00 a.m. of the day-ahead. The transmission customer is eligible for an allocation of transfer revenue directly from the ISO. The transmission customer cannot self-schedule use of the transmission rights in real time for the amount released to the market, but it can continue to submit a self-schedule or economically bid into the market as any other user of the system.

3. **Pathway 3** – Transmission customer did not exercise transmission rights in day ahead under pathways 1 or 2, but it retains the ability to exercise these transmission rights after the day-ahead market run. If the transmission customer does not schedule use of the transmission rights by the start of the day-ahead market processes at 10:00 a.m., the unscheduled transmission capacity would be made available to the market to support optimized transfers. If a transfer constraint binds, transfer revenue associated with the unscheduled transmission would accrue and be allocated to the EDAM entity for re-allocation under the terms of its OATT. The transmission customer may exercise its previously unscheduled transmission rights between day ahead and real time, and the market would seek to re-dispatch the system to accommodate the use of the transmission rights. The transmission customer will be held harmless from direct re-dispatch costs by the transmission provider as a result of it exercising previously unscheduled transmission rights, as described further below.

The final proposal retains these three options described above, which were introduced in prior iterations of the proposal. The proposal describes below the different attributes and characteristics of the pathways to how a transmission customer can utilize its transmission rights or make them available to the day-ahead market.

(a) Pathway 1 – Exercising Transmission Rights Through the Day-Ahead Market

Transmission customers with firm and conditional firm point to point or network integration transmission (NITS) rights at interfaces between EDAM BAAs can continue to exercise their transmission rights through the EDAM to the extent they choose to not economically bid in the supply associated with those transmission rights. Pathway 1 describes the implications if a transmission customer with transmission rights across an interface between two EDAM BAAs chooses to exercise those transmission rights in the market.

If the transmission customer elects not to economically bid its supply into the market and make associated transmission capacity available to the market to optimize as bucket 1 transmission, the transmission customer can seek to exercise its transmission rights by submitting a self-schedule in the market and associate that self-schedule with existing transmission rights secured under the OATT.[29] The transmission customer must exercise its transmission rights by 10:00 a.m. (*i.e.*, by the time of the day-ahead market and the firm scheduling deadline in the OATT). The transmission rights the customer exercises in the market would be its firm or

[29] The process for registering transmission rights with the market in order to exercise these is further described in section II.B.1(e).

conditional firm point to point transmission rights, or the associated self-schedule with the delivery of a designated network resource on network integration transmission service.

A transmission customer holding a legacy transmission contract, *i.e.*, a contract executed prior to adoption of the OATT or otherwise not governed by the terms of the OATT, can exercise its transmission rights by submitting a self-schedule in the market associated with those legacy transmission rights under pathway 1. These transmission rights would need to be registered in advance and known to the market to enable the proper exercise and accounting of these rights.

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

A transmission customer also has the option to release transmission rights voluntarily to the EDAM to support transfers between EDAM BAAs under pathway two. The transmission rights would be eligible for accrual of transfer revenues which the ISO would settle directly with the transmission customer. Releasing transmission rights to the market ensures that the transmission rights will be available to support transfers and not be utilized by the transmission customer after the day-ahead market has optimized its use. This pathway provides a direct settlement with the transmission customer.

The transmission rights eligible to be released to the market initially are long-term (one year and longer) and monthly firm and conditional firm point to point transmission rights. These transmission rights are of longer duration and reasonably can be registered with the ISO to facilitate their release to the market without adding significant complexity and other challenges.[30] The transmission customer could determine, on a daily basis, whether to make the full amount or only a portion of its registered transmission rights available to the EDAM for the day or a longer timeframe. The transmission customer would receive transfer revenue accrued directly from the ISO for the duration of the capacity's release to the market. NITS transmission rights would be ineligible for pathway 2 because under the OATT these rights are tied to a designated network resource, and if the resource is not scheduled to serve load it does not have transmission rights that can be released to the market.

The transmission rights released to the market cannot be reclaimed or scheduled for the duration and trade date for which they have been released. Nevertheless, releasing transmission rights to the market does not preclude the transmission customer from economically bidding generation or submitting a regular self-schedule in the day ahead and real time markets for the associated generation. To enable release of transmission to the EDAM would require modification of the EDAM entity OATTs to recognize the ISO and the EDAM as an "eligible customer."[31]

Transmission rights held under legacy contracts may contain unique terms and conditions not governed by the OATT. The transmission service provider and the transmission customer holding legacy transmission contracts should review the terms and conditions of transmission

[30] Due to their longer duration, long term firm and monthly firm point to point transmission rights reasonably and effectively can be registered in master file with the ISO and provide a stable set of rights that can be utilized and/or released under pathway 2. It would be a significant technological and settlements challenge to accommodate shorter duration transmission rights, such as daily firm point to point service. The ISO can consider the potential for making shorter term transmission rights eligible for release to the market under pathway 2 in the future.

[31] The OATT definition of "eligible customer" does not explicitly acknowledge the ISO or the organized market to which transmission rights could be released to optimize transfers.

service to determine whether they can be released to the market under pathway 2. If the terms of the contract support releasing legacy transmission rights consistent with pathway 2, these rights can be made available to the EDAM.

(c) Pathway 3 – Unscheduled Transmission Rights Availability in EDAM

Transmission rights that are not made available as bucket 1 transmission to support the RSE, are otherwise not scheduled under pathway 1 or released under pathway 2, remain unscheduled, *i.e.*, unused, by the time of the day-ahead market run. Under Pathway 3, firm and conditional firm point to point transmission rights that are not scheduled by the day-ahead market run (10:00 a.m.) become available to the EDAM to support optimized transfers. In other words, pathway 3 enables these unscheduled transmission rights to be made available to the market, at 10:00 a.m., to optimize EDAM transfers. Under pathway 3, transmission customers retain the ability to exercise their unscheduled transmission rights after the day-ahead market and into real time as they do under the OATT. If they schedule these transmission rights after the day-ahead market run, the market will seek to accommodate the exercise of those rights if practicable, by re-dispatch if necessary. The transmission customer would not be assigned direct costs of re-dispatch as a result of its use of previously unscheduled transmission rights, as described further below.

Stakeholder comments largely supported the pathway 3 design, particularly with the clarification that transmission customers exercising previously unscheduled transmission rights would not be directly assigned costs of re-dispatch. Some stakeholders continued to suggest that these unscheduled transmission rights should be "carved out" of and not be made available to the market. Stakeholders supporting the pathway 3 approach generally acknowledged the significant benefits provided to the market by making unscheduled, unutilized, transmission available to support transfers, and they indicated that pathway 3 is comparable to the treatment of unscheduled firm transmission rights under the OATT.

The overall EDAM design seeks to harmonize the transmission rights afforded under the OATT with the practical operations of the organized market and the resulting resource commitments and energy transfers emerging from the market optimization. Under Section 13.8 of the pro-forma OATT, schedules for the exercise of firm point to point transmission service must be submitted no later than 10:00 a.m. of the day prior to start of service, and schedules submitted after 10:00 a.m. will be accommodated if practicable. Thus, the OATT establishes a clear scheduling deadline. To the extent firm transmission rights are not scheduled in the day-ahead timeframe, the transmission provider may release them as non-firm transmission. The transmission customer with the firm point to point transmission rights can later seek to exercise these rights by submitting a schedule up until the real time scheduling deadline. However, the transmission customer is not guaranteed the ability to utilize its firm transmission rights not scheduled by the 10:00 a.m. deadline. If the transmission provider can - and does - accommodate the later schedule for firm point to point transmission service, the transmission customer is subject to the cost of the firm transmission reservation under the transmission provider's OATT. However, Section 13.8 of the OATT does not expressly obligate the transmission provider to utilize re-dispatch to accommodate a customer's late scheduled transmission service request, and point-to-point transmission customers generally have no right to rely on re-dispatch to meet their transmission service requests unless they have agreed to compensate the transmission provider for such re-dispatch under the OATT.

The design of pathway 3 for using transmission rights in the EDAM is comparable to transmission customers' ability to utilize these rights under the OATT today. Under pathway 3, firm and conditional firm transmission rights held by a transmission customer unscheduled by 10:00 a.m., would be made available to the EDAM to support optimized commitment of generation across the EDAM footprint and energy transfers in lieu of being released as non-firm transmission for sale by the transmission provider as is done under the OATT. If the transmission customer elects later (after 10:00 am) to exercise its previously unscheduled transmission rights, under pathway 3 it can submit a self-schedule into the market to indicate it wants to use its rights. This is comparable to how it can submit a late firm schedule request under the OATT today. If necessary, the market will seek to re-dispatch generation to accommodate the late self-schedule. In the vast majority of instances, there will be a feasible solution, involving re-dispatch or otherwise, to accommodate the late exercise of these transmission rights, just as a transmission provider today may accommodate such late schedules under the OATT if practicable (*e.g.*, by curtailing non-firm service). There may be instances, based on physical conditions on the grid, where the market may be unable to solve (infeasibility) due to generation outages, limitations in the available generation to support a feasible re-dispatch solution, or transmission outages or constraints. These factors may make it infeasible and not practicable, to accommodate fully or partly the late exercise of transmission rights.

As noted above, the market's ability to accommodate the exercise of unscheduled transmission rights after the scheduling deadline is based largely upon re-dispatch, which may cause certain uplifts in the market that will be allocated to the EDAM entity through settlements. Market re-dispatch is a frequent and common occurrence, driven primarily by changes in conditions between day ahead and real time and within real time as well. As load fluctuates across the footprint, generation and transmission outages materialize, and other physical changes or limitations occur on the grid, the market seeks to re-dispatch generation to meet the changing conditions. As such, the exercise of unscheduled transmission rights after the scheduling deadline is one additional variable that can contribute to the need for market re-dispatch. Because of the frequency of re-dispatch in the market and the interplay of the many factors causing it, the ISO as the market operator cannot specifically distinguish re-dispatch caused by the exercise of previously unscheduled transmission rights from other re-dispatch causes.

The proposal is for the EDAM transmission provider to hold all firm point to point and NTIS customers, including the firm point to point customers that exercise their firm transmission rights after 10:00 a.m. day ahead, harmless from EDAM transfer and congestion costs to the extent feasible by offsetting such potential costs with EDAM transfer and congestion revenues. This element should be a standardized requirement across the participating EDAM balancing areas under their OATTs. However, disposition of shortfalls or excesses of these offsets do not have to be standardized across EDAM balancing areas, and each EDAM entity will identify under the terms of its OATT how these offsets will be allocated further, whether to measured demand or to a different segment similar to how the EDAM entity allocates the surpluses or shortfalls in the WEIM today.[32] This is consistent with the treatment of late schedule submissions under the OATT where the transmission customer is not subject to additional charges for exercising its firm transmission rights to the extent the transmission provider can accommodate the schedule. However, as indicated above, the transmission provider is not obligated to undertake re-

[32] The ISO and EDAM entities will monitor the effectiveness of pooling the transfer and congestion revenues to offset congestion costs and potentially other uplifts that may arise in this context.

dispatch to accommodate a late point-to-point schedule under the OATT.[33] The EDAM, however, will use re-dispatch to accommodate late schedules. The ISO will settle transfer revenues that accrue as a result of transmission being made available to the market under pathway 3 with the EDAM entity.

Pathway 3 maximizes the transmission available to the EDAM to optimize robust transfers and produce significant benefits for the footprint. Although some stakeholders prefer a design that allows transmission customers to "carve out" their firm or conditional firm point to point rights from use by the market and use them at will after the scheduling deadline, such an approach could result in underutilization of the grid and will adversely affect market efficiency and has significant congestion implications. This would greatly reduce the benefits a day-ahead market provides. The proposed pathway 3 design mitigates the risks to the transmission customer of making unscheduled transmission available to the market, and the transmission customer is able to use its transmission rights in a manner similar to its ability under the OATT today. Indeed, the transmission customer arguably is being accorded a better opportunity because the market will seek to utilize re-dispatch to accommodate the customer's late schedule, a right that generally does not exist under the OATT unless it is a condition of the customer's service. In short, the transmission customer continues to be able to exercise it unscheduled transmission rights after the day-ahead market run, and the market will seek to re-dispatch the system to accommodate the use of such rights after the schedule deadline.

Below is a summary of the attributes of pathway 3:

- *Ability to exercise transmission rights after the day-ahead market* – under pathway 3, unscheduled transmission rights (firm and conditional firm point to point) are released to the market to support EDAM transfers, but the transmission customer retains the ability to exercise these rights after the day-ahead market run at 10:00 a.m. The customer exercises these rights by submitting a self-schedule associated with its transmission rights, which will have been registered in the masterfile, or through a different mechanism yet to be determined.
- *Re-dispatch* – as noted above, once the transmission customer exercises its previously unscheduled transmission rights after the scheduling deadline, the market will seek to re-dispatch (if necessary) to accommodate that use. In the vast majority of cases, the market is expected to find a feasible solution to accommodate as the market frequently re-dispatches the system in response to changing conditions and uses of the grid the late-submitted schedules. If the market cannot feasibly accommodate the late schedule, (whether due to derates or other market infeasibility), the market will not disturb the cleared day ahead schedules, or schedules of entities that self-scheduled or otherwise exercised their transmission rights (bucket 1) in a timely manner in the day-ahead market. However, the market will accommodate these late scheduled transmission rights before accommodating newly submitted real time self-schedules.

[33] An exception under the pro forma OATT may be if re-dispatch is a condition of providing point to point transmission service associated with studied transmission upgrades through a system impact study. In those instances, either as an alternative to the transmission upgrade or while awaiting completion of a transmission upgrade, a re-dispatch option may be in place depending on the results of the system impact study and subsequent terms and conditions between the transmission customer and transmission provider enabling re-dispatch. In those instances, section 27 of the OATT makes the transmission customer responsible for the cost of re-dispatch.

- *Transfer revenue allocation to the EDAM entity* – similar to bucket 1 and pathway 1, the ISO will allocate accrued transfer revenues to the EDAM entity. This is a consistent with how the ISO allocates and settles congestion revenues[34] in the WEIM, *i.e.*, with the WEIM entity rather than the individual transmission customer. The EDAM transmission provider would hold all its transmission customers – firm point to point and NITS customers, including the firm point to point customer exercising their firm transmission rights after 10:00 a.m. day ahead, harmless from EDAM transfer and congestion costs to the extent feasible by offsetting such potential costs by accrued transfer and congestion revenues. The EDAM entity would identify under its OATT how to equitably allocate shortfalls or excesses, whether to measured demand or another method which may be consistent with the entity's practice in the WEIM.

Pathway 3 does not apply to legacy transmission contracts, *i.e.,* those contracts executed prior to adoption of the OATT and which are not subject to the terms and conditions of the OATT. These legacy transmission contracts are governed by their own bilateral agreement terms and conditions. If there remains unscheduled transmission capacity associated with a legacy contract, such unscheduled transmission would not be made available to EDAM under pathway 3 recognizing the unique terms of the conditions of those arrangements.

(c) Bucket 3: Transmission Provider Unsold Firm Available Transfer Capability (ATC)

This final proposal retains the bucket 3 design described originally in the revised straw proposal, and retained in the draft final proposal. By excluding transmission hurdles from the day-ahead market design, the optimization can produce more efficient unit commitment and energy transfers that will provide greater benefits for all EDAM entities in the footprint. Moreover, the transmission revenue recovery design will allow EDAM entity transmission providers to recover revenues associated with historical sales of short-term firm ATC, making bucket 3 uses of transmission by the market fair and equitable.

The proposal requires EDAM entity transmission providers to make unsold firm ATC available to the market at the interfaces between EDAM BAAs at 10:00 a.m. to ensure the market can rely on this transmission capacity when identifying transfers. As noted in the context of the other transmission buckets, unsold firm ATC is only made available to the market at the interfaces between two EDAM BAAs and not between the EDAM BAA and a non-EDAM BAA. Moreover, as the unsold ATC is made available to the market at 10:00 a.m., the EDAM entity transmission provider function would need to stop sales of firm ATC at the interfaces between EDAM BAAs until 1:00 p.m. when the day-ahead market results are published. At that point, after the market results are published, the ISO will share a report with each EDAM entity identifying the amount of bucket 3 transmission (unsold firm ATC) used in day-ahead market, at which point the EDAM entity transmission provider can resume sales of unused firm ATC. Bucket 3 transmission, similar to the other buckets, is eligible for accrual of transfer revenues that would be allocated and settled with the EDAM entity.

[34] In the WEIM today, the term congestion revenue encompasses both revenues that accrue as a result of conditions on the transfer points and on the internal transmission system. As discussed in later sections, under EDAM transfer revenue is separated from congestion revenue to distinguish transfer revenue (that accrues on the interties as a result of scheduling limits being reached) and congestion revenue (that accrues on the internal transmission system as a result of binding constraints on the system).

The proposal further supports the EDAM entity's participation in reserve sharing programs and provides that the EDAM entity can specify under its OATT how it will deduct from the amount of firm ATC released to the market any necessary ATC associated with its participation in these programs. More broadly, the methodology for calculating ATC may differ among western transmission providers, and there may be unique circumstances that limit the amount of bucket 3 transmission that is made available. Any unique conditions or circumstances should be considered on a case by case basis and reflected in the EDAM entity's OATT to allow the ISO to account for it in EDAM.

c) Exercising Transmission Rights at Interties with Non-EDAM Areas

This final proposal recognizes there will be transmission customers with firm OATT transmission rights across the interties between an EDAM BAA and a BAA outside of the EDAM footprint. These transmission rights may support delivery of energy schedules wheeling through an EDAM BAA or exporting from an EDAM BAA to a BAA outside the EDAM footprint to support resource adequacy obligations or otherwise meet reliability or operational needs. The EDAM design supports the exercise of these firm OATT transmission rights. Similar to the exercise of transmission rights internal to an EDAM BAA (as described in section II.B.1(a)), the EDAM will accommodate use of these transmission rights. Transmission customers holding firm OATT rights will have pathways similar to those using transmission rights between EDAM balancing areas (as discussed in section II.B.1(b)), with differences that account for the nature of these transmission rights.

Transmission customers holding firm OATT transmission rights across interfaces between an EDAM and a non-EDAM BAA will be able to self-schedule their firm transmission rights through the day-ahead market, whether to wheel through or export from the EDAM footprint. This exercise of transmission rights is effectuated through the submission of a self-schedule in the market in association with existing and registered OATT firm transmission rights.

The transmission customer should indicate before the day-ahead market run, by 9:00 a.m., its intent to schedule energy supported by the exercise of its firm OATT transmission rights in real-time to support load service, meet operational or reliability needs, or otherwise exercise their transmission rights. This indication before the day-ahead market run, will provide the market operator and EDAM entity transmission provider with information on the expected utilization of these transmission rights. When a self-schedule associated with firm transmission rights is submitted into the real-time market, the market may re-dispatch if necessary to accommodate the exercise of those transmission rights. If the market cannot feasibly accommodate the real-time schedule, the market will afford these real-time self-schedules equal priority to cleared day-ahead schedules. In other words, if re-dispatch cannot accommodate the exercise of the transmission rights (previously indicated to be exercised) the market will afford equal priority in real-time to cleared day-ahead schedules. This is appropriate because the transmission customer will have indicated to the market before the day-ahead timeframe that it intends to schedule energy supported by its existing firm transmission rights in real-time. If the transmission rights a customer previously indicated it would use in real-time, are not ultimately exercised, they would be released to the WEIM and would support flows in real-time.

Firm OATT transmission rights that are left unscheduled in the day-ahead market, *i.e.*, without a day ahead indication of intent to utilize the rights later through a transmission reservation, will be available to the market to support optimized flows across the balancing area and between EDAM BAAs. If the transmission customer later seeks to exercise these unscheduled firm OATT transmission rights, the market will seek to re-dispatch to accommodate this later use. If the

real-time market cannot feasibly accommodate the late schedules, the market will not disturb cleared day-ahead schedules. However, the market will accommodate these real-time scheduled transmission rights before accommodating newly submitted real-time self-schedules.

The ISO will monitor the scope and magnitude of the late exercise of these firm OATT transmission rights, including the frequency with which these rights are exercised across different systems and the extent to which notice of intent of utilization is provided before the day-ahead market run. The ISO will be ready to engage with stakeholders to respond to any unintended consequences in the design if necessary.

If the exercise of these firm OATT transmission rights across interfaces with non-EDAM BAAs becomes burdensome across particular paths, interties, or flowgates, or otherwise creates unintended impacts on the market or affects grid reliability, the ISO will consider potential adjustments such as carve-outs of highly impacted transmission from the market. Further, if these rights are used for support of resource adequacy or resource planning programs, the ISO will engage with affected entities to consider further arrangements that may be required to facilitate the exercise of transmission rights across balancing areas.

d) 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 and 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 load serving entities 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 exported 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 priority.[35]
- 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 RSE.[36]

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 the appropriate pathways. Under pathway 1, the rights holder could schedule use of those rights, but unscheduled transmission would not be made available to the market because the rights holder can exercise rights generally into real time. This is consistent with the rights legacy transmission rights holders across the ISO system have today and how they exercise

[35] The ISO is currently undertaking the *Transmission Service and Market Scheduling Priorities* initiative to develop a new, and durable, process for establishing wheeling through priorities.
[36] Payment of the wheeling access charge (WAC) is consistent with the payment of transmission charges today for a high priority exports that are self-scheduled.

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 EDAM revenue recovery proposal described above would allow for the recovery of the revenue shortfall associated with historical WAC revenues.

e) Providing for Historical Transmission Revenue Recovery through EDAM

EDAM entity transmission providers may face the potential risk of foregone transmission revenues based upon decreased sales of short-term transmission because they have made transmission available to the EDAM. The ISO too may potentially experience reduced wheeling access revenues under the EDAM. Providing a mechanism in EDAM for transmission providers, including the ISO, to recover potentially foregone revenues is an important element of the overall design. This section describes the proposed design to enable a transmission provider to recover historical and associated transmission revenues through EDAM.

The draft final proposal continued to propose a design to allow for the recovery of EDAM recoverable transmission revenues that consist 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 approved[37] 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 transmission revenues based on these three components on an annual basis, with the exception of the wheeling through component, which would be included only for months where specified conditions trigger. The EDAM recoverable transmission revenue amounts would then be allocated to gross load across the EDAM footprint, with the understanding that each EDAM entity would not be allocated its own EDAM recoverable transmission revenues. There would be an annual true-up to support actual revenue recovery of shortfalls by individual EDAM entities.

Stakeholder comments continue to generally support the overall concept and framework for the transmission revenue recovery design, although some stakeholders sought further clarifications regarding the various design components. Stakeholders generally recognized the importance of a transmission revenue recovery mechanism to mitigate the risk of reduced revenues the transmission provider is expected to collect at the outset of EDAM. Other stakeholders suggested additional oversight and transparency measures regarding the data inputs and monitoring for unintended consequences.

[37] For new transmission upgrades to be incorporated into the EDAM recoverable transmission revenues, the upgrades must have been approved through an applicable regulatory process.

The final proposal retains the design framework described in the draft final proposal with clarifications and enhancements in response to stakeholder comments. The ISO provides further clarification and details regarding the proposal below.

(1) Determining the Revenues Recoverable Through EDAM

The EDAM recoverable transmission revenues are comprised of three components that represent the recoverable revenues through the EDAM. The intent is to ensure each EDAM entity transmission provider, or other transmission provider within the EDAM BAA, recovers its historical transmission revenues associated with certain transmission products that may experience reduced use as a result of EDAM.

(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 certain transmission products due to its participation in EDAM. These may be non-firm point to point revenues arising from the proposed bucket 2 transmission design where unscheduled firm and conditional firm transmission is 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. 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 made available for supporting EDAM transfers.

The draft final proposal continued to recommend that the EDAM recoverable transmission revenues consist of only those associated with historical transmission sales to third parties, not sales to the EDAM entity's merchant function. It further proposed that the following non-firm point to point transmission products, which may have lower sales volumes, would also be eligible for inclusion in the EDAM recoverable transmission revenues:[38]

- 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 firm products that may see reduced sales. It further proposed the following short-term firm point to point transmission products would also be eligible for historical revenue recovery and be included in the EDAM recoverable transmission revenues.

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

[38] 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.

- 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 revised straw proposal recommended that foregone WAC revenues associated with third-party wheels through or exports from the ISO be eligible for recovery and be included in the EDAM recoverable transmission revenues.

