EDAM

EXTENDED DAY-AHEAD MARKET

EDAM Workshop – Transmission & Bucket 3

July 19, 2022

California ISO

Reminders

- This call is being recorded for informational and convenience purposes only. Any related transcriptions should not be reprinted without ISO permission.
- Calls are structured to stimulate open dialogue and engage different perspectives with the understanding that stakeholders have reviewed the material.
- In the interest of time, please refrain from repeating or reiterating what has already been said.
- If you need technical assistance during the meeting, please send a chat to the event producer.

Thank you for joining us, and we look forward to an engaging discussion.

Instructions for raising your hand to ask a question

- If you are connected to audio through your computer or used the “call me” option, select the raise hand icon located on the top right above the chat window. **Note**: #2 only works if you dialed into the meeting.
  - Please remember to state your name and affiliation before making your comment.

- You may also send your question via chat to either Isabella Nicosia or to all panelists.

Agenda

- Discussion on Bucket 3 Approaches and Stakeholder Positions
- Bucket 3 Transmission – Volumetric Uplift Framework
- Examples – Illustrating the implications of revenue recovery

Transmission Bucket Refresher

Bucket 1 Transmission – Required to Support Resource Sufficiency Obligation

- High quality transmission: Firm and Conditional Firm transmission to support reliable transfers.
- Made available by transmission customer, whether hold transmission rights under OATT or legacy contracts to support RSE.

Bucket 2 Transmission – Transmission sold to transmission customers made available to EDAM

Bucket 3 Transmission - unsold firm available transfer capability (ATC) to support transfers at interfaces between EDAM BAAs.

- Bucket 3 transmission not utilized by the market would revert back to the EDAM entity for continued sales under the OATT.
- The ISO Straw Proposal focused primarily on two approaches:
  - Approach 1: EDAM entities would make bucket 3 transmission available to the market for optimization at a hurdle rate (i.e., the published tariff rate).
  - Approach 2: EDAM entities would make bucket 3 transmission available to the market hurdle-free, with option for cost recovery

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Discussion on Bucket 3 Approaches and Stakeholder Positions

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Bucket 3 Hurdle Rate Approach

- The straw proposal highlighted an approach under which the Bucket 3 transmission costs were included as a hurdle rate in the optimization.

- ISO recognized several drawbacks of a hurdle rate approach:
  – Decreased market efficiency through hurdles in optimization
  – Pancaking of rates across footprint diminishes benefits

Comments on Use of a Hurdle Rate

- Vast majority advocated that Bucket 3 transmission should be hurdle free to ensure the most efficient dispatch.

- Encourages structures that would minimize or eliminate hurdle rates (or other inefficiencies) that would distort market dispatch within the market optimization

- One commenter noted a hurdle rate is likely the simplest approach in the near-term as it would allow each EDAM BAA to make transmission available at their individual tariff

Comments on Hurdle Rates

- Significant difference in potential hurdle rates between the ISO and non-ISO hurdle rates due to the ISO TAC/WAC rates.
  - The hurdle rate for ISO Bucket 3 transfers currently would be approximately $16/MWh, and could be $20/MWh when EDAM is implemented.
- Rate pancaking between EDAM areas would diminish EDAM benefits.
- Principals acknowledge that initial assumptions about the amount of capacity needed from bucket 3 have changed (i.e., higher than originally assumed).

Bucket 3 “Reciprocity” Approach

- The straw proposal also identified an extension of the WEIM framework of transmission “reciprocity” in EDAM.
- Transmission providers would make Bucket 3 transmission available to EDAM hurdle-free to derive benefits that are in excess of foregone Bucket 3 revenues.
- The ISO also highlighted drawbacks:
  – Potential foregone transmission revenue
  – Difficulty of building consensus around framework

Comments on Reciprocity Framework

- Unlikely to be viable (without modification) in the day-ahead timeframe given the magnitude of transmission costs and the likely imbalance in cost impacts between potential participants

- Rather than carving out this category of revenues for make whole compensation, it would be preferable for potential EDAM participants to consider the impacts of changes in transmission revenue recovery as part of the overall costs and benefits of joining the EDAM.

Bucket 3 and historical transmission revenue recovery outside of optimization through uplifts

- The straw proposal introduced a framework where Bucket 3 transmission and associated historical transmission revenue shortfalls recovered through uplifts

- Attempts to ensure that transmission providers are kept whole from historical revenue perspective as a result of EDAM participation.

- The ISO indicated a leaning toward this approach:
  – Market efficiency without hurdle rates in optimization
  – Recognizes historical revenues

Comments on Approach 3

- Transmission compensation should be based on cost causation.

- A blend or combination of the 3 options might result in the optimal uplift design.

