Post-Workshop Comments
of the
EIM Entities

First and foremost, the EIM Entities[1] greatly appreciated the time and effort undertaken by the California Independent System Operator (CAISO) and stakeholders to discuss the issues presented in the February 11-12 workshops on an Extended Day Ahead Market (EDAM). We recognize that the EDAM initiative and the accompanying workshops are a significant resource commitment for the CAISO and all stakeholders. Our collective goal is to develop a market that brings broad-based benefits to the West to justify these significant efforts. As noted in the workshop, we recognize that there are several open issues still to be resolved and therefore welcome the input and observations of the CAISO and stakeholders.

The EIM Entities put forward materials as part of the workshops in an effort to tee up several high-priority market design elements. Attached are the applicable slides in order to ensure ease of reference as stakeholders review materials in subsequent stages of the stakeholder process. However, we do not wish to be redundant in these comments by repeating what was already contained in the presentations made at the workshop. Instead, the comments below focus on overarching principles and discrete issues that may require additional work, emphasis or clarification.

The task ahead is challenging and likely to call for innovative approaches. As emphasized during the workshop, the EIM Entities are a diverse group. These differences include – but go far beyond – jurisdictional status and encompass the scope and configuration of their transmission systems, the manner in which those systems have been used for native load and third-party customers, and the availability of transmission that has not been purchased. The EIM Entities appreciate the engagement of stakeholders on these issues, especially given the complexity imposed by this diversity. The discussion at the workshop was an encouraging first step.

What is the Meaning of a "Voluntary" Market in the Context of EDAM?

During the workshop there was considerable discussion of what "voluntary participation" means in the context of EDAM and what that means with respect to the commitment of generation and transmission into the market. At the highest level, the determination on the part of a Balancing Authority to join the Energy Imbalance Market (EIM) is voluntary, and we envision

[1] *The EIM Entities joining these comments include: Arizona Public Service Company ("APS"), Avista Corporation ("AVA"), Balancing Authority of Northern California ("BANC"), Bonneville Power Administration ("BPA"), Idaho Power Company ("Idaho Power"), The City of Los Angeles, Department of Water and Power ("LADWP"), NV Energy ("NV Energy"); PacifiCorp, Portland General Electric Company ("PGE"); Powerex Corp. ("Powerex"), Public Service Company of New Mexico ("PNM"), Puget Sound Energy, Inc. ("PSE"), Salt River Project ("SRP"),The City of Seattle, acting by and through its City Light Department ("Seattle City Light"), The City of Tacoma, Department of Public Utilities, Light Division ("Tacoma Power"), Tucson Electric Power ("TEP"), Turlock Irrigation District ("TID"); and NorthWestern Corporation d/b/a NorthWestern Energy ("NWE"). Some EIM Entities may not have yet formulated their own specific positions on all issues addressed within this document. Therefore, while these comments represent a consensus position of the group as a whole, these comments may not necessarily represent the views on every specific issue by each individual EIM Entity.*

that the decision of that Balancing Authority to expand its participation to include the day-ahead market will also be voluntary in the same sense as in the EIM.

The EIM Entities agree that it is important to discuss further what these issues mean in the context of EDAM and the CAISO's other day-ahead market participants. At the highest level, "voluntary," as it applies to EIM, means the ability of a Balancing Authority that has entered the EIM by executing an EIM Entity Agreement to provide advance notice of at least 180 days that it wishes to terminate the agreement and completely terminate participation in the market on a future date certain. It is also established through the EIM that EIM market participants are not required to submit resource bids. While the EIM Entities acknowledge that there are no "must offer" obligations in the EIM (or as the EIM Entities envision for EDAM), there are certain operational necessities of being able to participate in the market that place an EIM Entity in the position of ensuring that it is offering sufficient resource capability to pass Resource Sufficiency (RS) tests. To enable EDAM, an effective day-ahead RS test is necessary to allow participants to access the benefits of a day-ahead market in a manner that supports reliability and prevents entities from leaning on the resources in other Balancing Authority Areas (BAA)s. In this sense, these tests will impose a compulsory function on participation that is an important consideration in these stakeholder discussions. Moreover, there is the overarching responsibility as a Balancing Authority to ensure supply sufficiency within its own BAA.

The EIM Entities acknowledge that, in the EDAM context, additional work is needed to detail how a unit identified in the EDAM RS test in the day-ahead optimization timeframe is made available through various market intervals. We anticipate that these issues will need to be worked through in the stakeholder process and welcome any proposals or suggestions from the CAISO and stakeholders.

Beyond the requirements of an EDAM RS test, participants should be encouraged to provide bids into the market through appropriate products, price formation, and, in cases of local market power mitigation, reasonable default energy bids. Similarly, the issue should not be whether or not a transmission provider *must* make all Available Transfer Capability (ATC) available, but how best to value (and price) that transmission *to encourage participation* while minimizing cost shifts.

In general, there should be common agreement on the principle that more participation is better. More resources participating with bids, combined with more transmission made available, will lead to more efficient market outcomes and increased benefits. Thus, the immediate emphasis must be on encouraging (rather than mandating through existing CAISO market measures) participation with generation and transmission in the overall market design. That said, as was emphasized in the presentation materials, the overall intent is to create a pool of real, physical resources that can then be optimized by the market operator.

Both the Allocation of Congestion Rents and the Mechanism to Flow Congestion Rents to Transmission Rights Holders Deserve Considerable Post-Workshop Attention.

Congestion Allocation Principles

Ultimately, EIM Entities agree an approach should result in a fair allocation of congestion rents to the entities that contribute transmission to the system. This seems consistent with basic principles of market design and the CAISO's own positions when allocating Congestion Revenue Rights (CRRs). We look forward to continued dialogue on this matter and welcome proposals and feedback that can shape resolution of this issue.

Entities typically invest in transmission rights to receive the economic value that results from opportunities to deliver energy from one location to another. Under an Open Access Transmission Tariff (OATT) framework, this may result from the entity physically scheduling energy between the two locations. Under an LMP-based market, the fair allocation of congestion rents can enable the rights holder to receive such economic value through congestion-driven pricing differences when their transmission rights are made available to the market for optimization. A durable and fair allocation of congestion rents is therefore critical to provide incentives for entities to join and participate in the EDAM and to voluntarily contribute transmission on key paths to enable additional EDAM transfers.

Particular care must be given to addressing the congestion allocation on major pathways that can facilitate large EDAM transfers. For example, the Pacific AC and DC interties can enable deliveries of approximately 8,000 MW from the Pacific Northwest to California. These major pathways are heavily used, often congested, and present significant drivers of potential EDAM benefits between the Northwest and California. Critically, these major pathways are also exposed to significant risk of "seams" issues. While these major transmission lines enable deliveries between the Northwest and California, both the AC and DC interties are effectively split horizontally (and sometimes vertically), with different Transmission Service Providers (TSPs) offering service to different rights holders on the upstream/northern and downstream/southern segments of the transfer paths. Arriving at an approach to fairly allocate congestion rents across these seams is a key challenge to arrive at just and reasonable EDAM market design.

The EIM Entities believe that it is imperative that an equitable approach is developed and agreed upon in advance to the sharing of the congestion value resulting from transfers on paths in which rights are split between upstream and downstream segments, thereby ensuring a durable and predictable allocation of EDAM benefits.

Congestion Allocation Mechanisms

The EIM Entities appreciate the detailed information provided by CAISO staff regarding some of the typical approaches used by the CAISO markets, including annual and monthly CRR allocations and auctions and congestion credits for existing transmission contracts.

While the EIM Entities believe a consistent set of principles for fairly allocating congestion rents is necessary, more discussion is needed to evaluate the specific allocation mechanisms that are workable and most consistent with those principles. This is especially important in light of the need for EDAM to co-exist with the existing OATT framework. Given this need to comport with the OATT framework and for other reasons, our initial view is that utilization of CRRs to allocate congestion rents is not a desired element of the initial market design.

For example, CRR allocations appear to be most practical if transmission rights are relatively well defined in advance (e.g., monthly or longer). This approach may prove difficult in some cases because, in addition to long-term rights, TSPs make transmission service available on a short-term basis. Furthermore, many transmission customers make short-term "redirects" of longer-term transmission rights to more efficiently schedule resources during the day-ahead timeframe. The EIM Entities fully expect these activities to continue, including by participating entities that make day-ahead transactions to meet EDAM RS requirements. This means that both TSPs and transmission customers may only be able to determine the quantity of transmission service available to EDAM on a daily basis.

Ultimately, EDAM design will need to recognize and accommodate TSPs that may be differently situated, with different priorities and different OATT practices. For these reasons, the EIM Entities suggest exploring other alternatives for the distribution of congestion rents, such as BAA-level congestion balancing accounts that could provide flexibility to BAAs to employ different methodologies where required.

The Goals of the RS Test are Critical. Our Aim is to Find a Simple Method to Ensure that all Participating BAs are Adequate and Enforce the Principle of "No Leaning."

Why the EIM Entities Believe an RS Test is Needed

The EIM Entities recognize that the EDAM provides a tremendous opportunity to develop a voluntary, regional day-ahead market that will enable a more efficient short-term optimization of resources and transmission across a broader footprint.

A fundamental principle of EDAM is that entities will continue to maintain local authority over existing forward planning decisions. Therefore, the EDAM design must ensure that participating entities can continue to rely on their existing Integrated Resource Plans, Resource Adequacy, and/or other forward contracting to secure sufficient resources on a forward basis.

Such autonomy over forward planning decisions, however, results in a need to measure and ensure that each entity has voluntarily taken the necessary steps to secure adequate supply prior to participating in a voluntary day-ahead market that is relied upon to serve load. The EIM Entities have worked together and collectively believe that an effective day-ahead RS test is a vital component of an EDAM. The purpose of the RS test is twofold. First, it should ensure and promote reliability. A key benefit of EDAM is to achieve cost savings through a more efficient

day-ahead commitment of generating units across the wider EDAM footprint, including the displacement of internal unit commitments within one BAA when more economic resources can be committed in other BAAs instead. Such benefits can only be achieved if participants are confident that EDAM transactions can be relied upon to meet firm load without any elevated risk of curtailment due to resource shortfalls in other BAAs within the EDAM footprint. Since we do not wish to disturb underlying local procurement policy, the RS test will validate the resource plans of those entities which intend to participate against a reliability metric to ensure reliable operation can be maintained. Second, it should promote fairness. Resource sufficiency is critically necessary to prevent EDAM participants from "leaning" on the capacity and/or flexibility investments made by other EIM Entities, without explicitly compensating and contracting for it.

These dual rationales are why we believe an RS test is necessary. Undertaking a common long-term planning and procurement process is outside the scope of EDAM and outside the control of the CAISO and stakeholders, but some form of a test is critically necessary to ensure a reliable and fair market solution. Ultimately, an effective resource sufficiency test will promote maximum participation by providing participants with confidence in the market results and assurance that each BAA has individually secured sufficient energy, capacity, flexibility, and supporting transmission in advance to avoid leaning on other EDAM participants.

Factors to Consider When Developing the RS Test

An RS standard that is either too low or too high can have the same effect of limiting the success of EDAM.

If an RS standard is crafted too leniently, such that participating entities will not enter the market resource sufficient, this will increase the potential that entities will lean on the EDAM to avoid securing resources or capacity in advance. Conversely, a standard that is unnecessarily high will result in additional costs and reduced benefits for the market as a whole. Both outcomes severely limit the potential success of EDAM. The EIM Entities believe that solving this challenge should start with a determination of an acceptable level of reliability for the market solution as a whole. Once the overall RS standard is determined and agreed upon, the individual requirements (and diversity benefits) can be calculated for each BAA. This should be the first and primary deliverable in the stakeholder process.