The draft finial proposal also continued to recommend 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. It is not appropriate to include historical foregone revenues associated with sales of short-term and non-firm transmission to the merchant function of the EDAM entity. Such an approach would allocate or shift costs to the footprint associated with transmission sales to a different branch of the same company. Under most instances today, a vertically integrated utility has different accounting mechanisms for sales of transmission to a branch of itself, through offsetting accounts not an actual exchange of physical payments. It would be inappropriate to recover costs of transmission accounted for as inter-company offsetting accounts through the EDAM by shifting the costs to the rest of the footprint.

Some stakeholders continued to request that component 1 allow for recovery of historical revenues associated with monthly firm and non-firm transmission sales, in addition to weekly, daily, and hourly transmission sales. These stakeholders noted that there is a level of uncertainty associated with the impact of the EDAM on short-term transmission sales, which includes the monthly products, and thus these should be considered as part of the historical revenue recovery. The final proposal extends component 1 to include historical revenue recovery associated with monthly firm and non-firm transmission products. Including monthly transmission products in component 1 recognizes that monthly transmission products are short-term products and ensures the entire, spectrum of short-term transmission products ranging from monthly to hourly are eligible for historical revenue recovery. Short-term products generally are more at risk of reduced sales than long-term transmission service. Further, monthly transmission products typically make up a smaller portion of the overall short term sales; daily and hourly transmission sales are more prevalent. By including the requirement that generation must be associated with transmission reservations, or otherwise the transmission provider would assess a transmission charge, entities have a continued incentive to reserve transmission including longer duration transmission. As discussed later, continued sales of transmission under the OATT would reduce the revenue shortfall that would need to be recovered through the EDAM to ensure that the transmission provider is recovering their historical revenues associated with the eligible products.

The final proposal, with the inclusion of the monthly transmission product, provides that the EDAM recoverable transmission revenues consist of the historical revenues associated with the following short-term firm and non-firm transmission products:

- Short Term Firm Products:
    - Hourly Firm Point to Point (if product is offered by the transmission provider)
    - Daily Firm Point to Point
    - Weekly Firm Point to Point
    - Monthly Firm Point to Point
- Non-Firm Products:
    - Hourly Non-Firm Point to Point

- Daily Non-Firm Point to Point
- Weekly Non-Firm Point to Point
- Monthly Non-Firm Point to Point

The historical revenues recoverable through the EDAM based on the products noted above are associated with historical sales to third parties and not sales to the EDAM entity merchant function.

(i) Calculating the EDAM Recoverable Transmission Revenues and the Shortfall Recoverable Through EDAM

The EDAM recoverable transmission revenues are represented by the total historical revenue at risk associated with certain transmission products that are eligible for recovery through the EDAM. For EDAM entities operating under the OATT, the EDAM recoverable transmission revenue would be 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 function). Generally, non-firm and short term point to point transmission sales to third parties represent less than 10% of the total historical revenue requirement of the transmission provider, but it may vary among providers. For the ISO, the EDAM recoverable transmission revenues are the total historical Wheeling Access Charge (WAC) revenues associated with exports and wheels through the ISO system by third parties. For the ISO, WAC revenues associated with third parties represent 2-3% of the total transmission revenue requirement. The table below is a simple example of the EDAM recoverable transmission revenues design.

	Total Revenue Requirement	**Non-Firm sales (3rd party)[39]**	**Short-term Firm sales (3rd parties)[40]**	**EDAM Recoverable transmission revenues**	**Ratio (EDAM recoverable revenues / Total revenue requirement)**
EDAM Entity (OATT)	$100 Million	$3 million	$4 million	$7 million	7%

Table 1: Identification of the EDAM recoverable transmission revenues and ratio of recoverable revenues to total revenue requirement.

There are two key questions regarding calculation of the EDAM recoverable transmission revenues: (a) across what time period is the historical at risk EDAM recoverable transmission revenue derived; and (b) how often is the historical at risk EDAM recoverable transmission revenue amount updated.

- *Timeframe for deriving the at risk EDAM recoverable transmission revenue:* The proposal is for each EDAM BAA transmission provider to calculate its BAA's EDAM recoverable transmission revenues based on its average FERC-approved (or applicable regulatory authority-approved) historical transmission revenues 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 BAA's total EDAM recoverable transmission revenues as the sum of ISO participating transmission operators (PTO) EDAM recoverable transmission revenues amount. The ISO PTO EDAM recoverable

[39] Based on historical sales of non-firm transmission to third parties.
[40] Based on historical sales of short-term firm transmission to third parties.

transmission revenue amount shall be equal to the average FERC-approved transmission revenue balance account adjustment from wheeling third party transactions over 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 transmission revenues going forward. A longer duration sample size is appropriate. 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. Stakeholder comments generally supported the three-year lookback horizon for measuring historical EDAM recoverable transmission revenues. The EDAM entity would be required to provide supporting information for the calculation, and the final submission of the historical EDAM recoverable transmission revenues should be signed and attested to by an appropriate senior executive of the organization or ratified by the board or other overseeing authority of the organization. The data would be made available publicly in the interest of transparency.

- *Updating the EDAM recoverable transmission revenue amount:* The proposal continues to be that the EDAM recoverable transmission revenues be reviewed and updated after two-years of participation in the EDAM. Although some stakeholders suggested a longer time horizon to provide stability, a two-year horizon is important to provide an opportunity to update these values relatively soon after participation commences to evaluate patterns in transmission usage change and update the values to reflect those patterns. Locking in the period of the EDAM recoverable transmission revenues for a longer period may be overly restrictive and could lock the values for too long without providing an opportunity to account for changed conditions.

The EDAM recoverable transmission revenues represent the upper bound of transmission revenue recovery associated with the transmission products identified. However, the amount subject to recovery through the EDAM is expected to be much smaller because it will be offset by ongoing transmission sales throughout the year under the OATT or the terms of the ISO tariff, whichever applies. EDAM entities and the ISO will continue to administer their respective tariffs and continue to sell the transmission products noted above and, for the ISO, continue to collect WAC revenues. Those sales would reduce the amount needed to be recovered through the EDAM – the historical transmission revenue shortfall to support historical revenue recovery.[41]

The total recoverable revenues through the EDAM consist of the difference between the historical EDAM recoverable transmission revenues (upper bound) and the actual transmission revenues collected through transmission sales of the products eligible for recovery under the terms of the respective tariffs, deriving the recoverable shortfall.

$$Recoverable\ Shortfall = EDAM\ Recoverable\ revenues\ (historical) - Actual\ transmission\ revenues$$

[41] 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.

Table 2 below illustrates further the example of the recoverable shortfall recoverable through the EDAM.

	EDAM Recoverable shortfall	NF PTP Actual Sales	STF PTP Actual Sales	Total Shortfall
EDAM Entity	$7 million	$2 million	$3 million	$2 million

Table 2: Deriving the EDAM recoverable shortfall.

As indicated in the table above, although the EDAM recoverable transmission revenues 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 total shortfall recoverable through the EDAM would be only $2 million. The EDAM entity will be responsible for providing supporting information regarding actual sales of the applicable transmission products that contribute to the identification of the total shortfall recoverable through the EDAM.

(ii) Limits to the EDAM Recoverable Transmission Revenues

In response to the revised straw proposal, stakeholders that commented on this element of the design largely supported establishing a bound to limit the transmission revenues recoverable through the EDAM as described in the proposal. Stakeholders believed the bound was a reasonable initial safeguard to avoid disproportionate cost shifts. Some stakeholders suggested that the design should remain flexible to evolve to a different or otherwise superior design over time as the EDAM evolves and there is actual experience with proposed overall design.

In response to stakeholder feedback, consistent with the draft final proposal, this final proposal continues to provide for a bound, or limit, to the EDAM recoverable transmission revenue amount based upon the EDAM transfer flows compared to the total EDAM and non-EDAM exports of a BAA. Such a bound would avoid shifting of costs to the EDAM disproportionately compared to using the EDAM entity system to support EDAM transfers. The EDAM recoverable transmission revenues upper bound seeks to apply a limit 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.

$$Revenue\ Recovery\ \ Bound = \frac{EDAM\ Transfer\ Use\ (MWh)}{Total\ Exports\ (MWh)} \times EDAM\ Recoverable\ Transmisison\ Revenues$$

The ISO must consider the limit on a monthly basis based on the prior month's transfer use and exports to derive a recoverable limit. After gathering longer-term data, the limit would be applied on a longer term basis, across a full year of data to derive the ratio of EDAM transfer use to total exports. After EDAM launches and the ISO and other EDAM entities gain experience with implementing and applying these methodologies, we will consider changes and improvements to ensure it is applied appropriately and ultimately serves its function of avoiding cost shifts to the EDAM.

(b) Component 2: Percentage of New Transmission Builds

The second component eligible for transmission revenue recovery through the EDAM is associated with new transmission construction approved via applicable regulatory processes.[42] New transmission facility upgrades that increase the transfer capability between EDAM BAAs creating the potential for additional transfers. There could be foregone transmission revenues associated with non-firm and short-term firm transmission sales on new builds. This foregone revenue risk also should be considered. The amount of new transmission upgrade revenue requirement that would be recoverable through the EDAM is limited to the ratio of the non-firm and short-term firm point to point historical EDAM recoverable transmission revenues associated with third-party sales, associated with the transmission products described in component 1 above[43], on the new upgrade to the total EDAM entity transmission provider revenue requirement.

Table 1 above can be used to illustrate this. In that prior example showing derivation of the EDAM recoverable transmission revenues, the non-firm and short term firm point to point revenue requirement makes up $7 million of a total $100 million, *i.e.*, it is 7% of the total EDAM entity transmission revenue requirement. This percentage would be applied to the revenue requirement of the new transmission upgrade that increases transfer capability between EDAM BAAs. If the upgrade adds $50 million to the total revenue requirement, then the amount recoverable through the EDAM would be 7% of that amount, a total of $3.5 million.

A new transmission project is eligible for partial recovery through EDAM if it increases the transfer capability between two EDAM BAAs to support additional transfers and benefits for its participants, which is effectuated through and reflected in EDAM Transfer System Resource(s), (ETSR), between EDAM BAAs.

In comments to prior iterations of the proposal, some stakeholders requested that the component 2 mechanism also account for potential reduced short-term firm and non-firm transmission revenues associated with expiring legacy (non-OATT) transmission contracts, and the draft final proposal introduced this for consideration. Stakeholders commenting on this topic supported including this in component 2, recognizing it may not be a frequent occurrence and, to the extent the created ATC is sold through OATT process, it should reduce the recovery through this component. This is consistent with the general principle of allowing for recovery of costs associated with new transmission to account for a small portion of potentially reduced sales. Although transmission providers make transmission service available for sale under the terms and conditions of the OATT, there are still remaining legacy transmission contracts – executed prior to the adoption of the OATT – with unique terms and conditions. Over time, these transmission contracts may migrate to OATT service or otherwise expire. If a legacy transmission contract expires and is not converted to an OATT contract with that transmission customer, the transmission becomes available for sale through the OATT, and some of that

[42] The EDAM entity will need to provide supporting information to demonstrate approval of projects and relevant financial information to support the derivation of the amount to be recovered through the EDAM. The document should be signed by a senior executive of the organization or approved by the Board or other overseeing body.

[43] Component 1 is based on historical revenues associated with the following transmission products: monthly firm and non-firm transmission, weekly firm and non-firm transmission, daily firm and non-firm transmission, and hourly firm and non-firm transmission.

released transmission might support short-term firm and non-firm sales. In the context of the EDAM, the transmission provider may also see reduced revenues from sales of non-firm and short-term firm transmission associated with the release of transmission capacity resulting from the expiration of a legacy transmission contract. These reduced revenues would be approximated based on the same methodology applied to new transmission builds by applying the ratio of the short-term firm and non-firm historical revenues to the overall transmission revenue requirement. This ratio would be multiplied by the value of the firm transmission released to the market.[44] Because component 1 considers reduced transmission sales of short-term firm and non-firm transmission across the system as a whole, this design element would not need to be limited to transmission capacity that is created at the interties between two EDAM BAAs.

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

The third component of revenues 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 periods across the year. In those situations, the WEIM entity's transmission system supported robust wheels through its system benefitting other WEIM participants, and this scenario could occur in the EDAM as well.

The proposal continues to be that in those limited periods where this net difference occurs, the EDAM entity would be compensated for the excess transmission use supporting net wheel through transfers across its system. The wheels through the EDAM entity system create 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's 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.[45]

Stakeholders that commented on this particular element of the proposal largely supported or did not oppose the design. However, in comments to prior iterations of the proposal some commenters requested clarification that transmission costs for supporting wheeling through transfers above the import/export transfers should only recover these costs if there is insufficient alternate revenues to cover the uses of their system. This proposal clarifies that the EDAM recoverable transmission revenues, across the three components, are viewed together, and to the extent that the actual revenues through OATT sales exceed the historical EDAM recoverable transmission revenues, those revenues in excess of component 1 would be utilized to offset recoverable revenues through components 2 or 3 described above.

In comments to the draft final proposal, one stakeholder commented that compensation under this component 3 for net wheeling through transfer volumes in excess of import/export transfers

[44] To the extent there are unique conditions where the historical short-term sales cannot be derived, there may need to be consideration of an appropriate proxy to these on a case by case basis and discussed more broadly with the EDAM and stakeholder community.
[45] The EDAM entity will be required to submit supporting information for the derivation of the amount recoverable through component 3 signed off by a senior executive of the organization or otherwise approve by the organization's Board or other appropriate overseeing authority.

would allow for double recovery of transmission costs because component 1 already allows for recovery of historical transmission revenues associated with short-term transmission products. It is important to recognize that component 3 reflects compensation beyond component 1 and covers different uses of the transmission system than may be present today. Recovery under component 1 reflects recovery of historical transmission revenues associated with specified short-term transmission products, while compensation under component 3 provides for compensation associated with higher transmission use of the transmission system to support transfers, to support and derive benefits for the rest of the EDAM footprint, which are uses of the system not necessarily present today nor compensated. Moreover, historical transmission revenue volumes do not account for or reflect these new potential uses, associated with EDAM wheel through transfers across the EDAM entity's transmission system that may, in certain periods of the year and conditions, support more wheel through EDAM transfers across their system than import/export transfers.

(2) Allocating Revenue Shortfalls in the EDAM

The previous sections focused primarily on the inputs into the EDAM recoverable transmission revenues to recovery through the EDAM. This section describes a design to ensure each EDAM entity can recover the necessary revenues to cover its actual revenue shortfall based on the recoverable revenue elements and provides a true-up opportunity at the end of the year. The intent of the design is to cover actual revenue shortfalls as much as possible.

The proposal is that each EDAM entity estimate its expected annual revenue shortfall (associated with earlier components), 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 shortfall is identified by the EDAM entity, a rate that allows for recovery of the estimated shortfall across the footprint would be derived.

Prior iterations of the proposal recommended to apply this derived rate as an uplift rate that would be assessed either to gross load across the footprint or to demand plus supply across the footprint. In allocating this uplift charge, the proposal was to not allocate an EDAM entity its own revenue shortfall so its load does not have to pay for its own cost recovery.

Stakeholders that commented on the appropriateness of the allocation methodology generally supported allocating the uplift rate to gross load as opposed to gross load and supply. This is in large part predicated on the assumption that generation in the EDAM BAA is either a designated network resource dedicated to serving load or generators have purchased transmission service across the EDAM BAA transmission system. Stakeholders generally supported the proposal that the EDAM entity should not pay for its own revenue shortfall recoverable through the EDAM.

In light of the stakeholder comments, as well as the new requirement in this draft final proposal that generators within an EDAM BAA must be a designated network resource or otherwise have reserved transmission service under the OATT as described in section II.A.1(c)(3), the proposal continues to allocate the EDAM revenue shortfall to gross load[46] across the EDAM footprint. Load ultimately benefits from the optimized transfers, and because supply must be associated

[46] Gross Load: metered demand measured through meter data from end-use meters excluding excess behind the meter values or metered demand calculated without end-use meters.

with a transmission reservation on the system, supply will contribute to the costs of the system. However, each EDAM entity will not be allocated its own revenue shortfall.

The ISO would derive an annual EDAM entity-specific rate (which excludes its own recoverable 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 revenue 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 revenue shortfall is being distributed, (2) calculating the total BAA revenue shortfall allocation, and then (3) dividing the total BAA revenue shortfall allocation by the BAA gross load. The tables below illustrates the resulting rate for individual BAAs based upon this methodology.

BAA	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	Revenue shortfall Allocation ($ in Millions)					BAA Specific Rate[47]
	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 3: deriving a BAA-specific rate based on a gross load allocation.

The EDAM revenue shortfall amounts would be settled monthly. 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 EDAM revenue shortfall for BAAs 2, 3 and 4. These values are realistic as a starting point for EDAM revenue 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 3 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 EDAM revenue shortfall levels to provide a range of possible BAA specific rates.

[47] The BAA specific rate is calculated as the sum of BAA EDAM revenue shortfall allocations from other BAAs EDAM revenue shortfalls divided by the gross load of BAA in which the revenue 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.

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

Throughout the year, each EDAM entity will collect revenues towards its forecasted revenue shortfall. At the end of the year, each EDAM entity will also know its actual revenue shortfall based on the OATT sales conducted throughout the year, which would go towards reducing the revenue shortfall recoverable through EDAM. Based on the actual revenue 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.

The revised straw proposal offered two options for addressing any surplus or shortfall (1) a year end true-up where the surpluses and shortfalls are settled; or (2) year-end true-up carrying over the shortfalls or surpluses into the following year's calculation of the forecasted historical recoverable transmission revenues, 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). Under approach 2, any shortfalls or surpluses are carried forward into next year's forecasted revenue shortfall assessment (and either increase or decrease that value).

In comments to the draft proposal, stakeholder commented in support of option 2 – a year-end true-up that allows carrying shortfalls or surpluses of the forecasted historical recoverable transmission revenues into the following year's calculation. They recognized this may affect the calculated BAA-specific rate. This final proposal retains the framework of a year-end true-up as previously proposed. The ISO will monitor the process closely and work with stakeholders to adjust these processes if additional enhancements or clarifications are needed.

(4) Establishing Transparency and Miscellaneous Items

Throughout the initiative stakeholders noted the importance of ongoing oversight and monitoring of the historical EDAM recoverable transmission revenue process for any unintended consequences and to inform possible adjustment to the methodology as necessary. These stakeholders acknowledged a role for both the ISO and the EDAM entity to ensure unintended consequences can be identified and rectified promptly. Other stakeholders emphasized the need for transparency in this area to ensure that information forming the basis for recoverable revenues is made available publicly and is easily accessible and verifiable, instilling confidence in the resulting revenues that are recovered through the EDAM.

This proposal recognizes that transparency and oversight through robust monitoring are important aspects of the design for historical transmission revenue recovery through the EDAM. Monitoring and transparency by the ISO and EDAM entities will instill confidence in the overall design and allow for prompt identification and rectification of unintended consequences. Throughout the different sub-sections of the revenue recovery design, the proposal identifies transparency and data requirements. Additional suggestions to improve the transparency of the process can be considered and accommodated in the future.

Separately, throughout the initiative some stakeholders suggested that accrued transfer revenues associated with bucket 3 transmission – unsold firm ATC made available by the transmission provider – should be credited toward offsetting the EDAM recoverable transmission revenues. They note that the EDAM entity would realize value from the unsold transmission in exchange for making bucket 3 transmission available.

In this context, it is important to recognize the distinction between the EDAM recoverable transmission revenues and the accrual of transfer revenues to determine if these should effectively be commingled and transfer revenues used to offset the EDAM revenue shortfall. Transfer revenue represents a separation in the marginal energy costs between EDAM BAAs, and, along with congestion costs, they are new day ahead cost exposures to customers that are currently hedged in the bilateral world. Those transfer revenues can be utilized to hold transmission customer harmless because in some periods costs may be incurred, but in other periods, surplus revenues can offset those costs to mitigate customers' exposure. This may not potentially be seen as a new source of revenue but as a mechanism to hedge cost exposure for customers, along with congestion revenues. On the other hand, the design for the EDAM historical transmission revenue recovery seeks to ensure the transmission provider continues to recover its historical revenues paying for the embedded costs of the transmission system.

Another important element to recognize is that all transmission buckets realize and accrue transfer revenue, even bucket 1 and bucket 2 where the transmission reservation costs have been recovered by the transmission provider. Similarly, transfer revenue does not represent all of the uses of the transmission system, particularly given the conditions and limited frequency with which transfer revenue accrues. Bucket 3 transmission can be utilized every hour of every day to support EDAM transfers, and the revenue recovery framework is intended ensure historical revenue recovery associated with short term firm transmission reservations, which, in part, are represented by bucket 3 transmission. Although there is value realized through the accrual of transfer revenue associated with bucket 3 transmission, in instances when the transfer limit binds, these revenues do not necessarily represent the quantity and frequency of bucket 3 transmission use to support EDAM transfers. As such, this proposal does not require that bucket 3 transfer revenues offset the EDAM revenue shortfall for EDAM participants.

f) Registering and Exercising Transmission Rights

An important design component of the transmission framework is to allow transmission customers to exercise their transmission rights, whether under the OATT or as legacy (pre-OATT) transmission arrangements. In the ISO market today, the market recognizes the exercise of legacy contracts through functionality known as the exercise of "ETCs/TORs."[48] An entity holding a legacy transmission contract or a transmission ownership right exercises these rights by submitting a self-schedule that is paired with the ETC/TOR. This indicates to the market the exercise of transmission rights that is not subject to a transmission charge, receives a congestion hedge between the source and the sink, and has a high scheduling priority. The permissible parameters of ETC/TOR rights are defined by instructions provided to the ISO by the transmission owner - the ISO does not interpret existing contracts or define ownership rights.

Throughout the discussion of the transmission commitment design, the proposal has alluded to the exercise of ETC/TOR functionality to enable the transmission customer to exercise its OATT (or legacy) transmission rights and also obtain the hedge on the congestion. The congestion hedge not only precludes the accrual of congestion costs, it also precludes the accrual of congestion revenues. Functionality and procedures are necessary to support the exercise of existing transmission rights, including registration of the transmission rights so they are known

[48] ETC/TOR functionality refers to the mechanism for exercising existing transmission contracts and transmission ownership rights. It is used in this context to reference the functionality, not the rights.

to the ISO and the market.[49] These procedures and the associated functionality ensures that when these rights are exercised they are visible to and respected by the market, as well as settled.

Transmission rights in EDAM afforded ETC/TOR like treatment must be registered in the ISO master file following coordination between the transmission customer or transmission owner who holds the transmission rights and the EDAM entity (*i.e.,* the transmission owner or transmission service provider) that will validate the transmission rights. The entities would then coordinate with the ISO regarding the submission of transmission rights and transmission curtailment (TRTC) instructions that define the nature and scope of transmission rights. Once the TRTC instructions are finalized and registration in the master file is established, the transmission rights will be assigned a contract reference number (CRN) that identifies them. This unique number, which could correspond to the numerology used by the transmission owner if it is compatible with the ISO's systems, must be utilized when self-scheduling the use of such eligible transmission. The CRN also provides an indication to settlements not to assess transmission charges with the exercise of these rights, and the assigned scheduling priority in the market.[50] One stakeholder commented that the registration process for transmission contracts may be overly burdensome, especially with sizable volumes of transmission contracts that may be prevalent across transmission providers and balancing area. The ISO recognizes these concerns and is open to working with individual EDAM entities to find ways to ease this burden, including the potential aggregation of transmission rights that may not require registration of individual transmission contracts.

Because the EDAM entity transmission provider will continue to sell short term firm transmission under its OATT, it will also be necessary to design a system or mechanism where monthly, weekly and daily firm transmission reservations in particular can be exercised, released, or otherwise made available to the market. The transmission customer would register, in coordination with the EDAM entity not only transmission rights across interfaces between EDAM BAAs, but also point-to-point transmission rights that are internal to the system that they plan to exercise.

2. Day-Ahead Resource Sufficiency Evaluation

The EDAM resource sufficiency evaluation (EDAM RSE) is intended to ensure that each EDAM entity, including the ISO, is able to meet its BAA obligations (forecasted demand, uncertainty, ancillary service requirements) prior to engaging in transfers with other participating BAAs through the day-ahead market. Because balancing authority areas across the West are not subject to a common resource adequacy or resource planning program, the EDAM RSE is intended to serve as a common mechanism to ensure day-ahead supply sufficiency and avoid leaning on the pool of supply by any one EDAM participant. Although participating EDAM entities comply with their own individual resource adequacy or resource planning programs, in stressed system conditions the EDAM RSE design incents entities to come to the market with sufficient forward procured supply to prevent entities with insufficient resources leaning on others.

[49] *See* ISO Tariff sections 16 and 17 (explaining the procedures by which the ISO honors existing rights on the ISO controlled grid and transmission ownership rights in the ISO balancing authority area.
[50] Failure to reference the CRN properly and establish a balanced source and sink consistent with the TRTC instructions and master file registration may result in assessment of congestion and other charges.

