

**Comments of Powerex Corp. on
Intertie Deviation Settlement Issue Paper**

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Executive Summary

Powerex appreciates the opportunity to comment on the August 15, 2018 Intertie Deviation Settlement Issue Paper and associated presentation (“Issue Paper”). The Issue Paper highlights some of the challenges the CAISO faces when physical intertie awards in its day-ahead and hour-ahead market processes are not delivered. These delivery failures represent energy that must be replaced in the real-time markets, including through imports into the CAISO balancing authority area (“BAA”) through the Western Energy Imbalance Market (“EIM”). The Issue Paper seeks comments on one relatively narrow issue: how to encourage market participants to inform CAISO of any physical intertie award non-deliveries earlier (by T-40) rather than simply through the non-submission of an e-Tag by the WECC scheduling deadline of T-20.

Powerex strongly supports the CAISO’s efforts to address delivery failures on day-ahead and real-time physical intertie awards. However, Powerex believes the Issue Paper is far too narrow in its framing of the issues, its examination of the underlying causes and consequences, and its consideration of potential solutions. In particular, the Issue Paper fails to distinguish between the unavoidable, random intertie delivery failures that all BAAs experience in the ordinary course of scheduling interchange transactions and the **systemic** intertie delivery failures that the CAISO BAA routinely faces as a result of CAISO’s permissive market rules. These market rules enable marketers and/or financial participants to routinely submit physical intertie offers that they may choose not to deliver on, if and when they are dispatched and/or when they do not have any physical supply in the first place.

Powerex believes the continued inclusion of this “speculative supply” in CAISO’s day ahead and real-time markets, as well as in California’s resource adequacy (“RA”) program, is a serious issue that must be comprehensively addressed, as it:

- threatens real-time reliability, particularly in the CAISO BAA;
- undermines the integrity of California’s RA program;

- distorts market clearing prices in the CAISO's day-ahead and real-time markets, including the Western EIM; and
- results in inappropriate capacity and flexibility leaning by the CAISO BAA on other entities participating in the Western EIM.

The CAISO is largely unique among western BAAs in permitting the sale of forward capacity products, as well as day ahead and real-time physical energy products that the seller does not actually have at the time of the transaction. Powerex believes it is these lax rules that result in the CAISO BAA experiencing much greater challenges with intertie delivery failures than other BAAs in the west. While all BAAs face the risk of outages or de-rates to generating units and transmission facilities—which can in turn impact interchange schedules with other BAAs—in Powerex's experience, physical transactions for day-ahead or real-time energy, as well as for forward capacity and forward flexible capacity products in the western bilateral markets *other than* the CAISO generally require the seller to have the physical resources to support the product they are offering to sell *at the time they offer to sell it*.

As recognized in the Issue Paper, this is not the first time that CAISO has examined intertie delivery failures, nor is it the first time that stakeholders, including Powerex, have highlighted CAISO's inclusion of speculative supply in its markets as an important cause of intertie delivery failures. Powerex believes there have been two major changes to the CAISO's circumstances that warrant a different approach to external supply requirements in the CAISO markets:

- The consequences of delivery failures are far greater when there is limited surplus generating capacity that can be expected to be available in real-time. The supply/demand margins for the CAISO BAA have significantly tightened over the past years, and flexibility—as distinct from capacity—has emerged as a major challenge under certain circumstances. A reduced ability to make up for delivery failures places renewed emphasis on only including supply that does not expose the CAISO grid to undue risk of delivery failures.
- CAISO is now the market operator for a multi-state real-time organized market (*i.e.*, the Western EIM) and has been exploring plans to become the market operator for a multi-state day-ahead organized market. Organized markets create tighter inter-dependence among participating entities and regions, meaning the reliability and price consequences of CAISO's market rules are not confined to the CAISO BAA alone.

In light of these two significant developments, Powerex believes the CAISO should work with stakeholders to align its market rules with the general expectations and requirements that prevail elsewhere in the west: that physical day-ahead and real-time energy, as well as forward capacity and flexible capacity products, must be backed by

physical resources at the time they are offered to the market. Powerex recommends that a comprehensive set of measures be considered to achieve this objective, including the following:

1. Require intertie RA contracts to specify generation source and transmission path at the time of RA showings, and further requiring all associated energy offers to be e-Tagged accordingly;
2. Require intertie day-ahead energy market awards to be e-Tagged on a day-ahead basis;
3. Require real-time energy market awards to be e-Tagged by no later than 45 minutes prior to the operating hour; and
4. Discourage *discretionary* non-delivery on day-ahead and real-time market awards through application of financial penalties for failures beyond a specified threshold. Such penalties should not be applied to delivery failures due to the unavoidable risks associated with all interchange schedules. This can be achieved by the use of a quantity threshold (below which penalties do not apply) and/or exemptions in cases of delivery failures at interties that were de-rated or forced out of service after the applicable deadline for the submission of energy offers.