Supply must be real and capable of performing when needed.

As an RS test is crafted in the stakeholder process, the EIM Entities have general guidelines to present for consideration. First, internal resources must be counted based on a realistic measure of actual operating capability. Resources that cannot or do not perform when needed likewise cannot be included in an accurate RS test

Second, there must be rules for verifying the reliability of external resources transferred from one EIM Entity BAA to another and identified as available resources to meet the RS test. External resources must be real and identifiable, non-recallable, and supported by highly reliable

transmission. Day-ahead e-Tags are a critical tool to confirm supply meets the necessary criteria to be counted toward Resource Sufficiency, and to avoid double-counting between BAAs.

Third, where possible, the test should be simple and workable. This includes ensuring that each entity has the information and tools necessary to fully understand the requirements in advance.

Finally, the RS test must be transparent. Such transparency requires a commitment to ongoing review and continued improvement as experience is gained. Both RS requirements and results should be transparent to all participants, with extensive after-the-fact analysis to ensure the tests are applied accurately and equitably to all BAAs. Standardized metrics that support ongoing assessment of the results should be well-defined and support a comprehensive evaluation of RS on an ongoing basis.

The Consequences of Failure of the RS Test is an Area that Would Benefit for Additional Thinking and Discussion.

The EIM Entities recognize that this area of any RS test is one of the most challenging, and one in which much more consideration and deliberation is warranted. At this initial juncture, the EIM Entities would prefer a mechanism to enforce the RS test that is "preventative," rather than "punitive." A preventative test would limit that entity's participation in the market to ensure its participation does not undermine the reliability of the market solution nor enable the entity to lean on the market to make up for the shortfall. Such a preventative test could take several forms. However, we are concerned that the current EIM "freezing" approach under EIM may not achieve these objectives. The current EIM freezing approach only limits transfers from increasing from the prior interval and does nothing to prevent the entity from leaning on the market for an amount equal to that previous transfer (i.e., capacity leaning).

EIM Entities are concerned that financial penalties will not achieve these objectives. It may be extremely difficult to match financial penalties to the potential cost savings associated with avoiding forward commitments (e.g., building resources or forward contracting on an annual or seasonal basis). There may be challenges to creating a financial penalty severe enough to provide an effective economic disincentive for such leaning.

Again, the EIM Entities recognize that this is an area in which considerable work is required and look forward to detailed discussion in the stakeholder process.

Just like the EIM, EDAM Will Likely Require Some Give and Take on Market Timelines. Further Dialogue on the Impacts of a "Processing Hold" on Bilateral Transactions is Warranted.

The timing and efficacy of the RS test and market optimization are critical to the success of EDAM. This will require considering enhancements to the existing day-ahead timelines for transactions consummated in the CAISO markets and those done bilaterally. We note, based on

our historical experience and the empirical showings in the benefits studies, that the more transmission that is made available for the market solution, the more efficient and effective the market solution can be and, in turn, those benefits will promote greater participation. The EIM Entities welcome additional dialogue on the issue of how market timelines in EDAM may best accommodate existing practices.

In order for the market optimization to be robust and provide confidence EDAM transactions can be relied upon to meet firm load without any elevated risk of curtailment, the market will need to be constrained within the prescribed amounts of available transmission. Transmission providers will need to identify relevant constraints and communicate them to the CAISO for use in the market optimization. This is true whether the constraints are physical constraints, as represented in the Full Network Model or an outage submission for example, or commercial constraints that reflect pre-existing uses of the grid. These constraint amounts would then remain unperturbed for the duration of time needed to run the day-ahead market.

Thus, our initial thinking is that some "processing hold" on transmission during pre-described time periods may be necessary to accomplish these market design objectives and to appropriately honor existing and defined uses of the system, while enabling contribution of other rights and the optimization benefits that may be achieved.

Conclusion

The EIM Entities greatly appreciate the efforts of the CAISO and stakeholders to consider the market design concepts of an EDAM. Our materials presented at the workshop reflect our efforts to date to develop principles, and our thinking on how some of those principles translate into specific market design elements. We would greatly benefit from the input of stakeholders and the CAISO to further develop these concepts and look forward to the continuing dialogue of the stakeholder process.

Attachments:
EIM Entities Presentation on EDAM Resource Sufficiency Design
EIM Entities Presentation on Transmission Elements of EDAM Design
EIM Entities Presentation on Congestion Rents for EDAM Design

EIM Entities Presentation on EDAM Resource Sufficiency Design
Feb 11, 2020

Preamble

- The EIM Entities emphasize that they are a diverse group and are sometimes differently situated based upon geography, resource portfolios, and jurisdictional status, among other potential differentiating factors.
- Some EIM Entities may not have yet formulated their own specific viewpoints on specific market design issues. Therefore, while this presentation represents consensus viewpoints of the group as a whole, they may not necessarily represent any individual EIM Entity.
- Some EIM Entities may choose to offer their own individual contributions where appropriate, either in comments or throughout the stakeholder process.

Agenda

1. Objectives and Principles
2. Proposed Test Structure
3. RS Requirements
4. RS Supply
5. Meeting RS
6. Consequences of Failure
7. Transparency
8. Other Considerations

1. Objectives and Principles

EDAM is a Significant Opportunity

- A successful EDAM can provide **significant regional benefits**
  - Enable hourly DA transactions that better reflect the needs of a rapidly evolving grid
  - Support continued integration of renewables
  - More efficiently commit resources on a day-ahead basis
  - Strengthen and support system reliability
  - Allow entities to reduce costs and share diversity benefits in an equitable manner

- Resource Sufficiency is **critically necessary to achieve success**
  - EDAM volume will be **much larger** than EIM
  - EDAM will determine critical unit commitment across the West
  - Centralized market results in increased co-ordination and reliance on other BAAs
  - All participants must maintain sufficient resources to enable a reliable market solution

All entities must be able to pass an accurate and meaningful Day-Ahead RS test that is fairly applied to all BAAs

Core Objectives of EDAM Resource Sufficiency

- Promotes **reliability**
  - Ensures sufficient capacity, energy and flexibility under a variety of real-time conditions
  - Ensures EDAM transfers can be relied upon to serve load
  - Provides confidence in market results

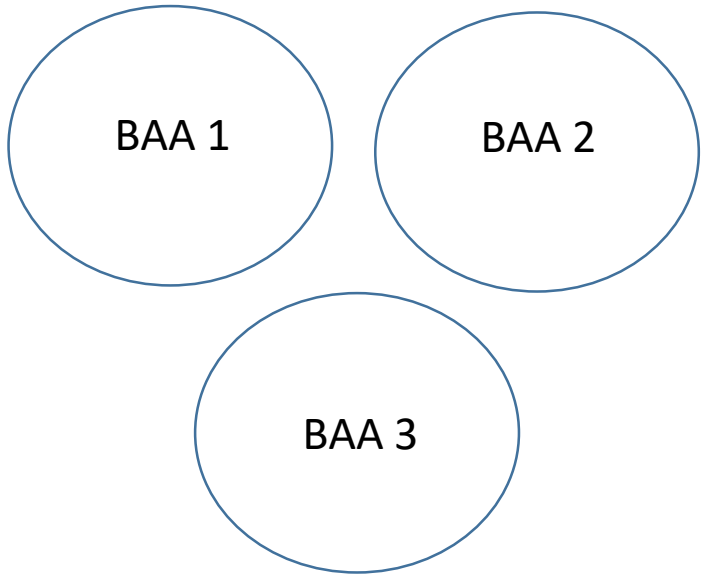
- Sustains robust market depth and **promotes participation**
  - Improves market flexibility and efficiency
  - Increases diversity benefits and supports an equitable allocation of **diversity benefits**

- Ensures **fairness**
  - Protects against leaning
  - Avoids holding entities to a higher or lower standard than necessary for reliability
  - Consistent application of RS to all BAAs in the footprint

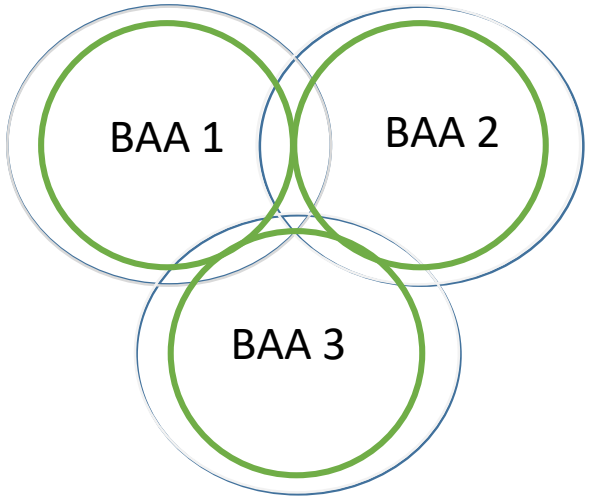
- **Complements** individual Resource Adequacy/Resource Planning processes
  - Clear feedback on actions needed to meet future EDAM RS

EDAM RS Enables Diversity Benefits

Status Quo



EDAM



- Each BAA plans on a stand-alone basis
- Individual unit commitment decisions may be sub-optimal

- EDAM facilitates “pooling” of resources
- Resources needed to meet reliability is reduced through diversity savings
- **Diversity Credit** can be fairly allocated to reduce each BAA’s RS requirement

Defining an Appropriate RS Standard

- Potentially **lower cost** for some entities
- **Less reliable** market outcome
- **Increased risk** of leaning
- **Decreasing** diversity benefits
- **More likely** to require a RT test

- Potentially **higher cost** for some entities
- **More reliable** market outcome
- **Decreased risk** of leaning
- **Increased** diversity benefits
- **Less need** to perform a RT test

- First objective must be to determine an acceptable level of **reliability** of the EDAM footprint as a whole
  - Working backwards: what level (fairly applied to each BAA) would need to be contributed to achieve the desired footprint-wide reliability standard?