- Expected lost revenue requirements should be transparent to all EDAM participants, and we should strive to impose the least cost if assigned based on actual use.

- All customers (not just load service customers) should pay for the transmission system including generators and power marketers looking to utilize the market.

Comments on Approach 3

- Complexities could undermine the ability of stakeholders to reach agreement on the details necessary to make Approach 3 workable.
- Some expressed concern that TPs will rely on the uplift payment for these transmission service revenues.
- Recommend ISO consider whether the transmission cost recovery mechanism put in place could be designed to scale down over time.

Participants Option 3 Proposals

- #1: **Market uplift or market charge** that will be used to offset the estimated lost transmission revenues which are directly related to EDAM participation, largely in the form of lost short-term firm and non-firm sales.
- Conceptually, this "lost revenue requirement" should be relatively easy to calculate for the TSPs and could be applied on a volumetric basis to all market demand or by some other means.
- ISO will discuss this Option in Approach 2.

Participants Option 3 Proposals

#2. **Revenue loss assigned to historical use**

- BAAs will make all bucket 3 transmission available to the ISO EDAM market without the use of a hurdle rate.
- In return, the ISO will identify the revenue historically associated with a BAA's bucket 2 transmission (e.g., a 3-year historical average) and keep the EDAM Transmission Provider whole if their bucket 2 revenues, including any Transfer Revenues, decline (below the initial baseline).
  - Load within each EDAM BAA is charged based on their historical use of the bucket 2 transmission.
  - All customers could potentially fund a BAA's transmission charge except the customers of that BAA.

Additional Suggestions

- Stakeholders suggests the ISO work with stakeholders to consider alternative bucket 3 transmission compensation methods than those currently proposed, such as a zonal rate.
  - Advocate that a zonal rate has the potential to reduce significant rate pancaking

- There should be some additional compensation for any entity that provides wheel-though benefits to the market above and beyond the volume of imports and exports

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Bucket 3 Transmission – Volumetric Uplift Framework

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Bucket 3 and Historical Revenue Recovery

- Provides for recovery of Bucket 3 transmission costs made available to EDAM and additional transmission costs to ensure historical revenue requirement recovery.

- Transmission sales under OATT continue, decreasing revenue requirement to be recovered in EDAM.

- Requires determination of transmission provider historical revenue requirement shortfall to be recovered through the EDAM.

Key Questions to Consider

- What historical revenues can be recovered through EDAM processes?
- How are the revenue shortfalls recovered in the EDAM?
- How is the collected revenue allocated to ensure historical revenue requirement shortfall is recovered?
- Can transfer revenues associated with Bucket 3 transmission be used to offset historical recovery?
- What are the associated administrative processes (confidence in data, timing of submission and settlement, etc…)?
- How should transmission revenue requirement shortfalls be adjusted over time?

Which historical transmission revenues should be recoverable through EDAM?

- Short-term firm transmission
  - Bucket 3 transmission – unsold Firm ATC - that is made available to EDAM would contribute to the potential shortfall.

- Non-firm transmission
  - If unscheduled firm transmission (Bucket 2) is made available to EDAM, there may be reductions of non-firm sales made through the OATT.

- For ISO, the foregone revenue may be up to the total annual WAC revenues.

How should the historical revenue shortfall be recovered?

- Gross Load across EDAM footprint
  - This approach recognizes the mutual benefits of a DA market and shared value .
- Measured demand (+ Load exports)
  - Recognizes that generation and + gen + export
- Wheels
  - Historical procurement of transmission derive the benefits of optimized commitment through DA market.
- Measured demand and supply
  - Recognizes that load and supply in the footprint can derive the benefits of participation in the market.
  - Provides largest base across which to recover TRR.
- Historical Transmission Usage

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Examples – Illustrating the implications of transmission revenue recovery

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Transmission Revenue Recovery - Assumptions

- Forecasted Converted TRR Revenue
  – Short-Term Firm and Non Firm Sales: $125M to $300M
  – ISO Wheeling Revenue (WAC): $40M to $55M

- Collection Options
  – Volumetric uplift charge of Actual Converted TRR Revenue
    - Gross Load, Measured Demand, or total Supply plus Demand
  – Volumetric uplift charge of Forecasted Converted TRR Revenue
    - Gross Load, Measured Demand, or total Supply plus Demand

Volumetric uplift charge of Forecasted Converted TRR Revenue

Volumetric uplift charge of Forecasted Converted TRR Revenue

- Calculate a volumetric rate for collecting the Forecasted Converted TRR Revenue

- Distribute the Forecasted Converted TRR revenue across the EDAM Area based upon transaction volume
  - Gross Load
  - Gross Measured Demand
  - Gross Supply