Additionally, the day-ahead RSE protects the diversity benefits created from participation in the EDAM through the procurement of imbalance reserves to meet any uncertainty or variability that materializes between day ahead and real time. Traditionally each BAA is responsible to meet its forecasted load and variability in net load between day ahead and real time to ensure reliable operations. The EDAM reduces the procurement requirement of each participating BAA to meet uncertainty over a large geographic footprint by sharing the collective risk that the uncertainty will materialize across the diverse footprint. The EDAM RSE design helps preserve this diversity benefit of a lower collective uncertainty requirement procurement target into real time.

The EDAM RSE tests whether each participating BAA has sufficient capacity and flexibility ahead of participating in the day-ahead market at 10:00 a.m. and imposes consequences for a 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 participating BAA to access more economic energy than it would have without access to the EDAM. The process also presents an opportunity to procure additional supply through the market or backfill a deficiency and thereby retain the pooling benefit of passing into real time.

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 the 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, the proposal is to offer an on-demand application to conduct advisory RSE runs.

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 each EDAM BAA's imbalance reserve requirements[51] 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 of the day-ahead market uncertainty calculated 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., shortly prior to running the day-ahead market. Nevertheless, EDAM entities will have access to the tool so they can test their sufficiency on an advisory basis outside of the 6:00 a.m. and 9:00 a.m. advisory runs.

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.[52] 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

[51] This proposal is being considered in the Day-Ahead Market Enhancements (DAME) initiative.
[52] The optimal solution will be subject to all constraints defined in Appendix 1.

function of the application to minimize the total cost, as a means to determine the most efficient use 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.(g).

c) Resource Deliverability in the EDAM RSE

Certain stakeholder comments have raised concerns that resources shown in the EDAM RSE ultimately may be unavailable for dispatch within the market application because transmission constraints existing in the market optimization may not be considered within the RSE. Underlying this concern is the potential that a BAA could pass the EDAM RSE yet still have insufficient resources available to clear the day-ahead market. Stakeholder comments also broadly recognized that although modeling the, transmission constraints in the EDAM RSE was desirable, it would not increase the accuracy of the test sufficiently to justify the significant effort and complexity of implementing such modeling at this time. For reasons discussed below, the draft final proposal does not propose modeling transmission elements and constraints within the EDAM RSE. The proposal includes adopting stakeholder recommendations that the ISO consider monitoring and evaluation of the RSE for a period of time to ensure that it performs as expected without the modeling of transmission constraints.

Including transmission elements in the EDAM RSE would require using the ISO's full network model (FNM), which in turn would require integration with additional market applications.[53] 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 thus there would be trade-offs between the number and frequency of advisory runs prior to the final binding EDAM RSE and the accuracy of 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 time of every advisory run; what is the acceptable level of accuracy of EDAM RSE with the full network model and transmission constraints?
- What volume of transmission constraints would be tested for in the market run?
- How would remedial action schemes (RASs) or nomograms be considered?
- What consideration should be given to intertie bids at the ISO's BAA border?

[53] 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.

Beyond these accuracy trade-offs and the functionality challenges, there would need to be consideration of 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, the policy would need to include a methodology to somehow attribute the cause of this insufficiency accurately.[54] 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?

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 undeliverable and to what extent. 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 undeliverable because the supply would have neither an IFM nor a RUC award. The results of this monitoring during parallel operations and the first year of EDAM participation will help inform market design evolution.

d) 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 BAA requirements, including demand and ancillary service obligations, in each of the 24 hours of the day-ahead market run, as well as the flexibility to ramp between the requirements in each hour. The following summarizes the 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; EDAM generation-only BAA's will have an average loss factor applied based on their forecast or bid in resource output. This will ensure the most accurate forecast is used for the EDAM RSE and RUC process; metrics will be maintained to ensure the most accurate forecast is being used.

(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.[55] Potential generation-only EDAM BAA's may

[54] Outages are submitted to the market operator through the outage coordination process, but outage coordination remains the responsibility of each EDAM balancing area, making this difficult.

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

receive imbalance reserve obligations if they operate variable energy resources that drive the intraday uncertainty imbalance reserves are designed to address.[56]

(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. These requirements will be provided to the market operator prior to running the EDAM RSE, and the EDAM entity can update them until 9:00 a.m. when all test inputs are fixed. 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 have in place today for delivery of the reserves. This transmission capacity will be withheld from the market optimization to ensure the deliverability of the reserve sharing obligations in real time.

(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. Availability bids for any portion of the forecasted supply of variable energy resources will be inserted for any forecasted quantity that does not have a bid. This will ensure RUC has sufficient capacity and accurately considers the impact of variably energy resources when clearing against the forecasted obligation.[57]

e) 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 resources[58] located within the ISO BAA that are bidding into the EDAM but are not otherwise forward contracted.[59] EDAM will include functionality for the EDAM entity to validate the contractual status of all resource bids and self-schedules within its BAA, without pricing information. This functionality will allow the EDAM entity to ensure third party resources not under a forward contract with a load serving entity either internal to or external to its BAA are not counted within its RSE (or are counted if the resource is contracted elsewhere and the transaction is being considered as a bucket 1 transfer to another EDAM BAA).

[56] Variable energy resources operated by a generation-only BAA will be eligible to fulfill this requirement.
[57] RUC is further discussed in section II.C.3.
[58] Resources participating within the ISO BAA operate under a participating generator agreement (PGA), which references performance obligations in the ISO tariff.
[59] Additional discussion regarding the counting of intertie bids made at the ISO border with a non-EDAM BAA are discussed in section II.B.2(e).

(1) 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 around 1:00 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.[60] 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 provide access to the advisory D+2 market results to the scheduling coordinators representing gas resources. They can request the information for their specific gas generators no later than 5:00 a.m. of the day-ahead market run; *i.e.*, 5:00 a.m. on D+1. Limited results would also be shared with the EDAM entity, transfer schedules that can support reliability studies and outage coordination.

Stakeholders also suggested additional enhancements such as the ability of the market to apply constraints or grouping constraints that capture pipeline restrictions in an EDAM footprint and ability to aggregate use limited modeling of gas resources in particular gas regions. The proposal is to consider further enhancements later as these are specific to pipelines to which multiple EDAM BAA's may interconnect. Any potential use of such a constraint will require careful coordination with potential EDAM BAAs. Some stakeholders also indicated that consideration should be given to extending the advisory day ahead results to D+3 to help inform gas procurement over the weekend period. The proposal is to make these advisory D+3 day-ahead results available; however, it should be noted that the accuracy of these results is only as good as the bids and available VER and demand forecasts, which in the D+3 timeframe may not be sufficiently accurate for this purpose. The ISO remains open to additional enhancements as necessary to support effective resource participation based upon unique limitations or considerations associated with gas pipeline delivery systems supporting EDAM entities.

(2) 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 proposal is to 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 proposal is that the ISO will facilitate hydro resource modeling that

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

allows multiple related resources comprising an aggregated resource to function as a single resource in the market.[61]

(3) 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. For EDAM BAAs that do not allow convergence bidding, bidding limitations will exist in the IFM to ensure demand cannot be scheduled above the supply brought by the BAA. These load bidding rules will be based on the difference between the bid-in VER supply and the forecast VER output; however, the market operator will work with each BAA to adjust this quantity for forecast supply forecast that may not be deliverable because of system conditions. These bidding rules will ensure that the day-ahead market is not exposed to artificial scarcity and its potential to increase prices artificially, due to BAAs participating without sufficient bid-in resources to clear against their own demand obligations. It remains the responsibility of each EDAM BAA to develop rules for how they or load serving entities embedded within their footprint account for the reduced ability to bid in load. 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 the resource's variable energy forecast;[62] otherwise the ISO will insert a zero dollar availability bid for that VER into the RUC. These rules will reasonably ensure the supply clearing in the day-ahead can reliably meet forecasted real time conditions.

(4) Non-Resource Specific Resources

EDAM BAA day-ahead supply plans consist 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.

[61] 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.
[62] 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.

(5) Delivered Firm Energy Contracts

Delivered firm energy contracts, commonly but not exclusively executed through WSPP Schedule C arrangements, are an important component of the supply portfolios of Western load serving entities and have been historically reliable and dependable sources of supply. These types of supply contracts generally include liquidated damages provisions or other performance incentives designed to ensure dependability. Moreover, these are delivered contracts where the supplier makes the necessary transmission arrangements to deliver the energy to a the border of the BAA where the contracting load is located and the point at which the contracting load serving entity takes title to the generation. 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 (10:00 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 rely on delivered firm energy contract 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.

Given the potential lack of resource and transmission specificity by the time of day-ahead market run at 10:00 a.m., stakeholders have expressed concerns regarding challenges that these arrangements raise, including the risk of the supporting resource potentially being double counted in how they are offered into the market and potential congestion price implications. 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 using potentially limited transmission between EDAM BAAs in the day-ahead market.

The proposal is to count delivered firm energy contracts in the EDAM RSE, including WSPP-C, and similar forward contracted supply for the participating EDAM BAAs. If 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.[63] All source-specific forward contracted supply will count towards the EDAM RSE and, if possible, will be modeled in the EDAM.

When the resource supplying the contract 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 day-ahead market price formation 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. Stakeholders have noted that at times they can identify specifically the source of the generation, but if not they can identify the source BAA with reasonable frequency. The participating BAA where the supply from these contracts will sink is expected to make every effort to coordinate both with the supplier/marketer fulfilling these contracts and the source BAA, to ensure these contracts are modeled as a bucket 1 transfers for purposes of EDAM RSE counting as well as IFM market clearing. Functionality will be available to allow the source BAA to incorporate additional resource bids in its EDAM RSE supply to offset the bucket 1 transfer. This will lead to better price formation outcomes in the IFM and, to the extent these non-resource specific supply contracts are modeled in this manner, reduce the potential double counting of resources.

[63] Additional discussion regarding the external resource participation can be found in section II.C.6.

Modeling non-resource specific supply contracts sourced from somewhere within the EDAM footprint as price taking self-scheduled injections into the sink BAA will serve as a secondary option, however, its use is discouraged due to its potential negative impacts on price formation and potential for double counting of supply. Non-resource specific supply contracts sourced from external to the EDAM footprint will be modeled as price taking self-scheduled injections into the sink BAA. Counting non-resource specific supply that is modeled as a self-scheduled injection will be limited by the transfer capacity of the intertie on which the supply is modeled.

Given how the modeling of these contracts in the market can affect day-ahead price formation, the ISO will monitor this issue. If the ISO observes that self-scheduled injections create persistent deviations in results between the day-ahead and real-time markets, causing congestion pricing differences, or producing other adverse outcomes, the ISO will consider developing mitigation measures such as volumetric limitations on the extent to which these contracts can be used.

In summary, the proposal is to count delivered firm energy contracts within the EDAM RSE with the following considerations:

- Strongly encourage identification of the source or source BAA, particularly if it is located in EDAM footprint.
- If source BAA is not known, the arrangement will be modeled as a self-scheduled injection at the intertie of the sink BAA.
- Tagging requirements discussed below that instill confidence in performance of these arrangements.
- Provision for continued monitoring of the impacts of these arrangements on congestion pricing, delivery and performance rate, and ultimate source of the generation.

Separately, the proposal is to require energy scheduled by the EDAM from non-source specific forward supply contracts be tagged within three hours of the ISO publishing day-ahead market results.[64] 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 described above, the EDAM entity will have until the start of the short term unit commitment horizon (STUC),[65] *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.[66]

Some stakeholders submitted comments seeking to establish a *de minimis* dead-band that would recognize how small failures to timely tag should not remove the EDAM entity from continuing within the WEIM RSE pool. If cleared imports are not tagged by the timelines noted above, the proposal allows the EDAM entity to cure these failures through resupply of the

[64] The day-ahead market results are published at 1pm. If publication is delayed, the tagging requirement is within three hours following publication of the results.
[65] 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.
[66] The proposed consequences for not passing the EDAM RSE are discussed in section II.B.2(f)

capacity by the STUC horizon, through additional real-time bids, to replace the supply previously not tagged. In the ISO, for example, additional supply bid in under a real-time must offer obligation or other internal resources can cure the tagging deficiency and keep the entity within the pooled WEIM RSE. Similarly, an EDAM entity can offer in additional supply to the market (whether economically bid or self-scheduled) to cure the deficiency and remain in the pool.

The EDAM BAA that fails to cure its untagged supply will not be a party to the shared uncertainty requirement procured for the EDAM footprint as a whole. The excluded EDAM BAA will instead receive schedules that were optimally procured from elsewhere in the footprint for purposes of passing the WEIM RSE; this is due to the energy and capacity transfers awarded by the day-ahead market meeting the excluded EDAM BAA's day-ahead obligations. Under this proposal, the STUC run assumes transfers into the EDAM BAA that did not pass the RSE are limited for the final four intervals. This allows the market to start additional resources that will be available to the excluded EDAM BAA, increasing its chances of resolving 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 energy and capacity transfers to/from the failed BAA would nonetheless be supported through the market optimization. Per stakeholder feedback, at this time the proposal is to not consider differentiating transfer priority between the real time and day-ahead market; more discussion on this topic can be found in section II.A.2(d).

The proposal is that the 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 could build on the existing reporting the Department of Market Monitoring already conducts for the WEIM.

(6) Day-Ahead Intertie Bids for EDAM BAA's

Stakeholder feedback supports the draft final proposal's direction regarding how non-resource specific intertie bids submitted at the ISO BAA border are counted in the EDAM RSE. Specifically, 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 contract[67] with a load serving entity within the ISO BAA or otherwise have a reasonable expectation of delivery. Accordingly, the proposal is to count:

- Intertie bids associated with a resource adequacy contract whether shown as part of a resource adequacy supply plan on not.
- Intertie bids originating from resources that are pseudo tied with the ISO BAA – these resources have their output telemetered into the ISO and are deemed produced in the ISO BAA under the terms of a contract with the ISO under the tariff.[68]
- Intertie bids originating from dynamically scheduled resources into the ISO BAA – these resources provide telemetered readings of their intertie schedules and have an

[67] The ISO will provide a means for load serving entities to link intertie bids with a forward contract
[68] ISO Tariff, *Pseudo-Tie Participating Generator Agreement,* Appendix B.16.

agreement with the ISO (with scheduling coordinator and host balancing authority area) under the tariff that sets out operating requirements.[69]

- 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.[70] In practice, these resources have a contractual relationship with ISO load serving entities so they 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.[71] 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.

(7) Load Modification/Demand Response Programs

EDAM BAAs may have emergency supply or load modification programs that inform its next-day operating plan. The EDAM design will account for these programs and ensure their potential use does not preclude a BAA from realizing the benefits of day-ahead market participation. To facilitate this approach, the ISO's two demand response models that allow load modification programs to participate in the market as load curtailment will be available in EDAM. 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. However, EDAM entities may have their own demand response programs that may not align with these existing market models.

The proposal would allow EDAM BAAs to represent load modification programs, or supply types that can only be utilized during real time emergencies, through a demand forecast adjustment similar to that used in the WEIM; these modifications will be utilized in both the EDAM RSE and the RUC process.[72] The demand forecast adjustment represents an expectation and a commitment the EDAM BAA will utilize these programs in real time if forecasted conditions materialize; effectively these programs becomes a part of the an EDAM BAA's day-ahead plan. The market operator will review load modifications made to the EDAM RSE requirement against demand response utilization in the real-time to ensure this functionality is not being used to pass the EDAM RSE erroneously. If this functionality is being misused, the market operator will consider limitations to this functionality and potential load bidding rules in the IFM. The objective of this is to prevent an entity from manipulating the EDAM RSE requirements for purposes of

[69] ISO Tariff, *Dynamic Scheduling Host Balancing Authority Operating Agreement,* Appendix B.9; *Dynamic Scheduling Agreement for Scheduling Coordinators,* B.5.
[70] ISO Tariff, *Resource-Specific System Resource Agreement,* Appendix B.13.
[71] 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.
[72] *See* ISO tariff section 29.34(l)(2)(D).

passing the test and avoiding the potential surcharge, 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) limits 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, un-modified, day-ahead forecast, but it would allow the ISO BAA to pass the EDAM RSE and fully participate in the day-ahead market. The ISO BAA would then have RDRR bids enabled into the real-time market for the same intervals ensuring the supply is available for the real-time market's optimal use.

f) RSE Obligation Trading Platform

The proposal is that RSE requirements can be traded between EDAM BAA's through a platform provided by the ISO, *i.e.*, functionally that serves as an ISO-hosted board to facilitate hourly transactions between EDAM participants. On an hourly granularity, EDAM BAAs 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 BAA 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 4: Illustration of bid range trading.

The proposed on-demand EDAM RSE combined with this platform will allow the EDAM BAAs 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 unlike the administrative surcharge to cure deficiencies through the market clearing process as proposed below.

g) Failure to Pass the EDAM RSE

The proposal aims to present a balanced approach to cure deficiencies through the EDAM during all periods with a surcharge commensurate with the magnitude of failure. The surcharge would be based on the maximum hourly deficiency as determined by the EDAM RSE application. The quantity of the RSE failure in any interval is determined as the summation of the under-supply power balance constraint, imbalance reserves in the upward direction, regulation, spinning reserve, and non-spinning reserve relaxation. 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. The maximum hourly value for failure will serve as an input to the failure surcharge calculation.

(1) Consequences of Failure

(a) On-Peak Upward Insufficiency Failure

The proposal is that deficiencies identified in the EDAM RSE be cured, if possible, by the EDAM market through a surcharge. The deficiency would be cured through surplus supply offers that have been willingly bid into the EDAM. The surcharge will vary depending upon the size of the EDAM RSE deficiency. The proposal is to have three tiers of varying consequence for upward insufficiencies for each EDAM BAA, which are described below:

Tier 1: *A de minimis RSE failure up to the higher of 10MW or the forecast error associated with the EDAM entity's upward imbalance reserve requirement.*

- This tier recognizes that a de minimis, failure of the RSE should not be subject to a consequence *i.e.*, an administrative surcharge. Failures within Tier 1 should not cause insufficient supply to clear the market.

Tier 2: *A RSE failure of a magnitude less than 50% of the EDAM entity's upward imbalance reserve requirement, but higher than a Tier 1 failure.*

- This tier recognizes that failures above a de minimis threshold can have more consequential impacts and thus will be subject to an administrative surcharge. Under this tier, although the EDAM balancing area can meet most of its obligations, it cannot meet 50% of its imbalance reserve requirement.
- Tier 2 RSE failures are subject to the administrative surcharge with a 1.25 multiplier. This tier creates a forward procurement incentive to ensure sufficiency ahead of the day-ahead market. A Tier 2 magnitude failure is subject to the administrative surcharge for the full amount of the failure.

Tier 3: *A RSE failure of a magnitude greater than 50% of the EDAM entity's upward imbalance reserve requirement.* A RSE failure within this tier is significant and sizable, indicating that the EDAM balancing area does not have sufficient supply to meet more than half its imbalance reserve requirement and potentially may not have sufficient supply to meet its load. This can create reliability conditions or potentially higher marginal prices for the rest of the footprint. Accordingly, Tier 3 RSE failures are subject to an administrative surcharge with a 2.0 multiplier, creating an incentive to avoid failures of this magnitude and cure insufficiencies through forward procurement before the day-ahead market. A Tier 3 magnitude failure is subject to the administrative surcharge for the full amount of the failure.

If sufficient excess supply is offered into the day-ahead market, the IFM will seek to cure the insufficiency. If the market cannot cure all resource insufficiencies, the power balance constraint will be relaxed optimally. This ensures the supply and transmission in the EDAM is used to meet the maximum quantity of bid in demand while minimizing losses and total cost for the EDAM footprint.

If the market can cure the full insufficiency, the EDAM entity will only be subject to the administrative surcharge based on the tier of the original RSE , and it will remain in the pool along with other EDAM entities that passed the day ahead RSE for pooled or joint evaluation of

the WEIM RSE. The sizing for all tiers and multipliers proposed for tiers 2 and 3 will be evaluated as the market evolves to ensure they properly incent entities to enter the EDAM resource sufficient.

However, depending on EDAM footprint conditions and the magnitude of failure, the market may not have sufficient excess supply to cure fully the insufficiency of an EDAM entity that has not met the RSE. If the market cannot cure the full insufficiency, the EDAM entity will remain subject to the administrative surcharge based on the tier of the original RSE failure, and it will be removed from the pool of EDAM entities being evaluated together for the WEIM RSE. The EDAM entity whose insufficiency was not cured by the market will be evaluated by itself for the WEIM RSE, and it will forego the diversity benefit of the day ahead uncertainty requirement.

Some stakeholders requested capping the amount of a resource sufficiency failure that can be cured by the market to, in part, avoid converting the decision to pass the evaluation into a purely financial decision. For example, they suggested a cap if the entity fails the EDAM RSE by a magnitude sufficiently significant to prevent meeting any portion of their imbalance reserve requirement, *i.e.*, some level whereby the market would not even consider a cure for the deficiency. Introducing a cap that would limit the market from curing an insufficiency even if there was excess supply in the market would preclude identifying efficient transfers and limit market efficiency. Such a limitation would likely need to be implemented through limitations on transfers, which throughout discussions stakeholders have not preferred as an initial design. Large magnitude RSE failures remain a valid concern because these can deplete excess supply, particularly in stressed conditions. The ISO is committed to monitoring the magnitude and frequency of failures and, as necessary, evolving the design to consider limitation of how much insufficiency the market should cure based actual experience and better understanding of the circumstances under which large magnitude sufficiency failures occur.

The administrative surcharge will be applied to the maximum hourly supply deficiency.[73] The surcharge will use the maximum of the Mid-C or Palo Verde day-ahead hub price for a 16-hour on-peak block of energy, for the entire multi-hour block, for each MW the BAA has been identified as being short. A credit will be applied in all hours that pass for the difference between a load weighted average[74] of LMP's within the BAA and the bilateral hourly price that the surcharge is based upon for each hour. The credit accounts for the value of the on-peak block of energy during non-failure hours. The credit will be structured to ensure it does not result in revenue generation, to the extent it exceeds the price of the surcharge. This crediting approach is similar to the bilateral contract construct in that during the hours the energy is not needed to meet a BAA's own obligation, it can be re-marketed or used to displace resources internal to that BAA.

Some stakeholders suggested that the administrative surcharge should not be based on bilateral market hub prices because those hub prices may not be sufficiently liquid to provide an

[73] By indexing the surcharge to the major bilateral hub prices, the surcharge will automatically scale with varying system conditions. Although concerns have been raised regarding the ongoing liquidity of the bilateral hubs following implementation of EDAM, the ISO does not determine their liquidity. If a hub does not remain sufficiently liquid, it may not be no longer be appropriate to use it as a reference point and the proposed reference will be reevaluated.

[74] Utilizing a load weighted approach allows us to account for GHG costs to the extent a BAA operates in multiple states both with and without GHG programs.

appropriate measure of financial consequences for failing the RSE, and they may have further decreased liquidity following implementation of the EDAM. These are valid concerns to consider and warrant continued monitoring of the liquidity at these hubs as a reference informing the size of the administrative surcharge. Nonetheless, as a starting EDAM design, the pricing at the different hubs represents, in part, the cost individual entities would bear if they must cure the insufficiencies without an EDAM and, by extension, when the EDAM is initially implemented. An entity that does not have sufficient supply to meet the RSE would seek out additional supply to cure that insufficiency, in part, by purchasing energy at these same hubs. The ISO views the use of the existing hubs as a preferable starting point for referencing the surcharge as compared to making the surcharge endogenous to potentially more liquid markets, such as the EDAM. The ISO will monitor the liquidity of the hubs and the effectiveness of the administrative surcharge so there are proper incentives to ensure day ahead sufficiency. The ISO remains open to evolving to other designs based on that experience and monitoring, including alternative methods of measuring the administrative surcharge.

The surcharge will be applied hourly, and it will prevent a BAA from profiting from the difference between the price for the on-peak surcharge and its hourly marginal energy cost. Hourly application ensures the hourly generation dispatch for a net-EDAM exporting BAA that cures the deficient BAA is compensated for its supply. More information regarding the revenue allocation can be found in section II.D.2(a).

To account for what otherwise would be the value of the on-peak block procurement during non-failed hours, the market operator will administer a credit as described above. Table 5 below provides a numeric example. Although the surcharge is based on the value of a 16-hour block of energy the credit represents the potential savings or additional uses of that energy during non-failed intervals.