- Goal is to formulate RS test to require each BAA to provide its fair share of total RS needs without unduly incurring increased costs to EDAM participants

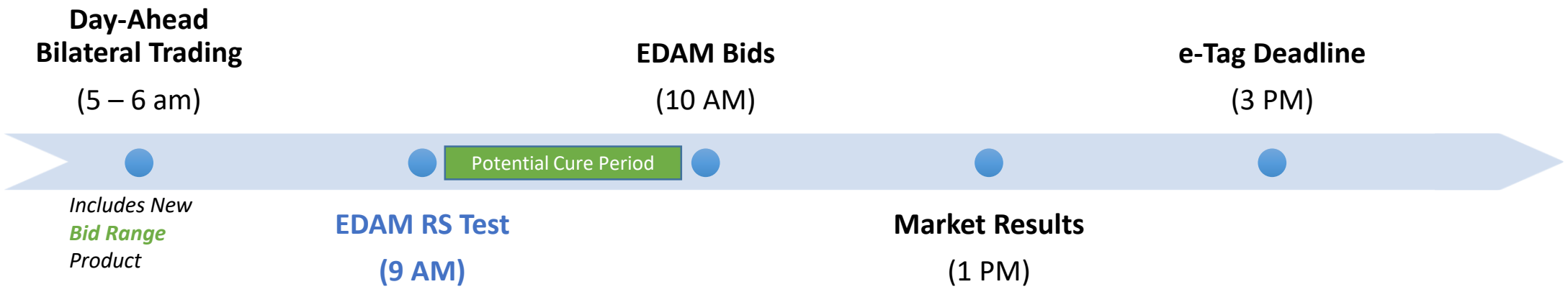
- EDAM RS requirements expected to be **lower** than stand-alone/status quo (due to diversity benefits of EDAM)

Key Principles

- RS **does not modify local control** over RA or replace BAA obligations
  - Complements long-term planning
- Test must be **accurate** and applied **consistently** to all participants
  - Qualifying supply that is real and capable of performing
  - No double-counting
- **Simple** and **workable**
  - Timely information and clear requirements
  - Compatibility with bilateral trading timelines
- **Preventative enforcement**
  - Prevents entities that fail RS from leaning on EDAM
- **Full transparency** and on-going review

2. Proposed Test Structure

Illustrative Day-Ahead Timeline



- EDAM RS test performed at **approximately 9 am** (before bid deadline)
  - Could provide time to address/cure any RS-related issues prior to 10 am

- Test timelines require careful consideration with respect to:
  - Existing day-ahead trading and scheduling timelines
  - EDAM transmission requirements
  - Ability to verify external supply included in RS through day-ahead e-Tags
  - Ability for EDAM participants to have tools and **advance information** to meet RS

Proposed Test Structure

24-Hour Non-Binding Operating Plan

Each BAA's operating plan submitted to ensure feasibility and sufficiency from 4 perspectives:

1. **Energy** (and fuel) to meet load with a high degree of confidence for all hours of the operating day from portfolio resource(s)

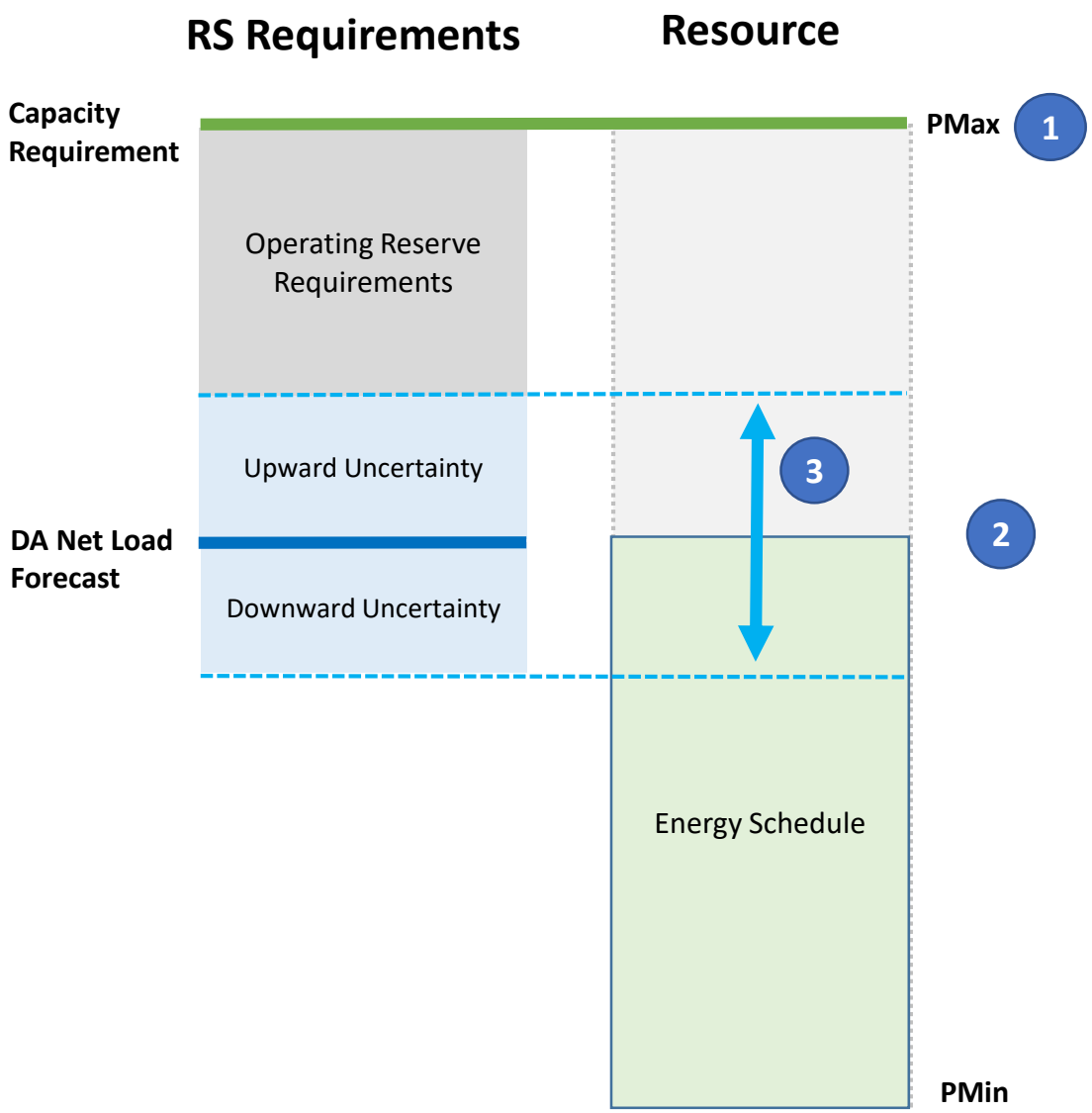
2. **Capacity** to meet upward and downward load and reserves with a high degree of confidence

3. **Flexibility** to ramp within a single hour and across multiple hours

4. **Transmission** to deliver energy from external resources and to reliably meet load in any major constrained zones within a given BAA

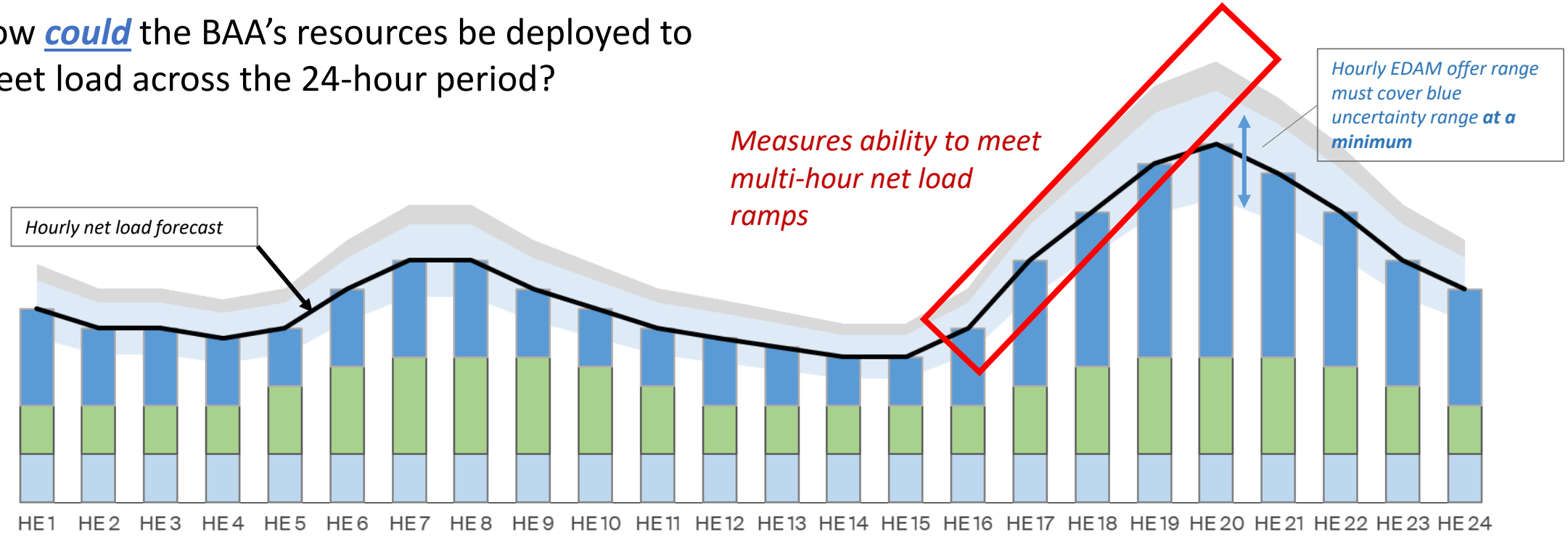
Single Hour Example

- ✔ 1 Do resources have sufficient **capacity** to meet load and reserve obligations?
  - DA Net Load Forecast
  - Upward and downward uncertainty
  - Operating Reserves (e.g., spin and non-spin)
- ✔ 2 Can resources provide **non-binding energy schedules** to balance against forecast net load?
- ✔ 3 Do resources have **within-hour flexibility** to ramp up/down from the energy schedule?
  - Generally reflects <u>minimum</u> "offer range" that must be available to EDAM



24-Hour Example: Feasible Energy Schedules

How ***could*** the BAA's resources be deployed to meet load across the 24-hour period?



	HE1	HE2	HE3	HE4	HE5	HE6	HE7	HE8	HE9	HE10	HE11	HE12	HE13	HE14	HE15	HE16	HE17	HE18	HE19	HE20	HE21	HE22	HE23	HE24
Firm Import	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Resource A	25	25	25	25	35	45	50	50	50	45	35	25	25	25	25	25	35	45	50	50	50	45	35	25
Resource B	50	40	40	35	30	40	50	50	35	30	30	35	30	25	25	40	65	80	100	110	95	80	65	60

Proposed Test Structure
24-Hour Non-Binding Operating Plan

- **Simple** and **effective**
  - Ensures portfolio is feasible for the day, including how resources would meet multi-hour changes in net load

- **Conceptually similar** to existing planning approach for many BAAs

- Interface could allow entities to submit plan and verify RS status **at any time** prior to test deadline (for a given net load forecast)

EIM Real-Time Test

- To the extent possible, EDAM participants should **not** be held to an additional RS test in the EIM once they have met a Day-Ahead requirement
  - If uncertainty is properly planned for in day-ahead, an entity should not be required to supply additional resources as such uncertainty materializes in real-time

- **Simplified RT test** for EDAM participants may be required to ensure entity hasn't taken actions in real-time to undermine DA test results
  - E.g., new real-time bilateral transactions / obligations

- Will require further discussion to ensure that EDAM and EIM RS tests are reconciled to ensure appropriate outcomes
  - Depends on confidence level of EDAM RS and which elements of uncertainty are planned for on a day-ahead basis
  - Should also recognize that not all EIM participants may be in EDAM

3. RS Requirements

Components of Hourly RS Capacity Requirement

Component	Description	Considerations
Hourly Net Load Forecast	DA Forecast of Load and VERs for each BAA for each hour of the day	• Allow EDAM BAAs to provide their own net load forecasts • Determine appropriate time to lock in DA forecast
Contingency Reserves & Regulation	Existing NERC obligations	• Consistent with contingency reserve sharing groups and BA real-time obligations
Upward / Downward Uncertainty	Capacity needed to respond to variable real-time conditions • DA Load Forecast error • DA VER Forecast error • Interchange curtailments • Resource non-performance	• Uncertainty calculations must be improved to reflect actual system conditions and align with CAISO's proposed DA Imbalance Reserve product • Standard must ensure sufficient capacity under a wide range of real-time conditions • Hourly bid-range products • Requirement will be reduced by a diversity benefit • Must consider treatment of accounting for VERS resources scheduled between EDAM entities
Replacement Reserve Product (New Opportunity)	Additional supply offered to EDAM that would support real-time forced outages that extend beyond 60-minute contingency period	• Opportunity to increase diversity benefits through pooling of "replacement reserve" within EDAM footprint • Enables additional efficiency of unit commitment

RS Flexibility Requirements

- Hour-to-hour flexibility measured by providing feasible hourly energy schedules across the day
- Remaining flexibility requirements based on **uncertainty** and **intra-hour ramping requirements**
  - Connected to Day-Ahead Imbalance Reserve being developed in CAISO's Day-Ahead Market Enhancements (DAM-E) Initiative
- Should recognize that a portion of DA uncertainty may materialize well in advance of the operating hour
  - What amount of DA uncertainty could be met by deploying slower resources in advance of hour?
  - What amount of DA uncertainty materializes within an hour? Within a 15-period?

