Comments of Powerex Corp. on
Resource Adequacy Enhancements
Third Revised Straw Proposal

Submitted by	Company	Date Submitted
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Powerex appreciates the opportunity to submit comments on CAISO's December 3, 2019 Resource Adequacy Enhancements Third Revised Straw Proposal ("Third Revised Straw Proposal"). Powerex is supportive of numerous aspects of the CAISO's proposal, in particular its adoption of a UCAP construct to better account for the risk of forced outages. Powerex's prior comments more fully addressed specific aspects of CAISO's proposal, so those comments will not be repeated here.

Powerex focuses these comments on a single issue: whether all RA imports should be required to specify the physical resource(s) supporting the contract at the time of the RA showing. This foundational issue has been raised since the very inception of this stakeholder process in 2018.[1] ***Powerex believes it is now time for CAISO to clearly and unequivocally commit to requiring all RA commitments to specify the physical resource—either a discrete identified generating unit or an aggregation of identified generating units or plants—at the time of the RA showings***.

Such a requirement is fundamental to ensuring a robust resource adequacy program, as evidenced by the resource-specific nature of resource adequacy programs in other organized markets in the nation. Continuing to permit RA requirements to be satisfied merely by a contractual commitment from a marketer to procure power "from some resource, somewhere" exposes California consumers and the CAISO grid to reliability risk and energy price spikes. These risks are not hypothetical. Events occurring in recent years, including 2019, have provided clear examples of the adverse consequences that can be expected when forward supply that is relied upon turns out not to have any physical resources behind it.

Powerex believes that the specific requirements for demonstrating that there are discrete physical resources supporting RA contracts can be designed with sufficient flexibility to accommodate the circumstances of <u>all</u> physical resources that can genuinely commit capacity on a forward basis. Thus, the imposition of such requirements will not pose an impediment to California load-serving entities' ("LSEs") ability to meet System RA requirements. ***However, opposition to the very principle of a resource-specific RA requirement should be recognized for what it is: an effort to water down the resource adequacy requirements, forcing CAISO to rely on the availability of residual last-minute energy supply.*** In an environment of tightening conditions across the western grid, this is a reliability gamble that the CAISO must not permit.

[1] *See, e.g., Comments of Powerex Corp. on Resource Adequacy Enhancements Issue Paper* (November 14, 2018) at 2-3. This is clearly not a new issue, as appeared to have been suggested at the January 8 workshop.

The remainder of Powerex's comments discuss the following points:

1. The CAISO requires access to sufficient real physical capacity to meet the needs of the CAISO BAA. Meeting the RA program's goal of ensuring reliability therefore requires that RA contracts result in a forward commitment of physical capacity that is available and committed to serve California loads.
2. The availability of physical capacity is not a "zero sum game," in which any capacity that is not contracted on a forward basis can be assumed to be available in the short-term energy markets. RA contracts that commit real physical supply "unlock" additional capacity that can be made available only through forward operational decisions.
3. In contrast, speculative RA contracts fail to increase the total supply of external physical resources that are available and committed to the CAISO BAA, exposing the CAISO grid to reliability events and energy price spikes similar to those observed in the Northwest and California in recent years.
4. The gaps in the RA program leave the CAISO BAA chronically short of sufficient physical supply to meet its needs, putting CAISO operators in the impossible position of taking all available actions to maintain reliability, including improperly "leaning" on other EIM participants. Ensuring RA contracts commit real physical supply can eliminate the need to engage in capacity leaning. The elimination of leaning is critical for the continued viability of the EIM and the development of any regional day-ahead organized market.
5. Neither marketers that sell speculative RA nor California LSEs that purchase it have adequate incentives—or face sufficient consequences—to ensure RA contracts commit real physical supply on a forward basis. Therefore, the CAISO tariff must ***require*** that RA be backed by committed physical supply at the time of RA showings.

I. The Core Purpose Of The RA Program Is To Increase The Physical Supply Available And Committed To Serve California Load

In order to safely and reliably operate the grid in real-time, CAISO must have access to physical resources in sufficient quantity to serve load and maintain a range of operating reserves. It is well established that the generation resources located within the CAISO BAA are insufficient to meet these needs in all hours. During several months throughout each year, physical supply from outside the CAISO BAA is required in order for CAISO to reliably serve California consumers.

The critical question is whether the CAISO BAA will continue to rely, from a reliability perspective, on external "residual supply" that may happen to be available on a given day or hour. Such "residual supply" generally consists of any surplus generation remaining after external entities have satisfied their own native load obligations, forward sales commitments and other reliability obligations. It is, in a sense, the collective "leftovers" of the broader western region.

It is widely recognized that the amount of residual supply in the broader region is declining and is increasingly unpredictable[2] due to the continued retirement of large quantities of fossil-fuel

[2] *See* Bonneville Power Administration *Southern Intertie Data as of FY* 2018, at Fig. 10.1 and Fig. 10.2 (showing declining daily average transaction volumes at Mid-Columbia). *Available at:* https://www.bpa.gov/Finance/RateCases/BP-

generation resources as states across the west adopt stronger environmental policies.[3] Continued reliance of the CAISO BAA on whatever residual supply may—or may not—be available from day to day is incompatible with the core reliability objective of a resource adequacy program.

The alternative to relying on residual short-term supply is to enter into forward physical commitments with the owners or marketers of real physical resources. Such forward commitments support reliability in several ways.

At the simplest level, a forward contract for real physical capacity or real firm energy ensures that available supply is dedicated to be available to serve California load, rather than to serve load in another BAA. The CAISO BAA is one of several western BAAs that face capacity shortages during peak conditions. This includes entities that, like the CAISO BAA, experience peak conditions on their systems during the summer months. Thus, when supply conditions are tight across multiple BAAs at the same times—or across the western region as a whole—entities that have surplus supply make it available first to support their forward physical supply contracts, before making the remainder, if any, available in the short-term energy markets. In this manner, forward contracting for real physical capacity or real firm energy ensures priority access to supply during critical periods, including when there is insufficient aggregate supply to go around.

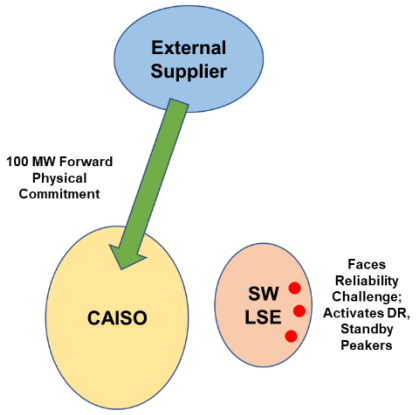
It would be a tremendous error, however, to view the procurement of supply as a "zero sum game," where any supply that is not committed under a forward contract will necessarily be available as residual supply in the day-ahead or real-time western markets. Indeed, ***perhaps the most important benefit of contracting for forward physical supply is that it ensures the availability of resources that might not otherwise be available at all.*** This occurs in at least two distinct ways:

First, when physical supply is committed to the CAISO BAA as opposed to another LSE in a different BAA that faces potential capacity shortages, it induces that *other* LSE to take steps to arrange or activate sources of supply that may only be available for reliability purposes. Such steps may include starting up and procuring fuel to operate less efficient peaker units that rarely run, or activating demand response or conservation measures. Importantly, these steps would likely be taken *only if* this other LSE determined such steps were necessary to maintain *its* reliability. If forward physical supply had been committed to this external LSE, rather than to the CAISO BAA, it is highly unlikely that these same supply options would be enabled ahead of time and then offered into the day-ahead or real-time energy markets.