Hour	Shortfall (MW)	Mid-C Price ($/MWh)	PV Price ($/MWh)	BAA Weighted LMP ($)	Hourly surcharge/credit ($)
1	0	100	80	40	1.25[max(0,(20*100)-(20*40))]
2	0	100	80	50	1.25[max(0,(20*100)-(20*50))]
3	20 (Tier 2)	100	80	90	1.25[(20*100)]
4	0	100	80	70	1.25[max(0,(20*100)-(20*70))]
Administrative Surcharge =					**$6000**

Table 5: Example of Administrative surcharge to cure supply deficiency through the EDAM.

Stakeholders expressed support for escalating consequences when there are repeated and systemic failures. In response, the proposal is to index the Tier 2 and Tier 3 multiplier prospectively for every daily failure during the retroactive 30-day period. For every additional failure over a rolling 30-day window, 1% will be added to the surcharge starting with the second failure. For example, if an EDAM BAA experiences a Tier 2 failure and it is the 7th failure over the rolling 30-day period, its surcharge multiple would be 1.31. The proposal contemplates these parameters can be adjusted in the future as necessary, based on EDAM experience to discourage repeated and systemic failures.

(b) Off-Peak Upward Insufficiency Failure

The surcharge is an alternative to procuring an on-peak block of energy. Although, failures can occur during off-peak periods[75], the proposal views this as unlikely. Depending on the magnitude of failure that occurs during this window, a penalty of 1.25 or 2.0 will be applied exclusively to the load weighted average[76] of LMP's within the deficient BAA asymmetric from on-peak failure, this asymmetry recognizes the likely surplus supply within the EDAM footprint and the reduced reliability risk and impact to market prices during this period. The ISO will monitor the frequency and magnitude of RSE failures during off-peak periods and, if failures are frequent, it may re-evaluate the design.

(c) Downward Insufficiency Failure

BAAs can also fail the EDAM RSE in the downward direction if they have a limited quantity of downward dispatchable or downward flexible supply. Failure in the downward direction does not create similar pricing or reliability impacts for the EDAM footprint as would failures in the upward direction. Although an individual EDAM BAA may experience downward flexibility challenges due to large amounts of low or zero dollar cost VER production in localized areas, downward flexibility is not expected to present a challenge across a more geographically diverse EDAM footprint. A geographically diverse EDAM footprint dramatically reduces the likelihood the market would have insufficient VERs to support de-committing a resources in another location to provide downward flexibility. For these reasons, the consequence of failure will be an hourly surcharge that precludes the failed EDAM BAA from profiting on the energy for which the EDAM market is providing an off-taker. For example, consider an EDAM BAA's failure of 10 MW in the downward direction with a resulting marginal energy price in the failed BAA of $25 MW. To ensure the failed EDAM BAA does not profit, a $250 surcharge will apply for the 10MW of oversupply for which the EDAM market provided an off-taker. This effectively claws back the energy revenue that would have been derived from the optimal solution.

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 its ability to participate in the pool of passing BAAs if, by the STUC horizon ending in the hour of their shortage, the BAA can backfill the deficiency with supply. This allows the EDAM BAA to participate in a pooled WEIM RSE, while also benefitting the passing group if the failed EDAM BAA cannot cure given its imbalance reserve requirement was calculated assuming the participation of the deficient EDAM BAA.

(2) Allocating Surcharge Revenue

The proposal is to allocate to EDAM BAAs the revenues associated with the surcharge to cure undersupply conditions that result in an EDAM BAA's failure to pass the EDAM RSE in the upwards direction on an hourly basis. An EDAM BAA will become ineligible for allocation of any upward surcharge revenue if it fails the EDAM RSE in the upward direction during any hourly interval across the day. This allocation of hourly upward surcharge revenues collected from EDAM BAAs failing the RSE will be based on the volume of net EDAM export transfers from an

[75] The off-peak period is defined as 10:00 p.m. – 6:00 a.m. Monday through Saturday, all day Sunday and Holidays.
[76] Utilizing a load weighted average can account for GHG costs to the extent a BAA operates in multiple states both with and without GHG programs.

EDAM BAA, including the EDAM BAAs transfers of energy and imbalance reserves. The upwards surcharge revenues will be allocated on a pro-rata basis among the passing EDAM BAAs based on this volume of net export transfers. This allocation methodology of hourly upward surcharge revenues applies to both for RSE failures that occur during on-peak and off-peak hours. Because these products overlap, the proposal is to consider the optimal procurement of imbalance reserves beyond an EDAM BAA's pro-rata obligation 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.

In summary, the proposal is to allocate revenues associated with the surcharge to cure an oversupply condition pro-rata to all net importing EDAM BAA's that have passed the EDAM RSE. Similarly, eligibility for downward failure revenue allocation will be predicated on the BAA not experiencing any EDAM RSE failures in the downwards direction during any interval across the day. The proposal also creates a backstop allocation to account for the possibility that no EDAM BAA avoids an upwards or downwards failure of the EDAM RSE across the 24-hour horizon. In this circumstance, the allocation will revert to hourly whereby only the hourly results, rather than the daily EDAM RSE results, will be utilized in determining eligibility for the allocation.

(3) Allocation of Assessed Failure Surcharges

The proposal is that in the event of a RSE failure within one of the tiers described earlier, the ISO will assess an administrative surcharge corresponding to the failure tier to the failing EDAM entity. The payment of surcharges by the entity that failed the RSE represents the revenue that is allocated as described in the prior section. Each EDAM BAA will be individually responsible for any surcharge assessment it receives. The proposal is that each EDAM entity will remain responsible for allocating any accrued surcharges to customers within its service area and it is expected that the allocation mechanism would be further described in the EDAM entity OATT.

(4) Monitoring and Additional Administrative Penalties

Certain stakeholders expressed concern 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 entity use of EDAM to cure deficiencies so the ISO has information necessary to ensure that the financial consequences are correctly set and do not incent EDAM entities to avoid sufficient forward procurement.

(5) ISO BAA Participation Rules

Because the ISO BAA is comprised of many load serving entities operating under various forward procurement rules, additional coordination may be required regarding both funding the RSE surcharge and curing a deficiency. To cure EDAM RSE deficiencies within the ISO BAA, based on exiting tariff rules, the ISO relies largely on the RA program for meeting the RSE, as well as additional tools such as exceptional dispatch, its capacity procurement mechanism

(CPM), and its reliability must run (RMR) authority to resolve supply shortfalls. Load serving entities also may have additional supply under contract that can be made available if necessary, following requests from the ISO. The ISO will consider what additional mechanisms may be necessary to ensure the ISO BAA can cure deficiencies in the advisory period as well as how any surcharges are to be allocated to its own load serving entities.

A related element that will be need to considered for the ISO balancing area is the allocation of EDAM RSE failure surcharges. The ISO would seek to allocate accrued failure surcharges based on cost causation principles through a two tiered approach by first seeking to allocate the surcharge to entities that caused or otherwise contributed to the RSE failure to the extent this can be discerned, and then the remainder distributed more broadly on a load-ratio share or different method. The ultimate design for the ISO will need to consider the interplay with other inactive mechanisms and policies that may be in place to ensure compatibility. Similarly, the design will need to consider allocation within the ISO balancing authority area of revenues associated with the distribution of failure surcharges allocated to the ISO due to RSE failures by other EDAM balancing areas. These revenues can contribute to offsetting accrued surcharges or costs.

The ISO will undertake an initiative that more narrowly considers potential enhancements to the ISO tariff and processes to enable curing of EDAM RSE advisory failures in a timely manner and avoid application of administrative surcharges. Relatedly, the initiative will consider the allocation of revenues or surcharges within the ISO arising out of EDAM RSE failures. Similarly, other EDAM entities will need to consider similar issues that are unique to their balancing areas regarding allocation of revenues or surcharges arising from EDAM RSE failures across the footprint or the individual entity.

h) EDAM Entities Pooled WEIM RSE

The proposal is that all parties that pass the EDAM RSE would be tested as a pool in the WEIM RSE. This pooling approach 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.

(1) Diversity Benefit and Linkages to WEIM RSE

Calculating a pro-rata diversity benefit[77] for the imbalance reserve requirements can reduce each participating EDAM BAA's forward showing obligation because the uncertainty in 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. Absent a pooled test, the diversity benefit would effectively reduce imbalance reserves within each EDAM BAA, which in turn would increase the potential failure of WEIM RSE 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.

[77] 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 both each BAA independently and for the 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.

The proposal is to test the EDAM footprint for WEIM resource sufficiency considering all day-ahead awards, imbalance reserves, and reliability capacity. 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.[78]

(2) 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 market operator can configure this quantity to provide the EDAM BAAs a collective mechanism to adjust imbalance reserve requirements dynamically.[79] This additional quantity of imbalance reserves can be utilized to provide additional confidence and reliability above the stated 97.5 upward procurement threshold or, if extreme levels of uncertainty do not materialize, to cover for intra-day changing system conditions. 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.

(3) 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.

The pooled EDAM footprint as a whole remains responsible for curing any shortfall in the WEIM RSE. Testing each EDAM BAA separately following the failure of the pool is inappropriate because effectively each BAA would have fewer imbalance reserves to address uncertainty within their BAA than otherwise could have been covered if imbalance reserves were procured for on a BAA-specific basis. Under this scenario, a single BAA could cause the pool to fail but, due high levels of materialized uncertainty, multiple BAAs could in turn fail the WEIM RSE. The market operator will provide information that allows for coordination between EDAM BAAs in curing real-time WEIM deficiencies; the specific information necessary to facilitate this coordination will be determine both through the onboarding process and the continued evolution of the EDAM.

In the future, intertie bids made at the ISO border or the border of an EDAM BAA that allows intertie bidding will be credited towards meeting the needs of the EDAM footprint as a whole. If that curing does not occur, the footprint would be exposed to the existing consequences for failing the WEIM RSE. If coordinated efforts between the EDAM BAAs to resolve the supply insufficiency do not resolve the infeasibility, the real-time market would isolate the power

[78] The EDAM technical workshops held on July 15th, 2022[78] 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(b).
[79] The process and considerations for configuring this quantity will be identified in the business practice manual as this is a configurable amount and discussed with stakeholders.

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

i) Managing Supply in Excess of RSE Requirements

During stakeholder meetings, the ISO 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 for a BAA to retain excess capacity from the market for operation during stressed conditions to protect against un-anticipated reliability needs that may not be covered by the day-ahead market.

In prior comments and meetings, ISO load serving entities expressed the need to consider how resource adequacy capacity, procured by load serving entities 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, resource adequacy supply 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. Other EDAM entities may have their own resource adequacy or resource planning regulatory programs, and they can retain supply above their RSE obligations in anticipation of stressed conditions and not offer it into the EDAM or to offer such excess supply to derive further benefits.

Based on stakeholder feedback, the draft final proposal introduced a net EDAM export transfer constraint into the market that permits all supply to be offered into the market while allowing the market to manage the amount of net export transfers supported by supply in the EDAM BAA. The net EDAM export transfer constraint would help remedy the asymmetry in the ISO BAA arising from the resource adequacy must offer obligation. The constraint would be made available, on a voluntary basis, to all EDAM BAAs that find it beneficial. The constraint would enable BAAs to offer supply in excess of their RSE obligation into the market and, through the constraint, manage how much internal supply is available to support export transfers out of the BAA on a net basis.

In comments to the draft final proposal, stakeholders supported introducing the net EDAM export transfer constraint, including making application of this constraint optional or voluntary for each EDAM BAA. Stakeholders noted a net export constraint's reliability benefit to a balancing area and its potential to allow an area to manage contractual capacity obligations, unique conditions and or stressed conditions more effectively by managing the level of export transfers from the balancing area. This final proposal retains the formulation of the net EDAM export transfer constraint, with minor clarifications. The design and formulation of the net EDAM export transfer constraint is discussed further below.

(1) Designing the Net EDAM Export Transfer Constraint

The net EDAM export transfer constraint is a mechanism that can limit net export transfer out of an EDAM BAA, particularly in stressed system conditions, to retain available supply within the BAA to respond to adverse grid reliability conditions that materialize in real time. The constraint would apply in the base scenario of the IFM for the net energy transfer - on an hourly basis - to

ensure that market adheres to the constraint when optimally scheduling EDAM import and export energy transfers.

The net EDAM export transfer constraint is based on the difference between bid in supply and the RSE obligation and provides the option for additional adjustment as described below:

$$(RSE\ Eligible\ Supply + Non\ RSE\ Eligible\ Supply\ x\ Confidence\ Factor) - RSE\ Obligatoin - Additional\ Margin$$

Where:

- *RSE eligible supply* = supply that counts toward the EDAM entity RSE.
- *Non RSE eligible supply* = supply that is ineligible to count toward the EDAM entity's RSE. For the ISO, intertie bids from supply not under contract are ineligible RSE supply.[80]
- *Confidence Factor* = an optional factor that accounts for confidence in delivery associated with a portion of the non-RSE eligible supply. For example, in the ISO BAA the confidence factor could be used to adjust for the risk of untagged intertie day-ahead schedules.
- *RSE Obligation* = the day ahead RSE obligation for the EDAM entity based upon forecasted load, positive uncertainty requirement, and upward ancillary services requirements. It includes high priority exports (PT exports to non-EDAM BAAs) since they are considered in the RSE.
- *Additional Margin* = represents an additional amount of capacity established by the EDAM BAA to reduce the limit on the BAA net export transfer, if necessary, to account for reliability risk and the ability to replace reserves particularly during tight supply system conditions.

In the context of applying the net EDAM export transfer constraint to the ISO BAA, the constraint would consist of all supply bid into the ISO counting toward the RSE plus economic intertie import bids that represent non-contracted supply offered at the ISO interties from non-EDAM BAAs. The ISO is uniquely positioned compared to other EDAM entities because it offers full economic intertie bidding. Although non-contracted intertie import bids do not count toward meeting the ISO RSE obligation, they can bid into the day-ahead market and may clear the market if they are economic. Once these intertie import bids clear the market, they may support energy export transfers in the EDAM.

If there is observed and empirical evidence of a non-deliverability risk of these intertie schedules or risk of non-performance by supply overall, the BAA may introduce a confidence factor less than 100%. In the case of the ISO, if there is evidence to support a non-delivery risk with cleared economic intertie bids, the bid in supply amount can be reduced by a confidence factor representing the risk of non-delivery. For example, if one percent of cleared intertie bids do not tag by the appropriate deadlines or do not perform, the bid in supply would be multiplied by 99% to reflect the non-delivery risk representative of the confidence factor.

Once the upper bound limit of the net EDAM export transfer constraint is derived, the BAA can further reduce the limit by an additional margin - that reflects an amount of non-exportable capacity held back in anticipation of needing to respond to reliability conditions. A realistic example where a BAA may need the additional margin is when there is significant risk the BAA

[80] The ISO will provide functionality that will allow parties to distinguish whether the supply is RSE eligible or non-RSE eligible supply, such as whether the supply is under contract.

could not replace operating reserves if a contingency occurs during tight supply conditions. Under such operating conditions, the BAA may benefit from reserving sufficient capacity using the export constraint in an amount equal to its most severe single contingency (MSSC). The additional margin provided by the export constraint would provide the BAA sufficient available capacity to replace its operating reserves if the MSSC were to occur. The export constraint enhances reliability by providing operators with an efficient mechanism to manage critical conditions.

Table 6 below provides an illustrative example of the formula for deriving the constraint.

Hour	RSE Eligible Supply	Non RSE Eligible Supply	Confidence Factor	RSE Obligation	Additional Margin	Net Export Transfer Constraint
HE 12	35,000 MW RSE Eligible	5,000 MW	95% (applicable to non-RSE eligible supply)	35,000 MW	3000 MW	1,750 MW
HE 13	39,000 MW RSE eligible	5,000 MW	95% (applicable to non-RSE eligible supply)	38,500 MW	0 MW	5,250 MW

Table 6: illustrative example of net EDAM export transfer constraint derivation.

In the example above, for HE12, the bid in RSE countable supply is 35,000 MW, and non-countable RSE supply is 5,000 MW for a particular hour totaling 40,000 MW. The non RSE supply of 5,000 MW is discounted by a confidence factor of 95% to represent the risk of non-delivery resulting in 4,750 MW of non RSE supply, resulting in a total supply of 39,750 MW to derive the net EDAM export transfer constraint. This amount is further reduced by the RSE obligation of 35,000 MW and an additional 3000 MW margin for the hour due to the reliability conditions, resulting in a net EDAM export transfer constraint of 1,750 MW that the market will consider when identifying transfers. Because the constraint is evaluated hourly, the constraint could have a different limit for HE 13 as illustrated above.

The constraint limit cannot be reduced below the shown bucket 1 transfers out of the EDAM BAA. If an EDAM entity relies on exports to meet the RSE from the EDAM BAA imposing the net export transfer constraint, the EDAM BAA sourcing the supply cannot reduce the net export transfer below the export committed for RSE purposes. At a minimum, bucket 1 transfers must be supported and maintained. The net EDAM export constraint cannot be negative and a negative value in the calculation will be set to zero.

The constraint is dynamic, applicable in the day-ahead market on an hourly basis. In normal system conditions, the constraint is not expected to bind because the bid in supply should be much larger than the RSE obligation. However, in more stressed system conditions, the difference between the bid in supply and the RSE obligation could be narrow, thus the net export transfer constraint may be binding.

The proposal is that the net export transfer constraint is optional for each EDAM BAA that each can adopt in its OATT based on the design described above. It would be an additional tool to limit or mitigate reliability risk in anticipation of stressed system conditions. Moreover, the constraint enables all supply to be offered into the market for optimization, and the market will respect the constraint when making resource commitments and identifying energy transfers. A similar constraint would also be enforced in the IRU deployment scenario in the IFM to constrain the IRU net export transfer, and also in the RUC to constrain the RCU net export transfer. The mathematical formulation for the constraint is described in detail in Appendix 4.

Because the constraint is optional, an EDAM BAA that wants to use the net EDAM export transfer constraint within the market must (1) indicate its intent to use the constraint to the ISO

and (2) describe either in its OATT or business practice manuals (a) the formulation for deriving the confidence factor applicable to non-RSE eligible bid in supply and (b) factors/criteria for deriving the additional margin that further reduces the constraint limit. The ISO will include formulation of these components of the export constraint in an upcoming ISO BAA implementation initiative that will consider this element and other aspects of ISO BAA specific rules associated with participation in EDAM including, the ability of the ISO to cure RSE deficiencies and allocate administrative surcharges resulting from the ISO RSE failure.

C. Extended Day-Ahead Market Processes

This section describes how the EDAM will be orchestrated through the day-ahead and real-time 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 considers several inputs to produce feasible and efficient market results. For example:

- *Bids* – scheduling coordinators submit bids to let the market know how much energy or reserves they are willing to sell or purchase in the day-ahead market, and at what price.
- *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.

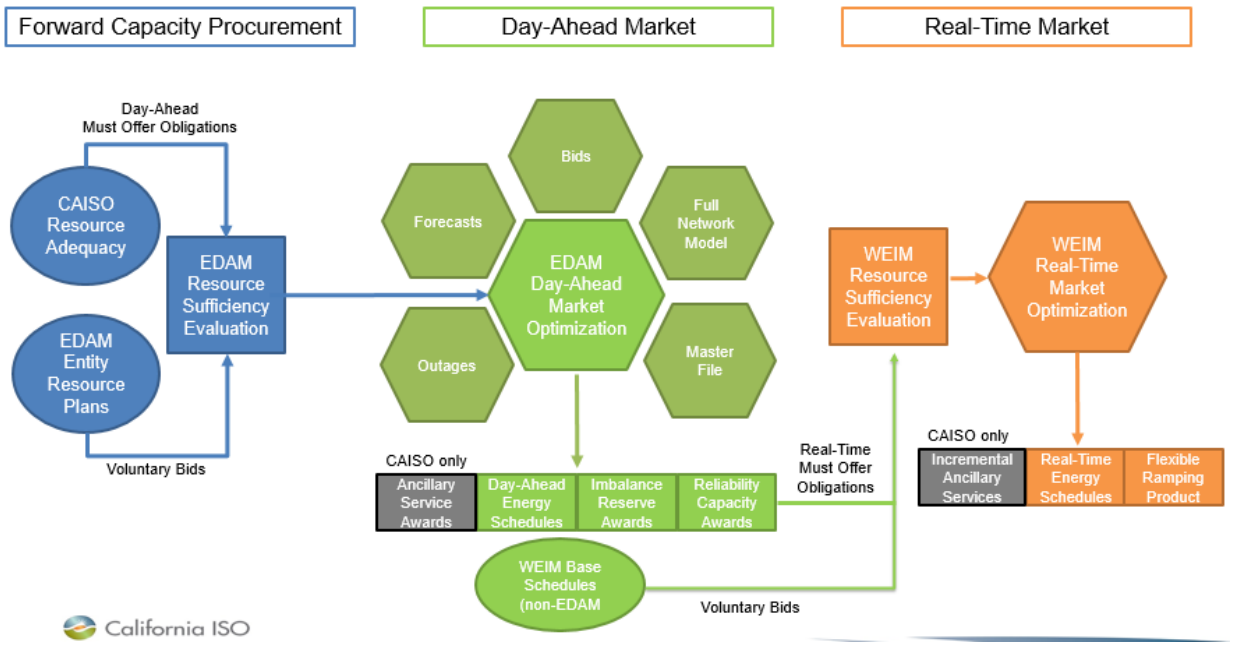


Figure 2: illustration of day-ahead market processes, inputs and outputs.

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. 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. For the initial EDAM implementation, the proposal is that the IFM will not co-optimize ancillary services with energy across the EDAM footprint.[81] The proposal is, 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.

Throughout the initiative, stakeholders have supported extending the Integrated Forward Market to the EDAM. Stakeholder comments generally support the concept of imbalance reserves, its inclusion in the EDAM, and its relationship to the EDAM resource sufficiency evaluation. Many stakeholders believe imbalance reserves are 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. The imbalance reserves design is being considered in a separate parallel initiative, *i.e.*, the Day-Ahead Market Initiative (DAME), which will be completed and considered for approval together with the EDAM proposal.

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

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

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 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 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 economic energy bids in the real-time market with a range above and/or below the day-ahead energy schedule for the real-time market to re-optimize. 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.[82] 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

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

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*.[83] 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 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 geographic 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.

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

[83] The uncertainty requirement and diversity benefit are discussed further in the EDAM RSE section II.B.2(h).

amount of physical energy that clears the IFM in relation to each EDAM BAA's load forecast.[84] 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 generally agree 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. The final 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 support this 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.

[84] Today, RUC only clears incremental supply. The ability to procure decremental supply in RUC is being considered in the DAME initiative and would apply to the EDAM if DAME is implemented.

Imports from non-EDAM BAAs can provide reliability capacity up and down at ISO interties. These intertie resources would have to be registered with a resource ID defined in the master file; no reliability capacity bids would be accepted from imports with just a Transaction ID. 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 draft final proposal continued to recommend extending the WEIM market power mitigation framework to EDAM. The proposal also noted that broader market power mitigation design enhancements, beyond extending the WEIM market power mitigation, are being considered within the *Price Formation Enhancements*[85] initiative conducted in parallel to this EDAM initiative. Stakeholder comments on the draft final proposal largely continued to support the idea that broader market power mitigation changes be considered in the *Price Formation Enhancements* initiative with the starting point for the EDAM being extension of the WEIM market power mitigation framework. In response, this final proposal continues to retain the extension of the WEIM market power mitigation practices in the WEIM to the EDAM and to discussing any necessary adjustments to those practices in the *Price Formation Enhancements* initiative.

Stakeholders that commented on this topic generally continued their support for extending the WEIM market power mitigation design to EDAM as a default starting point with an opportunity to evolve the design. The stakeholders recognized that the *Price Formation Enhancements* initiative is considering within its scope design enhancements to market power mitigation that will be informed by additional stakeholder input. Some of these stakeholders continued to express interest in further evolving the market power mitigation measures with enhancements being considered in the price formation initiative. The paragraphs that follow summarize the existing WEIM market power mitigation processes that would be extended to the EDAM and notes any further structural changes under consideration in parallel with the EDAM initiative through the *Price Formation Enhancements* initiative.

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

[85] Price Formation Enhancements initiative webpage - Link

ISO generated default energy bid (DEB).[86] 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.[87]

5. Convergence Bidding

The ISO day-ahead market enables participation by convergence bidding entities, which can submit financial bids that do not represent physical supply or demand. Instead, convergence bidding provides market participants with 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.[88] Convergence bids are referred to as *virtual supply* or *virtual demand.*[89] 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 prices for the corresponding hour.