Calculating RS Requirements

- RS calculations should be calibrated to reflect anticipated system conditions
  - *e.g.,* uncertainty based on the current forecast of wind, solar, and load conditions
  - Current EIM method (time of day approach) must be improved before EDAM
- RS requirements will likely incorporate multiple uncertain outcomes such as load, VER output, and forced unit outages
  - Resulting requirements could be over-stated if simply added together (e.g., load and VER changes may be offsetting)
  - Determining those relationships will be complex and take time to work through
- CAISO and stakeholders should establish a **comprehensive process** on an annual basis to assess whether the methodology is achieving desired goals and make changes as needed

4. Qualifying Supply

RS Qualifying Supply: Internal Resources

- Internal resources must be capable of **performing** when **dispatched**
  - Must be **realistic** and reflect actual operating capability
  - May consider fuel, ambient de-rates, outages, and other restrictions
  - Not simply nameplate or Master File values
  - Ongoing metrics should include historical performance measures

- Deliverability assessment:
  - Internal resources should be deliverable to major load zones within a BAA
  - May require a zonal RS test for some BAAs

RS Qualifying Supply: External Resources

- External resources must be **real**, **identified** and **non-recallable**
- Supported by **highly reliable transmission**
- DA E-Tags are **critical** to confirm supply meets RS criteria and identify:
  - Resource (or system resource) used to meet RS
  - Source and Sink BAA
  - Transmission path and priority
- Ensures **no double-counting** between BAAs

RS Qualifying Supply: External Resources

- External supply types may include a variety of transactions:
  - Bilateral transactions between EDAM participants
  - Imports from outside EDAM footprint
  - Import supply offers into CAISO/EDAM intertie bidding framework

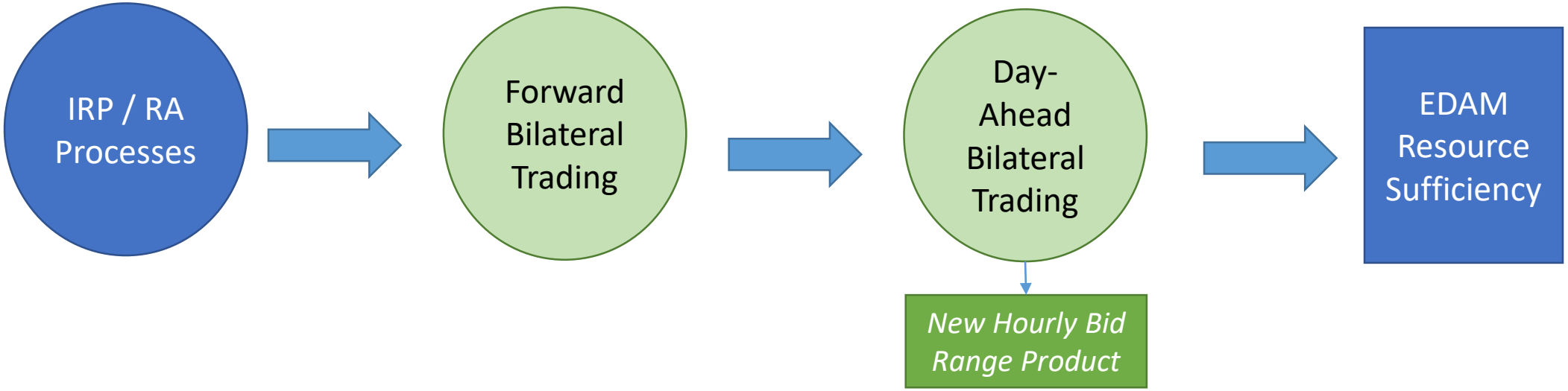
- Different “types” may require different approaches:

  Type 1: Firm Energy Transactions
  - Most easily verifiable (it is clear if energy is not tagged)
  - Finalize e-Tag information by 3 PM **at the latest**

  Type 2: Import offers into CAISO/EDAM intertie bidding framework
  - More difficult to verify an ‘offer’ that may never be dispatched
  - **Requires e-Tag by time of RS Test** to verify Source BAA, Resource(s), Transmission Path and associated reservations

5. Meeting RS

Bilateral Products Enabling EDAM RS

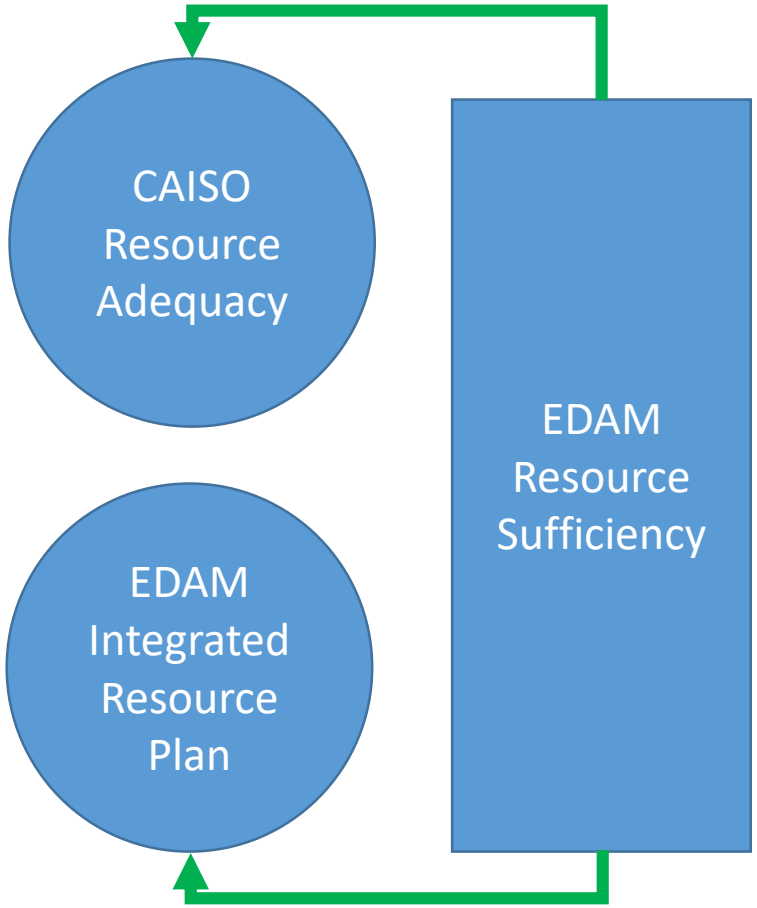


Opportunity to develop a new **hourly bilateral "bid range"** product

- Could be used to transfer flexible capacity from one BAA to another to help meet EDAM RS requirements
- Both upward (import) and downward (export) directions
- Seller would be obligated to offer resource flexibility into EDAM
- Transmission requirements similar to other external supply (firm transmission and DA e-Tags)
- Similar product(s) could be enabled for real-time

6. Failure Consequences

Failure Consequences



- Core objectives of EDAM RS
  - A **reliable** market solution
  - Robust market depth / maximum participation
  - A fair allocation of diversity benefits
  - No leaning on the capacity and flexibility of others
- Financial penalties and/or the current EIM freezing approach will **not achieve these objectives**
  - **Preventative** enforcement is critical
- An effective EDAM RS will also provide a **feedback mechanism** to complement forward planning

7. Transparency

Transparency

- EDAM RS requires a commitment to **ongoing review** and **continued improvement** as experience is gained
- Both RS requirements and results should be **transparent** to all participants, with extensive after-the-fact analysis to ensure the tests are applied accurately and equitably to all BAAs
- Determined **standardized** metrics
  - Are the RS requirements being calculated correctly?
  - Are entities being held to an appropriate standard?
  - Are resources performing when needed?

8. Other Considerations

Sub-Allocation Within BAAs

- EIM entities may need to develop tariff requirements, rate schedules and business practices associated with the allocation of day-ahead resource sufficiency requirements

- RS design framework must be flexible to allow entities to determine how to accomplish this

Fuel Adequacy

- In order to maintain reliability, resources need to have adequate fuel supplies with deliverability and flexibility.
  - These fuel supplies include natural gas, liquid fuels, hydrogen, water, battery state of charge, etc.

- Having sufficient fuel supplies to support the BAA's submitted RS operating plan is necessary to ensure an accurate RS demonstration

- Explore measures that could be needed during periods when fuel constraints may exist in certain areas

Fuel Adequacy – Market Optimization

- Fuel supplies and associated transportation can vary by season or day-to-day

- Some entities may face challenges with current market optimization
  - Few tools to limit use of resources based upon fuel supply over the course of the operating day
  - Existing Use Limited provisions may not provide the needed capability for some entities

- EDAM market design should explore mechanisms to allow participants to provide limits based upon fuel availability to prevent overruns
  - Scheduling coordinators could set daily limits at a portfolio, as well as individual unit level and provide during RS or DA bid submission

EIM Entities Presentation on Transmission Elements of EDAM Design Feb 11-12, 2020

Preamble

- The EIM Entities are a diverse group differently situated based upon geography, resource portfolios, and jurisdictional status, among other potential differentiating factors.
- Some EIM Entities may not have yet formulated individual positions on specific market design issues. Therefore, while this presentation represents a consensus view, it may not necessarily represent the ultimate position of any individual EIM Entity.
- Some EIM Entities may choose to offer their own individual contributions where appropriate, either in comments or throughout the stakeholder process.