Powerex Comments

I. There Are Multiple Distinct Causes Of Intertie Delivery Failures

It is critical to recognize that intertie supply failures can occur for a variety of different reasons. Moreover, the factors behind delivery failures affect not only day-ahead and hourly real-time energy awards, but also monthly and yearly import RA contracts. Understanding how and why delivery failures occur is necessary to ensure remedies are developed that are effective in *preventing* detrimental behavior *without penalizing or discouraging* activity that supports reliability and enhances market efficiency.

1. Causes of delivery failure of day-ahead and hourly real-time energy awards

Delivery failures of day-ahead or hourly real-time intertie awards occur for a variety of reasons.¹ For example, in some cases, they may be due to the inevitable risk of forced outages or de-rates of generating units or transmission facilities; this risk is no different

¹ As explained in the Issue Paper, 15-minute economic intertie bids require a valid e-Tag to be submitted by T-40 (*i.e.*, prior to running the binding Fifteen Minute Market run). While 15-minute awards may still experience delivery failures due to forced outages or transmission curtailment, the tagging requirement ensures failures will not be the result of speculative supply or discretionary non-delivery.

for resources external to the CAISO than for internal resources. Because such risks can never be entirely eliminated, it is important that any enhancements adopted by CAISO in this stakeholder process not penalize market participants for something they can neither control nor foresee.

Delivery failures can also arise for reasons entirely unrelated to the unexpected unavailability of generation or transmission service. For instance, an external supplier may simply *choose* to not deliver on its CAISO final market award² in order to sell its output to another party (presumably at a more attractive price).

Delivery failures under CAISO's current market rules can also be the result of a market participant selling energy in the CAISO markets even though it has not procured any supply (and/or necessary external transmission service) to support that sale. Such "speculative supply" relies on the market participant being able to procure energy in the short-term markets external to the CAISO. In effect, speculative supply does not result in the CAISO "securing" physical resources at all, but merely delegates procurement responsibility from the CAISO to a marketer or financial participant that is willing to speculate that they will be able to purchase energy in the external bilateral spot markets once (and if) they receive a CAISO market award, and will be able to do so at a price that is less than the price they will receive from the CAISO market. To the extent the speculative supplier is unable to purchase energy in the bilateral spot markets—or if bilateral market prices make it uneconomic to follow through with the sale to the CAISO—then delivery failures are likely to occur.

Importantly, the risks of delivery failure are very different under each of the above scenarios. The risk of outages is generally random, and can occur under high demand or low demand conditions. But the risks of delivery failures associated with the inclusion of speculative supply in CAISO markets, as well as the risk of discretionary non-delivery, are driven by the market conditions *outside* of the CAISO. For instance, during periods of tight supply conditions in the western region, it is more likely that a speculative supplier will be simply unable to procure last-minute energy in the external bilateral markets. Furthermore, tight market conditions outside of the CAISO can also increase the likelihood that an external supplier with real physical supply may simply choose not to deliver on its obligation if it has found a more profitable sales opportunity for its facilities. The conditions that increase the risk of non-delivery also limit the supply likely to be available to the CAISO to replace the non-performing supply. That is, the

² To the extent a supplier reduces its delivery obligation to CAISO (and reduced the associated e-Tag quantity) as a result of a dispatch in the CAISO real-time market (*i.e.*, pursuant to the submission of a real-time purchase bid), and actually had real physical supply, this should generally not be considered a "delivery failure", since the market has dispatched the import reduction to the real physical supply delivery and this outcome is fully reflected in the market outcomes and prices.

risk of these types of delivery failures is greater precisely when the consequences to the CAISO grid—and the Western EIM—may be most severe.

