

Markets+ Phase 1 Funding Parties to Publish “Issue Alerts” to Inform Public Dialogue on Day-Ahead Market Choices

In recent months, there has been considerable industry dialogue focused on the market seams that will exist between EDAM/EIM and Markets+, as well as the EDAM/EIM governance enhancements being pursued through the Pathways Initiative. While both topics are important, the Markets+ Phase 1 Funding Parties believe this dialogue is incomplete without also considering the numerous governance and market design differences between Markets+ and EDAM/EIM that are driving continued support for Markets+. To address this gap, some of the Markets+ Phase 1 Funding Parties¹ have worked together expeditiously to prepare timely information in this third “Issue Alert.” Markets+ Phase 1 Funding Parties will continue this collaboration to issue a series of Issue Alerts identifying and explaining the key governance and market design elements that differ between Markets+ and EDAM/EIM and why these differences have important consequences for customers in terms of reliability, economic value, and environmental objectives.

The Markets+ Phase 1 Funding Parties will share a new Issue Alert every few weeks covering the following topics:

1. Governance
2. Reliability
3. Fair and Accurate Market Pricing
4. Seams Issues
5. Support for Clean Resources
6. Market Operator Actions & Modeling
7. Durable Customer Benefits

¹ Arizona Public Service Co, Chelan County PUD, Grant County PUD, Powerex Corp., Public Service Company of Colorado, Salt River Project, Snohomish PUD, Tacoma Power, Tri-State Generation and Transmission Association Inc. and Tucson Electric Power Company prepared this Issue Alert 3.

Issue Alert 3: Fair and Accurate Market Pricing

Fair and accurate pricing promotes long-term investment in the electric grid, clean energy integration, and equitable and reliable service for customers

This Issue Alert is part of an ongoing series highlighting the key governance and market design elements that differ between Markets+ and EDAM/WEIM and why these differences have important consequences for customers in terms of reliability, economic value, and environmental objectives.

Key Take-Aways

- **How prices are calculated in a western day-ahead market is critical to market participants and their customers, as \$25 billion or more in annual trade will be affected.**
- **Markets+ achieves fair and accurate pricing through several key market design features that differ substantially from EDAM.**
- **Studies using production cost models do not reflect the full impact of price formation differences between EDAM and Markets+ to consumers.**

Fair and accurate wholesale energy prices are a fundamental element of a well-functioning market. Prices serve to help attract and retain the right resources to serve customers efficiently, affordably, and reliably, while supporting environmental objectives. Accurate wholesale prices can:

- Achieve equitable outcomes for all market participants and their customers;
- Encourage the installation, availability and use of the most cost-effective resources;
- Support long-term reliability by providing an important signal for developers, utilities, and investors to pursue resource and transmission investments in the locations, and with the characteristics, of greatest value to the grid; and
- Help achieve environmental goals by promoting the development and integration of clean resources and storage technologies.

FERC's Guidance on Price Formation

FERC emphasizes the importance of accurate prices to encourage efficient behavior in both the short-term and the long-term. FERC explains that its price formation efforts “seek to ensure that market rules provide appropriate price signals, which compensate resources at prices that reflect the value of the service resources provide to the system and operational conditions and ensure resources accurately respond to dispatch instructions.”² Further, FERC has found that “[a]dequate investment in resources and resource participation in ISO/RTO energy markets ensure adequate and reliable energy for consumers.”³ According to FERC, Locational Marginal Prices “ideally ... would reflect the true marginal cost of production, taking into account all physical system constraints, and these prices would fully compensate all resources for the variable cost of providing service. The RTO/ISO would not need to

² [Energy Price Formation | Federal Energy Regulatory Commission \(ferc.gov\)](https://www.ferc.gov/energy-price-formation)

³ FERC Order No. 831, at P5.

commit any additional resources beyond those resources scheduled economically ... [and] market prices would reflect the value of electricity consumption without the need to administratively curtail load.”⁴

Market Pricing Impacts Market Choice

Entities choosing whether to join a regional organized market must have confidence that both their market purchases and market sales will occur at fair and accurate prices. Most Markets+ stakeholders expect to be both sellers and buyers at different times. For example, all load-responsible entities will need to meet the Western Resource Adequacy Program (WRAP) forward showing obligation, meaning they could have surplus energy available in the operational time frame during periods when demand is lower than expected. At the same time, future Markets+ participants have increasingly diverse fleets – including natural gas, hydro, wind, solar, and storage – that include resources with variable and/or uncertain output, that could leave them seeking power to fill in the gaps. With most market participants expecting to be net purchasers in some periods and net sellers in other periods, there is a common interest in ensuring fair and accurate wholesale prices for all potential purchase and sale transactions.