Agenda

- Overview and Principles
- Western OATT Environment vs. CAISO Transmission
- EIM Transmission
- Sources of EDAM Transmission Capacity
- Seams and Third-party Transmission Customer Issues
- Other Considerations
  - Losses
  - BA vs TSP Modeling
  - Operational and Commercial Seams
  - Tariff Structure and Rate Change Rights

Overview and Principles

Overview of Presentation

Design concepts presented

- Informed by experience in the EIM
- Guided by EDAM principles document

Design must be mindful of differences of Transmission Providers among the EIM entity community

- System topology
- Transmission cost recovery
- Interactions with third-party transmission customers
- Modeling of Joint-owned transmission
- Jurisdiction

Key Principles

Planning and Operational Control Unchanged	• OATT Administration (modified to facilitate EDAM) • Transmission and Balancing Authority Operations • Transmission planning and siting remains with utilities and regulators
No Materially Significant Cost Shifts	• Balance cost and benefits of transmission including recovery of transmission costs and compensation for transmission utilization
Transmission Should Facilitate Market Activity	• Transmission charge/hurdle rate imposed should not impede EDAM efficiency
Reasonably Compatible with Existing Market Transactions	• Bi-lateral purchases and sales • Reserve Sharing Groups • Respect long-term transmission ownership/rights
Congestion Rent Revenue	• Transmission Customers contributing transmission should receive proportionate congestion rents

Open Access Transmission Tariff (OATT) Environment

FERC OATT

FERC's Order No. 888 required all public utilities that own, operate or control interstate transmission facilities to:

- Offer network and point-to-point transmission service and ancillary service to eligible customers;
- Take transmission service for their own use under the same terms and conditions;
- Functionally separate transmission and power marketing functions;
- Adopt an electronic transmission system information network; and
- Have on file with FERC an Open Access Transmission Tariff

The FERC pro-forma tariff defines:

- Process for requesting transmission service;
- Rates, terms, and conditions for service;
- Required ancillary services and rates for those services;
- Studies conducted to determine the availability of transmission and interconnection service;
- Priorities among competing transmission service requests, including rights of first refusal;
- Curtailment priorities; and
- Provisions dealing with billing and payment, creditworthiness, force majeure, liability, and indemnification

OATT Service

Network Integration Transmission Service (NITS)

- Firm transmission utilized by a Designated Network Resource (DNR)
- Transmission rate based on load ratio share
- Allows for secondary network (non-firm) utilization for non-DNR with priority over other non-firm service

Point-To-Point Transmission Service (PTP)

- Capacity based reservation from a **specified point of receipt** to a **specified point of delivery** on a transmission providers system
- Varies in length of service term (Long-Term or Short-Term) and firmness (Firm or non-firm)
- Transmission charged on reserved capacity

Available Transfer Capability (ATC)

- ATC is the transfer capability remaining on a transmission provider's transmission system that is available for further commercial activity over and above already committed uses
  - Firm – unreserved by a customer
  - Non-firm – reserved but not scheduled for that timeframe
- Methodology for calculating ATC typically found in OATT Attachment C

Comparison of OATT to CAISO

Provision	OATT	CAISO Tariff
Products	Network and (Firm and Non-firm) Point-to Point	Schedule delivery (economic, not firm physical, rights)
Rate Structure	Single provider - charges based on posted OATT rates and vary based on form of transmission services procured by Transmission Customer, often offered in hourly, daily, monthly and annual increments and firmness/quality Network – load ratio share Point-to-point based on capacity reservation	High voltage (200 kV and above) single-system (combined revenue requirements of all participating transmission owners); Low voltage zonal rates based on utility-specific costs Currently a volumetric rate ($/MWh); proposal to move to ½ volumetric and ½ demand CAISO loads are charged TAC Exports and MSS Loads are charged WAC
Firm Transmission Rights	Network transmission service is firm when Network Load is supplied from Designated Network Resources (DNR) If there is ATC available, firm PTP transmission can be procured	Firm PTP rights only for "grandfathered" pre-existing transmission contracts on PTOs' systems Priority to inject or withdrawal based on economic bids, system constraints and other factors (e.g., RMR for supply) Firmness of exports protected through "supporting resource" in CAISO (i.e., supply tied to export not already committed to an internal CAISO RA obligation)

Comparison of OATT to CAISO (continued)

Provision	OATT	CAISO Tariff
Congestion Management	Expectation is that absent an outage or de-rate there will be sufficient transmission capacity to accommodate NITS and Firm PTP without any redispatch charge. Non-Firm PTP may be subject to curtailment, not redispatch with an associated congestion charge.	Collected through Locational Marginal Price (LMP) [LMP = system marginal energy + marginal congestion + marginal loss] Load can be hedged through Congestion Revenue Rights
Transmission Losses	Average system losses based on stated rate	Marginal losses charged though LMP [LMP = system marginal energy + marginal congestion + marginal loss]
Curtailment Priority	Based on "firmness" of rights used by transmission customer	Based on economic bids/Self-Schedules based on priority assigned in Tariff (i.e., "penalty factors" – assigned numeric values to schedules. The higher the value, the firmer)
Wheeling	If PTP wheeling moves through multiple balancing authorities/transmission service providers, rates are "pancaked" (i.e., cumulative). Dependent on PTP reservation not import/export of energy in the BA.	Single WAC for exports from anywhere within the CAISO (except EIM exports). Will see additional pancaked charge from an OATT transmission service provider beyond CAISO boundary.

Transmission Service Regulatory Diversity

Investor Owned Utility	Municipal or Public Utility District	Power Marketing Administration	Provincial Utility
• Provides transmission service under a FERC-approved OATT • Rates and OATT changes approved by FERC in publicly notified dockets under the FPA • Non-interstate business regulated by a state regulatory body	• Various organic statutes that create/govern the utility • Very limited FERC regulation and no FERC-approved OATT • Various mechanisms for memorializing terms and conditions of transmission service • Various local governance and regulatory schemes	• Various organic statutes that create/govern the utility • Various oversight by DOE and Congress • Limited FERC regulation • Maintain OATT but none are approved by FERC • Various rules for changing OATT terms and conditions	• Organizational separation between operational and marketing functions • Limited FERC regulation • Marketing organization is the EIM Entity and does not provide transmission service

EIM Transmission

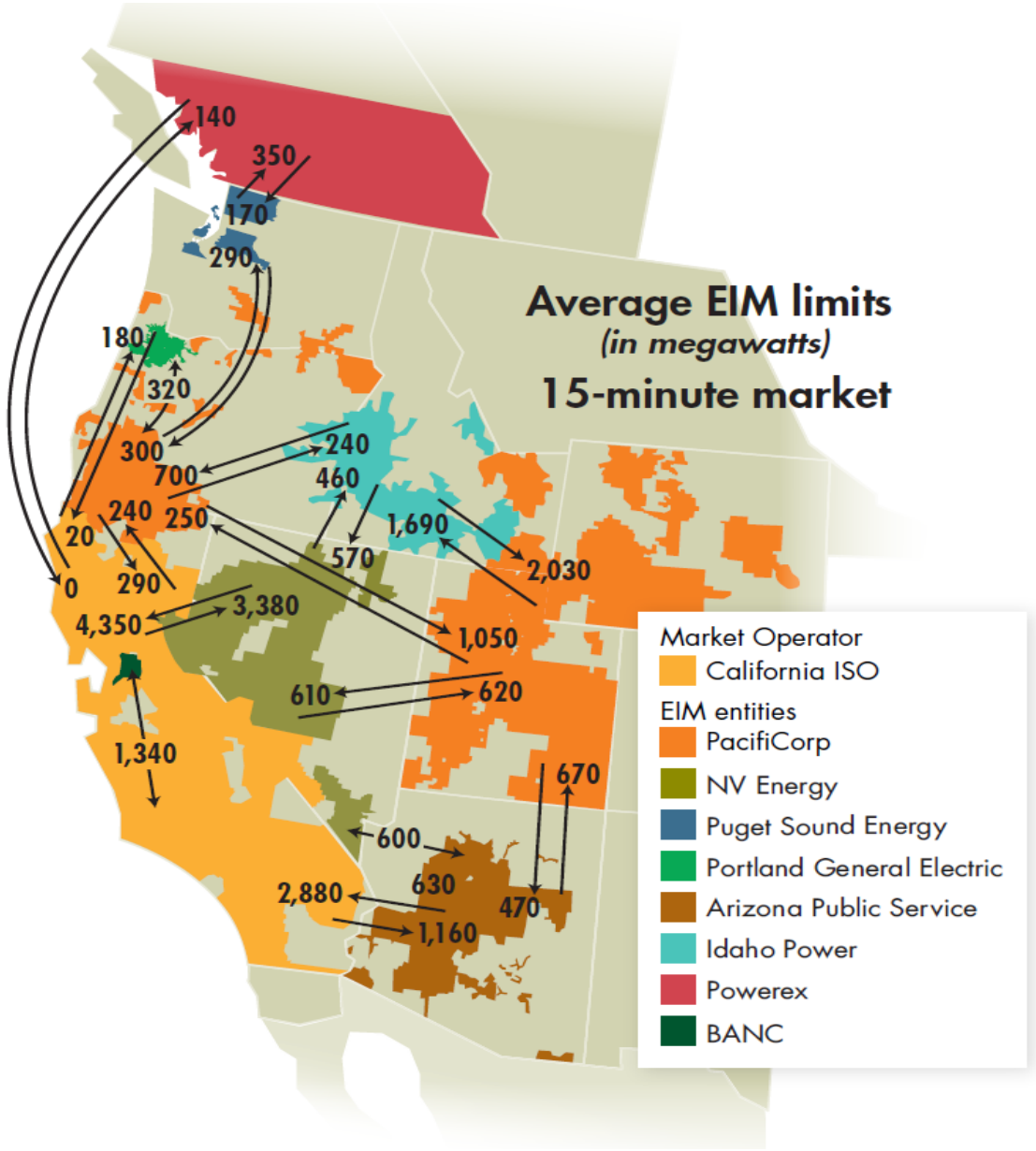
EIM Transmission

Sources of EIM Transmission	Interchange Rights Holder – previously reserved transmission donated by Transmission Customers
	Available Transfer Capacity – Unreserved or unscheduled transmission identified by the EIM Entity transmission provider

Energy Transfer System Resources (ETSRs) are defined in each EIM BAA to anchor the Energy Transfer schedules from that BAA to other BAAs in the EIM Area for tracking, tagging, and settlement

There is no charge for transmission usage in the EIM

Average EIM Transfer Limits Q3 2019



Sources of EDAM Transmission Capacity

Sources of EDAM Transmission

Key Objectives of EDAM Transmission Design:

- Enable maximum transmission availability through a voluntary design framework
- Avoid material cost shifts (i.e., winners and losers)
- Respect OATT right holders
- Compatible with TSPs' OATTs and practices
- Ensure appropriate transmission compensation framework
  - Sufficient revenue recovery for Transmission Service Provider
  - Consistent with FERC open access policies

Key Principle: Transmission supporting EDAM must be **reliable and "high quality"**

- EDAM Entities will be **relying** on EDAM transfers to avoid committing units and to serve load
- This transmission could be restricted to firm, although there may be potential for use of other transmission capacity that is typically only sold as non-firm (e.g. Capacity Benefit Margin, Transmission Reliability Margin, seasonal unused network capacity)

Sources of EDAM Transmission

EDAM Resource Sufficiency (RS) Transmission "Bucket 1"	Transmission demonstrated to support RS prior to the EDAM run by a transmission customer to meet EDAM RS test(s).
EDAM Interchange Rights Holder ("IRH") Transmission "Bucket 2"	Transmission contributed prior to the EDAM run by an IRH transmission customer on a voluntary basis.
EDAM Balancing Authority ("BA") Transmission (ATC) "Bucket 3"	Transmission contributed prior to the EDAM run by an EDAM BA/transmission provider based on its determination of ATC.

EDAM Resource Sufficiency (RS) Transmission (Bucket 1)

Transmission (**acquired in advance at OATT rates**) to meet EDAM RS test

- Examples include transmission to support
  - Resources external to the BA but are owned or contracted to serve load in the BA
  - Bilateral firm energy contracts
  - Bilateral “bid range” and/or capacity transactions

As transmission is already paid for:

- Re-optimization of RS transmission in EDAM should not require an incremental transmission rate because TSP has already received compensation
- Transmission rights holder should receive a fair allocation of congestion rents for voluntarily providing “optimizable” RS transmission

Optimizing RS Transmission: 3rd Party Customer Treatment

Transmission that is needed for third-party OATT customer resource sufficiency (Bucket 1) should be included as market inputs but do not necessarily get optimized in EDAM; they could be treated as a non-optimized self-schedule.

