

# WESTERN ENERGY IMBALANCE MARKET (WEIM)

## Extended Day-Ahead Market (EDAM) Opinion on Final Proposal

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As requested by the Governing Body, this report presents observations and assessments of the EDAM Final Proposal (EDAM FP).

- Organization
  - Section I: Overview of Recommendations
  - Section II: Observations and Assessments
    - Resource Sufficiency Evaluation (RSE)
    - Transmission Scheduling
    - Greenhouse Gas (GHG) Modeling
  - Section III: Detailed Recommendations

# SECTION I: OVERVIEW OF RECOMMENDATIONS

I advise the Governing Body to support continued development of the market rules presented in the EDAM FP.

- The FP is a significant step toward establishing a voluntary day-ahead energy market to benefit participants by optimizing the EDAM unit-commitment and balancing area (BA) transfer schedules
- It maintains agreed-upon BA independence established in the WEIM
  - No common BA resource adequacy (RA) requirement
  - Accommodation of both OATT transmission reservation and scheduling practices and transmission scheduling via the California ISO's bid-based centralized energy market

I also advise the Governing Body to require additional conceptual development or more complete explanation of some elements of the EDAM FP.

- Market rules for some elements are ambiguous or incomplete and some could be unworkable, especially:
  - WEIM Resource Sufficiency Evaluation (RSE) rules and real-time curtailment rules for EDAM BAs
  - Re-dispatch to accommodate OATT transmission scheduled after the Integrated Forward Market (IFM)
  - The proposed GHG model
- Section II explains why these elements of the proposal require additional conceptual work or clarification

Finally, I recommend the Governing Body require monitoring of the outcome of certain market rules presented in the FP to ensure the competitive functioning of EDAM.

- Section II explains why the ISO should carefully monitor, as it proposes:
  - Changes to EDAM schedules following the IFM that are permitted by the terms of OATT transmission service and Western Systems Power Pool (WSPP) Schedule-C contracts
  - The availability of transmission across interties where transmission customers own rights to a high percentage of the Available Transmission Capacity (ATC)
- Following the assessment of issues in Section II, Section III elaborates my recommendations to the Governing Body

# SECTION II: OBSERVATIONS AND ASSESSMENTS

This section addresses issues that, in my judgment, are the most consequential to the success of the EDAM, per instruction from the Governing Body.

- I avoid overlap with written comments provided by the DMM and MSC with which I agree, except about the most significant issues
- The discussion assumes familiarity with the EDAM FP



# SECTION II: OBSERVATIONS AND ASSESSMENTS

## Resource Sufficiency Evaluation

## Clear and stringent RSE rules are essential to the success of EDAM.

- EDAM BAs can benefit from pooling uncertainty risks and economically sharing supply resources and transmission capability
- But they will require confidence that sharing will not:
  - Degrade the reliability of service to their native loads, or
  - Increase the cost of service for their native loads
- These concerns must be clearly addressed in:
  - Evaluating EDAM RSE compliance and penalizing EDAM RSE failure, and
  - Applying the WEIM RSE to BAs who have passed the EDAM RSE, including priorities and procedures for real-time curtailment of EDAM load, if necessary

Since EDAM BAs accept interdependency in ensuring reliability, it is not apparent why the RSE rules do not account for resource-specific reliability differences.

- The FP does not consider the reliability of a BA's RSE resources, other than to ensure transmission deliverability to the BA
- As an example, a BA with less reliable RSE resources would share the imbalance reserves of other EDAM BAs, although its reserves contribute less to EDAM reliability
  - A BA with less reliable resources leans on the EDAM pool
  - Other EDAM BAs bear costs if they fail the WEIM RSE because of the lower reliability of this BA's less reliable resources
- Differences in the reliability of supply resources are far more important in EDAM than the WEIM

Evaluation of how the imbalance reserve requirement will affect the reliability and costs of EDAM BAs requires completing work on imbalance reserve penalty pricing in the Day-Ahead Market Evaluation (DAME) initiative.

- The design of imbalance reserve penalty pricing affects:
  - The quantity of imbalance reserves scheduled in EDAM and passed to the real-time market
  - The probability of EDAM resource insufficiency in the WEIM RSE and in real-time
  - EDAM energy prices, because scheduling of imbalance reserves is co-optimized with energy in the IFM
  - WEIM prices, because the penalty price will at times set the quantity of EDAM imbalance reserve flowing into real-time
- The DAME initiative is continuing discussion of this issue

As the MSC and DMM (June 2022) have pointed out, the market rules do not provide sufficient detail about the consequences of the EDAM BA pool failing the WEIM RSE.

- If the EDAM BA pool fails the WEIM RSE, the FP states that the usual WEIM consequences would apply, but provides no additional explanation
  - Would the ISO restrict the real-time imports of each EDAM BA, individually, or of the EDAM BA pool as a whole?
  - Alternatively, would the BA pool share the cost of real-time emergency imports?
- These failure consequences affect the potential costs of joining the EDAM

Further, the FP does not sufficiently explain how ISO models and procedures will address situations in which the resource insufficiency of one of the EDAM BAs causes a power balance violation for the BA pool.

- The ISO has stated that any loss of load would be isolated to the EDAM BA with the resource insufficiency, rather than being shared among the EDAM BAs
  - The FP provides an example of this
  - But, it does not conceptually explain how this specific, rather than pooled, allocation of load-shedding would dependably occur during different real-time operation scenarios, such as when:
    - The resource insufficiency of two BAs jointly causes a power balance violation
    - The resource insufficiency occurs in a BA whose IFM exports enabled a second BA to pass the EDAM RSE

More detail is needed about the proposal to dynamically adjust the extent to which the real-time diversity benefit of the EDAM pool will be deducted from the pool's WEIM RSE.