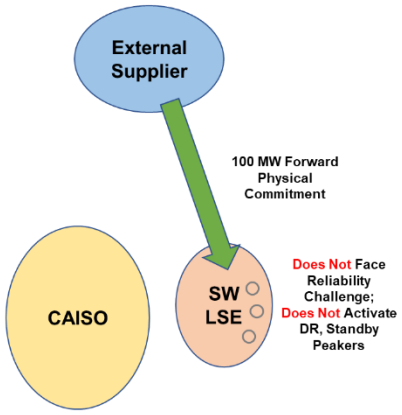
20/Models/Southern%20Intertie%20Data%20Report_FY2018.pdf. *See also* U.S. Energy Information Administration data on wholesale electricity transactions, showing day-to-day transaction volumes at Mid-Columbia. *Available at:* https://www.eia.gov/electricity/wholesale/

[3] *See, e.g.,* WECC *Pricing Event of March 2019—System Impact Assessment* (August 20, 2019), at 12 (August 20, 2019) ("Several states within the Western Interconnection have established carbon-free mandates [.] In response, electric utilities are retiring most, if not all, of their coal-fired resources and many natural gas-fired resources."), a*vailable at:* https://www.wecc.org/Reliability/PricingEvent_Paper_Final.pdf; *id.,* Appendix 1 (list of planned major generation retirements from 2019 to 2028).

Physical Forward Contracting Provides CAISO Access To Additional Capacity That Would Not Otherwise Be Available Through Day-Ahead Or Real-Time Markets



Scenario 1: Physical Supply Committed to CAISO BAA



Scenario 2: Physical Supply Committed to LSE In Desert Southwest

Second, the amount of capacity that is available and capable of supporting deliveries to other entities at any point in time is not "fixed," but rather is the end result of forward operational decisions made well in advance of delivery. These forward operational decisions are generally driven by the need to ensure reliable service to native load customers and to minimize costs; the possibility that short-term sales opportunities might arise in the day-ahead or real-time markets may often have little or no impact on these decisions. Rather, an entity with surplus supply will generally make day-ahead and real-time sales with whatever supply it happens to have available on the day, but will generally not set aside supply to be available for that purpose.[4]

In contrast, a forward supply contract *does* prompt entities to take the steps necessary to ensure that the committed supply is available, as forward obligations are incorporated into forward operational decisions. For example, with a forward supply commitment in place, an entity may need to reduce the generation maintenance outages scheduled during the summer months, when they might otherwise be scheduled to make the most efficient use of available maintenance crews. The entity will also take steps to ensure that fuel is available for thermal generation and/or that water is conserved to enable additional production from hydroelectric facilities.

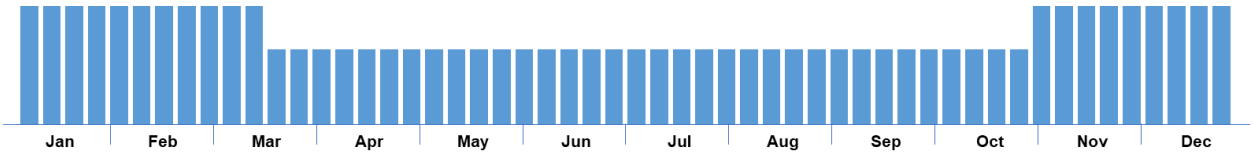
Each of these forward operational decisions entail additional costs, which can be very significant. For example, numerous entities in the northwest experience peak domestic electricity demand during the winter, and therefore typically schedule generation maintenance outages across the spring, summer, and early fall. This approach maximizes the resources available during the peak winter months, but it also implies that a substantial fraction of generating capacity may be on maintenance outage during the summer months when the CAISO BAA and many entities in the desert southwest experience *their* peak demand conditions. Scheduling maintenance outages to

[4] *See, e.g.,* Bonneville Power Administration Power Services presentation at CAISO's October 6, 2015 intertie liquidity workshop at 7 ("~90% of BPA Power Services revenue and FCRPS Flexibility is committed prior to Trading Floor transactions"), *available at*: https://www.caiso.com/Documents/BPAPresentation_Import-ExportLiquidity_15-MinuteMarket_Workshop_Oct6_2015.pdf; *id.* at 9 (showing that majority of the sales volume is in forward transactions, rather than daily or hourly).

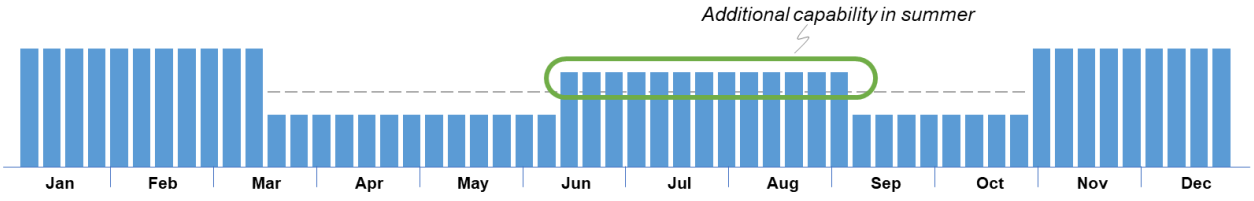
avoid the peak summer months could permit additional capacity to be available to support exports to California or other summer-peaking systems, but this would mean completing all of the required maintenance during a compressed period of time (*i.e.*, in late spring and/or early fall), and at greater cost.

Moreover, in order to be able to supply energy to California during the peak summer periods, generating resources must have sufficient fuel to enable energy production when needed. For fossil fueled generation, this requires fuel—primarily natural gas—to be purchased and scheduled. Such decisions are typically made in the early day-ahead morning hours *before* CAISO day-ahead and real-time dispatches and prices are known. For hydroelectric generation, this requires that water be managed—perhaps weeks or even months in advance—to enable generation from each of the multiple hydro facilities needed to comprise the committed capacity. This implies incurring additional costs to run other resources in prior periods and/or additional costs associated with energy purchases in prior periods in order to conserve water. In addition to these incremental direct costs, taking steps to increase reservoir levels to support summer sales may also increase the risk of spill in the prior spring period.

The incurrence of the costs and risks associated with modifying maintenance schedules, prospective day-ahead and/or forward fuel procurement, and adjusted water management activities generally cannot be justified by the mere *possibility* of making additional energy sales in the day-ahead or real-time markets, even if there is some potential of tight conditions and relatively high prices for a few days. However, a forward physical contract for a season or for a year can provide the certainty and the compensation necessary to justify incurring these additional costs. The figure below illustrates the capacity available to a hypothetical winter-peaking entity that operates is system only considering its own needs (top) compared to the capacity available if it also enters into a forward physical supply commitment of capacity during the summer months.