- Full optimization is worth considering because it would increase transmission used by the market;
- The benefit of treating the transmission as a self-schedule (non-optimized) is to minimize potential congestion costs - important that accommodation of third-party schedules not cause uplifts for other customers;
- This should be the customer's option as there may be other non-EDAM uses for transmission or contractual restrictions on usage that aren't compatible with EDAM optimization

EDAM Interchange Rights Holder Transmission (Bucket 2)

Transmission contributed on a voluntary basis by a transmission rights holder (similar to EIM Interchange Rights Holder approach)

Highly reliable (EIM Entities currently require Interchange Rights Holder transmission to be FIRM transmission)

No incremental transmission charge (“hurdle rate”)

Rights holder receives fair allocation of congestion rent

EDAM ATC Transmission (Bucket 3)

Unsold ATC made available by EDAM BA/TSP

- Transmission not already purchased and paid for by an OATT customer

Requires an incremental charge to contribute to TSP cost of service

- Risk that the transmission provider (and other transmission customers paying the embedded cost of the transmission provider's system) is not being compensated for this category of transmission unless a charge is designed and applied

Must be generally unsold ATC (not unscheduled rights that may result in curtailments if later used by another rights holder)

- Potential exceptions may be considered, such as:
  - Network service that BA has information will not be scheduled
  - Capacity Benefit Margin ("CBM") or Transmission Reserve Margin ("TRM")

Compensation for Bucket 3

Reason for Compensation

- Larger volume of transactions in day-ahead
- Unsold ATC not already acquired or paid for by a transmission customer is used
- Minimizes cost shifting including to customers paying embedded cost of transmission system

Potential approaches to EDAM BA Transmission Charge

- **Individual EIM Entity Rates and the CAISO wheeling access charge** - each BA/TP retains autonomy over its OATT rates: *EDAM BA Total Transmission Revenue Requirement / BA Load + exports (measured demand) = EDAM BA Transmission Charge*
- **Blended EDAM Rate:** *Combined EDAM BA Total Transmission Revenue Requirement / Combined BA Load + exports (measured demand)*
- **Nominal EDAM Rate (e.g., $X.XX MWhr)**: The nominal rate can be viewed as a voluntary discount off cost-based, approved rates.
  - Options for Nominal EDAM Rate should analyze whether the rate is applied at each EDAM Entity BA (i.e., hurdle rate) or on a postage stamp basis (i.e., flat fee)
- **A volumetric uplift charge** based on power flows

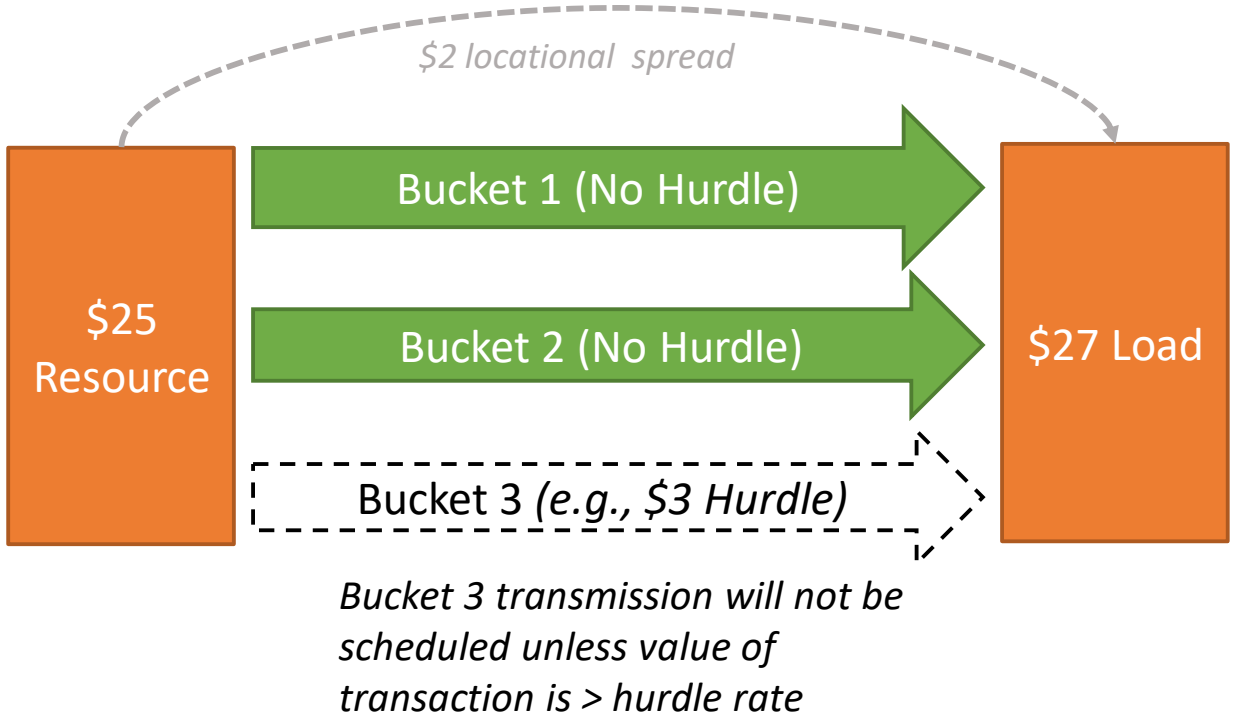
Determining Bucket 3 Rate

Balancing the need to meet revenue requirements with the desire to have a charge that does not prevent economic optimization.

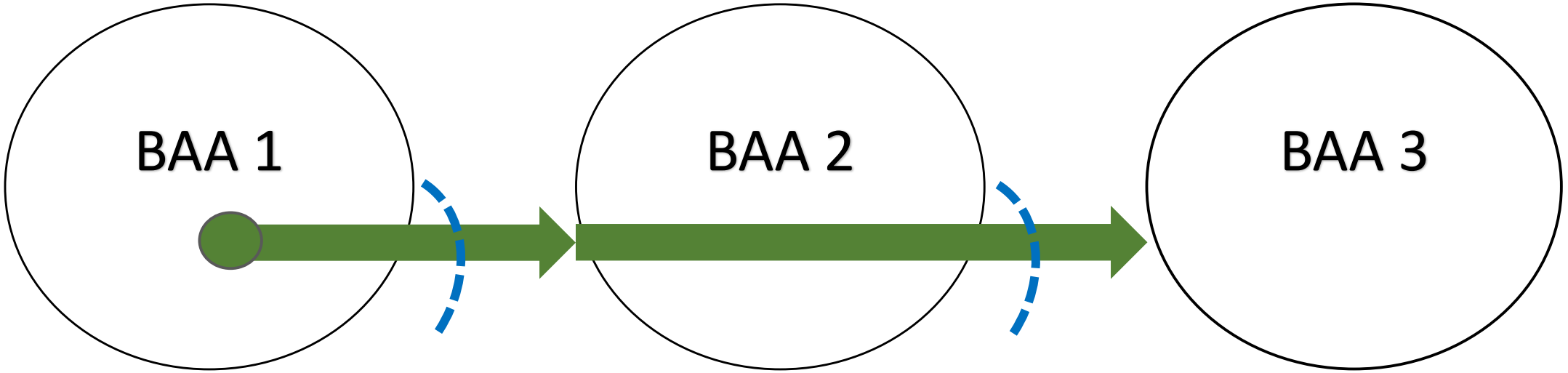
- Whether to/how to de-pancake rates
- Whether to/how to develop cost based rates
- Complex regulatory, governance and stakeholder context

Optimizing Each Transmission Type

- **Bucket 1** and **Bucket 2** will be used to enable transfers first (at no hurdle)
- **Bucket 3** will only be used to the extent that a transaction can clear the transmission charge (e.g. hurdle rate, flat fee, other)
- Potential to leverage existing ETSR Transfer Cost mechanism to include incremental transmission rate in market optimization



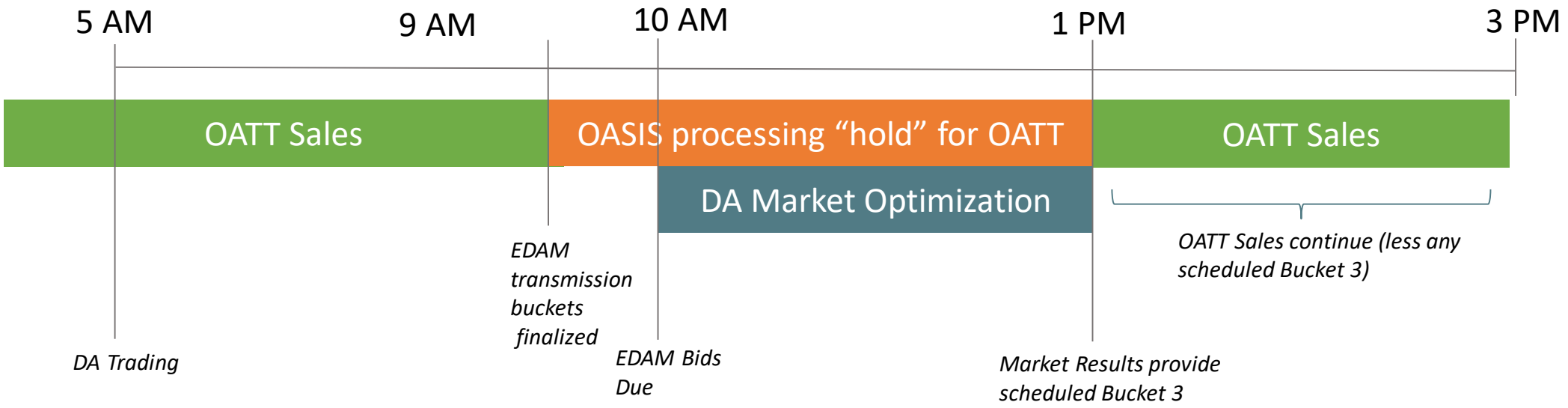
Bucket 3 - EDAM BA Transmission



Hurdle rate model charged based on total Bucket 3 EDAM **exports** from a particular BAA

- Imports would not incur a charge (as load has generally already paid for transmission to meet RS requirements)
- Application to exports would also provide revenues to BAAs that are wheeled-through (e.g., BAA2)

Day-Ahead Timelines for Transmission



- Entities communicate total transmission available for market use
  - Potential "processing hold" period could limit further OATT sales of transmission identified as Bucket 3 while EDAM optimization identifies the amount used by the market
  - Lock-out period would end at ~1 PM when market results are finalized
  - OATT transmission requests can continue to be queued on OASIS but not processed until the end of the optimization period
  - Does not limit use of previously-reserved transmission

Joint Owner, Seams, and Third-party Transmission Customer Issues

Joint Owner Operation & Seams Issues

Transmission and Balancing Authority Areas in WECC have many different relationships and seams, often without clear boundaries

- Joint ownership of transmission facilities where one entity acts as the path operator
- Load Serving Entities that serve load in multiple BAAs
- BAA's reliance on 3rd-party transmission providers (who may or may not be in EIM or EDAM) to deliver remote resources that they own and operate
- Shared ownership of generators that may reside in multiple BAAs

Solutions to EDAM transmission should be developed with due consideration to the limitations and opportunities related to this complexity. These and other issues should be addressed as part of a complete market design.

Issues related to 3rd party customers

Change in the OATT timeline – Day ahead plan for RS will need to be submitted early. For example, load serving entities in EDAM BA will need to communicate how they plan to serve their load by deadline for the RS test and not by current OATT tagging deadlines.

Financially binding day-ahead schedule – In the EIM, a base schedule submitted by the EIM Entity before the EIM market run is the fixed point of settlement for the market. In EDAM , day ahead market results become the “base” from which changes are settled financially.