- Volumetric Rate = Forecasted Converted TRR Revenue/Transaction volume

- Recognizes the shared benefit of releasing Bucket 3 transmission

Forecasted Converted TRR Revenue

BAA	Forecasted Converted TRR Revenue *($ in Million)*
BAA A	$ 52
BAA B	$ 13
BAA C	$ 4.5
BAA D	$ 44.5
Total	$ 114

- Forecast Converted TRR Revenue and Gross Export Transfers
  - Previous year Gross Export Transfer
  - Estimated converted Short-term Firm and Non-firm sales capacity to EDAM optimized transmission

Distributes Forecasted Converted TRR Revenue across EDAM Area

Option 1: Metered Load

BAA	Gross Load *(MWh in Million)*	Rate	Converted TRR Revenue Collected *($ in Millions)*
BAA A	211		$71.32
BAA B	18		$6.08
BAA C	38.75		$13.10
BAA D	69.5		$23.50
Total	337.25	$ 0.338	$114.00

Option 2: Measured Demand

BAA	Gross Load *(MWh in Million)*	Rate	Converted TRR Revenue Collected *($ in Millions)*
BAA A	226.25		$69.62
BAA B	18.5		$5.69
BAA C	41.5		$12.77
BAA D	84.25		$25.92
Total	370.5	$ 0.308	$114.00

Option 3: Demand Plus Supply

BAA	Gross Load *(MWh in Million)*	Rate	Converted TRR Revenue Collected *($ in Millions)*
BAA A	458.50		$69.41
BAA B	35.25		$5.34
BAA C	82.00		$12.41
BAA D	177.25		$26.83
Total	753.00	$ 0.151	$114.00

Make-whole uplift assigned to total transaction volumes - Summary

- Assigns Forecasted Converted TRR Revenue to volumetric transactions
- Assure TSP is not harmed by releasing Bucket 3 transmission at a hurdle free rate and kept whole from historical TRR perspective
- Recognizes the share benefit to all BAAs for providing the Bucket 3 transmission

Volumetric uplift charge of Actual Converted TRR Revenue

Volumetric uplift charge of Actual Converted TRR Revenue

- Calculate uniform volumetric rate based upon Total Forecasted TRR Converted Revenue and Total estimated Gross Export Transfers
- Calculate Actual Converted TRR Revenue is equal to product of Volumetric Rate and Gross Export Transfers
- Distribute to TSP in proration to TSP Forecasted Converted TRR Revenue to Total Converted TRR Forecasted Revenue
- Collect Actual Gross Transfer Revenue from EDAM/WEIM Footprint gross load, gross measured demand or sum of gross demand plus gross supply
- Potential need for true up

Actual Converted TRR Revenue – Example

BAA	Forecasted Converted TRR Revenue *($ in Millions)*	Forecasted Gross Export Transfers *(MWh in Millions)*	Forecasted Converted TRR Rate
BAA A	$ 52.0	6.0	
BAA B	$ 13.0	9.5	
BAA C	$ 4.5	5.0	
BAA D	$ 44.5	36.5	
Total	$ 114	57	$2.00

- Forecast Converted TRR Revenue and Gross Export Transfers
  - Previous year Gross Export Transfer
  - Estimated converted Short-term Firm sales capacity and Non-firm sales capacity
- Calculate Forecasted Export Transfer rate which will be applied to actual Gross Export Transfers
- Note: the $2 charge is only used to calculate actual

Calculate Actual Gross Export Transfer Amount

BAA	Actual Gross Transfer *(MWh in Millions)*	Actual Gross Transfer Revenue *($ in Millions)*
BAA A	6.5	
BAA B	9.75	
BAA C	5.5	
BAA D	36	
Total	57.75	$ 115.5

- Actual Converted TRR Revenue is equal to product of Forecasted Converted TRR Rate and Gross Export Transfers
  - Use a historic rate to determine actual lost revenue
  - Actual Gross Transfer Revenue true-ups the forecasted converted TRR with actual converted TRR

Compensate Transmission Service Provider/ Participating Transmission Owner

BAA	PTO/TSP Distribution *($ in Millions)*
BAA A	$ 52.68
BAA B	$ 13.17
BAA C	$ 4.56
BAA D	$ 45.09
Total	$ 115.5

- Distribute the Actual Converted TRR Revenue to TSP/PTO in pro-ration to Forecasted Converted TRR Revenue

- Collected from EDAM Area based upon Gross Load, gross measured Demand, or Total Gross Demand plus Gross Supply

Distributes Actual Converted TRR Revenue across EDAM Area

Option 1: Metered Load

BAA	Gross Load *(MWh in Million)*	Rate	Converted TRR Revenue Collected *($ in Millions)*
BAA A	211		$72.26
BAA B	18		$6.16
BAA C	38.75		$13.27
BAA D	69.5		$23.80
Total	337.25	$ 0.342	$115.50