Winter-peaking systems typically manage water and schedule maintenance to maximize capability during their peak needs

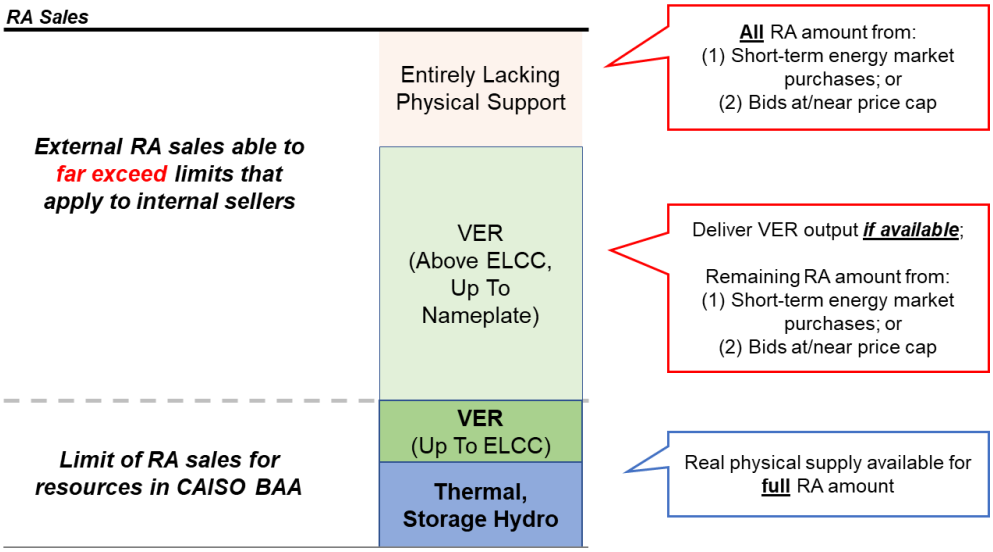


Forward supply commitments can unlock additional capability to supply needs of summer-peaking customers through changes to maintenance schedules and water management

II. Speculative RA Contracts and Speculative Firm Energy Contracts Fail To Increase The Physical Supply Available In The Day-Ahead And Real-Time Markets, Leading To Price Spikes And Reliability Events

The use of forward physical contracts for real physical capacity or real firm energy increases the supply that is *available* and *committed* to serving California load during peak periods and stands in stark contrast to the result of forward contracts that are not required to be backed by physical resources. For the CAISO BAA, such speculative RA contracts and speculative firm energy contracts (that are claimed by the receiving LSE in its RA showings) only exist at the CAISO interties; internal RA showings are held to far more rigorous standards tied to the specific resources associated with each contract.

The lack of a resource-specific RA requirement enables marketers to sell RA contracts in quantities that are entirely unrelated to the real physical supply at their disposal. The illustration below depicts a range of these potential strategies, ranging from RA consistent with physical capacity (adjusted for Effective Load Carrying Capacity, as appropriate) to RA that is wholly reliant on spot market purchases to make any required deliveries, or to RA where such delivery obligations are deliberately avoided by submitting offers at uneconomically high prices.

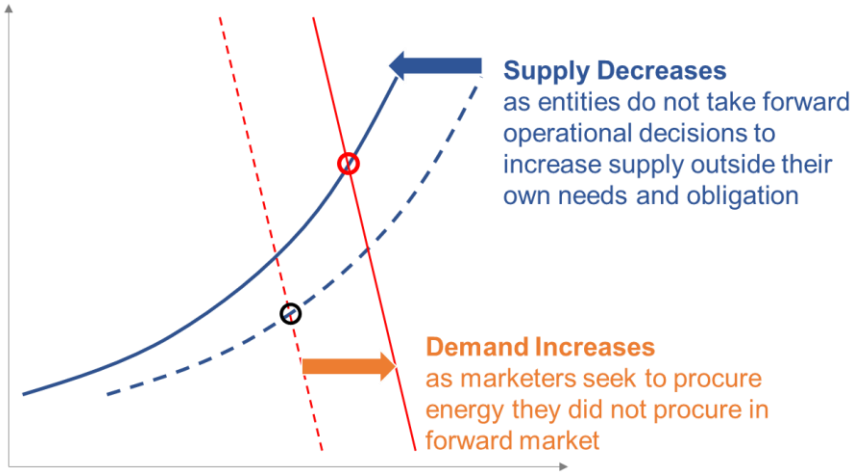


The above illustration highlights that the harm from this activity at the interties extends well beyond the reliability risks and the resulting energy price spikes experienced by California LSEs that have been discussed in this stakeholder process, and also beyond the harm to external suppliers that are displaced in the RA market by such activity. *Internal* suppliers who are subject to more rigorous requirements are also clearly disadvantaged by such activity. This includes what appear to be discriminatory RA market outcomes whereby internal renewable resources such as wind or solar are (appropriately) only able to receive RA revenues for a fraction of their nameplate capacity (based on RA ELCC values), while marketers with external renewable resources are able to receive RA revenues on the full nameplate of their wind and solar projects (or even more). In hours when the respective external wind or solar project does not produce energy at its nameplate value, the marketer simply substitutes the supply with short-term energy market purchases or does not deliver any additional energy to the CAISO BAA at all – yet it continues to collect all of its RA revenues.

More generally, when a marketer sells a forward RA contract without having a real physical external resource to support this commitment, it may simply meet its must-offer obligation by submitting very high priced offers that are never dispatched, or it may attempt to procure any needed supply in the short-term energy markets. But by the time of the day-ahead market, it is far too late to take many of the actions that could have made additional physical supply available. It is too late to move maintenance outages, for example, and it is too late to conserve water or purchase fuel to operate a generator.

Not only is there less supply than if real physical resources had been committed ahead of time, but demand in the day-ahead market is also higher, as the marketer that sold the RA contract now often seeks to supply that contract entirely through day-ahead energy purchases. Ultimately, the sale of forward RA contracts that are not backed by a commitment of physical resources actually ***increases demand and reduces supply*** in the day-ahead market. This is precisely the *opposite* effect of forward contracts with real physical supply, as illustrated below.