Consistency between resources that qualify as DNRs and resources that meet the EDAM resource sufficiency test

3rd party customers must be permitted to **self-schedule** their loads and resources – maintain existing transmission reservation priorities

Need to identify any **new settlement charges** and **just and reasonable allocations**

Other Considerations

Losses

ALL OATT Transmission Providers

- Use average system loss rates

EIM Entities

- Use average system for balanced base schedules
- Most use marginal losses as part of EIM LMP imbalance settlement

EDAM Entities (Proposal)

- Continue to charge based on average system loss factors
- Harmonize seams across EDAM footprint with respect to different loss settlements

Transmission Design – BA to BA vs TSP

Current EIM implementation of BA to BA settlement transactions does not work with Joint Owned Transmission

- BA may be reflecting wheel through schedules today on its system that is not using transmission provided under that EIM Entity's OATT.
- BA responsibilities and TSP do not always align with joint owned transmission.

Need a design that ensures the market is appropriately allocating payments to the party that offers its transmission for EDAM use

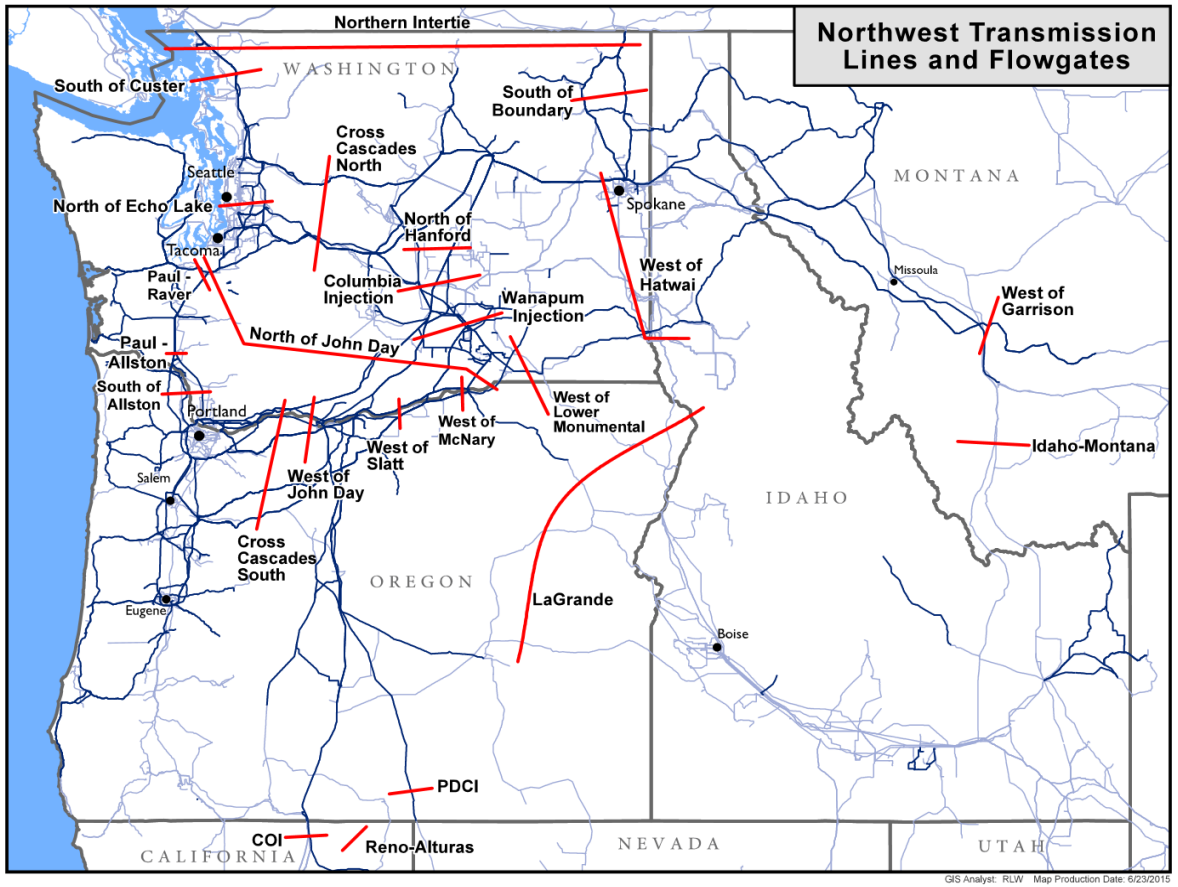
- Compensate the Transmission Service Provider (TSP) via a transmission charge and/or congestion rent for transmission offered as Bucket 3
- Compensate the Transmission Customer (TC) via congestion rent for transmission offered as buckets 1 and 2

Operational and Commercial Seams

ETSRs represent boundaries between BAAs and are used for energy and market accounting

They may or may not represent physical transmission elements that can cause congestion

This differentiation may have impacts on market modeling and distribution of congestion rents



Tariff Structure and Rate Change Rights

The proper balance of tariff structure and rate change rights between the CAISO Tariff and OATTs of Entities

More simply stated: **what goes where and who has the right to change it**

Need to develop a consistent and durable approach to this critical component of the market

Appendix

Illustrative Range of ETSR Hurdle Rate for Revenue Recovery

The table adjacent gives a **rough idea** of what sort of rate would be needed given a range of lost revenue and a range of potential transfers.

The table presumes a per MWh charge for EDAM Transfers as a rate design and is **only meant to be informational**.

		Bucket 3 Transmission Rate Level to Remain Revenue Neutral ($/MWh)								
Tx Revenue Lost	Incremental Transmission Revenue									
Annual Revenue	Annual Bucket 3 Transfers (GWh)									
	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	10,000
$5,000,000	$10.00	$5.00	$3.33	$2.50	$2.00	$1.67	$1.43	$1.25	$0.50
$10,000,000	$20.00	$10.00	$6.67	$5.00	$4.00	$3.33	$2.86	$2.50	$1.00
$17,500,000	$35.00	$17.50	$11.67	$8.75	$7.00	$5.83	$5.00	$4.38	$1.75
$25,000,000	$50.00	$25.00	$16.67	$12.50	$10.00	$8.33	$7.14	$6.25	$2.50
$27,500,000	$55.00	$27.50	$18.33	$13.75	$11.00	$9.17	$7.86	$6.88	$2.75
$30,000,000	$60.00	$30.00	$20.00	$15.00	$12.00	$10.00	$8.57	$7.50	$3.00
$35,000,000	$70.00	$35.00	$23.33	$17.50	$14.00	$11.67	$10.00	$8.75	$3.50

EIM Entities Presentation on Congestion Rents for EDAM Design

Feb 11-12, 2020

Preamble

- The EIM Entities are a diverse group differently situated based upon geography, resource portfolios, and jurisdictional status, among other potential differentiating factors.
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Agenda

- Congestion Rent and Allocation Background
- Congestion Rent Allocation Objectives
- Potential Complexities
  1. Mismatching Transmission Buckets
  2. Transfers between two BAAs with mismatching transfer capability

Congestion Rents

Congestion Rent and Allocation Background

Congestion leads to LMP price separation between resources and loads

- Generator “behind” a transmission constraint generally receives a lower price than the price paid by load on other side of the constraint
- Congestion can occur from BA to BA and also intra-BA between generation and load

Congestion rent resulting from this price differential is collected by the Market Operator and typically allocated to the Transmission Owner and/or CRR holder

Congestion rent allocation is an important mechanism to provide revenue to the relevant transmission rights holder

Congestion Rent and Allocation Background

Existing congestion allocation approach in CAISO markets:

- CAISO typically uses congestion credits and CRRs to allocate congestion revenues within the CAISO BAA

Existing congestion allocation approach in EIM:

- *Congestion within an EIM BAA:*
  - CAISO allocates total BAA congestion rents to the relevant EIM Entity
  - EIM Entity typically uses OATT provisions to sub-allocate congestion rents to transmission customers and/or measured demand
- *EIM Transfers:*
  - Typically congestion rents resulting from EIM transfers are allocated **50/50** between BAAs at an EIM intertie (but exceptions apply, particular with CAISO Interties)

Congestion Rent Allocation Principles

EDAM market design must include mechanisms to fairly allocate congestion rents that arise from EDAM transactions across the broader footprint

- Including Intra-BAA congestion
- Including EDAM transfers between BAA

Approach should result in a fair allocation of congestion rents to the entities that contribute transmission to EDAM

- Allow for allocation to the transmission rights holder providing Bucket 1 or 2
- Allow for allocation to the TSP/BA for incremental sales of Bucket 3

Achieving a fair allocation is necessary to provide incentive to make transmission available

- Remainder of the discussion focused on congestion from EDAM transfers

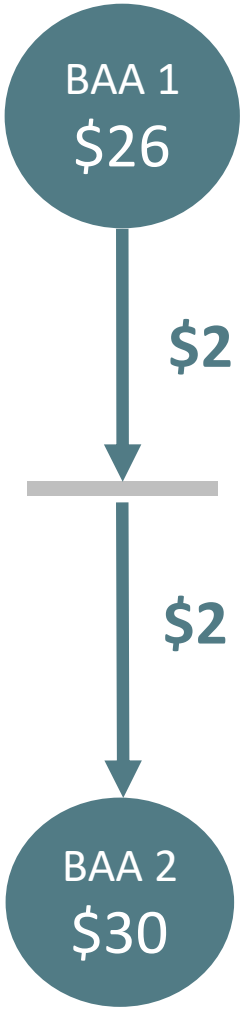
Congestion Rents - Potential Complexities

1. Transfers between two BAAs using mismatching transmission buckets

2. Transfers between two BAAs with mismatching transfer capability

Congestion Rent Allocation Potential Complexities

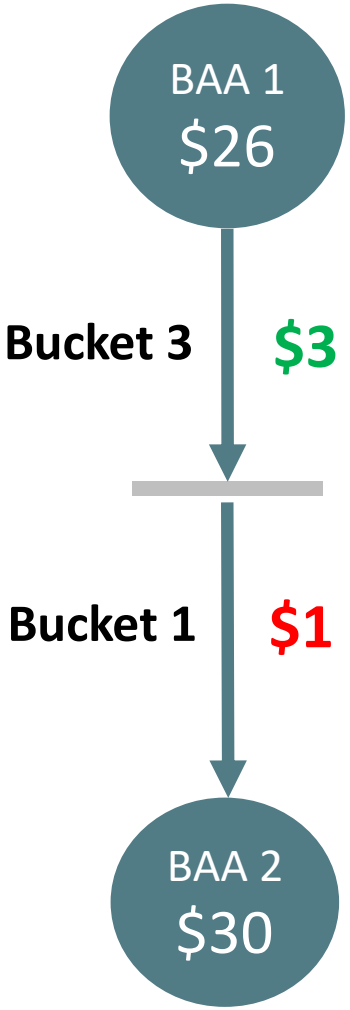
1. Mismatching Transmission Buckets



- Congestion rents resulting from EIM transfers are typically allocated **50/50**
  - EDAM could use a similar approach
- Example: $4 in total value on transmission path from BAA 1 to BAA 2 (no losses)
- Congestion rent is $4, and each side of intertie receives $2