The different categories of external supply, and the associated risk factors for non-delivery, are summarized in the table below:

Category	Factors Driving Delivery Failure	Risk to CAISO (and EIM)
Physical supply, delivery according to final award	Forced outages or de-rates at source BAA; transmission curtailment	Risk generally not correlated to alternative supply conditions; comparable to risks for internal resources
Physical supply, but seller elects non-delivery to CAISO in order to sell in other markets	Risk that more attractive market opportunities exist outside CAISO	Risk is elevated during tight regional supply conditions; Consequences are also likely more severe , as CAISO faces fewer or more costly alternative supply options
Speculative energy supply (non-RA)	Risk that external supply is not available, or price makes physical delivery uneconomic for seller	
Speculative RA supply	Risk that seller has no intention to procure physical supply (must-offer met via high energy price offers) or is unable to procure supply in external spot market when dispatched	Reduces physical supply committed to meeting needs of CAISO BAA; Increases reliance on short-term energy markets

2. Speculative supply of Resource Adequacy capacity

In addition to the participation of speculative external supply in the CAISO day-ahead and real-time energy markets, speculative supply can also be found in the arrangements that are permitted to satisfy RA requirements. Under current rules, system RA requirements can be satisfied by a contract with an external supplier without specifying any of the most fundamental characteristics of such capacity, such as the generation source, the source BAA, or the transmission service that will be used to effect delivery of the RA capacity. A failure to require this straightforward information makes it possible for marketers and financial participants to sell import RA capacity on a purely speculative basis, without the need to secure and set aside any physical supply resources or transmission service. And although all sellers of RA are subject to an energy must-offer requirement for the duration of the RA commitment, these speculative RA sellers can seek to ensure they rarely, if ever, have to actually procure any energy

or transmission service by submitting energy offers at very high prices that are unlikely to clear the market. In this way, a speculative RA seller can collect substantial capacity commitment revenues under yearly and/or monthly RA contracts while incurring virtually no up-front costs to actually commit real physical resources or to reserve transmission service, while also facing little risk of anyone “calling its bluff” by actually requiring physical energy deliveries.

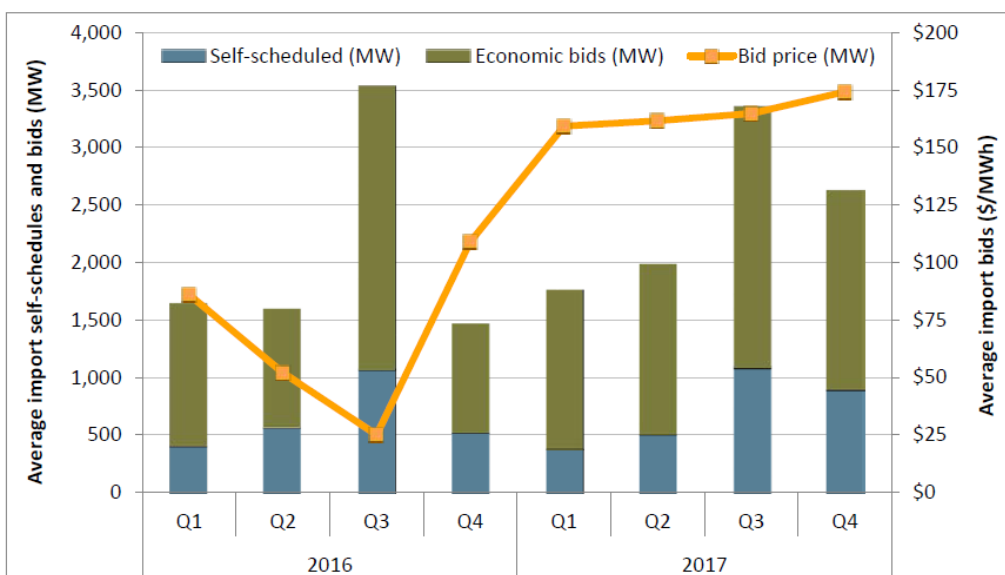
The CAISO Department of Market Monitoring (“DMM”) highlighted the bidding behavior of import RA resources during high demand hours during 2017.

Resource adequacy imports are only required to be bid into the day-ahead market. Imports can be bid at any price and do not have any further obligation if not scheduled in the day-ahead energy or residual unit commitment process. DMM has expressed concern that these rules could allow a significant portion of resource adequacy requirements to be met by imports that may have limited availability and value during critical system and market conditions. For example, resource adequacy imports could be routinely bid significantly above projected prices in the day-ahead market to ensure they do not clear and would then have no further obligation to be available in the real-time market.