When Sufficient Physical Supply Is Not Committed On Forward Basis, Short-Term Energy Markets Experience Price Spikes Or May Lack Enough Residual Supply To Meet All Needs



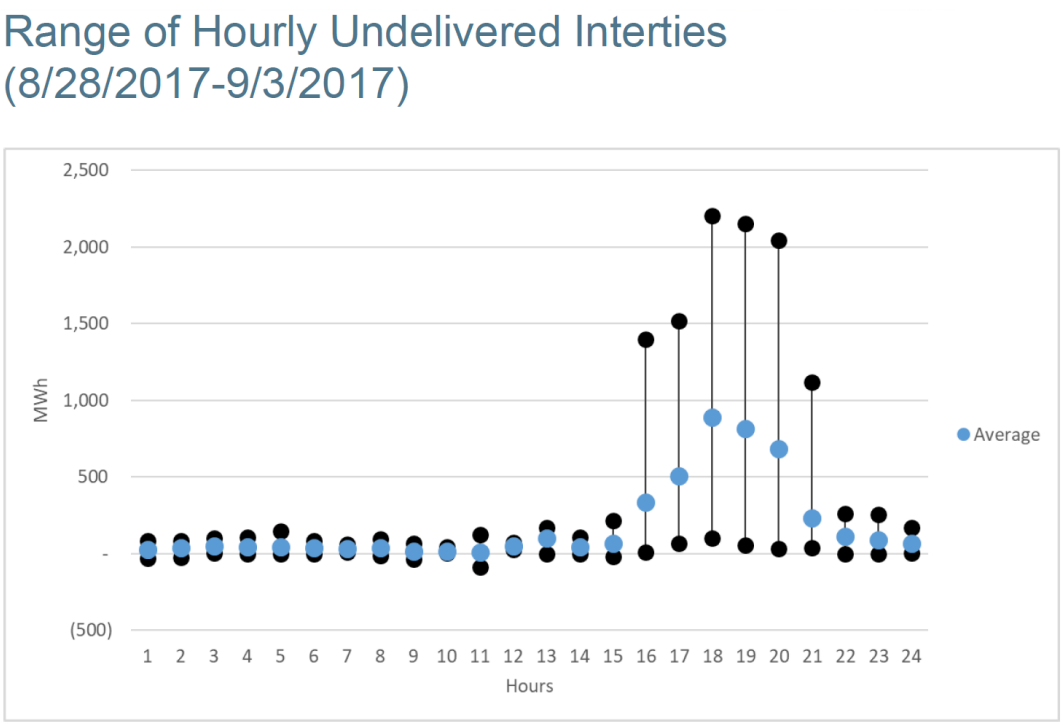
When entities rely—either knowingly or unknowingly—on purchasing energy in the spot market to meet their load obligations, the outcome is more buyers competing to obtain less supply, resulting in reliability events for the entities that are "short," and very high energy prices for all entities. A few recent examples vividly demonstrate such outcomes:

- On May 3, 2017, the CAISO BAA experienced an Emergency Alert 1 in its BAA, the first such emergency situation in California in approximately 10 years. While there were relatively high loads in California that day, *CAISO staff later explained*[5] *that large delivery failures by import suppliers played a major role in the CAISO BAA's supply shortfall and the resulting emergency conditions*. Not only did actual import deliveries begin to fall approximately 1,150 MW below expected day-ahead schedules as CAISO entered its evening peak hours, but also an additional 830 MW of incremental real-time supply offers for HE 20 were declined by external suppliers at the last minute after receiving an accepted

[5] See the CAISO Market Performance and Planning Forum Presentation, May 16 2017

market dispatch. Notably, this occurred despite FMM prices reaching nearly $900/MWh at most interties for that hour. Such significant delivery failures suggest that in light of high loads and tight supply conditions in other BAAs, external suppliers hoping to deliver to California were simply unable to secure last-minute real-time supply, even at elevated prices.

- The CAISO BAA experienced a peak load of 50,116 MW on September 1, 2017, its highest load in a number of years (and at a level that has not been reached since then). During the evening peak hours of HE 17 – HE 20, CAISO IFM prices at SP-15 averaged $466/MWh and reached as high as $750/MWh. During these same hours, day-ahead imports to CAISO ranged from 7,400 MW to 8,500 MW. Such import quantities are in stark contrast to the imports that were available to the CAISO from only five days earlier. On August 28th, temperatures and loads in the Pacific Northwest and Desert Southwest were also very high, resulting in CAISO day-ahead imports reaching only 3,700 to 4,500 MW during HE 17-20. These relatively lower imports (4,000 MW below the quantities from September 1) occurred despite evening peak IFM prices at SP-15 also reaching relatively high levels (between $340/MWh and $430/MWh). Had weather patterns resulted in the California loads peaking on August 28 rather than on September 1, it appears that the total external supply available to CAISO may have been well below what ultimately materialized on September 1 - and below the level that would have been necessary to maintain reliability. Importantly, CAISO experienced excessive import delivery failures during this entire week, particularly in the evening peak hours, reaching over 2,000 MW in the worst hours as shown in the chart below:



Source: CAISO Intertie Deviation Settlement: Draft Final Proposal Presentation (Dec 19, 2018)

- On March 3rd and 4th 2019, Day-Ahead Mid-C index prices reached $832 for Off Peak hours (including the entire 24-hour period on Sunday, March 3rd) and $890 for On Peak hours. Regional dialogue concluded that this pricing event was driven by a number of factors—including extended below average temperatures, poor hydro conditions, gas supply limitations and forced unit outages. It appears that due to the lack of available short-term supply during this period, some marketers failed to deliver on forward energy obligations to northwest LSEs (that they had expected to fulfill by purchasing energy in the spot market). Moreover, there are indications that numerous other marketers scrambled to acquire energy in the day-ahead market to fill the forward physical firm energy sales commitments they had made to northwest LSEs in order to avoid relationship and/or reputational damage.

Additionally, RA contracts that are not backed by a physical resource can create reliability challenges for the CAISO BAA even if the broader regional grid is not experiencing critically tight conditions. This additional risk arises because RA contracts that rely on purchases of standard multi-hour blocks of energy in the day-ahead bilateral markets are poorly suited to addressing needs in the CAISO BAA that may be of shorter duration, are unexpected, or arise in real-time. Stated differently, in order for the CAISO BAA to receive energy deliveries from an RA contract that relies on market purchases, the marketer that sold the RA contract without real physical supply must *anticipate* those delivery needs and execute the market purchases during the trading window, which typically ends by 6 a.m. Offers into the CAISO day-ahead market are not due until four hours later, at 10 a.m., and market results are not communicated until 1 p.m. or later, by which time the major opportunity to acquire additional needed supply has long since passed.

Consider, for example, a marketer that has sold 500 MW of contracts to California LSEs, which are not backed by physical resources:

1. Prior to day-ahead trading in the bilateral markets, the marketer estimates that prices in the CAISO day-ahead market will average $50/MWh during the on-peak hours;
2. During bilateral trading, the marketer is able to purchase 300 MW of on-peak energy at a price at or below $50/MWh (net of transmission charges);
3. By 10 a.m., the marketer self-schedules 300 MW into the CAISO day-ahead market, and submits a further 200 MW of economic offers at $999/MWh, thus notionally satisfying its must-offer obligation, but virtually ensuring it will not receive a day-ahead market award.

The above scenario results in 200 MW of RA capacity that has been contracted—and that California ratepayers have paid for—being entirely inaccessible to the CAISO BAA, even if day-ahead market conditions turn out to be tighter than the marketer anticipated (*e.g.,* even if day-ahead prices turn out to be $100/MWh, rather than the expected $50/MWh). Moreover, the 200 MW of contract RA capacity is entirely unavailable to the CAISO to meet needs that arise after the day-ahead market. Thus, the CAISO BAA may not have access to the full amount or benefit of RA contracts that, on closer review, merely consist of a “middle-man” between the CAISO BAA’s needs and the standard products traded in bilateral markets.