The draft final proposal recommended a design under which EDAM entities could either start with convergence bidding or have a one-year transition period before enabling it. This design attempted to accommodate stakeholder requests for optionality to enable convergence bidding if ready at the onset of participation, but also allow entities not ready at the onset of their participation to gain experience with the market and develop the necessary readiness prior to implementing convergence bidding in their area after the expiration of the one-year transition period. Stakeholder comments generally supported this design and the balance it sought to strike. However, a number of stakeholders expressed concern with a mandatory transition to convergence bidding after one year and the imposition of convergence bidding in each EDAM balancing area without evaluating readiness. These stakeholders noted that one year may be insufficient for the EDAM entity to develop experience in the market and be ready to implement convergence bidding. They also suggested that one year may be insufficient for the market to develop and offer a more holistic opportunity to evaluate the impacts of convergence bidding. They instead suggested conducting a stakeholder process at the two-year mark of EDAM operation to identify a more permanent EDAM convergence bidding policy informed by market

[86] 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.
[87] The competitive LMP used in this mitigation is the power balance constraint shadow price of the ISO BAA.
[88] *See, e.g.,* Federal Energy Regulatory Commission, ENERGY PRIMER: A HANDBOOK FOR ENERGY MARKET BASICS at p. 68 (April 2020), *available at* Link.
[89] The term "convergence bidding" is unique to the ISO. "Virtual bidding" is the common industry term.

experience and the experience of those entities that implemented convergence bidding at the onset of their participation.

This final proposal allows EDAM entities to choose whether to enable convergence bidding in their balancing area at the onset of their EDAM participation. However, this proposal removes a mandatory transition to convergence bidding after a one year transition period if an entity does not elect to implement convergence bidding at the onset of their participation. Under the final proposal, in the lead-up to the two-year anniversary of EDAM operation – as a year-two enhancement – the ISO will conduct a stakeholder process to derive a more permanent EDAM convergence bidding policy informed by operational experience and stakeholder input. The proposed optionality enables interested EDAM entities to implement convergence bidding functionality in their balancing area at the onset of their participation in EDAM. It also allows entities that are not yet ready for enabling convergence bidding in their balancing area at the start of their EDAM participation to gain experience with the market and implement convergence bidding at a later time. The first two years of EDAM operation will allow the ISO and EDAM participants to develop valuable operational experience in the EDAM and evolve the design based on that experience. A future stakeholder process will evaluate a holistic implementation of convergence bidding, including a formal transition to convergence bidding for participating EDAM entities, the necessity for any interim bidding requirements, and design enhancements based on EDAM operational experience. The ISO will, in coordination with the Department of Market Monitoring (DMM), continue to monitor and evaluate the market's performance with or without convergence bidding in various parts of the footprint to help inform the evolution of the future design and address any unintended consequences of an optional convergence bidding design at the onset of EDAM. The ISO will continue supporting convergence bidding within its own balancing area.

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.

Previous versions of the proposal stated that interim bidding requirements in EDAM BAAs without convergence bidding may be necessary during the transition period to prevent inefficient market outcomes. One interim bidding requirement that was considered was a measure to prevent load under-scheduling. The ISO implemented its nodal market in 2009 and phased in convergence bidding after the first year. In the absence of convergence bidding during this period, FERC required the ISO to include interim provisions to offset load-serving entities' 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 final proposal continues to 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 ISO's previous convergence bidding transition period. In the latter, load-serving entities 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 load-serving entities 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.

Today, the ISO has the authority to suspend or limit convergence bidding if necessary for system reliability.[90] The ISO can exercise this authority at specific eligible nodes or at all eligible nodes. In comments to prior iterations of the proposal, some stakeholders questioned whether each EDAM entity would be able 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 convergence bidding. However, it is equally necessary for EDAM participants to be able to 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 those outlined in the WEIM market disruption operating procedure,[91] to allow EDAM entities to recommend and justify suspending convergence bidding in their BAA. While the ISO, as market operator, would make the final decision, it would give deference to the EDAM entity in making the decision.

Some stakeholders continued to question 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. These settlements are described in the Post Day-Ahead Market Process section. At this stage, there are no apparent reasons to believe convergence bidding applied in some EDAM areas and not in others will cause detrimental market impacts.[92]

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 draft final proposal continued to extend the current WEIM external resource participation framework to the EDAM, which limits participation to pseudo-tied, dynamically scheduled, and self-scheduled contracted supply, while committing to continue evaluation of this framework as the EDAM evolves. The draft final proposal further introduced the ability for off-system designated network resources, under the terms of the EDAM entity OATT, to bid economically at the EDAM entity intertie where these are contracted to serve load.

Stakeholder comments largely supported the proposed design, including introduction of the ability for off-system designated network resources to economically bid at the EDAM entity

[90] See ISO Tariff section 7.9.
[91] See *Market Disruption – Western Energy Imbalance Market (WEIM)* operating procedure. (Link)
[92] 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.

interties if the relevant criteria is met. This final proposal retains the design introduced in the prior proposal as described further below, including the proposal to retain economic intertie bidding at the ISO external interties.[93]

a) External Resource Participation at EDAM Entity Interties

Stakeholders, particularly WEIM entities, largely continue to support extending the WEIM framework for external resource participation to the EDAM. More specifically, they support external resource participation at the EDAM entity interties by pseudo-tied, dynamically scheduled, and self-scheduled contracted supply. Stakeholders continued to express 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, enable transmission cost avoidance, and limit the incentives to participate in EDAM.

This final proposal retains the proposal to extend the WEIM external resource participation model to the EDAM where pseudo-tied and dynamically scheduled supply can be economically bid at the EDAM entity interties; other contracted supply must be self-scheduled and cannot be economically bid. The reliability-based concerns discussed in the revised straw proposal[94] and reiterated by numerous WEIM entities in their comments warrant, at the onset of EDAM, extending the WEIM external resource participation model. It will be necessary to work with stakeholders to re-evaluate the merits of implementing more comprehensive intertie bidding design after EDAM entities gain experience with the market. The later re-evaluation of external resource participation will allow consideration of the matter in conjunction with possible co-optimization of energy and ancillary services in the EDAM, which mitigates some of the reliability concerns raised by WEIM entities. Also, supply structures across the West may evolve in a manner that further mitigates the reliability concerns expressed.

The proposal expands the EDAM external resource participation model to include source-specific off-system designated network resources, as introduced in the draft final proposal. An external resource located in a WEIM BAA outside of the EDAM footprint[95] can economically bid or be self-scheduled at the intertie of an EDAM BAA in which the resource is designated as a network resource to serve load under the terms of the EDAM entity's OATT. An off-system designated network resource under the terms of the EDAM entity's OATT (or the OATT of another transmission provider in the EDAM BAA) can be designated to serve load in the EDAM BAA. The OATT process requires (1) an attestation that the designation is supported by a contract for the supply, (2) the supply will be delivered on firm transmission to the BAA where

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[93] 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).

[94] Stakeholders expressed concern that non-contracted, non-source specific resources economically bidding at the EDAM entity interties may adversely affect reliability by displacing internal generation that cannot be committed in real time if this unknown, bid-in external supply does not materialize. Moreover, they raised concerns about operational uncertainty associated with unknown supply that may or may not be deliverable to the EDAM entity at the interties. They believed this risk outweighs the benefit of the additional economic supply. They further noted that economic intertie bids from unknown supply may dis-incent participation in the EDAM by allowing external entities to derive benefits of the market without making the significant investment EDAM entities make to participate. Finally, they noted concerns regarding (1) suppliers avoiding transmission costs absent a transmission requirement if they bid at interties, and (2) the difficulty of planning for ancillary service procurement to address the risk posed by economic bids at the interties.

[95] This is a resource physically located in a WEIM BAA that is not yet participating in the EDAM.

the load is located, and (3) the resource is designated to serve that specific load.[96] If the resource is designated as a network resource under the terms of the OATT, it will be delivered on firm transmission to the intertie of the EDAM BAA where the load is served, and it will be delivered to load using the NITS service across the EDAM BAA where the load is located. This mitigates deliverability and free-riding concerns for transmission service. Specifically, the proposed EDAM requirements for an off-system designated network resource eligibility to bid economically at the EDAM BAA intertie where the load is located include:

- *The resource must be located in a WEIM BAA* **–** resources located in a WEIM BAA are already largely modeled in the ISO full network model, and the resource characteristics and abilities are already visible to the market operator.
- *The resource must be modeled as a specific resource in the ISO master file* **–** this provides visibility and confidence that the off-system resource is a specific resource visible to the market. This can include grouped resources or system resources that are modeled as a specific market resource.
- *Economic bidding at the EDAM BAA intertie where load is located* – the off-system designated network resource, if choosing to bid economically, must be bid at the intertie with the EDAM entity where the load associated with the designated resource is located. In other words, the resource should not economically bid at an EDAM BAA's intertie where it does not have a contractual relationship to serve load as an off-system designated network resource. The bid amount should not exceed the amount of the off-system network resource being designated.

Off-system designated network resources meeting these requirements either reserve and pay for transmission or are associated with NITS transmission and the source and transmission path are known. This mitigates the reliability risks stakeholders identified when the source and transmission is unknown. The proposal allows the generation that the load serving entity has procured and designated to serve its load, to bid economically into the market and allows the market to serve load cost effectively through optimization.

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
Off-System Designated Network Resource	Economically bid and self-scheduled into market
Other Contracted Supply[97]	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 7: Summary of external resource participation framework in WEIM and EDAM.

[96] Open Access Transmission Tariff (OATT), section 29.2(v), (viii).
[97] This can include other supply that is not a designated network resource but is under contract to serve load in the EDAM BAA.

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 load serving entity 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 10:00 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 cannot 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.[98]

b) External Resource Participation at ISO Interties

Most stakeholders continued to support or not oppose 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. As noted in prior comments, stakeholders 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 not allowed to the same extent at the external interties of other EDAM BAAs. This draft final proposal retains in EDAM the ISO's 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, it 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

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

evaluate the external resource participation model and evolve the design as entities gain experience in the market.

Similarly, the draft final proposal continues to allow 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

This draft final 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 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 seeks to account for the costs and reporting requirements arising from state GHG accounting and reduction policies. This includes factoring in GHG emission costs incurred by parties for GHG regulatory compliance associated with power transactions, reflecting those costs in the ISO's security constrained least cost dispatch, and facilitating any required GHG reporting and verification processes.

The proposal is to start EDAM with the resource-specific approach on the basis that stakeholders are familiar with the design as an extension of the WEIM, it is the most defined option, and it requires the least amount of implementation changes. Moreover, it effectively models the emissions costs of participating resources offering their output to serve demand in a GHG regulation area. The ISO commits to continue working collaboratively with regulatory agencies to pursue alignment of market design with applicable regulations. If necessary, the ISO will work with stakeholders and regulatory agencies to consider design improvements based on actual market experience and regulatory changes, including considering different design approaches identified and considered in the EDAM stakeholder process.

In comments, stakeholders sought clarifications and provided recommendations and feedback on the resource-specific approach. Key areas of feedback included reactions to the net export constraint and the ISO's attempt to include measures to limit secondary dispatch while ensuring there are no reliability or severe pricing impacts, the design of the GHG counterfactual, recommendations on what resources should be fully attributable, interest in LADWP's approach in future years, and recommendations regarding state and entity level reporting metrics. This GHG section responds to these topics raised by stakeholders.

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, point of regulation, and reporting requirements of the California Air Resource Board's (CARB) cap-and-trade program. 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 GHG price ($/MWh) that reflect the scheduling coordinator's willingness to make output from the resource available to serve California demand and the participating resource's costs to comply with California's GHG regulations in alignment with the first jurisdictional deliverer approach.[99] When determining total imports to a GHG regulation area, the ISO's optimization utilizes both the GHG bid adder and energy bid to determine which resources to attribute as 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 does not attribute the resource to serve California demand.

This design accounts for WEIM transfers serving California demand. In connection with these imports, the ISO, CARB, and stakeholders have recognized the phenomenon of secondary dispatch in which higher-emitting resources may backfill to serve demand outside of California when the optimization attributes lower emitting resources to serve California demand. The ISO has implemented market rules to reduce the potential for secondary dispatch in the WEIM and proposes additional enhancements in this final proposal.

The ISO does not identify emissions associated with secondary dispatch; rather, CARB accounts for them through its outstanding emissions calculation by calculating total California WEIM emissions at the unspecified source rate and then subtracting emissions of WEIM participating resources outside of California that the market optimization attributes as supporting California demand.[100] 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. The outstanding emissions calculation is subject to CARB's jurisdiction.

(2) State Regulations

California has established a carbon price for electricity transactions, and Washington will do so starting in 2023.[101] To the extent practicable, the GHG market design allows scheduling coordinators to reflect the costs of complying with state GHG reporting and reduction programs in their economic bids. The ISO may then reflect the cost of carbon under these state programs in its optimization.

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[99] *See generally* ISO Tariff section 29.32. Resources internal to California include the cost of GHG compliance in their energy bid.

[100] Title 17 California Code of Regulations. Section. §95111(h)(1)(A).

[101] The ISO understands Washington's approach will continue to evolve. Under Washington statute, the Washington Department of Ecology, in consultation with the Washington Utilities and Transportation Commission and Washington Department of Commerce, must adopt by regulation a methodology in the cap-and-invest context for addressing imported electricity associated with a centralized energy market by October 1, 2026. If the point of compliance changes in the future in this regulation, potentially under a linked program with California, the resource-specific model will accommodate this change.

b) Resource Specific Approach

(1) Overview

The EDAM resource-specific approach is an extension of the WEIM design that uses resource-specific bid adders to optimize dispatch. It is important to note in the EDAM context all GHG compliance is ultimately based on real time dispatch and resulting emissions. However, the settlement of GHG attributions is based on the GHG attributions scheduled in the EDAM, and then on GHG attribution deviations dispatched in the WEIM. The approach includes four design areas that differ from the current WEIM design. First, to align with state GHG regulations, the final proposal models the GHG regulation areas and their GHG transfers instead of from the BAAs and their transfers as in the current WEIM design. Second, it supports GHG bid adders and GHG attributions for multiple GHG regulation areas. Third, it introduces a new GHG counterfactual approach based on an optimized solution rather than self-submitted base schedules. Fourth, it applies a GHG net export constraint to mitigate the potential for secondary dispatch by limiting aggregate GHG attribution.

The final proposal includes three changes from the draft final proposal. First, it clarifies and updates the counterfactual that would roll over from EDAM to the WEIM as the difference between the day-ahead energy award and the day-ahead GHG award to align with the approach taken in the WEIM. Second, the final proposal clarifies three aspects of the GHG net export constraint which was developed to limit secondary dispatch: the proposal retains the optionality to have the constraint as a static or dynamic constraint and to the extent implementation requires a static constraint, it will be based on the optimal net transfer of the previous market run; the constraint will be turned off for all non-GHG regulation area BAAs for any hours a BAA that overlaps with a GHG regulation area fails the RSE; and it identifies the exceptions for RA capacity. Third, the final proposal explains that the GHG settlement value will be represented as a positive value. This last clarification is necessary when there are multiple GHG regulation areas, but it does not change the settlement payment to resources that receive an attribution to serve demand in a GHG regulation area.

(2) Geographic Boundary

The proposal is that the ISO will update the geographic boundary used for GHG accounting purposes to reflect state boundaries. Today the ISO uses BAA boundaries to represent GHG regulation areas. The rationale for changing the geographic boundary from BAAs to GHG regulation areas (*i.e.*, state-level boundaries) is that state regulations do not align with BAA boundaries. This will allow the ISO to reflect the dispatch costs associated with GHG pricing program compliance for resources within a state or dispatched to serve demand within that state, but not reflect these costs in the dispatch of resources not subject to these programs.[102] This design change will also affect the GHG design in the WEIM.

In cases where an entity has special state provisions in which either generation or load is not associated with the state for GHG accounting purposes, the ISO can model these unique circumstances. In collaboration with these entities, the ISO will model these footprints to ensure

[102] 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 WEIM load aggregation points (ELAPs), at the BAA level, and then distributing the demand to custom load aggregation points (CLAPs) using load distribution factors to identify demand at the GHG regulation area. Under this approach, the ISO will continue to enforce a power balance constraint at the BAA level, but it will be able to identify within its market optimization the EDAM Entity demand in the GHG regulation area.

the optimization correctly accounts for the price of carbon and does not affect resources or loads not subject to a state's program.

(3) Bidding, Optimization, and Attribution

(a) Bidding Mechanics

The EDAM GHG design reflects costs of compliance submitted by scheduling coordinators for participating resources in their bids. Through the bids submitted by scheduling coordinators, the ISO's market optimization considers certain information based on where resources are located and what GHG regulation area they plan to serve demand. This information takes three forms (1) to serve energy outside a GHG regulation area the optimization only considers the resources' energy bids because they are not subject to any GHG regulation, (2) to serve energy inside a GHG regulation area (imported in the GHG regulation area) the optimization considers the resources' energy bids + GHG bid adders, and (3) to serve energy inside a GHG regulation area (from resources inside the GHG regulation area), the optimization considers only the resources' energy bids, which include the cost of GHG compliance.

Submitting a GHG bid adder is voluntary and reflects the willingness of an EDAM scheduling coordinator to serve demand in a GHG regulation area and be subject to the GHG compliance for imports into that area. Similar to the current WEIM rules, the ISO will calculate a maximum GHG bid adder price for each resource outside GHG regulation areas on a daily basis to cap the GHG bid adder that a scheduling coordinator may submit in the day-ahead market for each hour to serve demand in a GHG regulation area.[103] A GHG bid of zero MW will reflect the resource is unavailable for dispatch to serve load in a GHG regulation area.

Currently, the two states that will have carbon pricing at the start of the EDAM, Washington's cap-and-invest program and California's cap-and-trade program, are not linked.[104] The two states are unlikely to share a common GHG price at the outset of the EDAM. This poses a challenge in determining how to treat transfers between California and Washington because the two states will not recognize each other's compliance instruments. This will result in some entities facing GHG compliance costs from both states when in-state electricity generation has a compliance obligation in one state and serves the other GHG region. The ISO anticipates state regulators will address this issue, and the ISO will provide any necessary support to them.

Recognizing the two programs will not be linked at the start of the EDAM, 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 allows for resource-specific attribution of resources in a GHG regulation area for serving load in another GHG regulation area. For example, a resource in Washington could submit a GHG bid adder to serve demand in California. Likewise, a resource in California could submit a GHG bid adder to serve demand in Washington.[105]

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[103] For resources located within a GHG regulation area, the ISO will also include reference level updates based on prevailing allowance prices as is done today for GHG pricing regions.
[104] 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.
[105] *See, supra* footnote 97. The ISO will work with state regulators as the rules around point of compliance evolve.

(b) Attribution and Secondary Dispatch

Below the ISO outlines how attribution occurs as well as the difference between secondary dispatch and incremental dispatch:

1. **Bid adders:** Under the ISO's resource-specific approach, the ISO will not attribute a transfer to serve demand within a GHG regulation area unless the resource's scheduling coordinator submits a voluntary GHG bid adder, indicating their willingness to serve demand in a GHG regulation area. The market optimization determines the total economic GHG transfer, or net import, for a GHG regulation area based on these bid adders and the corresponding energy bids.

2. **Attribution is based on energy + GHG bids:** Based on the submitted bid adders, the optimization selects, or attributes, resources based on their composite energy and GHG bid, lowest to highest, until the total MW of GHG transfers is fully allocated. The shadow price of this GHG transfer allocation constraint is the marginal GHG price. Attributed resources are paid the product of the marginal GHG price and the quantity of their GHG attribution.

3. **Attribution in relation to the counterfactual:** Attribution of transfers to serve demand in a GHG regulation area can occur either above or below a resource's counterfactual operating level established by the GHG reference pass, further discussed below. For example, in the WEIM, a resource can receive a GHG attribution when its economic award is less than its base schedule due to a reduction in load or economic displacement by other resources.

4. **Attributing resources to a GHG regulation area may result in secondary dispatch:** Attributing resources to a GHG regulation area can result in higher-emitting resources backfilling this attribution to serve load in other BAAs not in a GHG compliance area (*i.e.,* secondary dispatch).[106] For example, a GHG attribution to resource capacity below its optimized counterfactual schedule may result in secondary dispatch.

5. **Incremental dispatch should not be conflated with secondary dispatch:** Incremental dispatch is all dispatch above the GHG counterfactual. Not all incremental dispatch that is not otherwise attributed is the result of secondary dispatch, and there is no MW to MW relationship between transfers and secondary dispatch. Incremental dispatch can occur for a variety of reasons, some of which include (1) economic displacement: surplus power in a non-GHG regulation area that otherwise would not have been scheduled can economically displace resources in the GHG regulation area, and (2) hourly ramping schedules for resources in the non-GHG regulation area. Even if the GHG counterfactual obtained by the GHG reference pass is an optimized solution, this economic displacement is still possible outside GHG regulation areas in the IFM because the unit commitment and congestion patterns are very different in the two problems.

[106] As a 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)

(c) Counterfactual

The purpose of a GHG counterfactual is to establish a baseline to determine what dispatch would have occurred in the non-GHG regulation area without offers to serve demand in GHG regulation areas. In the WEIM, the counterfactual is the self-submitted base schedule.[107]

Because there are no base schedules in EDAM, the proposal leverages a special market run in the day-ahead market processes before the actual market run, solely to calculate a GHG counterfactual ("GHG reference pass"). The ISO anticipates the largest area of secondary dispatch reductions will occur due to an improved GHG counterfactual. This is because a more optimal GHG counterfactual should result in lower deviations between the GHG counterfactual and the actual market run. The ISO outlines the various market passes below, which will generally will occur between 10:00 and 13:00 one day before the Trading Day, and indicates where and how GHG regulation costs are considered in each market pass:

1. **RSE pass:** 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, ancillary services requirements, and uncertainty requirements.
    - To ensure RA resources can be accounted for, RA capacity in EDAM BAAs must be shown as bucket 1 energy transfers into the ISO BAA. The ISO expects the GHG bid for these RA resources to match the resources' RA capacity.

2. **GHG reference pass**: Serves as the GHG counterfactual by finding an optimal solution where the demand in the non-GHG area is optimally served by resources in this area without GHG transfers into GHG regulation areas. This market run will be identical to the IFM with the following exceptions:
    - It will not allow net imports into a GHG regulation area, however, exports from a GHG regulation area will be allowed. This will approximate how BAAs outside GHG regulation areas will meet their own load with their internal generation, similar to the concept of base schedules. 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. In the WEIM, base schedules include day-ahead transactions with other BAAs. This modeling convention is an appropriate extension of that logic. In response to two stakeholder requests that the ISO only create a counterfactual at the BAA level and not for the total non-GHG regulation area, such an approach would not allow for economic transfers to occur and thus result

[107] In the IFM, the proposal will limit GHG attributions to the lower of (a) the GHG bid capacity, (b) the resource's optimized dispatch, and (c) the positive difference between the highest energy bid capacity and the resource's base schedule. This constraint reflects the logic that a base schedule supports demand obligations prior to the real-time market, which limits to some degree available capacity offered to serve demand in a GHG regulation area. This rule reduces the potential for secondary dispatch and also applies to the WEIM market passes

in a non-optimal counterfactual. The optimal counterfactual is for the broader non-GHG regulation area.
    - It will not schedule RA resources in EDAM BAAs outside the ISO BAA by ignoring the energy bids of these resources. Consequently, these RA resources will have a zero GHG counterfactual schedule, which means they can be fully attributed to the CA GHG regulation area in the IFM (and its MPM pass).

3. **MPM pass for the IFM**: Provides effective measures against the exercise of market power when there is an opportunity for suppliers to exercise market power in the day-ahead market. In this pass, GHG transfers are unlocked and the following GHG constraints are applied:
    - First, the GHG attribution to a resource outside a GHG regulation area with a GHG bid is limited to the lower of (1) the GHG bid capacity, (2) the positive difference between the upper economic limit on the energy bid and the GHG reference obtained from the GHG reference pass, and (3) the optimal energy schedule.
    - Second, the aggregate GHG attribution to resources in a BAA in the non-GHG area is limited by the net export constraint; it would not exceed either the BAA's export capability or optimal net export transfer in a given interval (with the exception of RA capacity), relative to the net export transfer in the GHG reference pass. The optimization will view RA resources as internal to the GHG regulation area when they are either pseudo-tied[108] or dynamically scheduled from non-EDAM BAAs as system resources or tie-generators at an ISO scheduling point.

4. **IFM:** Co-optimizes energy, ancillary service bids, and imbalance reserve bids to produce day-ahead schedules and awards to ensure bid-in supply meets bid-in demand and all ancillary services and uncertainty requirements. In this market pass, the ISO will optimize for each BAA and GHG regulation area to reflect the optimal dispatch in the EDAM footprint considering GHG bids. The GHG constraints described in the MPM-IFM pass also apply to the IFM at the BAA and GHG regulation area level.