Congestion Rent Allocation Potential Complexities

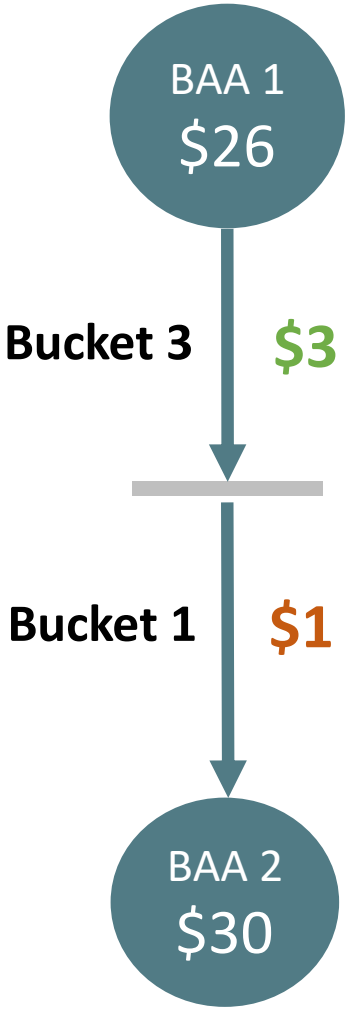
1. Mismatching Transmission Buckets



- Congestion rent will be impacted if a hurdle rate is used on one side of the intertie
- Assume BAA 1 is using Bucket 3 (with $3 hurdle rate) and BAA 2 is using Bucket 1
- $4 value from BAA 1 to BAA 2 is now allocated differently:
  - The first $3 is necessary to satisfy the hurdle rate and paid to BAA1
  - Only $1 congestion rent remains for allocation to BAA 2

Congestion Rent Allocation Potential Complexities

1. Mismatching Transmission Buckets



<u>One Potential Solution to Mismatched Buckets:</u>

a. Bucket 3 receives the "first" $3 of value to satisfy hurdle rate
b. Bucket 1 then receives any congestion rent, up to $3
c. Any additional congestion rent beyond $3 is split 50/50

- This approach would likely require a monthly true-up to address systemic shortfalls in payments to Bucket 1 Entity

<u>Or</u>:

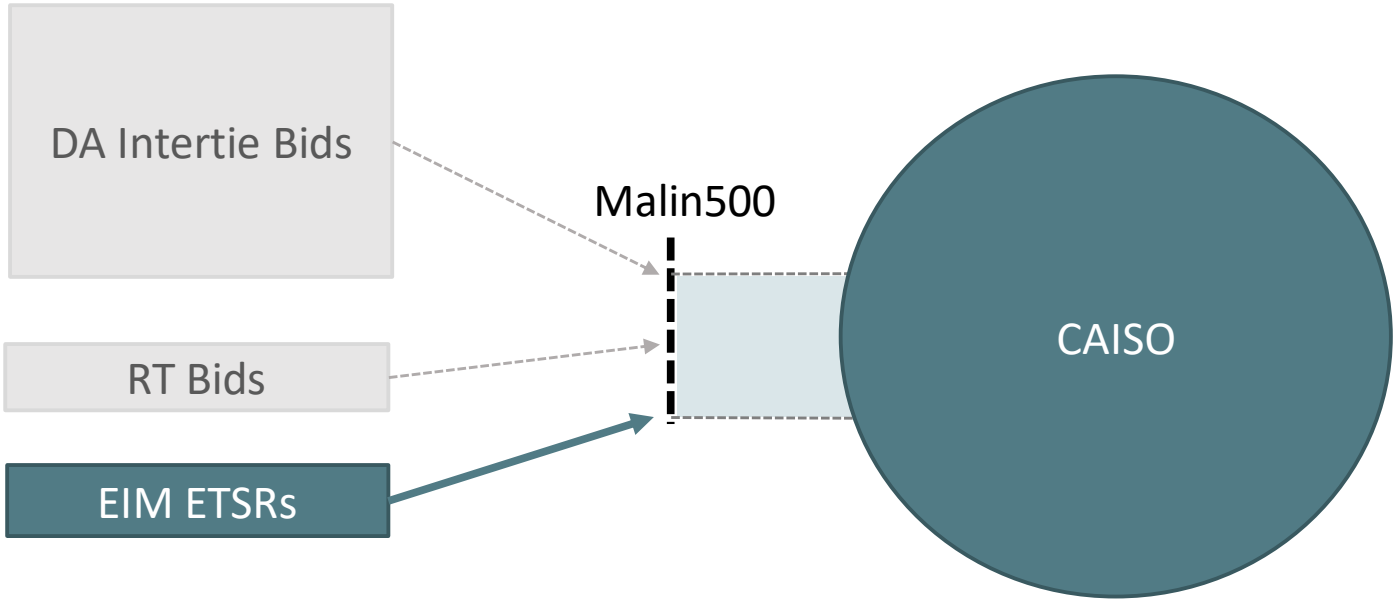
- Entity providing Bucket 3 could waive the hurdle rate for transmission on mismatched path (and instead receive 50% of congestion rents)

Congestion Rents Allocation Potential Complexities

2. Mismatching Transfer Capability

Some EIM interties have mismatching transfer capability

- Mismatch typically occurs with ETSRs connecting to CAISO
- CAISO interties are used for multiple purposes (CAISO DA, CAISO RT **and** EIM ETSRs)

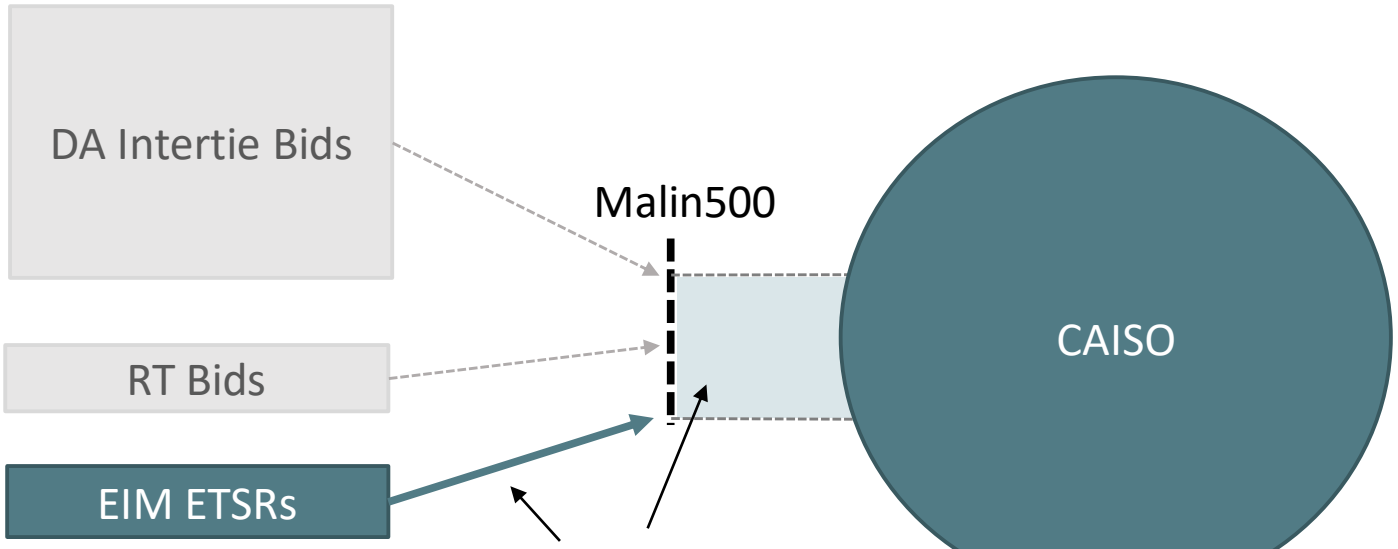


Congestion Rents Allocation Potential Complexities

2. Mismatching Transfer Capability

EIM currently uses an “all or nothing” allocation approach

- **100% congestion value** is allocated to whichever side fills first
- **No congestion value** is provided to other side of the path



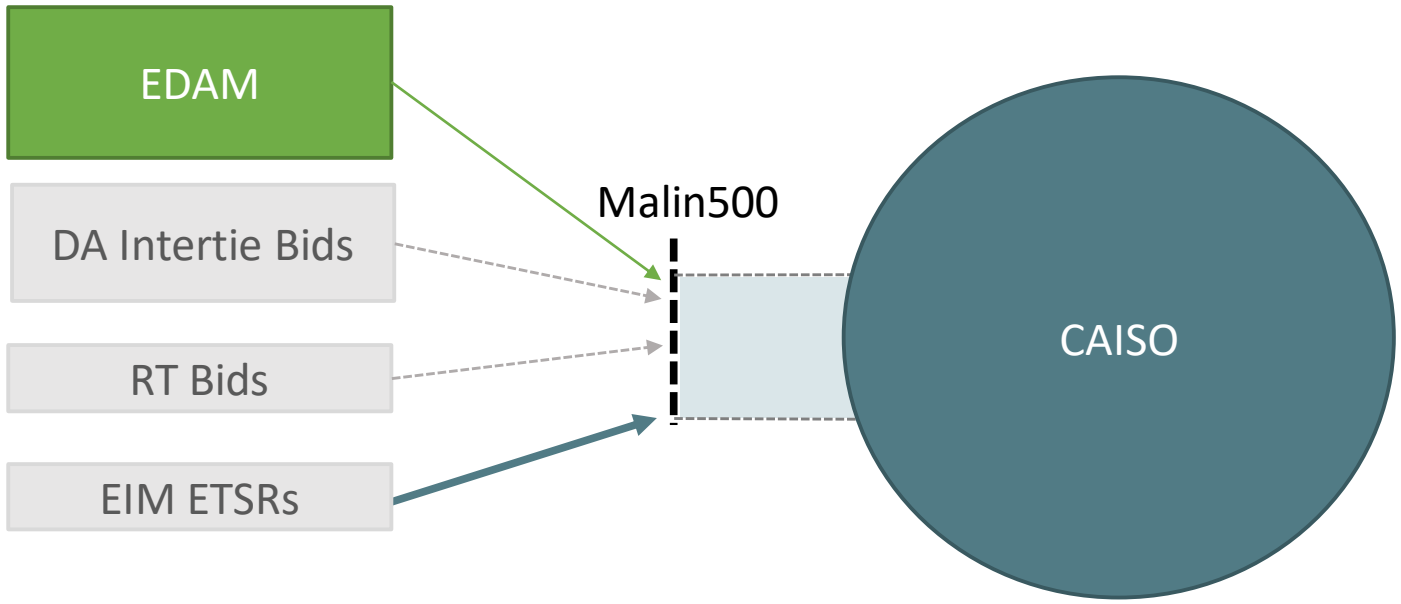
0% *or* ***100%*** *depending on which side fills first*

Congestion Rents Allocation Potential Complexities

2. Mismatching Transfer Capability

EDAM transfer capability likely **much greater** than EIM

- Design could determine allocation of congestion value for majority of flows on major interties such as COB and NOB



Congestion Rents Allocation Potential Complexities

2. Mismatching Transfer Capability

- Extending “all or nothing” approach can result in **unfair** and **systemic** windfalls for owners on one side of the transfer path

- EDAM congestion rents must be fairly allocated to entities that provide transmission to enable EDAM transfers

- Should seek durable and predictable outcomes to attract maximum transmission to EDAM

Congestion Rents Allocation Potential Complexities

2. Mismatching Transfer Capability

One possible solution is to allow transmission to be provided in exchange for 50% CR allocation on the “full” path:

- Entity A provides **100 MW** of upstream transmission from EDAM BAA to Malin500
- Entity A receives **50 MW** “full path” CR allocation (including across Malin500 intertie constraint)
- Eliminates risk of systemic payment to one “side” of path