A vivid example of this problem occurred in early September 2019. Despite relatively mild weather throughout the summer, CAISO’s CEO described CAISO operators as having to “scramble” to find supply during the evening peak of September 3, when CAISO demand peaked at a historically

unremarkable level of just over 44,000 MW.[6] According to the CEO's report, the CAISO grid was down to approximately 100 MW of supply remaining before it would have had to deplete required contingency reserves. CAISO real-time market prices spiked at over $900/MWh during HE19 of that day, reflecting the lack of physical supply available to the CAISO. These price spikes affected not only the CAISO BAA, but also real-time prices of EIM entities including NV Energy, Arizona Public Service, and PacifiCorp East.

These price spikes and reliability challenges occurred despite the fact that, at least on paper, the CAISO BAA had secured more than enough RA capacity to cover its needs. The peak demand for summer 2019 was approximately 5 percent below the 1-in-2 forecast peak used to establish the RA requirements[7], and total System RA capacity in LSEs' month-ahead showings for September was over 47,000 MW.[8] By all accounts, contracted RA capacity should have been more than adequate to meet the actual peak demand on September 3. But as the events of that day show, a significant portion of the contracted RA capacity simply was not "real." When this supply failed to materialize, CAISO operators were left desperately short of supply to maintain reliability. And because these conditions materialized after the day-ahead markets had run, access to external supply in the bilateral markets was limited.

Powerex believes that, had all RA contracts been required to identify in advance the real physical resources that were committed and available to California load, CAISO operators would have had access to sufficient supply to meets its needs and avoid the reliability challenges on that day. Indeed, Powerex believes that the lack of forward commitment of adequate physical capacity to meet California's needs is perhaps the single largest cause of price spikes that are increasingly observed during critical periods. When RA requirements are notionally satisfied without the actual forward commitment of physical resources, the need for physical supply is left to be met by the limited and uncertain amount of residual supply available in the short-term energy markets, exposing consumers to high prices and reliability risks.

III. Continued Reliance On Spot Purchases Jeopardizes The Fairness And Integrity Of The EIM And Could Undermine Other Regional Market Initiatives

The CAISO's September 2019 event highlights an additional adverse consequence of the flaws in the RA program: they have put CAISO operators in the impossible position of being forced to resort to any available means to maintain reliability. This includes "leaning" on resources in the EIM for capacity and flexibility, directly contrary to one of the founding principles of that market, and counter to the intended objectives of the EIM resource sufficiency tests.

During the peak hour (HE19) of September 3, 2019, the CAISO BAA received 1,584 MW of 15-minute EIM transfers throughout the operating hour, despite failing the EIM Flexible Ramping

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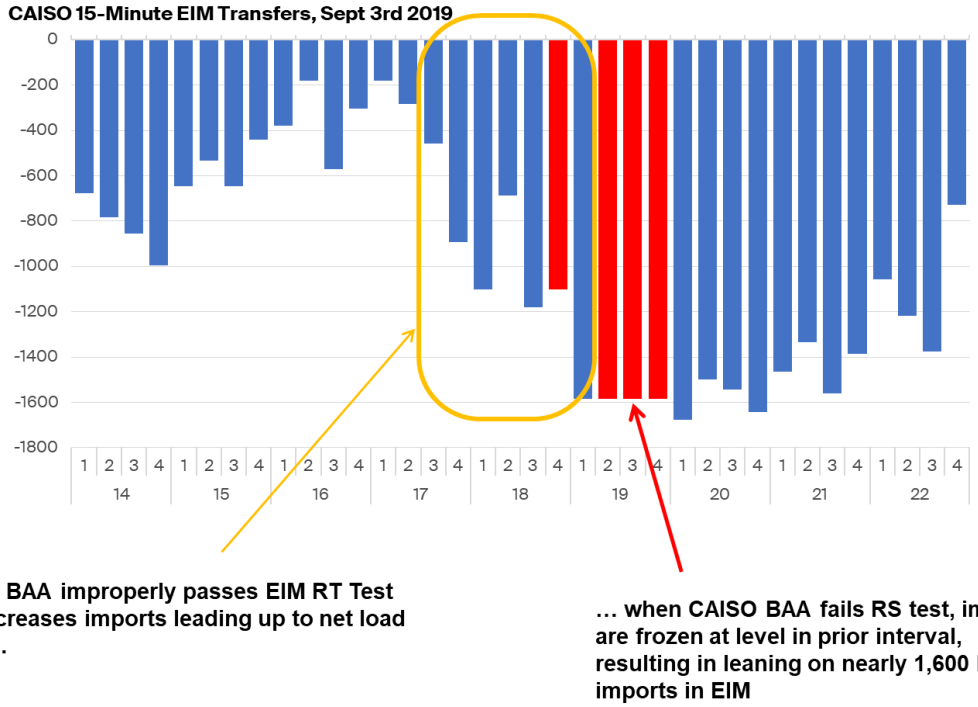
[6] *See Cal. Indep. Sys. Operator Corp.,* CEO Report at 1 (September 16, 2019), *available at*: http://www.caiso.com/Documents/CEOReport-Sep2019.pdf; Audio Recording: Cal. Indep. Sys. Operator Corp., Board of Governors Meeting (Sept. 18, 2019), *available at: http://www.caiso.com/Documents/Audio-BoardGovernorsMeeting-Sep18-2019.mp3* and verbal comments (available at http://www.caiso.com/Documents/Audio-BoardGovernorsMeeting-Sep18-2019.mp3).

[7] Cal. Indep. Sys. Operator Corp., Dept. of Marketing Monitoring, Q3 Report on Market Issues and Performance at 1 (Dec. 5, 2019), *available at* http://www.caiso.com/Documents/2019ThirdQuarterReportonMarketIssuesandPerformance.pdf.

[8] Cal. Pub. Util. Comm'n, *The State of the Resource Adequacy Market* at Tbl. 1 (Revised Jan. 13, 2020), *available at:* https://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=6442463739.

Sufficient Test in three of the four FMM intervals during that hour. Given that even *with* these energy imports from the EIM, the CAISO BAA was within approximately 100 MW of its available supply, this implies that supply in the CAISO BAA (without EIM imports) was well below levels necessary to meet demand. The flaws in the RA program left the CAISO BAA relying on RA contracts that did not represent real physical supply committed and available to meet California's needs, and EIM imports were used to "fill the gaps" of the RA program.