5. **MPM pass for RUC:** Checks for and mitigates market power for reliability capacity bids. GHG considerations are not applicable.

6. **RUC**: Identifies capacity needs and commits additional resources to ensure grid reliability. GHG considerations are not applicable.

In the draft final proposal the ISO suggested that the day-ahead schedule produced in EDAM would carry over to the WEIM and serve as the real time counterfactual. In this final proposal, the ISO clarifies the counterfactual for use in real time will be the difference between the day-ahead market energy schedule and day-ahead market GHG award for two reasons. First, this

[108] Any pseudo-tie participating generator agreement with a BAA within a GHG regulation area will also require modeling the resource as a GHG pseudo-tie to the GHG regulation area. The proposal does not accept a GHG pseudo-tie arrangement without the resource having a pseudo-tie agreement with a BA within a GHG regulation area.

approach more closely aligns with the concept of a base schedule. If the day ahead energy award is the energy needed to serve the whole market and the day-ahead market GHG award is the energy needed to serve a GHG region, the difference between them is the energy needed to serve the non-GHG portion of the market. Although this is not a perfect match with the base schedule, the ISO believes this is a closer approximation than the day ahead energy schedule. Second, this approach aligns with the fact that the real-time market is performing its own optimization and determines the final attribution. This is how the WEIM works today, and it allows for resources with lower GHG bids that only participate in the WEIM to displace more expensive resources that participate in both the WEIM and EDAM. The examples below highlight both the draft final proposal approach (Example 1) as contrasted with the final proposal approach (Example 2, 3, and 4) to clarify the mechanics of the approach.

	DA	FMM	Settlement	Comments
Background	For all examples assume: - Pmax / UEL= 100 MW -GHG bid = 50 MW - Marginal cost of GHG = $30	The GHG attribution to a resource outside a GHG regulation area with a GHG bid is limited to the lower of: (1) the GHG bid capacity, (2) the positive difference between the upper economic limit on the energy bid and the GHG reference obtained from the GHG reference pass, and (3) the optimal energy schedule. - Assume that FMM award is equal for all 4 intervals	**Day Ahead Settlement** = IFM Award MW * IFM Marginal cost of GHG **FMM GHG settlement (assuming the FMM award is equal for all 4 intervals)**= (FMM Award MW – IFM Award MW) x FMM marginal cost of GHG **RTD GHG settlement (assuming the RTD award is equal for all 12 intervals)**= (RTD attribution MW – FMM Award MW) x RTD marginal cost of GHG	Attribution is not guaranteed but based on voluntary bids submitted. Once the total MW of GHG transfers are determined, resources are selected for attribution at least cost to satisfy total GHG transfers All settlement is a deviation from the day ahead (i.e., higher attribution in RT will settle above DA settlement, lower attribution in RT will settle below DA settlement)
Example 1: Challenges with the ISO's draft final proposal: DAM energy schedule as the reference	DAM Energy Award = 90 MW DA GHG Award = 50 MW	FMM Counterfactual = Energy Award = 90 MW Max FMM GHG Award = UEL-Counterfactual = 100 MW – 90 MW = 10 MW	DA GHG Settlement = 50 MW * $30 = $1,500 FMM GHG Settlement = (10 MW – 50 MW) x $30 = ($1,200) Total: $300	Only 10 MW of the resource could potentially be awarded in RT
Example 2: Final proposal: Resource Energy Award	DAM Energy Award = 90 MW DAM GHG Award = 50 MW	FMM Counterfactual = DAM Energy Award - DAM GHG Award = 90 MW - 50 MW= 40 MW	DA GHG Settlement = 50 MW * $30 = $1,500	The resource is attributed to the GHG area in DA and RT

Higher than GHG Award		FMM Eligible Attribution = UEL – Counterfactual = 100-40 = 60 MW	FMM GHG Settlement = (60 MW – 50 MW) x $30 = $300 Total: $1,800	
Example 3: Final proposal: Resource Energy and GHG Award are equal in DA	DAM Energy Award = 50 MW DAM GHG Award = 50 MW	FMM Counterfactual = DAM Energy Award - DAM GHG Award = 50 MW -50 MW = 0 FMM Eligible Attribution = GHG bid = 50 MW = 50 MW	DA GHG Settlement = 50 MW * $30 = $1,500 FMM GHG Settlement = (50 MW – 50 MW) x $30 = $0 Total: $1,500	The resource is attributed to the GHG area in DA and RT.
Example 4: Final proposal: Resource is not awarded GHG in DA	DAM energy award = 100 MW DA GHG Award = 0 MW	FMM baseline = DAM energy schedule - DAM GHG award = 100 MW – 0 MW = 100 MW FMM Eligible Attribution = UEL – Counterfactual = 100-100 = 0	DA GHG Settlement = 0 MW * $30 = $0 FMM GHG Settlement = (0 MW – 0 MW) x $30 = $0 Total: $0	The resource is not attributed; it is serving the non-GHG portion of the market

Table 8: Day ahead to real time counterfactual and attribution examples.

For entities that participate in the WEIM and not in the EDAM, the ISO will continue to use the self-submitted base schedule as the GHG counterfactual. Some stakeholders posed additional questions on how the EDAM counterfactual differs from the two-pass solution previously considered in the context of the WEIM and expressed concerns that entities may withhold supply from the first market pass in order to secure a GHG attribution in the second market pass. The ISO emphasizes that it would be difficult to do this based on the optimized GHG reference pass proposed for the EDAM. As background, in the WEIM, a resource in the non-GHG area may submit a low base schedule (even zero) to create headroom for a GHG attribution to serve demand in California and profit from the additional payment for that GHG attribution. As documented in the ISO's compliance filing to FERC, the ISO did not find there were changes to the submission of WEIM base schedules by market participants to maximize revenue from GHG payments as opposed to the optimal dispatch of the resource.[109]

Unlike the WEIM, the EDAM GHG reference pass does not use a self-submitted base schedule; rather, it calculates an optimized supply schedule to meet the demand in the non-GHG area without GHG transfer imports into GHG regulation areas. As a result, it should yield realistic schedules for EDAM entities to serve their native load prior to making additional supply

[109] See ISO's December 27, 2019 Informational Report on EIM Market Bid Adder Rules. ER18-2341. Link

available to serve demand in a GHG regulation area. Unlike the WEIM, in EDAM a scheduling coordinator that bids a high energy bid for a resource in the non-GHG area to result in a low GHG reference that would increase its GHG attribution, risks pricing the resource out of the IFM.

(d) Secondary Dispatch Constraints

To reduce the potential for secondary dispatch, the ISO has proposed constraints to limit attribution. None of the constraints eliminate secondary dispatch. This final proposal includes two key measures to mitigate the potential for secondary dispatch. First, in the IFM, mirroring the approach used in the WEIM, the proposal is to limit resource-specific attributions to the lower of: (a) the GHG bid capacity, (b) the positive difference between a resource's upper economic limit and its GHG reference pass, or (c) the optimal energy schedule. Second, based on stakeholder feedback regarding concerns that the ISO was attributing resources to a GHG regulation area in periods when the BAA was a net importer or in excess of net optimal transfer schedule, the proposal is to implement an hourly GHG net export constraint for BAAs outside of GHG regulation areas.

In EDAM, the GHG net export constraint is an hourly constraint that applies to every BAA that does not overlap with a GHG regulation area. When a BAA that overlaps with a GHG area (no export constraint is enforced for that BAA) fails the RSE, all net export constraints are deactivated for that hour so as to not restrict imports into that BAA potentially creating a reliability issue. The constraint treatment is the same in both EDAM and WEIM, except for the interval duration. In the WEIM, this constraint will be deactivated for every 15 minute interval when a BAA that overlaps with a GHG area fails the RSE, and apply to all non-GHG EDAM BAAs.

In response to the draft final proposal, the ISO received stakeholder feedback both in favor of and opposing turning off the constraint. The final proposal maintains it is prudent to turn off the constraint to ensure there are no reliability impacts resulting from an attempt to limit attribution and therefore secondary dispatch.

This final proposal maintains considerations for RA resources so that the constraint limits the aggregate GHG attribution to resources in a BAA in the non-GHG area to the higher of the optimal net transfer (positive for export and negative for import) or the aggregate available RA capacity in that BAA. Furthermore, the constraint limit would be set relative to the net transfer of the BAA in the GHG reference pass; therefore, GHG attributions will be allowed to resources in a BAA with a reduced net import transfer in the IFM compared to the net transfer in the GHG reference pass. The proposal maintains implementation flexibility on whether the constraint will be static (now defined not as the capability of the line, but rather, it is defined as the optimal net transfer from the previous market run) or dynamic (based on the optimal GHG net transfer capability in a given interval). This constraint has the effect of reducing the available choices for GHG attributions, thus it may indirectly result in a higher marginal GHG price. This measure will also apply to WEIM. Lastly, the proposal also clarifies that if a BAA fails the RSE, the ISO will turn off the GHG net export constraint for the hours of that day that the BAA fails the RSE.

The final proposal clarifies how ISO RA resources[110] will be treated in the table below:

Viewed as internal to the GHG regulation area; not attributed	Viewed as external to the GHG area; can be fully attributed
Resources with both a pseudo-tie PGA to associate the resource with the BAA and a GHG pseudo tie (flagged in the master file) to associate the resource with the GHG regulation area will be viewed as internal to the GHG regulation area. In the case of a partial pseudo-tie, the resource would need to be registered as two separate resources, and one of them would be pseudo-tied. The logical[111] resources are bid, scheduled, and settled individually without any dependency with each other and the physical resource; the SC is responsible for dividing the physical resource capacity and technical characteristics between the logical resources. Similar to a full pseudo-tie, a partial pseudo-tie would need to have both a pseudo-tie PGA and a GHG pseudo-tie. A partial pseudo-tie is not a recommended approach and it can result in an infeasible dispatch.	RA resources from EDAM BAAs must be shown as bucket 1 energy transfers into the ISO BAA for RSE. They will have a zero GHG reference so that RA capacity can be fully attributed; their attribution will not be constrained by net export transfer constraints.
Dynamically scheduled resources from non-EDAM BAAs shown as system resources or tie-generators at an ISO scheduling point would be viewed as internal to the GHG regulation area.	Dynamically scheduled resources from non-EDAM BAAs shown as system resources or tie-generators at an EDAM BAA intertie can be viewed as external to the GHG regulation area if the EDAM BAA is not inside the GHG regulation area.

Table 9: RA treatment in the GHG counterfactual.

As follow up to questions from stakeholders and the November 21, 2022 Market Surveillance Committee (MSC) meeting regarding the extent to which the GHG net export constraint could limit transfers to a GHG regulation area and result in either reliability or pricing impacts, the ISO provided analysis in the draft final proposal which is also included in this final proposal. The ISO's analysis, using WEIM data for the most stressed months of July, August, and September, 2022 assessed the extent to which the GHG net export constraint would affect the availability of GHG bids. To do this, the ISO assessed what "currently eligible GHG bids" would be after determining it could not exceed the positive difference between the upper economic limit and the base schedule. From the "currently eligible GHG bids," the ISO then subtracted bids from BAAs that were net importers and bids in excess of the BAAs' transfer capabilities.

While the ISO did not find a reliability impact, it did find some pricing impacts. The preliminary analysis, summarized in the table and figures below, finds less than one percent of all Real-Time Pre-Dispatch (RTPD) intervals from July through September 2022 have exhausted the

[110] The proposal contemplates ISO RA resources. If there are other BAAs that participate in EDAM that have a resource adequacy construct that the ISO should allow to be fully attributable in the context of the GHG net export constraint, the resource-specific information of those resource adequacy resources will need to be provided to the ISO in the onboarding process to account for them.
[111] Logical means that it is not a physical resource, but a logical resource representation in the market.

submitted GHG bid capacity.[112] This refers to a situation where, after imposing both the current WEIM constraints on GHG awards and the proposed GHG net export constraints, no more GHG bids would be available to serve load within the GHG regulation area. The ISO does not anticipate a reliability impact arising from such a situation for two reasons (1) the RSE should ensure sufficient supply, and (2) the ISO has provisions in place to turn off the constraint as described above.

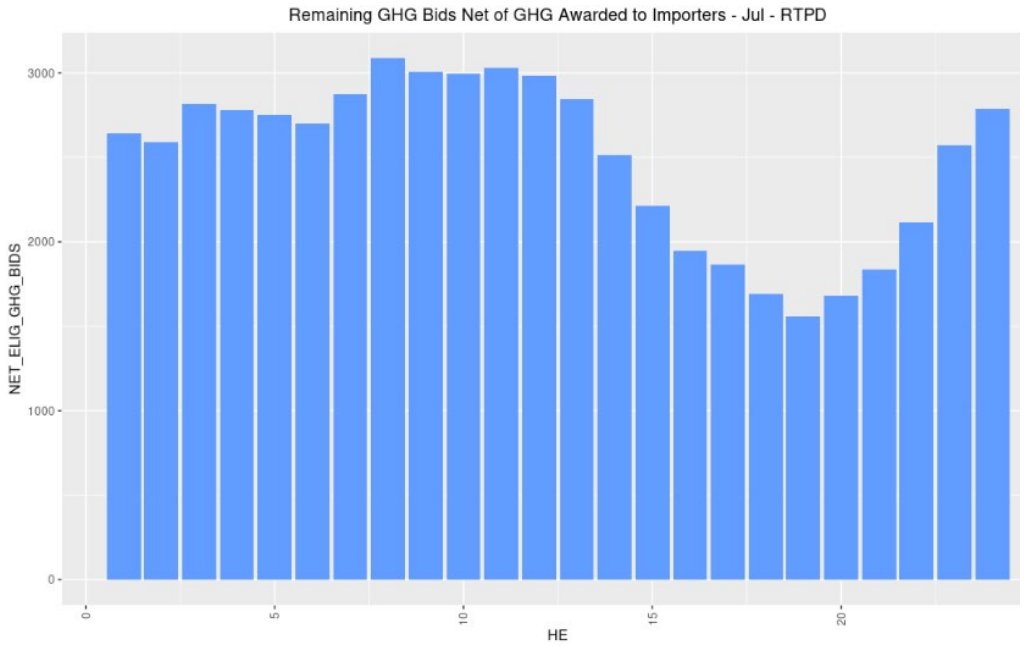
The ISO anticipates some pricing impacts because adding any new constraint to limit GHG attribution will likely affect prices as the constraint can affect which resource's bid sets the GHG marginal price. Thus, the marginal GHG bid will be higher up the bid stack. Conversely, the GHG net export constraint should limit the potential for secondary dispatch and therefore better reflect actual costs.

	Number of RTPD Intervals		
Month	Yes	No	Total[113]
July 2022	1	2,972	2,973
August 2022	25	2,940	2,965
September 2022	27	2,850	2,877

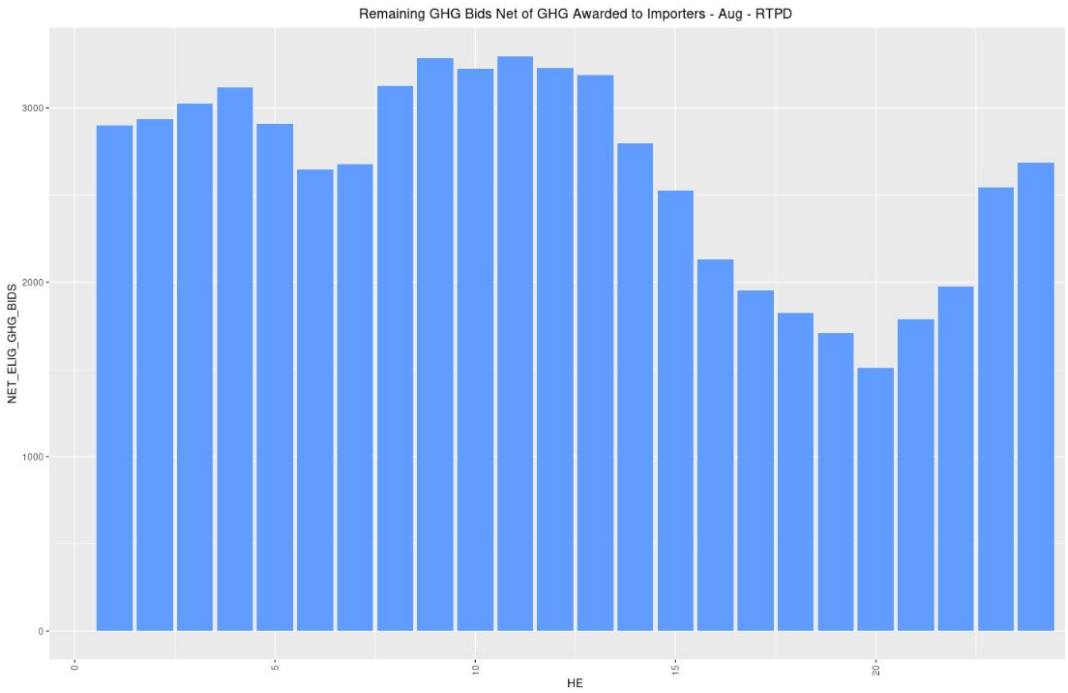
Table 10: Number of RTPD intervals in which GHG bid capacity might be exhausted.

The ISO has captured average hourly remaining GHG bids in the WEIM which are in excess of the constraint in the graphs below for July, August, and September 2022. These are remaining bids that have not been attributed after considering the constraint that the GHG bids cannot exceed the positive difference between the upper economic limit and base schedule, cannot come from a BAA that is a net importer, and cannot come from a BAA if attribution exceeds actual export capability.

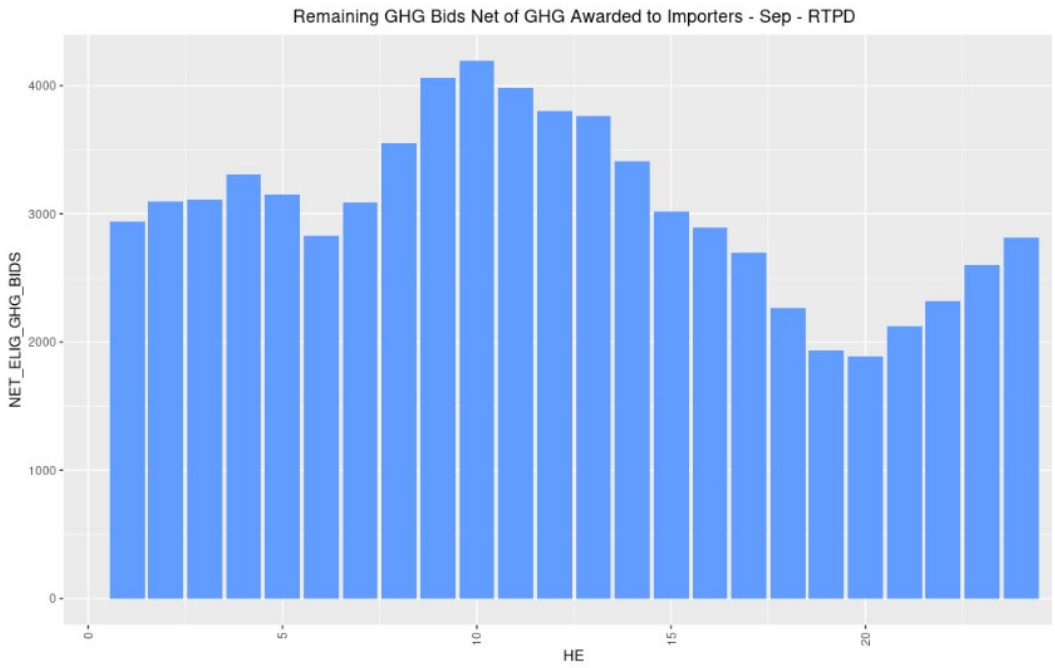
[112] Note: the results of the analysis shown herein reflect a slightly different export constraint than the one proposed in the revised straw proposal. Specifically, the analysis considered the net export constraint to be based on actual export capability rather than the constraint based on the optimal transfer. The ISO performed a similar analysis using the optimal transfer which yielded qualitatively similar results as the analysis shown here. As noted, the ISO is still evaluating if this constraint should be based on the optimal net transfer schedule or based on the transfer capability between BAAs.
[113] Note: an immaterial number of RTPD intervals were removed from the analysis due to various minor data integrity issues.



Graph 1: July 2022 average hourly remaining GHG bids in excess of the constraint.

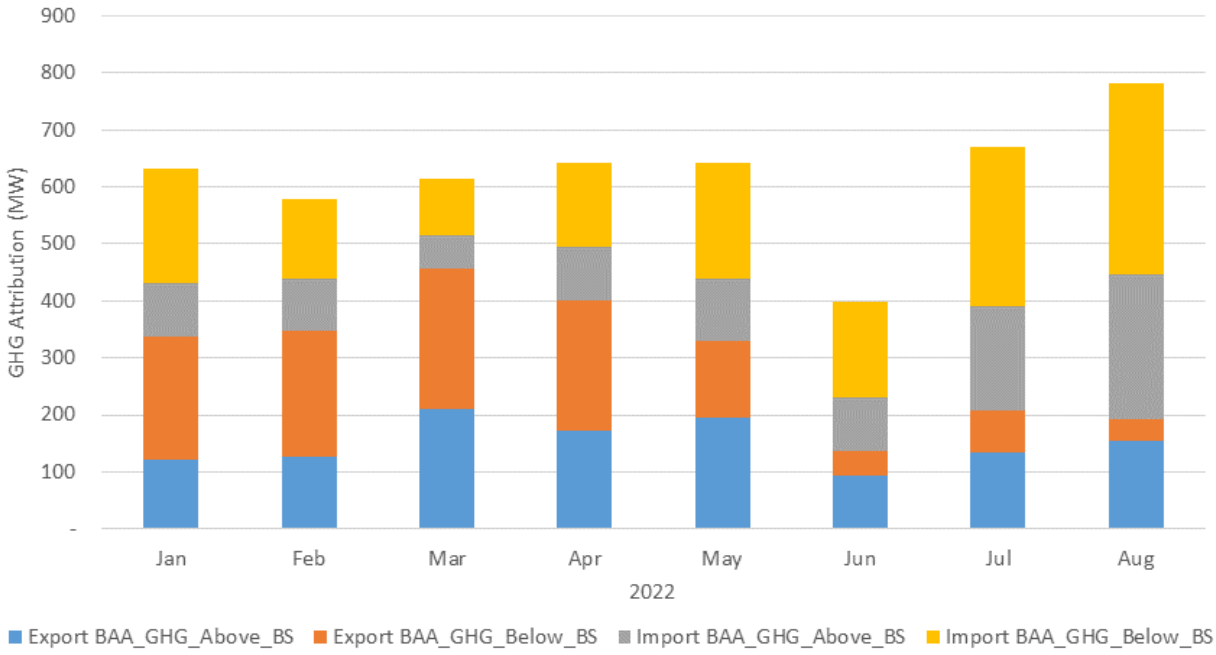


Graph 2: August 2022 average hourly remaining GHG bids in excess of the constraint.



Graph 3: September 2022 average hourly remaining GHG bids in excess of the constraint.