Option 2: Measured Demand

BAA	Gross Load *(MWh in Million)*	Rate	Converted TRR Revenue Collected *($ in Millions)*
BAA A	226.25		$70.53
BAA B	18.5		$5.77
BAA C	41.5		$12.94
BAA D	84.25		$26.26
Total	370.5	$ 0.312	$115.50

Option 3: Demand Plus Supply

BAA	Gross Load *(MWh in Million)*	Rate	Converted TRR Revenue Collected *($ in Millions)*
BAA A	458.50		$70.33
BAA B	35.25		$5.41
BAA C	82.00		$12.58
BAA D	177.25		$26.19
Total	753.00	$ 0.153	$115.50

Possible Shortfall or Surpluses

BAA	TRR Forecasted to be Recovered *($ in Millions)*	TSP/PTO Distribution *($ in Millions)*	Surplus/ Shortfall *($ in Millions)*
BAA A	$ 52	$ 52.68	$ 0.68
BAA B	$ 13	$ 13.17	$ 0.17
BAA C	$ 4.5	$ 4.56	$ 0.06
BAA D	$ 44.5	$ 45.09	$ 1.09
Total	$ 114	$ 115.5	$ 1.5

Need to develop a method for true-up between Forecasted and Actual

1. Apply Shortfall/Surplus as an adjustment to next year Forecasted Converted TRR Revenue
2. Resubmit current year Forecasted Converted TRR Revenue and resettle through normal settlement cycle

Volumetric uplift charge of Actual Converted TRR Revenue - Summary

- Based upon Actual Converted TRR Revenue
- Assigns Actual Converted TRR Revenue to volumetric transactions
- Assure TSP/PTO is not harmed by releasing Bucket 3 transmission at a hurdle free rate
- Recognizes the share benefit to all BAAs for providing the Bucket 3 transmission

Should Converted TRR Revenue be limited to EDAM or extend into WEIM?

- TSP can sell the transmission after the close of EDAM up until Real Time Market (RTM)
- TSP provide WEIM market transmission at hurdle free rate
  - Compensated through Transfer Revenue and Congestion Rents only
- Should RTM Export transfers be considered in calculating Actual Converted TRR Revenue
- If limited to EDAM, should the costs allocation be limited to Day Ahead Schedules
  - Should convergence bids be included in the allocation transactions

Should the volumetric uplift charge of Actual Converted TRR Revenue for each BAA be based upon BAA Forecasted Converted TRR Rate

- Currently, Volumetric uplift charge of Actual Converted TRR Revenue assumes shared benefits by calculating EDAM Area Forecasted Converted TRR Rate

- Should the Actual Converted TRR Revenues be calculated by BAA and then distributed EDAM Area
  - Each BAA Actual Converted TRR Revenue will need to be distributed separately
  - Could create a BAA by BAA volumetric rate

How should Transfer Revenues be factored into transmission cost recovery?

- Transfer Revenues associated with Bucket 3 transmission could offset loss of historical transmission revenues.

- Could forecasts or actuals be used in determining rates?

What are the associated administrative processes (confidence in data, timing of submission and settlement, etc…)?

- How do we ensure confidence that the EDAM is factoring in comparable Bucket 3 transmission revenues?

- What data sources should be used?

- What level of review/documentation should be required in approving costs?

How do we adjust transmission recover values over time?

- Over time, both the transmission system and use of the transmission system will evolve.
  - Should the rate recovery factor in new transmission build outs and Bucket 3 cost recovery to the degree such upgrades support EDAM transfers?
  - How could transmission use changes factor in changing cost recovery mechanisms (ideally without creating inefficiencies in the dispatch)?

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Next Steps

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July 2022 EDAM Workshop Schedule

Date/Time	Format	Focus
July 20, 2022 (8 a.m. – 12 p.m.)	Virtual only	Transfer revenue and congestion rent allocation
July 26, 2022 (9 a.m. – 5 p.m. Mountain Time)	In-person and virtual Salt Lake City, UT	(1) Confidence in transfers (2) GHG accounting (3) Day-Ahead RSE and transmission (recap/review from prior workshops)
July 27, 2022 (9 a.m. – 12 p.m. Mountain Time)	In-person and virtual Salt Lake City, UT	GHG accounting

If you plan to attend the July 26-27 EDAM workshops in Salt Lake City, UT, please register by July 21.

- The ISO is pleased to be hosting the Stakeholder Symposium in-person at the Safe Credit Union Convention Center in downtown Sacramento on Nov. 9 – 10, 2022

- Registration now on the Stakeholder Symposium page at: https://californiaiso.swoogo.com/2022StakeholderSymposium

- Please direct questions to symposiumreg@caiso.com