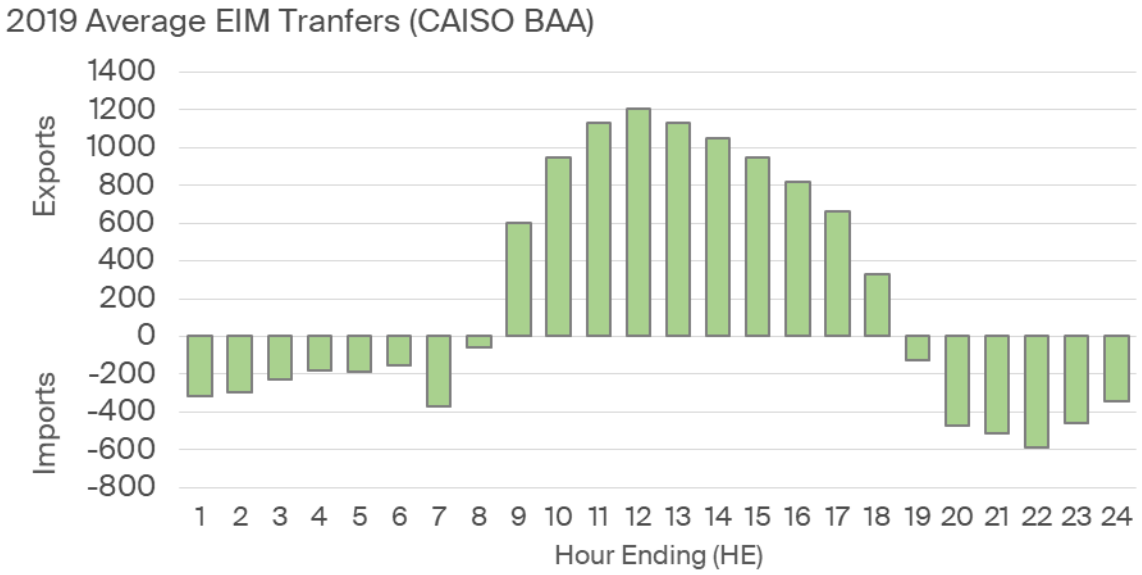


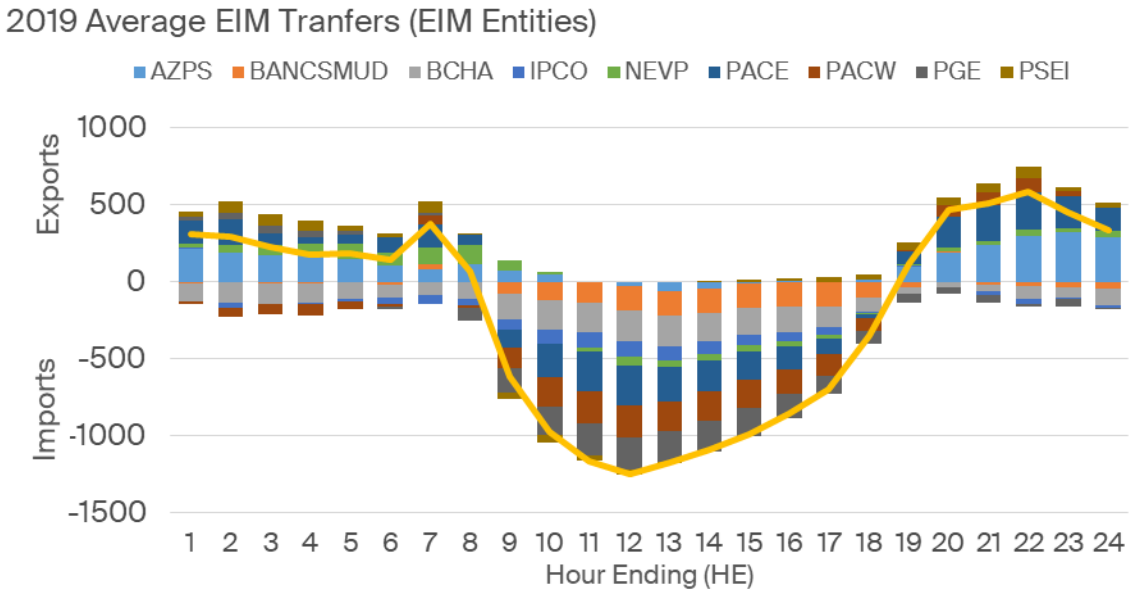
Source: CAISO OASIS

The above chart highlights multiple gaps in the EIM's Resource Sufficiency evaluation framework ("EIM RS test") as applied to the CAISO BAA. First, the CAISO BAA's inclusion of import "offer range" from "non-resource specific: imports that do not represent "real" physical supply enabled the CAISO BAA to erroneously pass the EIM RS test in the numerous fifteen minute intervals immediately preceding the event (i.e. HE17 and HE18). This import "offer range" includes (i) offers associated with import RA where the energy offer is near the price cap (to entirely avoid dispatch), as well as (ii) RA and non-RA energy offers where the marketer intends to try to procure supply if and only if it receives a CAISO award, but does not actually have any supply at the time of the EIM RS test. From past presentations by the CAISO, Powerex understands such non-resource specific import "offer range" can often represent several thousand MWs. As a result of this erroneous "passing' of the EIM test, the CAISO BAA was able to increase its EIM imports dramatically during the intervals leading up to its peak net load hour (HE19) when it experienced EIM RS test failures, rather than being required to limit imports to earlier levels (*i.e.*, perhaps to about the 200 MW level that prevailed in HE17).

Second, the CAISO EIM RS test failure consequences do not appropriately prevent capacity leaning, only flexibility leaning. This is because the consequence of EIM RS test failure is merely to prevent any *increase* in EIM imports. It thus allows an entity to continue to "capacity lean" on the EIM for the level of imports that existed prior to the EIM RS test failure.

Third, it is the CAISO BAA - and only the CAISO BAA - that appears to have a persistent pattern of increasing imports in the intervals and hours immediately preceding the peak net load hour. The CAISO BAA thus uniquely benefits from a "limit" consequence that allows "capacity leaning" at the existing level of imports, as illustrated by the charts below:





Such capacity leaning is clearly contrary to the design principles of the EIM, in which an EIM entity is required to demonstrate that it is "resource sufficient" in order to have access to energy imports through the EIM. This design recognizes that a voluntary imbalance energy market must not enable an EIM entity to avoid its obligation to ensure reliability in its respective area, including through forward contracting for adequate amounts of physical supply.

When an entity that is not resource-sufficient nevertheless is able to import energy through the EIM—as occurred on September 3 in the CAISO BAA—the result is highly inequitable, as those

in the BAA leaning on the rest of the EIM avoid investing in or contracting for physical supply by relying upon the capacity investments of other EIM participants, and do so without compensation.[9]

In addition to being inequitable, such leaning also means that the inadequate supply position of the CAISO BAA causes price spikes to extend across the EIM footprint, including to entities that *are* resource sufficient. In this manner, transmission customers that are located outside the CAISO BAA, but pay EIM prices through imbalance charges under Schedule 4 or Schedule 9 of the *pro forma* OATT, suffer the consequences of RA contracts that are not backed by a forward commitment of physical capacity.

As has been discussed in other forums, there are significant gaps in the EIM RS test that erroneously permit the CAISO BAA—but not other EIM entities—to "pass" and have access to energy imports under circumstances that plainly constitute "leaning." Of particular relevance to this initiative is that energy offers and market awards where the physical source is completely unknown are counted when evaluating whether the CAISO BAA passes the RS test—even though this supply is, in many cases, not real. No other EIM entity is permitted to include supply from unknown sources in its RS test, and as a result EIM entities *other* than the CAISO BAA incur substantial costs to ensure they have enough real physical supply in order to be resource sufficient.