Figure 10.4 summarizes the bid prices and volume of self-scheduled and economic bids for resource adequacy import resources in the day-ahead market, during peak hours, throughout the year. ... Prices for weighted average bids began to climb in the fourth quarter of 2016, and remained very high 2017. Prices averaged above \$150/MWh for the entire year, and peaked in fourth quarter, at just about \$175/MWh. These were the highest quarterly average prices since 2013 and are primarily the result of a change in bidding behavior by a few market participants.³

³ DMM 2017 Annual Report on Market Issues and Performance, at 30. Available at: <http://www.caiso.com/Documents/2017AnnualReportonMarketIssuesandPerformance.pdf>

Figure 10.4 Resource adequacy import self-schedules and bids (peak hours)



Powerex notes that the DMM’s concern and analysis appears to also have attracted the attention of the California Public Utilities Commission, which requested the participant-specific energy offer data underlying the above chart.⁴

II. Speculative Supply Undermines Reliability And Leads To Inequitable Outcomes

Market rules that fail to distinguish between physical supply and speculative supply compromise both reliability and market performance. In addition, expanded organized markets—such as the Western EIM and any potential day-ahead regional organized market—extend those adverse consequences beyond the CAISO BAA and to all participating entities and regions.

1. Reliability

It is straightforward to see how reliance on physical market offers that are not backed by physical resources would undermine reliability. A physical market offer whose performance is contingent on the speculative seller being able to procure supply in the external short-term bilateral markets is exposed to delivery risks that go beyond the risk of infrequent forced outages. And as discussed previously, the risk of non-performance is not random. During times of relatively modest demand and abundant supply options

⁴ See CAISO August 22, 2018 Market Notice, “CPUC Request for Department of Market Monitoring Import Bidding Analysis and Data.” Available at: <http://www.caiso.com/Documents/CPUCRequest-Department-MarketMonitoringImportBiddingAnalysis-Data.html>

in the western region, there is a high likelihood that a speculative seller in the CAISO markets may be able, and willing, to procure supply in the external bilateral spot markets. That is, the risk of delivery failures when the speculative supply offers are dispatched is relatively low during these conditions; and even if there is a delivery failure, the consequences are limited because CAISO is likely to have adequate alternative supply options to make up for the shortfall. But during times of regional high demand, such as during a heatwave or cold snap affecting multiple western states, the supply available in the external short-term bilateral markets is more likely to be limited, and what is available is likely to sell at relatively high prices. Hence, the risk that a speculative seller will be unable to procure supply, or may be unwilling to pay the market price for that supply, is significantly increased. And these same market conditions also mean that the consequences to CAISO of delivery failure are greater, as CAISO is likely to also have fewer internal supply options to make up for delivery failures.

CAISO's DMM described such an event during a heat wave that affected large areas of the west in June 2013:

*Overall, the hour-ahead market did not have significant issues during the heat wave period, with the exception of June 28. On this day, temperatures and loads throughout the west were extremely high. During the mid-day and afternoon hours, some of the inter-tie imports into the ISO system declined their hour-ahead energy schedules. **The decline amounts reached up to 1,000 MW. This created reliability concerns given the large unanticipated decrease in imports and tight overall supply conditions throughout the west.***⁵

On May 3, 2017, the CAISO declared a Stage 1 emergency for the first time in nearly ten years.⁶ The CAISO highlighted intertie delivery failures of day-ahead market awards as well as declines of hour-ahead awards in its summary of the events leading up to that emergency.⁷

⁵ CAISO DMM Q3 2013 Report on Market Issues and Performance (November 2013) at 52 (emphasis added). Available at: http://www.caiso.com/Documents/2013ThirdQuarterReport-MarketIssues_Performance-Nov2013.pdf

⁶ See CAISO AWE Grid History Report (August 2018). Available at: http://www.caiso.com/Documents/Alert_WarningandEmergenciesRecord.pdf

⁷ CAISO presentation at May 16, 2017 Market Performance and Planning Forum, at 5. Available at: http://www.caiso.com/Documents/Agenda-Presentation-MarketPerformance-PlanningForum-May16_2017.pdf