Markets+ achieves fair and accurate wholesale pricing through several key market design features that are based upon best practices established in FERC precedent, including:

1. Targeted Market Power Mitigation
2. Graduated Scarcity Pricing
3. Fast-Start Pricing
4. Virtual Bidding

These design features are key areas in which Markets+ differs from EDAM. However, the costs and benefits for customers of these differences are not revealed in studies using production cost models that have been used by some entities to show the relative financial costs and benefits of EDAM and Markets+. Production cost models apply few, if any, differences in how prices are calculated between the two markets. Production cost models also are generally not well suited to modeling real-world outcomes during scarcity events, evaluating market power mitigation procedures, or considering other market features that support price convergence between market intervals, such as virtual bidding. Accordingly, price formation design differences between Markets+ and EDAM can substantially impact participants and their customers.

Targeted Market Power Mitigation

Market power mitigation is a foundational element of a well-functioning and competitive market. Market power mitigation mechanisms are built into the framework of each market to identify and mitigate supply offers that reflect the exercise of market power, thereby protecting purchasers – and by extension consumers – from inappropriate and uncompetitive behavior.

Markets+ employs an industry standard Conduct-and-Impact framework for protecting market participants against the exercise of market power. A Conduct-and-Impact framework is also used in MISO, ISO-NE, NYISO, and SPP’s Integrated Marketplace. Under this framework, a bid is mitigated if it materially exceeds an established reference level and that bid would have a material impact on market

⁴ FERC Price Formation in Energy and Ancillary Services Markets Operated by RTOs and ISOs, Notice, Docket No. AD14-14-000 (June 19, 2014)

prices, absent mitigation. This two-part assessment applies mitigation when needed to ensure market prices are not distorted by the exercise of market power, while providing market participants with flexibility to submit bids that reflect their own evaluation of their costs (including opportunity costs). Enabling this flexibility is important because, as FERC staff noted, “measuring marginal cost can be a complicated endeavor. For example, fuel costs, particularly the costs of natural gas and fuel oil, can change substantially day-to-day and potentially within the day; further opportunity costs for some resources can be difficult to determine with precision.”⁵ The Conduct and Impact framework lowers the risk of inappropriate mitigation being applied when market power does not actually exist and helps to ensure that flexible resources with dynamic opportunity costs will be available to support reliability when most needed.

In contrast to Markets+, EDAM’s market power mitigation framework applies mitigation whenever an entity is determined to have the *potential* to exercise market power, either at the Balancing Authority Area (BAA) level or at a local level. Mitigation is triggered without examining whether the market participant’s bids likely reflect the exercise of market power and without examining whether the participant’s bids would materially impact market prices. Consequently, the EDAM approach has the potential to result in more frequent, and overly-broad, mitigation to price levels that can be below a market participant’s actual costs. For example, thermal resources may face significant variation in the availability and/or cost of intra-day gas, giving rise to the risk that EDAM mitigation could over-ride bids to price levels that do not reflect those costs or limitations. Similarly, hydro, battery storage, and other energy-limited resources have complex and dynamic opportunity costs, creating the risk that EDAM’s mitigation procedures may over-ride bids to price levels that cause these resources to deplete their limited energy at the wrong time. For example, inaccurate mitigation could result in a hydro resource being inefficiently deployed earlier in the day rather than saving the hydro resource’s energy and ramping capability to support evening system ramping needs.

In summary, overly aggressive mitigation procedures can harm individual market participants by dispatching their resources at prices below their costs and by deploying energy limited resources at the wrong time. Both of these outcomes ultimately result in harm to consumers.⁶

Graduated Scarcity Pricing

Graduated scarcity pricing allows market prices to rise above the variable cost of the marginal resource as system conditions tighten and the risk of insufficient supply to meet demand rises. Scarcity pricing supports reliability and market efficiency during tight conditions by encouraging all resources to be available during these periods, and to perform when called upon. This also sends a valuable price signal to encourage demand response, where possible. As a result, scarcity pricing helps ensure prices reflect actual system conditions during periods of tight supply and that customers receive the benefit of the most optimal market clearing solution.