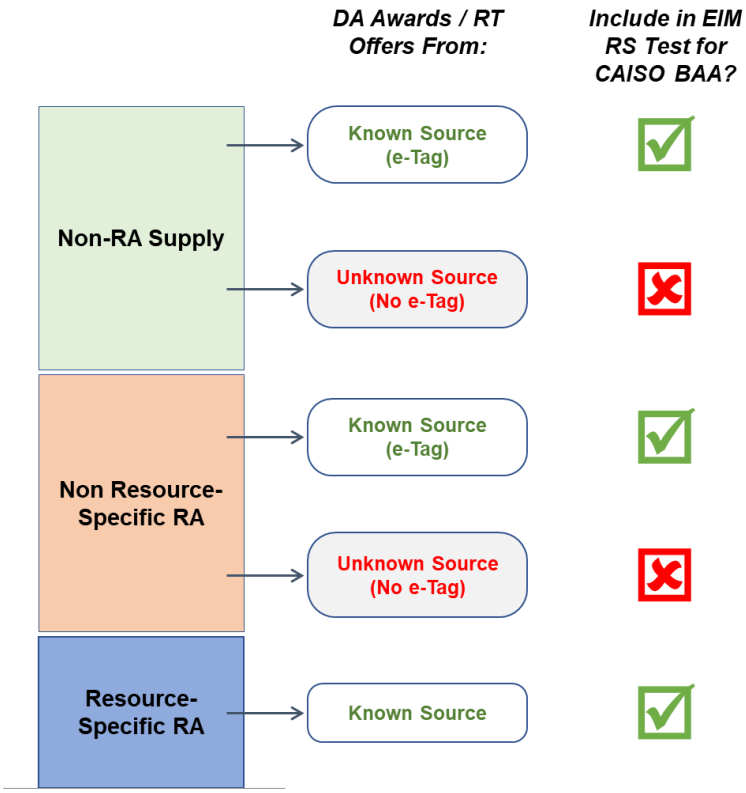
To be clear, Powerex does not suggest that, when confronted with insufficient physical supply, CAISO operators should sacrifice reliability. To the contrary, Powerex recognizes that the top priority of every balancing authority is the safe and reliable operation of the grid, and CAISO operators must frequently take extraordinary actions in real-time to compensate for the insufficient real physical supply that results from the current RA program and from certain aspects of the existing market design. Powerex also recognizes that there may be differing views as to whether EIM leaning is an acceptable extraordinary action in such circumstances, or whether other extraordinary actions – such the CAISO Capacity Procurement Mechanism or exceptional dispatches – are more appropriate.

But leaning on EIM resources "in the moment," when there are very few other viable alternatives to maintaining reliability, is completely different from *planning to lean* by failing to take decisive steps to ensure adequate levels of genuine physical supply. The current gaps in the existing EIM RS test, as applied to the CAISO BAA specifically, cannot continue to be a crutch that enables delay or failure to address the flaws in the RA program. Those flaws are now well-known, there is extensive evidence that the flaws are causing significant challenges and harm, there is a clear and effective solution available, and there is time to implement those reforms prior to the critical summer 2020 season. Given the ability to genuinely ensure sufficient physical supply, there is no longer any acceptable justification for refusing to close the loopholes in the EIM RS test that inappropriately enable leaning by the CAISO BAA. Powerex therefore intends to explore available

[9] The forward contracting or investments savings from leaning on other entities during the highest load hours of an entire year can be very substantial. For example, if the CAISO were to have instead procured annual capacity through its Capacity Procurement Mechanism to ensure the CAISO BAA was resource sufficient on September 3, this could have cost as much as $114 million for the 1,500 MW deficiency quantity. This cost would likely be significantly higher under conditions in which new resources need to be added, as the CPM soft offer cap is based only on going-forward costs.

Notably, in order to deter such leaning, SPP's resource adequacy program applies a penalty that would range from $151 million to $257 million for a 1,500 MW deficiency. *See* SPP Tariff Attachment AA, Section 14.4.

avenues to bring about changes to the application of the RS test to the CAISO BAA such that, at a minimum, the CAISO BAA no longer includes either non-resource specific RA capacity, or untagged import supply more generally, in the EIM RS test.



Powerex believes that the gaps in the RA framework have made it challenging if not impossible for CAISO to strengthen the EIM RS test so that it performs as intended. There is an inherent conflict between CAISO's responsibility to compensate for the lack of adequate physical supply committed to the CAISO BAA—including, at times, by leaning on the capacity and flexibility of other EIM participants—and CAISO as the leader of efforts to expand voluntary participation in regional organized markets across the west. The flaws of the RA program have effectively "tied the hands" of the CAISO in terms of the type of market design it can propose, commit to, and faithfully implement. It is difficult to see how CAISO could commit to a regional day-ahead organized market with robust requirements for each participating entity to be resource sufficient on a day-ahead basis—which is a "must have" element for many potential participants—unless the known defects of the RA program are fully addressed. Thus, strengthening the RA rules to require all RA contracts to be backed by identified physical resources at the time of the RA showing will have the additional benefit of removing potential barriers to increased regional market transactions, supporting the continued viability of the EIM and the potential development of an Extended Day Ahead Market.

IV. Forward Contracting With Physical Resources Must Be *Explicitly Required,* Since It Will Not Occur Merely By Applying Financial Incentives Or Penalties For Non-Performance During Individual Day Or Hours

The risk of reliability events in the CAISO BAA and of price spikes across the EIM area can be reduced through the forward commitment of physical resources—and only through such commitment. For this to occur, however, ***the identification, in advance, of the physical resources supporting an RA contract needs to be required by CAISO tariff*** and by the rules of the RA framework. Without such an explicit requirement, physical resources will not be committed on a forward basis, as none of the entities involved in RA procurement have an incentive to incur the cost of doing so if they do not have to.

Marketers that sell RA contracts to California LSEs do not have an incentive to commit physical supply in support of the contract

Even if the marketer is exposed to potentially high day-ahead market prices (*e.g.,* by committing to a fixed delivery obligation at a fixed price), the cost of market purchases on a handful of high-priced days will be far less than the costs of contracting for real physical capacity across every day and hour of the RA contract period. This is simply the flip side of the same reason why owners of physical resources generally do not set aside supply for the specific purpose of making day-ahead or real-time energy sales: it is not an economic tradeoff.

Furthermore, a marketer has a far less expensive way of hedging its exposure to the cost of procuring energy in the short-term energy markets: it can simply purchase a financial contract as a hedge against day-ahead market prices. Such an arrangement effectively leaves the marketer as an intermediary that purchases a *financial* contract and sells it to a California LSE as a purportedly "firm energy" product or as RA capacity.[10] The marketer collects the premium and minimizes or eliminates its price risk.