- It seems that any diversity benefit not allocated to the EDAM BAs would be shared with all WEIM BAs through the real-time dispatch
- This could reduce the incentive for BAs to join the EDAM
- It is particularly important to clarify whether the EDAM BAs would receive the full diversity benefit during tight system conditions

# SECTION II: OBSERVATIONS AND ASSESSMENTS

## Transmission Scheduling



Transmission scheduling rules with the potential to alter grid capacity following the IFM need to be closely monitored.

- The FP allows the following after the IFM:
  - OATT transmission scheduling, “if practicable, by re-dispatch, if necessary”
  - Changes to the injection locations for WSPP Schedule C contracts
- The proposal appears to support these transmission scheduling requests without additional charges to the transmission customer in order to honor current contract terms
  - Possible exceptions for OATT scheduling requests
  - No discussion of possible exceptions for WSPP Schedule C

Additional information should be provided about how re-dispatch will accommodate OATT transmission schedules submitted after the IFM but before real-time.

- Will the ISO would cut non-firm transmission service, such as economically scheduled IFM transfers, to accommodate firm OATT service?
- If many OATT schedules are submitted after the IFM, how will the ISO determine which can be accepted?
- How will the ISO match specific re-dispatch costs with each OATT transmission schedule?
- Could the re-dispatch cause new transmission constraints to bind in the EDAM schedules passed to real-time, as long as it honors firm EDAM schedules?

Additional thought should also be given to the possible consequences of the IFM modeling of WSPP Schedule C contracts that do not identify a supply source.

- The IFM will include an injection of power at the likely BA intertie that will be used to supply the contracted load
- This appears to be equivalent to (and enable) a virtual supply offer, provided there is a binding EDAM import schedule
- The ISO should explain whether changes to injection locations could cause predictable changes to real-time prices

The possible impact of post-IFM schedule changes on the functioning of the EDAM cannot be evaluated without further information about how, exactly, the schedule changes will be addressed.

- Additional market rules could be needed to ensure that post-IFM transmission schedule changes could not:
  - Enable exploitation of relative risk-free profit opportunities (gaming) by causing a predictable change to real-time prices, all else being equal
  - Lead the ISO to incur extremely high redispatch costs during tight system conditions

## My views on two additional transmission issues:

- Monitoring should occur to ensure that concentration in the ownership of transmission rights across interties does not limit access to transmission tags required to firm up RSE resources.
- I agree with the proposal to charge recoverable transmission revenue to EDAM footprint gross load less the recovering EDAM BAA's gross load.

# SECTION II: OBSERVATIONS AND ASSESSMENTS

## Greenhouse Gas Modeling

## The GHG model is central to the success of the EDAM, not an after-the-fact accounting procedure.

- The GHG model will be included in **all** of the scheduling and dispatch models used for the EDAM and WEIM
- The methodology will have material impacts on Western electricity prices and on which non-GHG BA resources are deemed to supply GHG load vs. non-GHG load
- However, a “correct” modeling approach cannot be developed based on economic principles
- Decisions about modeling assumptions entrench equity and policy trade-offs, such as between the price of GHG credits and the amount of secondary dispatch

There is insufficient information to assess the reasonableness or implementation feasibility of the FP GHG model.

- There is not adequate support at this time for the proposed central modeling assumptions
  - An optimized counterfactual for the non-GHG region
  - The application of BAA-level net export constraints in the IFM
- The software implementation of the model proposed is under development
  - Key technical assumptions, such as the starting point for an iterative solution (if required), need to be studied
  - The replicability and reasonableness of the model results have not been tested, to the best of my understanding



It would be extremely helpful for the ISO to provide empirical results for its proposed GHG model, as well as for alternative model designs.

- Stakeholders and the MSC have suggested alternative model assumptions
- Empirical results should enable comparison among model designs
  - Total cost of the dispatch
  - GHG emissions
  - GHG price
  - Secondary dispatch quantity
  - Power prices
- The modeling assumptions for LSE import contracts into GHG regions require further thought and explanation

# SECTION III: SPECIFIC RECOMMENDATIONS

I recommend the Governing Body support continued development of the market rules presented in the EDAM FP.

- **Require additional conceptual development** of the GHG model, supported by empirical tests of alternative model designs.
- **Require detailed explanation and possibly additional conceptual development** of market re-dispatch procedures to accommodate new OATT transmission schedules and changes to WSPP Schedule C injection locations following the IFM. The explanation should address the procedures under a range of scenarios and possible impacts on WEIM prices.

- **Require further explanation and possibly additional conceptual development** of the application of the WEIM RSE to the EDAM BA pool, the consequences if the pool fails the WEIM RSE, and the rules and procedures for real-time load-shedding in the EDAM BAs under a variety of scenarios.
- **Require a report** to evaluate whether a reasonably well functioning EDAM should account for resource-specific differences in resource reliability.

- **Support ongoing monitoring of:**
  - Post-IFM scheduling of OATT transmission and changing of WSPP Schedule C injection locations, including assessment of any attendant impacts on real-time prices.
  - The availability of new transmission service across congested interties, especially daily service to support EDAM RSE resources.
  - Whether any BA consistently submits an RSE resource plan that could not be feasibly dispatched to serve its load (agree with MSC and DMM).
  - Whether the GHG model implementation causes unintended and unreasonable changes to bids, offers, or power contracting (not discussed herein).