Markets+ includes a scarcity pricing approach that is specifically designed to ensure that market prices can rise gradually as the quantity of available flexible reserves begins to fall and the risk of an energy shortfall increases. This design also ensures that prices appropriately reflect scarcity conditions to the

⁵ [Energy Offer Mitigation in RTO and ISO Markets \(ferc.gov\)](https://www.ferc.gov/energy-offer-mitigation-in-rto-and-iso-markets), at pg 1.

⁶ Many utilities share the benefits and costs of wholesale transactions with their customers through fuel adjustor mechanisms inside their state jurisdictional rates.

extent that supply is sufficiently tight that low-priority exports must be curtailed in order to meet load inside the market footprint.

EDAM, in contrast, does not reflect a scarcity pricing approach explicitly designed for the EDAM footprint and instead uses the existing CAISO design that is generally linked to shortfalls of ancillary services inside the CAISO BAA. The effectiveness of this approach is frequently undermined by extensive manual interventions that commonly occur in the CAISO BAA during scarcity conditions, including deploying out-of-market supply and emergency demand response. This behavior puts inaccurate downward pressure on market prices, producing pricing results that are inconsistent with actual system conditions and limiting shorter-term and longer-term market participation incentives.

Fast-Start Pricing

Prices in Markets+ include the cost of starting and running gas peaking units, known as “fast-start pricing.” Fast-start pricing is necessary for market prices to accurately reflect the cost of using gas peaking units to meet peak load and ramping needs, which can pose significant challenges due to the combined effects of load and renewable resource variability. Fast-start pricing plays a key role in accurately calculating market prices, and can encourage alternative use of cleaner and/or lower cost resources – including hydro and storage – that are capable of ramping quickly to meet system needs in hours of greatest need.

Without fast-start pricing, organized market prices generally would not include the cost of starting and operating gas peaking units, and the market operator may instead make out-of-market side payments directly to individual gas generators to cover their costs. This approach results in a lower market clearing price being paid to all other resources that are also providing energy at the same time of critical supply need.

All current FERC-jurisdictional organized markets have adopted fast-start pricing, except markets operated by the California ISO (including WEIM and EDAM). Failing to include fast start pricing negatively impacts Northwest and Southwest ratepayers⁷, and impedes long-term efficiency by discouraging investment in new flexible resources and storage that could displace the use of gas peaking units in the future. Furthermore, for regions with greenhouse gas (GHG) pricing programs, failing to include gas peaking units in market prices means that the GHG costs of gas peaking units in those regions may not be fully captured in the market price, diminishing the price signal to encourage the use of clean resources to reduce emissions.

Virtual Bidding

Virtual bidding within the Markets+ footprint provides a valuable tool for load-serving entities to hedge exposure to price deviations between the day-ahead and real-time timeframe. It also creates a vehicle for market participants to provide liquidity to the market and improve convergence of prices between day-ahead and real-time. Virtual bidding also aids in enhancing competition by reducing the ability of a physical buyer or physical seller to exert market power. Given the complexity of virtual bidding,

⁷ In 2022 Energy GPS conducted an analysis that estimated that excluding the cost of gas peaking units in CAISO prices negatively impacts Northwest and Southwest ratepayers by as much as \$188-420M per year by reducing the sales revenue associated with sales to California. This study was commissioned by Powerex and the Public Power Council.

Markets+ includes customer protections against unintended consequences including a 6-month stabilization period before the functionality is enabled. Additionally, the Markets+ tariff grants authority to SPP to temporarily halt virtual bidding if unexpected outcomes or issues are identified.

In contrast, in EDAM virtual bidding will be an optional election for each BAA within the EDAM footprint. This BAA-by-BAA approach introduces uncertainty for load-serving entities and other market participants on their ability to hedge real-time energy costs across the market footprint, potentially limiting the tools that can support market efficiency in EDAM. It also potentially precludes a very important market tool for enhanced liquidity, competition, and price convergence between day-ahead and real-time, putting greater price risk exposure on market participants in BAAs that may choose not to enable virtual bidding within their area.

Conclusion

Fair and accurate prices are necessary to maximize aggregate market benefits by encouraging the dispatch of low-cost resources, providing a transparent price signal for investment in the necessary resources and transmission needed to maintain reliability, and supporting environmental objectives by promoting the use of clean, renewable and storage technologies. Fair and accurate prices are also necessary to achieve equitable outcomes for individual participants, most of whom will be both purchasers and sellers over time. Markets+ incorporates multiple price formation design choices – including market power mitigation procedures, graduated scarcity pricing provisions, fast-start pricing, and virtual bidding – that will support these important objectives.