May 3, 2017 Stage 1 Emergency Summary

- Peak load at 17:45 with sufficient capacity and operating reserves
- Actual Net Scheduled Interchange (including dynamics) was ~1,150 MW below Day Ahead schedules
- ~600 MW of forced generation outages
- The HA market awarded 1,230 MW of supplemental energy on the interties for HE20 (19:00 to 20:00) but 830 MW of that was declined
- At 19:01 a Stage 1 Emergency was declared and all DR verbally dispatched (PDR & RDRR)
 - Two Contingency dispatches issued, RDRR enabled in the market in the second dispatch (and actually dispatched during manual implementation of DR.)
- Operating reserves recovered at 19:56
- 21:00 Stage 1 Emergency terminated



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Speculative supply undermines reliability in other ways, too. The CAISO's residual unit commitment ("RUC") process is run after the day-ahead energy market solution is determined. RUC compares the amount of physical supply scheduled in the day-ahead market run against the CAISO's forecast of CAISO load, and can commit additional units as necessary to ensure reliability. In this manner the RUC process can accommodate substantial amounts of internal virtual supply in the day-ahead market solution while still ensuring sufficient physical resources are committed to be able to meet load in real-time. And the costs incurred to commit additional units are allocated, at least in part, to the internal virtual supply that cleared the day-ahead market and displaced real physical supply. This process ensures reliability only because CAISO is able to distinguish between physical and virtual sources of internal supply, however. While this distinction is clear and enforced with respect to internal supply, there is no differentiation between physical and speculative sources of external supply. All intertie awards are regarded as "physical" for purposes of CAISO's reliability assessment, even though, in fact, an important fraction of those awards may be no more "physical" than internal virtual supply.

The speculative supply of import RA capacity poses an even greater concern, as it directly undermines the core objectives of the RA program. The principle of any resource adequacy program is to secure advance commitments from resources to be available to meet firm load. If additional resources happen to be available in the short-term markets, then there may be opportunities to reduce *the costs* of serving load through economic displacement, but the availability of resources in the short-term

market should not impact *whether* firm load can be reliably met. This concept is turned on its head when forward RA capacity is routinely sold by marketers and/or financial participants without being backstopped by any real physical supply. Sellers of speculative RA capacity are effectively relying on their ability to either price their energy high enough to never be called upon and/or on their ability to procure energy and transmission service in the short-term markets if and when it is called on by the CAISO: this leads to the precise reliance on short-term energy markets that RA programs are intended to avoid.

Powerex believes that speculative sales of RA capacity raise two additional reliability concerns compared to speculative sales of energy in the day-ahead and real-time markets. First, unlike speculative offers of day-ahead or hour-ahead energy (that are not pursuant to an RA obligation offer), which provide a trading profit only if the seller actually procures external supply and delivers on its CAISO award,⁸ speculative sales of import RA can produce significant revenues even if the seller is completely unable—or does not even attempt—to supply physical energy to the CAISO BAA. It is difficult to see such an arrangement as anything other than an inefficient waste of California ratepayers' money. Second, speculative sales of RA further undermine reliability by displacing the forward commitment of real physical capacity (and/or flexible capacity) that the CAISO BAA relies on to maintain reliability. That is, every megawatt of RA capacity procured from a speculative seller without physical capacity is a megawatt that will *not* be procured from real physical resources, thereby reducing the quantity of physical resources committed in advance to meet the needs of the CAISO BAA.

2. Market distortions and equity

The failure to differentiate between speculative external supply and external supply offers supported by real physical supply capabilities also leads to numerous inequitable distortions to market outcomes.

At the most basic level, failures of intertie awards to deliver according to the final market schedules create an unexpected supply shortfall that must be made up in the real-time market. This can lead to price spikes that affect all real-time transactions. For example, the CAISO market response to the intertie failures on June 28, 2013 was described by DMM as follows:

As a result, ISO operators made manual adjustments to the load levels in the hour-ahead market to prevent potential reliability problems from

⁸ As explained in the Issue Paper, failed deliveries are financially settled as purchases in the 5-minute or Fifteen Minute Markets. Failed deliveries that were not e-Tagged, however, are subject to a reversal rule that prevents the seller from realizing a profit associated with a failed delivery.

occurring in real time. These adjustments reached up to almost 3,000 MW in hour ending 16.