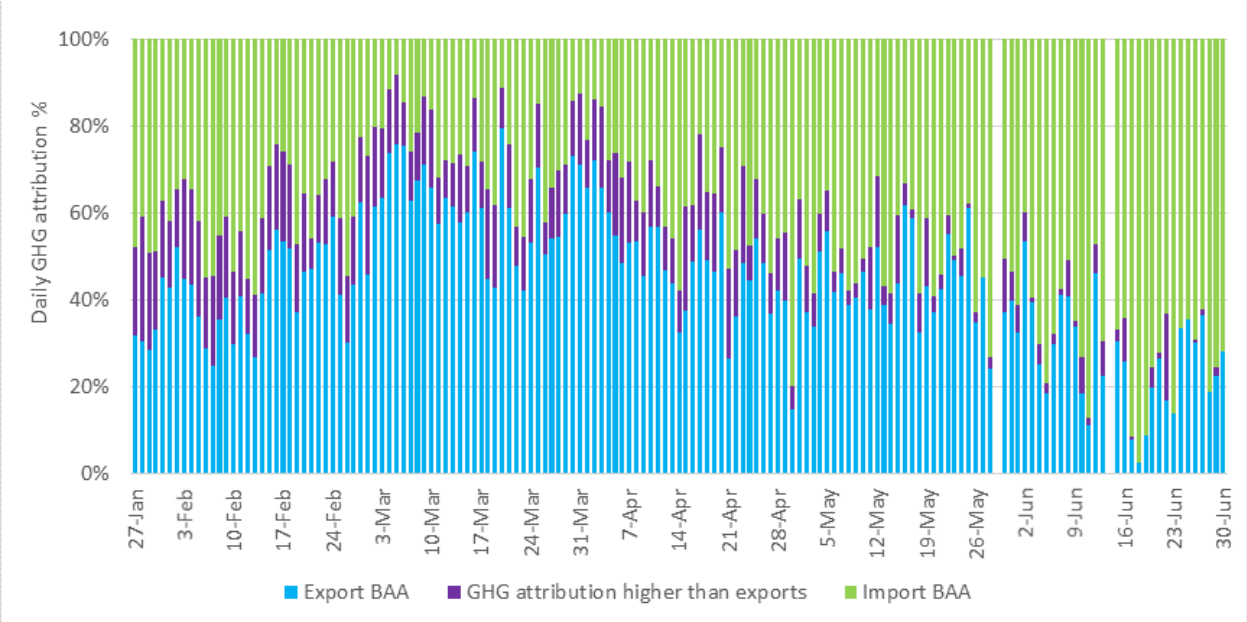
The MSC asked questions to understand where secondary dispatch came from in the GHG bid sufficiency analysis (the analysis above). They requested information on what attribution occurred above or below the base schedule. In response, the ISO produced the analysis below. The graph below provides the GHG attribution that are currently in an importing BAA or exporting BAA and the quantity that represent secondary dispatch. As a result of the net export constraint, the attributions in a currently importing BAA would no longer be available. The exporting BAA figures are not in excess of transfer limits, and resources located in those exporting BAAs could still receive an attribution based on bids to serve demand in a GHG regulation area. Both the importing and exporting BAA figures highlight what is above or below the base schedule, with the yellow and orange areas representing total secondary dispatch arising from attributions below resources' base schedules.



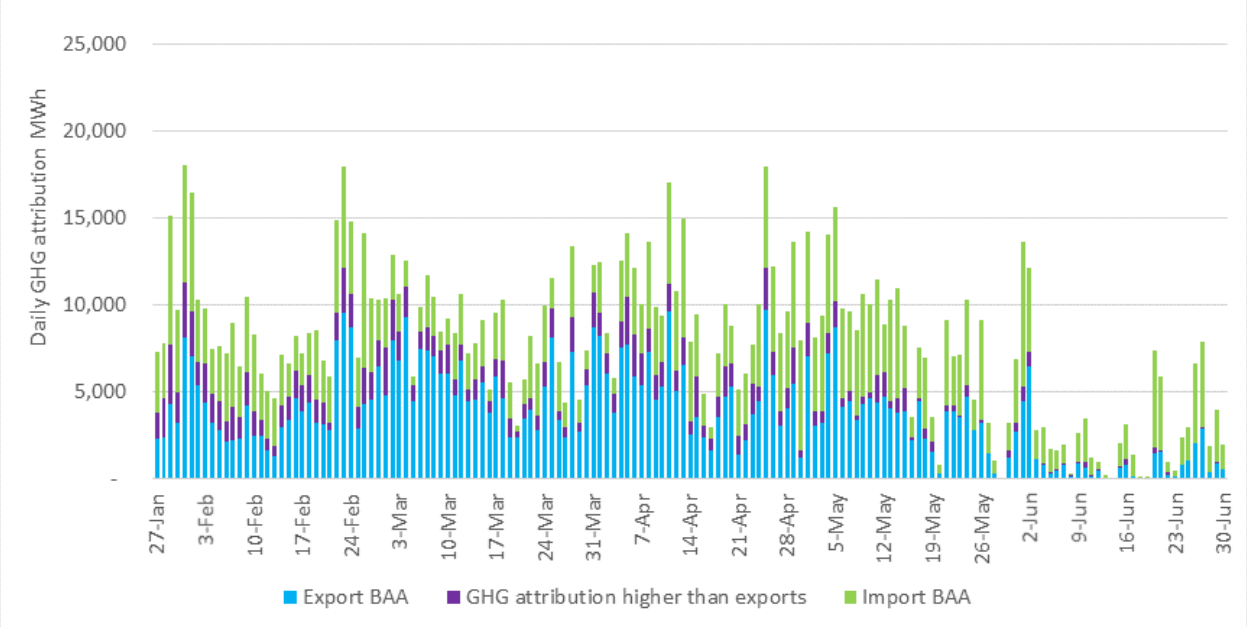
Graph 4: 2022 GHG attribution awards above and below the base schedule for importing and exporting BAAs.

There are some limitations to the analysis. First, unlike the proposal, the ISO did not adjust for monthly RA capacity from a BAA. Thus, this aspect of the analysis is more conservative than what would occur in EDAM. Second, the analysis considered the GHG net export constraint to be based on actual export capability rather than the constraint based on the optimal transfer. This aspect of the analysis is less conservative than what has been proposed. Lastly, although WEIM data can serve as a proxy, uncertainties remain regarding the extent the WEIM will mirror EDAM based on EDAM participation, bidding behavior, and the use of a different and optimal counterfactual.

Stakeholders also requested information on the amount of secondary dispatch in EDAM using the resource specific approach, and information regarding the extent to which the approach would minimize leakage compared to the WEIM approach. Without actual EDAM bids and awards, the ISO cannot forecast the amount of secondary dispatch. However, 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.



Graph 5: EDAM secondary dispatch constraints applied to the WEIM on a percentage basis in 2022.



Graph 6: EDAM secondary dispatch constraints applied to the WEIM on a volumetric basis in 2022.

This dataset from January 27, 2022 through June 30, 2022 reveals that a net GHG export transfer constraint would have reduced total attributions to resources within BAAs that were net importers. Although this does not indicate the possible magnitude of GHG attributions we might see in the EDAM, it provides context to the possible impact of the constraints.

- **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.

Certain stakeholders requested the ISO introduce a constraint to limit GHG attributions to only dispatches above the counterfactual. Although this approach appears straightforward, testing and modeling examples indicate this constraint would create significant implementation concerns. First, it may not be implementable. The number of binary variables required to linearize the constraint impose a performance challenge. Introducing a binary variable for each resource with a GHG bid (*i.e.*, for hundreds of resources in each hour), would increase the performance effort in the IFM (and its MPM pass) because the complexity increases exponentially with the number of binary variables. No matter how much time the market has to solve, it may even be impossible to obtain a solution. This issue will be exacerbated if applied in the real-time market. Second, the constraint produces pricing which is inconsistent with resource costs, which is antithetical to market design principles. The constraint removes the convexity of the problem leading to solutions with inappropriate and inconsistent unit commitment, dispatch, production cost, and marginal prices. The constraint may increase the cost and marginal prices for load outside the GHG regulation area. Also, resources outside the GHG area can be uneconomically scheduled above the GHG reference to receive a GHG attribution, resulting in payment inadequacy (payment below bid cost). This goes against a key benefit of EDAM and the WEIM; namely that the markets support economic displacement. The reduction of the secondary dispatch is but a secondary objective because the first and main objective is to minimize the scheduling cost in the market footprint.

Stakeholders may question how far should the market go to reduce the secondary dispatch before severely compromising its primary objective. The ISO shared examples and modeling efforts in its November 14th stakeholder meeting that demonstrate these problems. Most stakeholders that commented on the constraint in response to the draft final proposal, approved of not moving forward with the constraint in light of the inconsistencies it creates between the resource's prices and costs. The ISO understands that many stakeholders would like to better understand the frequency with which these issues occur. These instances occur during periods of economic displacement, which is the objective of EDAM. However, the ISO cannot quantify the frequency these events would occur outside of a live EDAM market.

(4) Transparency

As described above, the optimization takes the total imports for a GHG regulation area and then attributes resources lowest to highest. The shadow price of the GHG transfer allocation to GHG attributions is the marginal GHG price. Only resources with GHG bids receive an attribution of a transfer serving demand in a GHG regulation area. The ISO publishes GHG attribution data in various forms:

- For scheduling coordinators, the proposal is to make GHG attribution data available on a resource-by-resource basis in the Customer Market Results Interface (CMRI) and through settlement statements. Scheduling coordinators could use data from the CMRI to report MWh imports, by source, to their respective GHG regulation programs. This information can also be reviewed by third-party verifiers to confirm reported values. The proposal is also to make resource specific data from the GHG reference pass solution available to the resource's scheduling coordinators.

- At the state level, today the ISO reports total and WEIM-entity level MWh GHG attributions to CARB pursuant to a subpoena. The ISO will continue to explore how best to provide total WEIM and EDAM transfers to states with GHG accounting and reduction programs.

(5) 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. Deviation payments or charges will apply to the difference between the real-time and the day-ahead GHG attribution at the relevant real-time marginal GHG price.

As a clarification, in both EDAM and the WEIM the marginal greenhouse gas regulation cost (MGC) component of the LMP will be positive inside the GHG regulation area and zero outside the GHG regulation area. As a result, in settlements, the GHG component will be a positive payment to EDAM participating resources that receive a GHG attribution. This is a departure from today's approach in the WEIM in which the MGC is a negative value outside the GHG regulation area and zero inside California. The ISO is updating its approach in order to support multiple GHG areas. This does not change settlement outcomes.

(6) Compliance and Reporting

For regulatory purposes, the proposal is to for the ISO 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 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. The ISO is open and willing to begin longer term efforts to provide states with and without carbon pricing programs data on centralized market transactions. To support such reporting efforts, the ISO will work with state representatives to assess what type of data would best support their requirements and the frequency they would like it provided.

Regarding REC reporting and compliance, stakeholders raised concerns that some states may view market dispatch as a claim on the REC and suggested improved data reporting to ameliorate this issue. The ISO makes no claim to a resource's environmental attributes, either for itself or on behalf of its market participants, as a result of a dispatch in its markets. To assist with this issue, one stakeholder encouraged the ISO to work with The Western Electric Coordinating Council's (WECC) Western Renewable Energy Generation Information System (WREGIS) to develop a comprehensive tracking and reporting mechanism that covers all generating units operating in the Western Interconnection. This request extends beyond the scope of an initial EDAM design. The ISO is willing to explore data needs with entities in the Western Interconnection as efforts to implement EDAM continue.

Lastly, some states require deliverability to the service territory of the purchasing utility for a utility to claim the REC. This type of policy can prohibit market participation and, consequently, efforts to lower emissions in the west. The final proposal is to defer to states to address this issue.

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

The draft final proposal retained the proposal for sharing of transfer revenue which accrues at the interfaces between EDAM BAAs.[114] Under this approach, there would be a 50:50 sharing arrangement between two EDAM BAAs that made available transmission at the interface between the BAAs to facilitate energy transfers, imbalance reserve transfers, and/or reliability capacity transfers. The draft final proposal also retained the proposal for distribution of congestion revenue,[115] which accrues on the internal transmission system when there are binding constraints, and includes intertie constraints (ITCs), would be retained by the EDAM BAA where the congestion occurs.

Stakeholders generally supported the proposed shared allocation of transfer revenue that accrues at the interfaces between two EDAM BAAs. However, a few stakeholders continue to raise concerns with the allocation of congestion revenues accrued as a result of transmission constraints binding on the internal transmission system of an EDAM BAA to that BAA. These stakeholders stated that if a constraint is binding because of limitations on the internal system driven by flows across the interties, known as an intertie transmission constraints (ITC), the revenue should be shared with the transmission owners of the intertie. Other stakeholders supported allocating congestion revenues accrued on the internal system of an EDAM BAA to that BAA on the grounds such BAA must resolve the congestion, which results in re-dispatch and other costs. Accordingly, they argued accrued congestion revenues should remain with that entity. As discussed further below, this final proposal retains the proposals to (1) share transfer revenue 50:50 accrued at the interties between the two EDAM BAAs, and (2) assign the congestion revenues accrued resulting from congestion and constraints on the internal transmission system to remain with the EDAM entity on whose transmission system the constraint materialized.

a) Background and WEIM Congestion Revenue Allocation Today

The ISO models internal transmission constraints, internal transmission limits, and transmission transfer limits in the WEIM and would continue to do so in the EDAM. If these internal transmission limitations or constraints are reached – the constraint or limit binds – the market will seek to re-dispatch around these constraints. When these limits or constraints bind, the marginal cost of congestion (MCC) component within the LMP accounts for differences between the incremental cost to serve demand and recovers these costs as congestion revenues.

Similarly, entities make transmission available at the interfaces/interties between EDAM BAAs to support energy transfers. The transmission across interfaces between WEIM BAAs may have

[114] Transfer revenue is the revenue collected at transfer locations when one EDAM BAA provides energy, imbalance reserve and/or reliability capacity to another EDAM BAA, and the transfer scheduling limit is binding at the optimal solution.
[115] Congestion revenue is produced by a binding transmission constraint or intertie scheduling limit (ITC/ISL) in the optimal solution such that the LMP, exclusive of Marginal Cost of Losses and Marginal GHG regulation cost, at different locations of the transmission system generally is not equal across an EDAM BAA.

limitations or other constraints, largely informed by the amount of transmission capacity made available to the market across the transfer interfaces that derives a scheduling limit. When this transfer scheduling limit is reached, *i.e.*, becomes binding, the market will seek to re-dispatch to meet the obligations across the footprint. For example, the market may award capacity from higher cost resources within the BAA to meet BAA load and other requirements. When the transfer limit binds in the EDAM, it will result in price separation of the marginal energy component (MEC) of the LMP for the binding BAA and the rest of the footprint, which represents the accrual of transfer revenue.[116]

In the WEIM, real-time congestion revenue accrues when either internal transmission constraints bind or transfer constraints bind, and both constraints are considered within the congestion component of the LMP. The WEIM entity is allocated congestion revenues accrued associated with binding internal transmission constraints within the BAA in which the constraint is modeled. The ISO allocates congestion revenue accrued as a result of binding transfer scheduling constraints among the BAAs associated with the transfer point. If the transfer point is between two WEIM BAAs, the congestion revenues are shared between the two BAAs 50:50, with the exception that across interfaces with the ISO BAA, the congestion revenue is allocated fully to the WEIM BAA supporting the transfer. In the WEIM, the WEIM congestion revenue – also known as congestion rent – is settled through one charge code on a net basis where the revenues accrued are offset by incurred congestion costs.

b) Transfer and Congestion Revenue Allocation in EDAM

Revenue associated with binding transfer limits or constraints at the interfaces between two EDAM BAAs, as well as congestion revenue associated with binding internal transmission limits, will accrue in EDAM similar to how they accrue in WEIM. However, rather than settling these revenues under the umbrella of "congestion revenue" (or congestion rent) under one settlement charge code, these components will be separated and settled independently with the EDAM entity – one settlement for accrued transfer revenue and a separate settlement for accrued congestion revenue.[117]

This final proposal retains the proposal that transfer revenue accruing at the interfaces between two EDAM BAAs is shared 50:50 between the two entities, including with the ISO. The transfer revenue accrues because two EDAM entities brought transmission to the interface to support mutual transfers, and they derive mutual benefits. Thus, sharing these transfer revenues is fair and equitable. The transmission brought to the EDAM encompasses bucket 1, bucket 2, and bucket 3 transmission that facilitates transfers and accrual of transfer revenues when net transfer limits – represented by ETSRs – bind (reach the limits). The exception to the sharing of transfer revenue 50:50 between two EDAM BAAs is when transmission across an interface is made available by a transmission customer under pathway 2, *i.e.*, where they release their transmission rights to the market in advance for optimization. In that instance, the transmission

[116] 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 becomes binding.
[117] During the *Real Time Settlement Review Initiative*, the ISO identified an asymmetrical settlement for energy wheeling through the WEIM area when one WEIM BAA has a power balance constraint violation. This could lead to limited cost shifting within the WEIM area and between WEIM and non-WEIM BAAs. The initiative determined that the ISO would settle all ETSRs, which are associated with transfers between BAAs. Thus, there must be separation between the settlement of transfer and congestion revenues. *Real Time Settlement Review Initiative,* October 21, 2020. Link

customer will receive the full allocation of transfer revenue associated with its transmission rights released to the market. In unique instances where the sharing of transfer revenue 50:50 between two EDAM BAAs does not align with existing or future commercial arrangements between the two BAAs (*i.e.*, specific contracts between the entities), different transfer revenue sharing arrangements can be accommodated.

Similarly, this final proposal retains the proposal that congestion revenue accruing because of binding transmission constraints on the internal transmission network of the EDAM entity be fully allocated to the EDAM entity, including with the ISO.[118] This approach is consistent with the allocation of congestion revenues in the WEIM, where the full allocation is settled with the EDAM BAA. On the ISO system, congestion revenues accruing on the internal transmission system are allocated to fund congestion revenue rights, and sharing these revenues could lead to under collection and undermine the ISO's ability to fund these congestion revenue rights. More practically, if there is a binding internal transmission constraint, the market re-dispatches generation internal to the BAA to continue serving load and meeting the BAA's obligations. Sharing the accrued revenues with other entities would be inequitable in these circumstances. Stakeholders do not oppose this approach for allocating congestion revenue for purely internal constraints.

Some stakeholders continue to oppose fully allocating congestion revenues to the EDAM BAA where the constraint materializes accruing as a result of binding limits or constraints on internal paths due to import or transfer flows across interfaces between EDAM BAAs. These constraints on the internal transmission paths of a BAA arise, in part, due to import flows across one or multiple interfaces. A common example of an ITC is a constraint or limit on an internal path or physical facilities that may bind due to simultaneous flows across particular interties. These are common limits or constraints transmission providers may have on their internal transmission network today. When these constraints or limits are reached, it may lead to curtailment of transmission service or re-dispatch within the BAA to ensure those limits are respected and do not impede reliability. In the WEIM, although the ISO has many ITCs modeled in the market because its entire load is offered in the day ahead, only a few participating entities have elected to model ITCs in the market. They have opted instead to monitor and resolve them outside of the WEIM, in part, because of the limited scope of the WEIM in optimizing supply to meet imbalance needs. Also, it may be more practical to manage internal transmission system constraints outside of the market consistent with a BBAs' historical practice.

In the EDAM, where the scope of participation is broad, entities will be similarly situated to the ISO and will seek to model more if not all their internal transmission constraints in the market to ensure feasible commitment of supply in the day ahead and dispatch in real time. The ISO therefore expects ITCs will be more prominent in the EDAM across all participating EDAM BAAs, with congestion revenue accruing in every EDAM BAA as a result of a binding ITC on the internal transmission network. These revenues would be allocated to the EDAM BAA to compensate for re-dispatch of generation internal to the BAA to manage the constraint and ensure continued reliable service to load. This practice is consistent with actions outside of the

[118] To the extent there are multiple transmission owners within a BAA, they may also be eligible for allocation of accrued congestion revenue associated with their facilities availability in the EDAM and there may be a need for direct payment of congestion revenues to these transmission owners. The accrual and disposition of congestion revenues associated with multiple transmission owners within an EDAM BAA depends on the individual ownership rights, contractual arrangements and physical aspects of the transmission system and as such would be addressed and delineated during the implementation and onboarding process of an EDAM entity and the associated circumstances and arrangements.

EDAM by Western BAAs where the transmission provider resolves internal transmission constraints, whether caused by simultaneous import flows or other constraints materializing on the system. As such, it is fair and equitable that the congestion revenues accruing on all internal constraints be allocated fully to the EDAM entity where the internal transmission constraint is binding.

In order to align practices across the markets, the proposal is to extend this proposed transfer revenue and congestion revenue allocation design to the WEIM to ensure consistent treatment across markets. As explained above, the proposed EDAM design is largely consistent with the WEIM where congestion revenue accruing on binding internal transmission constraints is fully allocated to the EDAM entity on whose system the internal constraint binds. Similarly, in the WEIM the transfer revenue is largely being shared today (50:50), and the proposal is to make this the default allocation for all transfer revenues between EDAM BAAs, including with the ISO, except for transmission being released under pathway 2 where the transmission customer will be allocated a full share of transfer revenue associated with its transmission rights released to the market.

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.

The draft final proposal provided more details on the settlement of the integrated forward market and reliability unit commitment, as well as interactions with the real-time market. Although stakeholder comments support the majority of the settlement details, several stakeholders continue their encouragement to consider settling transfer revenue, congestion revenue, and uplift allocations, directly with the third party customers.

This final proposal retains most of the proposal elements described in the draft final proposal. However, the proposal includes some clarifications to reflect design changes made in prior sections as well as some clarifying revisions.

This section describes the proposed settlement principles and requirements that would apply to supply and demand resources 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 in Section II.B.2(g), EDAM BAAs that fail the RSE test(s) will be assessed an administrative charge based on the direction of the RSE failure (*i.e.*, upward or downward), the magnitude of the failure, and the hour(s) in which the failure occurs.

IFM Resource Sufficiency Failure Settlement:

The proposal is that for EDAM BAA(s) that fail the RSE in the upward direction in an off-peak hour, the ISO will calculate an RSE off-peak upward administrative penalty in that failed hour. For EDAM BAA(s) that fail the RSE in upward direction in at least one hour of 16 hour on-peak period, the ISO will calculate the RSE on-peak upward administrative penalty for each hour within the16-hour peak block period. In addition, for BAA(s) that fail the RSE in the downward direction, the ISO will calculate the IFM RSE downward penalty for each hour the BAA failed.

The ISO will calculate the RSE off-peak upward administrative penalty as the product of the hourly RSE deficiency quantity, the BAA load weighted average LMP, and the RSE failure

multiplier adjusted by any scaled persistent RSE failure factor. As described in section II.B.2(g), the RSE failure consequence multiplier will depend upon the amount of deficiencies cured by the market and will be 0, 1.25, or 2. The persistent RSE failure factor is calculated on a rolling prior 30 day window and is the product of the number of daily upward RSE tier two or above RSE failure consequences levels in that rolling 30 day period less RSE threshold and a configurable RSE scaling factor.

The ISO will apply the RSE on-peak upward administrative penalty each hour within the 16 hour block on-peak period. For each hour in the 16 hour block period in which the BAA failed the RSE upward test, the administrative penalty equals the product of the highest RSE deficiency quantity across the on-peak hours, the higher of the bilateral hub price of MID-C or bilateral hub price at Palo Verde, and the RSE failure multiplier adjusted by any scaled persistent RSE failure factor. For those hours within the 16 hour block period where the BAA passed the RSE upward test, the hourly administrative penalty will be adjusted by the RSE pass credit amount, which equals the product of the highest deficiency quantity and the BAA load weighted average LMP of the passed hour. In addition, if the RSE credit exceeds the RSE administrative charge in the hour for which the entity passed the RSE, the administrative charge will be capped at zero. RSE credits will not be netted across the 16-hour block period.

The ISO will calculate the IFM RSE downward administrative charge in each hour the BAA failed. The RSE downward administrative penalty equals the product of the hourly RSE deficiency quantity and the marginal energy cost for that BAA.

If an EDAM BAA is assessed IFM RSE Failure Penalty, the cost will be allocated directly to the EDAM Entity to re-allocate through the OATT. If the ISO BAA is assessed the IFM RSE Failure Penalty, the ISO will re-allocate the costs to participants through a two-tiered approach. The first-tier allocation is to the resource adequacy resources that contribute to the ISO deficiency up to the higher of the bilateral hub price at MID-C or the bi-lateral price at Palo Verde. Any unallocated RSE penalty costs will be allocated to ISO metered demand.

IFM Resource Sufficiency Penalty Revenue Distribution:

On an hourly basis, the ISO will sum the RSE off peak upward administrative penalty revenue of the BAAs that failed the RSE upward test and distribute the revenue to EDAM BAAs that passed the RSE upward test pro-rata based upon a BAA's total net export transfer to total net export transfer of all the BAAs that passed the RSE upward test. On an hourly basis, the ISO will the sum of the RSE on-peak upward administrative penalty revenue of the BAAs that failed the RSE upward test and distribute the revenue to EDAM BAAs that passed the all-peak hour RSE upward tests pro-rata based upon a BAA's total net export transfer to total net export transfer of the BAAs that passed the RSE upward test. In addition, because energy and imbalance reserve capacity is fungible, the total net export transfer equals the sum of the net energy transfer plus net imbalance reserve transfer. On an hourly basis, the RSE downward administrative penalty revenue will be distributed to those BAAs, in that hour, that passed the RSE downward test pro-rate based on their load forecast in relationship to total load forecast of those BAAs that passed the RSE downward test. Afterward distributing the RSE administrative penalty revenue to the BAAs, the ISO will distribute the total BAA RSE Penalty revenue to the EDAM Entity for sub-allocation per the OATT or if, the EDAM BAA is the ISO, the total RSE Penalty revenue will be allocated to participants within the ISO BAA as determined in an upcoming ISO BAA implementation initiative.

b) Integrated Forward Market (IFM)

The day-ahead market primarily comprises the IFM, RUC, and the market power mitigation processes. 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 and will produce hourly day-ahead energy schedules, convergence bid (virtual) schedules, ancillary service awards, and imbalance reserve awards. The IFM also produces 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 ISO will settle the results of the IFM and RUC processes as described in the following sub-sections.