These load adjustments exacerbated hour-ahead congestion in Northern California. For instance, hour-ahead prices in the PG&E area ranged between \$2,000/MWh and \$4,000/MWh for several intervals from hour ending 13 through hour ending 17, reaching above \$5,000/MWh in a few intervals. During this period, prices in the other areas increased up to \$700/MWh.⁹

Knowing that some portion of intertie supply is likely to not be supported by physical external capacity, and hence at risk of non-delivery, CAISO might determine that it needs to commit additional internal generating units to protect against the risk of delivery failures. It would be appropriate and consistent with cost-causation principles for that cost to be allocated to the specific imports with an elevated risk of non-delivery. In other words, it would be appropriate to allocate a greater portion of that cost to speculative external supply, reflecting that supply commitments that are not backed by physical resources expose the CAISO grid to much greater delivery risks. But since CAISO rules currently do not distinguish between external supply that is backed by physical resources and external supply that not, it has no way of achieving that cost allocation. As a result, it is largely California load customers that would bear the cost of committing additional resources to ensure reliability.

Sales of RA capacity that are not supported by real physical supply capability also lead to substantial inequities amongst suppliers. First, marketers and/or financial participants selling RA with no real physical supply receive RA revenues—ultimately paid by California load customers—even if they do nothing to reduce the CAISO grid's reliance on spot market purchases to meet firm load. Second, when this speculative RA capacity is either not dispatched for energy (*i.e.*, due to the seller's high energy offer prices) or the seller simply fails to deliver on its energy offers when dispatched, it implies that it was some *other* capacity resources that were relied upon to reliably meet load. But sellers of energy from these other resources that make up the shortfall do *not* receive any compensation for providing the replacement capacity. Powerex believes there is mounting evidence that this is precisely what is occurring on a regular basis under the California RA program, with external physical suppliers effectively backstopping the CAISO BAA's capacity and flexible capacity needs without RA compensation.

⁹ CAISO DMM Q3 2017 Report at 52.

Moreover, suppliers with real physical resources are placed at a significant cost disadvantage in competing to provide RA capacity to California load-serving entities relative to these speculative suppliers. This is because a physical supplier of RA must incur both direct costs and opportunity costs in order to set aside dedicated physical generating capacity to be available in the CAISO markets, and to reserve and/or set aside necessary transmission service to deliver the output of the physical resource to the specified CAISO intertie. A marketer and/or financial participant selling RA without any real physical capabilities incurs no such costs, and hence can almost always offer RA at a lower price than a physical supplier. In other words, because the RA product that has no real physical capability supporting it is generally available at a lower price, the procurement of import RA may disproportionately consist of contracts with these speculative marketers and/or financial participants, which only heightens the reliability and equity concerns expressed above.

3. Speculative supply enables the CAISO BAA to improperly “lean” on capacity from EIM participating resources

The adverse reliability and equity consequences described above are not limited to the CAISO BAA and intertie market participants. The growth of the EIM can extend these consequences to all EIM entities and their ratepayers. This means that price spikes that originate in the supply and demand conditions of one BAA can propagate across the EIM footprint.

For example, on May 3, 2017, real-time (5-minute) prices in the CAISO BAA rose to approximately \$1,000/MWh during the half hour preceding the declared emergency, while real-time Fifteen-Minute Market prices in the CAISO BAA remained at very high levels for approximately two hours (*i.e.*, for the duration of the emergency). The EIM extended these price spikes to the areas of NV Energy, Arizona Public Service Co., and PacifiCorp-East.

Furthermore, the EIM enables participating resources located in other EIM entity areas to be deployed to make up for non-performance of CAISO intertie supply offers that never reflected real physical supply in the first place. The resource sufficiency requirements do not meaningfully prevent capacity or flexibility “leaning” by the CAISO BAA since speculative supply at the CAISO interties is generally included as if it were real in the resource sufficiency assessment of the CAISO BAA (since delivery failures are often not apparent until the CAISO BAA e-Tag deadline for day-ahead and real-time hourly energy awards of T-20). Notably, it appears the CAISO BAA has rarely, if ever, failed the upward resource sufficiency evaluation. Consequently, the “freezing” of EIM transfers into the CAISO BAA—which is the EIM’s protection against “leaning”—appears to have rarely, if ever, been triggered. Powerex believes this may likely include hours in which the CAISO BAA erroneously passes the resource sufficiency evaluation

because of the inclusion of material quantities of speculative supply, but would not have passed had the assessment included only supply supported by real physical resources.

Powerex notes that the smaller, real-time nature of the EIM provides a degree of protection to EIM entities against reliability risks associated with the CAISO's inclusion in its markets of supply that is not backed by real physical capability. The reliability exposure will be far greater in any day-ahead organized market, however, as a co-optimized day-ahead unit commitment process across the combined footprint will expose firm load service in one BAA to the physical supply sources actually carried by other BAAs. Entities may be unwilling to enter into such a day-ahead organized market without greater assurance that CAISO will only include supply that is supported by real physical capabilities in its resource sufficiency assessment.

III. The CAISO Rules Should Be Enhanced To Exclude Speculative External Supply And Penalize Deliberate Non-Delivery Of Physical External Supply

The foregoing leads Powerex to conclude that comprehensive measures are needed that prevent the participation of intertie supply offers that do not reflect real physical supply capabilities in all of CAISO's markets and processes. This is not to say that CAISO should, in any way, prevent marketers and/or financial participants from participating in CAISO's day ahead and real-time markets at the interties, or in sales of intertie RA products. But all participants that offer external physical supply into CAISO's markets and California's RA program must be required to support their offers with real physical resources.

It is worth noting that this is precisely the expectation that generally prevails in the bilateral markets in the west for day-ahead and real-time energy, and for forward capacity and flexible capacity products.¹⁰ Marketers and financial participants play an active role in these markets; however, purchasers in the region generally expect that the physical products offered by sellers, including by marketers or financial participants, are backed up with real physical supply capabilities at the time the sale offer is made. Thus entities that have not procured physical resources and that seek to sell into in the bilateral markets outside the CAISO BAA are generally required to transact products that are clearly and unambiguously financial, rather than physical, in nature.

¹⁰ This describes the general practice based on Powerex's experience, and does not refer to an explicit rule or formal requirement. It may therefore be conceivable that, in limited circumstances, an entity might sell physical energy in the bilateral day-ahead or real-time market without having first procured physical supply from which to support that sale. However, in Powerex's experience this does not generally occur in practice, and Powerex expects that if a seller transacted in this manner and consequently failed to e-Tag the supply or otherwise failed to perform, purchasers would be very reluctant to continue purchasing physical power from such a seller.

Speculative participation in the sale of *physical* capacity and energy products is generally not tolerated.

Powerex urges CAISO to use this stakeholder process to provide a comprehensive response that recognizes the different root causes of intertie delivery failures. Specifically, Powerex recommends that CAISO work with stakeholders to carefully design measures to (i) eliminate the participation of intertie supply offers that are not supported by real physical capabilities; and (ii) encourage intertie participants that have real physical capabilities to deliver consistent with their final market awards. These measures must be carefully design to avoid or minimize penalizing external physical suppliers for unavoidable and infrequent delivery failures due to circumstances beyond their foresight and control.

Powerex recommends consideration and further discussion of the following specific measures:

1. Require intertie RA contracts to specify generation source and transmission path at the time of RA showings, and further requiring all associated energy offers to be e-Tagged accordingly;
2. Require intertie day-ahead energy market awards to be e-Tagged on a day-ahead basis;
3. Require real-time energy awards to be e-Tagged by no later than 45 minutes prior to the operating hour; and
4. Discourage discretionary non-delivery on day-ahead and real-time market awards through application of financial penalties for failures beyond a specified threshold. Such penalties should not be applied to delivery failures due to the unavoidable risks associated with all interchange schedules. This can be achieved by the use of a quantity threshold (below which penalties do not apply) and/or exemptions in cases of delivery failures at interties that were de-rated or forced out of service after the applicable deadline for the submission of energy offers.

Powerex believes the measures outlined above are specifically tailored to the distinct factors and causes that underlie intertie delivery failures in the CAISO markets, as summarized below.

Category	Potential Enhancements
Physical supply, delivery according to final award	<i>Risk is beyond control and foresight of seller, and similar to delivery risk for internal supply. Penalties will increase cost or reduce participation, but will not improve performance.</i>
Physical supply, but seller elects non-delivery to CAISO in order to sell in other markets	<i>Apply penalties for delivery failure beyond appropriate threshold</i>
Speculative energy supply (non-RA)	<i>Ensure all intertie supply is physical through e-Tagging requirements</i>
Speculative RA supply	<i>Ensure all import RA supply is physical by requiring designation of generation source, source BAA, and transmission path at time of RA showing, and requiring e-Tags consistent with these attributes for each hour of RA contract period</i>