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 an import energy transfer. These import and export energy transfers will be paid and charged the LMP at their relevant scheduling point-intertie locations.

d) Day-Ahead Greenhouse Gas (GHG) Settlement

In the final proposal, 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. After taking the GHG counterfactuals under consideration, the IFM clearing will optimize bids in non-GHG region and GHG regions, and dispatch resources to meet demand. The IFM optimization can result with the scheduling of energy from a non-GHG supply resource 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) ETC/TOR IFM Settlement

Scheduling Coordinators who self-schedule energy in the IFM using their ETC/TOR rights will settle at the LMP in a manner similar to all other day ahead schedules. However, the balanced portion of ETC/TOR schedules is eligible for mitigation against congestion. The ISO will facilitate this mitigation by reversing the marginal cost of congestion component of the LMP difference between the balanced source day ahead schedule and sink day ahead schedule. The ISO will include these congestion costs in the calculation of Day Ahead Congestion revenue. In addition, long-term contracts with special marginal losses provision will have a similar settlement mechanism apply to the marginal cost of losses component of LMP.

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

The ISO's 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.

g) 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 hourly day-ahead marginal losses offset amount will also include any ETC/TOR marginal losses reversal. 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, the ISO will allocate the hourly day-ahead marginal loss offset to measured demand in same manner as today.

h) 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, the energy transfer schedules, the GHG transfer schedule, and the marginal cost of GHG. The ISO will allocate the BAA hourly day-ahead marginal GHG 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.

i) Day-Ahead Marginal Congestion Offset

The ISO will calculate an hourly day-ahead marginal congestion revenue amount for each EDAM BAA. The hourly day-ahead marginal congestion revenue amount will equal the sum of the product of day-ahead energy schedules, including virtual schedules and energy transfer schedules, and the marginal cost of congestion contribution for each EDAM BAA at its relevant pricing location and considering relevant intertie transmission constraints. The hourly day-ahead congestion revenue amount will also include any ETC/TOR marginal congestion reversal amounts. The ISO will allocate the hourly day-ahead marginal congestion revenue amount to

each EDAM BAA through day ahead marginal cost of congestion offset for distribution based upon its OATT, and the hourly day-ahead marginal congestion revenue amount allocated to the ISO BAA will be distributed first to CRRs and then to any surplus allocated to measured demand per the ISO tariff.[119]

j) 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.

k) IFM 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 at which the transfer scheduling limits are binding. The transfer revenue equals the product of the transfer quantity and the difference between the transfer import marginal energy component (MEC) price and transfer export MEC price.

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/IRDP) in the binding EDAM BAA from the IRUP/IRDP. The proposal is to calculate an hourly transfer revenue for IRU/IRD for each transfer point at 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/IRDP price and transfer export IRUP/IRDP.

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/RCDP) in the binding EDAM BAA from the RCUP/RCDP. The proposal is to calculate an hourly transfer revenue for RCUP/RCDP for each transfer point at 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/RCDP and transfer export RCUP/RCDP.

The ISO will calculate the total transfer revenue per transfer location as the sum of energy transfer revenue, plus imbalance reserve transfer revenue, plus reliability capacity transfer revenue. Pathway 2 transmission will have designated transfer resources that will be optimized by the market and award energy, imbalance reserve, and/or reliability capacity. Scheduling

[119] ISO tariff section 11.2.4.

Coordinators associated with Pathway 2 transfer resources will receive a direct allocation of the appropriate energy, imbalance reserve, and/or reliability capacity transfer revenue. The total transfer revenue less Pathway 2 Transfer revenue distribution will be distributed to the BAAs associated with the transfer location on a 50:50 ratio. EDAM BAA transfer revenue will be assigned 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 measured demand compared to ISO total measured demand. Allocating ISO transfer revenue to measured demand compensates a participant in a manner similar to congestion revenue right surplus allocation and the real time congestion offset allocation.

l) 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 IRU capacity in excess of the resource 5-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 IRD capacity in excess of the resource 5-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 separately allocate each EDAM BAA's IRU and IRD costs through a two-tier allocation methodology under development in the DAME initiative. The ISO will update stakeholders regarding the allocation methodology when the DAME initiative concludes.

m) 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.

n) 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 export transfer, which is the sum of BAA net energy transfer plus the BAA net imbalance reserve transfer is the export direction, the ISO will transfer a portion of the BAA's IFM BCR amount to BAAs receiving net import transfers, where sum of BAA net energy transfer plus the BAA net imbalance reserve transfer is the import direction. This IFM BAA BCR transfer adjustment amount will equal the product of the BAA hourly IFM BCR amount and the BAA net transfer export divided by the sum of the BAA net transfer export plus day-ahead load schedule and day-ahead export schedules. The IFM BAA BCR adjustment amount will be allocated to BAAs with net transfers in the import direction and added to the BAA IFM BCR amount. For EDAM BAAs, the adjusted BAA IFM BCR amounts will be allocated directly to the EDAM entity for reallocation in accordance with the BAA OATT. For the ISO BAA, the ISO will reallocate the adjusted IFM BCR amounts through the current two-tier IFM BCR allocation in the ISO tariff.

o) 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. The ISO discuss below the settlement of specific transactions in RUC.

p) Reliability Capacity Settlement

Stakeholders and the ISO are 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.

q) 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.

r) 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 (FMM), and real time dispatch process (RTD). 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.

s) 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 must 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 must demonstrate ability to pass the capacity test and ability to pass the flexible ramping sufficiency test.

t) 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 allows BAAs to cure insufficiencies through the WEIM. BAAs that voluntarily elect to participate in the assistance energy program will be subject to energy assistance surcharge for the portion of its RSE failure cured by the market above their available balancing capacity or equivalent product. The energy

assistance surcharge will be collected and distributed through ISO settlement system, *i.e.*, outside of the market.

u) 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 will incent balanced schedules in the WEIM, but it is unnecessary for the EDAM, which relies on the day-ahead market to produce balanced schedules through its own incentive mechanisms.

v) Transmission Recovery Settlement

The transmission commitment section of this draft final 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" EDAM recoverable transmission revenue, transmission revenue associated with certain transmission new-builds, and excess wheeling revenue.[120] This draft final straw proposes to collect each BAA's EDAM recoverable transmission revenue amount from the EDAM footprint gross load less the recovering EDAM BAA's gross load. The collected BAA revenue recovery amount will be paid to the EDAM entity or to the ISO's participating transmission owners (PTO) pro rata based on their PTO transmission recovery amount in proportion to the ISO total transmission revenue recovery amount.

w) Real-Time Market Energy Settlement

The ISO will settle 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.

x) 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.

[120] Additional information about the EDAM recoverable transmission revenues proposal is discussed in the transmission commitment discussion in section II.B.1(d).

- 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.

y) 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.

z) Uninstructed Imbalance Energy Settlement

The ISO calculate uninstructed imbalance energy settlement 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 LAP LMP.

aa) ETC/TOR Real-Time Market Settlement

Scheduling Coordinators who self-schedule energy in the RTM using their ETC/TOR rights will settle any imbalance energy at the relevant LMP in a manner similar to all other imbalance energy settlement. Because the imbalance settlement reflects the imbalance energy between day ahead schedules and meter/tags, the ISO will derive the incremental/decremental imbalance ETC/TOR balanced quantity. These resource imbalance ETC/TOR quantities are eligible for mitigation against RTM congestion. The ISO will facilitate this mitigation by reversing the marginal cost of congestion component of the LMP difference between the balanced source imbalance energy quantity and sink imbalance energy quantity. The ISO will include these congestion costs in the calculation of real time congestion offset. In addition, long-term contracts with special marginal losses provision will have a similar settlement mechanism apply to RTM marginal cost of losses component of LMP.

bb) 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 LAP LMP and will be allocated to relevant metered demand. Based upon stakeholder comments, the draft final proposal agrees to extend the WEIM Unaccounted for Energy election provision to EDAM BAAs.

cc) 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.

dd) Real Time Offsets

For BAAs that join EDAM, the BAA real time marginal loss offset settlement and BAA real time congestion offset settlement will account for any ETC/TOR marginal losses reversal and ETC/TOR real time congestion reversal, if applicable. 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 allocate RTM offsets for the ISO 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 draft final proposal removes 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 l incorporate the WEIM BAAs.

ee) 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.

ff) 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 ISO calculate the IDS penalty 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. Because EDAM BAA OATTs have specific provisions addressing non-delivery of bi-lateral intertie schedules, the proposal is to not assess the IDS penalty at the start of EDAM for other BAAs, and continue to assess the charge only for the ISO BAA. Instead, the ISO would monitor the intertie scheduling and tagging practices for reliability concerns.

gg) 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 RTD forecasted movement from the FMM forecasted movement and the price differential between relevant RTD flexible ramping up and RTD 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 the ISO does today. RTD FRU/FRD settlement will be the product of the difference between the RTD FRU/FRD award and 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.

E. EDAM Fees Framework

The ISO is committed to fiscal responsibility, including fair and reasonable rates for its customers. For the EDAM, the ISO will develop EDAM fees using the rate design model and activity-based costing 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.

The ISO 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.

Stakeholder comments on the draft final proposal continued to express support for the proposed design, which remains unchanged in this final proposal.

1. 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 require the ISO to perform changes to its systems that 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. One stakeholder asked whether the ISO could provide an updated estimate of the start-up costs at the time of the signing of the implementation agreement based on the associated complexity for implementation of the particular EDAM entity. The ISO commits to provide an updated estimate at that time.

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, the ISO will determine hourly rates for onboarding activity on an annual basis based on current aggregated and burdened labor rates. The ISO does 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, the average cost to onboard an EDAM entity is projected to 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 of invoice. 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 the entity's onboarding project. The ISO will calculate the average interest earned on the deposit at the end of the onboarding project. 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 a party terminates 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 will 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 other existing tariff processes. Following this existing process allows the ISO to account for its costs in performing onboarding activities accurately and efficiently.

2. Administrative Fees Framework

The ISO recovers its GMC revenue requirement through unbundled grid management charges and other fees developed using the most recent triennial cost of service results.[121] 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 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

[121] *See* the most recent triennial cost of service study, available on the ISO website. Link

administrative fees, only EDAM administrative fees. As participation in EDAM grows, the increase in volumes will contribute to lower market services and system operations rates, all other factors held constant. This, in turn, will contribute to lower WEIM administrative fees. At this time the ISO does not expect that introducing the EDAM administrative fees will change the rate structure of the WEIM 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, receiving market services (including existing ISO customers) will benefit from a lower market services rate when 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 lower the rates will be.

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

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

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.[123] 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. Stakeholder comments and the workshops informed development of the revised straw proposal.

On August 16, the ISO published the EDAM revised straw proposal describing a more detailed, evolved, design informed by stakeholder discussions. The ISO held four stakeholder meetings, from August 29 to September 14 to discuss the different elements of the design. Additionally, on October 11 the ISO held workshop on EDAM settlements processes based on the most recent design. This draft final proposal is informed by written stakeholder comments received on September 26 and the prior stakeholder meetings.

On October 31, the ISO published the EDAM draft final proposal continuing to evolve various aspects of the design based on stakeholder discussions and comments. The ISO held a stakeholder meeting on November 14 to discuss and review the incremental design elements put forward in the draft final proposal, and received stakeholder comments on November 30.

2. Initiative Schedule

The following table describes the upcoming EDAM milestones and schedule.

Date	Milestone
Q4 2022	
October 31, 2022	Publication of draft final proposal
November 7, 2022	Publication of draft tariff framework
November 14, 2022	Stakeholder meeting (in-person and virtual)
November 22, 2022	Comments due on draft final proposal
December 7, 2022	Publication of final proposal
December 14, 2022	Joint ISO Board of Governors and WEIM Governing Body meeting (**briefing**)

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

February 2023	Joint ISO Board of Governors and WEIM Governing Body meeting (**decision**)
Q1 2023	Draft tariff publication and stakeholder process
Q2 2023	FERC filing
Q4 2023	Implementation
2024	EDAM go-live coordinated with interested entities

Table 9: EDAM milestones schedule.

B. Decisional Classification for WEIM Governing Body

This initiative proposes a day-ahead market that extends beyond the ISO footprint, and across participating WEIM BAAs. The current 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 WEIM Governing Body's joint authority or advisory role. These changes, however, are only a part of the overall EDAM initiative, and thus if the current rules were applied, the remaining changes would fall outside the WEIM Governing Body's decisional role.

The EDAM design involves the creation of a new unique market paradigm that the current decisional classification rules did not contemplate. The Board of Governors, during its May 11, 2022 meeting, proposed that the entire EDAM initiative fall under the joint authority of the WEIM Governing Body and the Board. The revised straw proposal explained this proposed classification and requested stakeholder comment. Stakeholders expressed support for this approach. Accordingly, ISO management expects that the entire initiative will be subject to joint authority, requiring the approval of both the Board and the WEIM Governing Body under that construct.

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
SR, NR	Spinning and Non-Spinning Reserve schedule	η	Charging efficiency
$\overline{\ }$, $\underline{\ }$	Denotes upper/lower limit	$^{(+)}$, $^{(-)}$	Denotes discharging/charging schedule
D	Demand forecast*	*v*, *w*	Penalized upward/downward capability shortfall
IRUR/IRDR	Imbalance reserve up/down requirement*	*u*	Discharge binary variable
RUR/RDR/SRP/NRR	Regulation up/down & spinning/non-spinning reserve requirement*	$\alpha, \beta, \gamma, \delta$	Shared ramp capability constraint coefficients
*adjusted for bucket-1 energy/imbalance reserve/regulation/contingency reserve transfers			

Table 10: Notation for EDAM RSE application

Power balance requirements:

$$\sum_i EN_{i,t} + v_t - w_t = D_t$$

Imbalance reserve requirements:

$$\sum_i IRU_{i,t} \geq IRUR_t, \quad \sum_i IRD_{i,t} \geq IRDR_t$$

Ancillary Services requirements (cascading for ISO BAA is not shown):

$$\sum_i RU_{i,t} \geq RUR_t, \quad \sum_i RD_{i,t} \geq RDR_t, \quad \sum_i SR_{i,t} \geq SRR_t, \quad \sum_i NR_{i,t} \geq NRR_t$$

Capacity Constraints:

$$EN_{i,t} + IRU_{i,t} \leq UEL_{i,t}$$
$$EN_{i,t} - IRD_{i,t} \geq LEL_{i,t}$$
$$EN_{i,t} + IRU_{i,t} + NR_{i,t} + SR_{i,t} + RU_{i,t} \leq UOL_{i,t}$$
$$EN_{i,t} - IRD_{i,t} - RD_{i,t} \geq LOL_{i,t}$$

Ramping Capability Constraints:

$$EN_{i,t} - EN_{i,t-1} \leq RRU_i(EN_{i,t-1}) - \alpha\, RU_{i,t} - \beta\, SR_{i,t} - \gamma\, NR_{i,t} - 4\,\delta\, IRU_{i,t}$$
$$EN_{i,t} - EN_{i,t-1} \geq -RRD_i(EN_{i,t-1}) + \alpha\, RD_{i,t} + 4\,\delta\, IRD_{i,t}$$

Energy Constraints:

$$\underline{E_i} \leq \sum_t EN_{i,t} \leq \overline{E}_i, \forall i$$

Energy Storage Model:

$$SOC_{i,t} = SOC_{i,t-1} - \left(EN_{i,t}^{(+)} + \eta_i\, EN_{i,t}^{(-)}\right)$$
$$EN_{i,t} = EN_{i,t}^{(+)} + EN_{i,t}^{(-)}$$
$$0 \leq EN_{i,t}^{(+)} \leq u_{i,t}\, UEL_{i,t}$$
$$(1 - u_{i,t})\, LEL_{i,t} \leq EN_{i,t}^{(-)} \leq 0$$

$$SOC_{i,t-1} - RU_{i,t} - SR_{i,t} - NR_{i,t} - IRU_{i,t} \geq \underline{SOC_i}_{,t}$$
$$SOC_{i,t-1} + \eta_i\,(RD_{i,t} + IRD_{i,t}) \leq \overline{SOC}_{i,t}$$

V. Appendix 2: EDAM Revenue Shortfall Allocation

This appendix shares additional illustrations of the BAA-specific rate for recovery of the forecasted EDAM revenue shortfall if allocated to gross load as discussed in section II.B.1(d). The BAA specific rate is derived by excluding both the forecasted EDAM revenue shortfall and the denominator.

Method 1 - Gross Load Allocation, BAA-specific scenarios

Medium-end forecasted EDAM revenue shortfall scenario

BAA	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	Revenue Shortfall Allocation ($ in Millions)					BAA Specific Rate[124]
	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 11: deriving a BAA-specific rate based on a gross load allocation.

High-end forecasted EDAM revenue shortfall scenario

BAA	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

[124] Calculated as sum of BAA revenue shortfall allocation from other BAAs revenue 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	Revenue Shortfall Allocation ($ in Millions)					BAA Specific Rate[125]
	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 12: deriving a BAA-specific rate based on a gross load allocation.

[125] Calculated as sum of BAA revenue shortfall allocation from other BAAs revenue 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: Mathematical Formulation of the WEIM Power Balance Constraint Relaxation (Confidence in Transfers)

Notation

i	Node/resource index
j	BAA index
t	Time index
BAA	Set of resources in a BAA
G	Supply resource (including virtual supply in EDAM)
D	Demand forecast
T	Algebraic net transfer (positive for export)
$\bar{T}$	Net transfer reference
$T^{(EN)}$	Day-Ahead or base net energy transfer
$T^{(IRU)}$	Day-Ahead net imbalance reserve up transfer
$T^{(IRD)}$	Day-Ahead net imbalance reserve down transfer
$T^{(RCU)}$	Day-Ahead net reliability capacity up transfer
$T^{(RCD)}$	Day-Ahead net reliability capacity down transfer
$s^{(+)}$	Supply shortfall
$s^{(-)}$	Supply surplus
$ABC^{(+)}$	Available balancing capacity up
$ABC^{(-)}$	Available balancing capacity down

For a given time interval, the BAA power balance constraint with penalized supply shortfall and surplus is as follows:

$$\sum_{i \epsilon BAA_j} G_{i,t} - D_{j,t} - T_{j,t} + s_{j,t}^{(+)} - s_{j,t}^{(-)} = 0$$

The power balance constraint relaxation when either the shortfall or the surplus take value is constrained as follows:

$$\left(s_{j,t}^{(+)} + \sum_{i \epsilon BAA_j} ABC_{i,t}^{(+)} \right) \left(T_{j,t} - \bar{T}_{j,t}^{(+)} \right) \leq 0$$

$$\left(s_{j,t}^{(-)} + \sum_{i \epsilon BAA_j} ABC_{i,t}^{(-)} \right) \left(T_{j,t} - \bar{T}_{j,t}^{(-)} \right) \geq 0$$

Where the net transfer references are determined as follows:

$$\bar{T}_{j,t}^{(+)} = T_{j,t}^{(EN)} + T_{j,t}^{(IRU)} + T_{j,t}^{(RCU)}$$
$$\bar{T}_{j,t}^{(-)} = T_{j,t}^{(EN)} - T_{j,t}^{(IRD)} - T_{j,t}^{(RCD)}$$

VII. Appendix 4: Mathematical Formulation of the Net EDAM Export Transfer Constraint

Notation

i	Node index
j	BAA index
k	Innermost ITC index
t	Time index
G	Generation schedule
I	Import schedule
E	PT Export schedule
T	Net transfer
$\bar{T}$	Net base transfer (net of bucket 1 transfers, positive for export)
UEL	Upper economic limit, reflecting derates
AS	Total upward ancillary service award (regulation up + spinning reserve + non-spinning reserve)
IRU	Imbalance reserve up award
RCU	Reliability capacity up award
ITC	Import scheduling limit
NEC	Non-exportable capacity margin
u	Unit commitment status (0/1)
a	Confidence factor for non-RSE eligible supply
BAA_j	Set of resources in BAA j
S_k	Set of intertie resources constrained by ITC k
S_{RSE}	Set of RSE-eligible resources
$\widetilde{\ }$	Denotes RSE optimal schedule meeting RSE requirements

Assuming for simplicity that the energy bid extends to the maximum resource capacity ($UEL = P\max$) and that there are no AS and IRU/RCU intertie bids, the net energy export constraint in the base scenario of IFM is as follows:

$$
\begin{aligned}
T_{j,t} \le \bar{T}_{j,t} + \max\Bigg(0, & \sum_{i \epsilon BAA_j \cap S_{RSE}} u_{i,t}\left(UEL_{i,t} - \widetilde{AS}_{i,t} - \widetilde{IRU}_{i,t} - \tilde{G}_{i,t}\right) \\
& + a \sum_{i \epsilon BAA_j - S_{RSE}} u_{i,t}\left(UEL_{i,t} - \widetilde{AS}_{i,t} - \widetilde{IRU}_{i,t} - \tilde{G}_{i,t}\right) \\
& + \sum_{k} \min\Bigg(ITC_{k,t} - \sum_{i \in S_k}\left(\tilde{I}_{k,i,t} - \tilde{E}_{k,i,t}\right), \sum_{i \in S_k \cap S_{RSE}}\left(UEL_{k,i,t} - \tilde{I}_{k,i,t}\right) \\
& + a \sum_{i \in S_k - S_{RSE}}\left(UEL_{k,i,t} - \tilde{I}_{k,i,t}\right)\Bigg) - NEC_{j,t}\Bigg)
\end{aligned}
$$

The net (energy + IRU) export constraint in the IRU deployment scenario of the IFM is as follows:

$$T_{j,t} + T_{j,t}^{(IRU)} \leq \bar{T}_{j,t} + \bar{T}_{j,t}^{(IRU)}$$
$$+ \max\Bigg(0, \sum_{i \epsilon BAA_j \cap S_{RSE}} u_{i,t}\left(UEL_{i,t} - \widetilde{AS}_{i,t} - \widetilde{IRU}_{i,t} - \tilde{G}_{i,t}\right)$$
$$+ a \sum_{i \epsilon BAA_j - S_{RSE}} u_{i,t}\left(UEL_{i,t} - \widetilde{AS}_{i,t} - \widetilde{IRU}_{i,t} - \tilde{G}_{i,t}\right)$$
$$+ \sum_{k} \min\Bigg(ITC_{k,t} - \sum_{i \in S_k}\left(\tilde{I}_{k,i,t} - \tilde{E}_{k,i,t}\right), \sum_{i \in S_k \cap S_{RSE}}\left(UEL_{k,i,t} - \tilde{I}_{k,i,t}\right)$$
$$+ a \sum_{i \in S_k - S_{RSE}}\left(UEL_{k,i,t} - \tilde{I}_{k,i,t}\right)\Bigg) - NEC_{j,t}\Bigg)$$

Finally, the net (energy + IRU + RCU) export constraint in the RUC is as follows:

$$T_{j,t} + T_{j,t}^{(IRU)} + T_{j,t}^{(RCU)}$$
$$\leq \bar{T}_{j,t} + \bar{T}_{j,t}^{(IRU)}$$
$$+ \max\Bigg(0, \sum_{i \epsilon BAA_j \cap S_{RSE}} u_{i,t}\left(UEL_{i,t} - \widetilde{AS}_{i,t} - \widetilde{IRU}_{i,t} - \tilde{G}_{i,t}\right)$$
$$+ a \sum_{i \epsilon BAA_j - S_{RSE}} u_{i,t}\left(UEL_{i,t} - \widetilde{AS}_{i,t} - \widetilde{IRU}_{i,t} - \tilde{G}_{i,t}\right)$$
$$+ \sum_{k} \min\Bigg(ITC_{k,t} - \sum_{i \in S_k}\left(\tilde{I}_{k,i,t} - \tilde{E}_{k,i,t}\right), \sum_{i \in S_k \cap S_{RSE}}\left(UEL_{k,i,t} - \tilde{I}_{k,i,t}\right)$$
$$+ a \sum_{i \in S_k - S_{RSE}}\left(UEL_{k,i,t} - \tilde{I}_{k,i,t}\right)\Bigg) - NEC_{j,t}\Bigg)$$

Note that there are no RCU bucket 1 transfers:

$$\bar{T}_{j,t}^{(RCU)} = 0$$