If conditions in the short-term energy markets are so tight that the marketer cannot find the energy at all, the marketer is likely to just face liquidated damages under its firm energy supply contract to the California LSE (or deviation charges from the CAISO), which typically amount to only the energy price in the short-term markets (against which the marketer may already be hedged). There is simply no financial incentive for a marketer that sells an RA contract (or a firm energy contract that qualifies for RA purposes) to support the contract by committing actual physical capacity if it is not explicitly required to do so. Nor are the potential consequences sufficient to make sales of speculative RA contracts unprofitable, particularly as System RA prices continue to rise, making this type of arrangement more profitable than ever.

California LSEs that purchase RA contracts do not have an incentive to contract only with sellers that commit physical supply in support of the contract

One might expect that LSEs—whose customers ultimately bear the consequences of price spikes and reliability events—would seek to procure forward supply only under arrangements that commit physical capacity on a forward basis. And indeed, many entities in the west have done precisely that. After the March 2019 event in the northwest, discussed above, many entities in the northwest realized that the forward firm supply contracts (*i.e.*, WSPP Schedule C physical

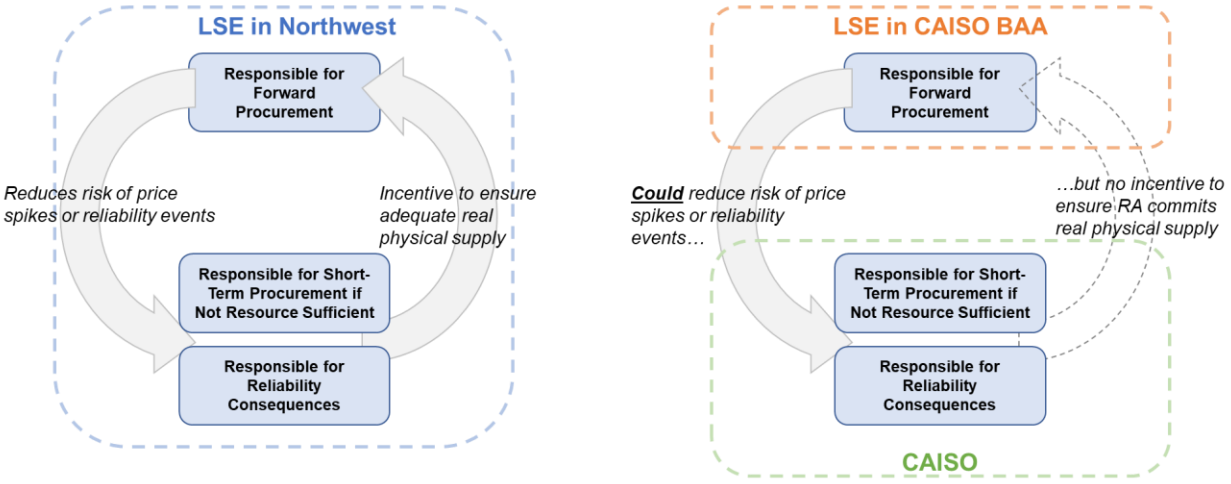
[10] Perhaps even simpler, the marketer can sell the "firm" energy to a California LSE at a price tied to a reference index, plus a premium.

contracts) that they had purchased from marketers in preparation for the winter season were, in fact, not backed by the forward commitment of physical resources. Rather, some of these forward "physical" contracts appeared to have been sold by marketers speculating on their ability to make daily spot market purchases to enable the required deliveries. Some of these forward supply commitments even appeared to have been met by energy purchases and exports from the CAISO day-ahead and real-time markets. In the aftermath of that event, forward procurement of physical power by external LSEs in the northwest appears to be shifting to suppliers that are known to have the ability to commit physical supply on a forward basis, and a strong track record of physical delivery. Powerex has also experienced LSEs external to the CAISO grid now requesting that the source be identified to support the physical sale commitment. In addition, there has been strong northwest regional support for the development of a new regional resource adequacy framework to enable greater transparency and accountability for the forward physical arrangements intended to backstop reliability.

California LSEs, however, are differently situated from other entities in the west. In particular, while California LSEs are each individually responsible for RA procurement, the consequences of procuring speculative RA are socialized over all users of the CAISO grid. When RA contracts fail to materialize as physical supply in the day-ahead and real-time timeframes, it falls on CAISO—not the California LSEs—to seek alternative supply to make up the deficiency. It is also CAISO—not the California LSEs—that bears the responsibility for reliability in the CAISO BAA.

The fragmentation of responsibility for RA procurement from the responsibility for how well those RA contracts actually support reliability creates incentives for California LSEs to comply with the RA requirement in the lowest-cost manner possible, even if that means contracting with a marketer that will not commit physical resources on a forward basis, and whose ability to deliver will be limited by whatever residual supply happens to be available for purchase in the short-term energy markets.

CAISO Must Require RA Contracts To Be Backed By Real Physical Capacity, As There Is No Incentive For California LSEs To Require It



Compounding the lack of incentives for California LSEs to contract for resource-specific RA capacity, California's Import Capability allocation framework can *prevent* resource-specific

contracting by those California LSEs that do seek it. The fact that substantial quantities of Intertie Capability go unused masks the fact that the additional physical capacity that could be committed to California on a forward basis is primarily located in the northwest, and would be delivered almost entirely on the two major northwest interties (*i.e.,* COB and NOB). The availability of Intertie Capability on *other* paths, such as paths connecting California to the desert southwest, is largely irrelevant as there is little or no additional physical supply that could be committed to California on those paths in the years ahead, given that the entities in that region are generally either neutral or short in the summer season, from a capacity perspective. Thus, contracts for speculative RA delivered at COB and NOB encumber scarce Import Capability at those locations, effectively displacing and blocking RA contracts that would commit real physical supply to California.

CAISO must take decisive action to require all RA resources to identify the underlying physical resources at the time of the RA showing

With no financial incentive for either California LSEs or sellers of RA contracts to voluntarily commit forward physical supply, CAISO and the CPUC ***must explicitly require*** that all RA contracts be supported by identified physical resources on a forward basis. This is the only way to increase the amount of external physical supply available and committed to the CAISO BAA such that the CAISO has access to the physical supply needed to maintain reliability and to mitigate energy price spikes, and such that the reliability of the CAISO BAA does not depend on the "leftover" residual supply that may or may not be available from day to day in the west.

Powerex therefore urges CAISO to clearly and unequivocally commit to requiring that all registered RA resources identify the physical resource supporting the RA commitment at the time of the RA showing. Powerex believes the details of these requirements can be designed with sufficient flexibility to accommodate all genuine physical resources that are committed on a forward basis, such that California LSEs have the maximum possible range of options for resource-specific RA contracting. But Powerex does not believe that this fundamental requirement can be the subject of compromise or otherwise be watered down in a manner that continues to permit RA requirements to be met by speculating on procuring supply in external markets on a day-to-day basis. Powerex believes a resource-specific demonstration should be required for the upcoming Summer 2020 season, and urges CAISO to work with CPUC and stakeholders to develop the enhancements necessary to meet this objective.

Powerex also urges CAISO and stakeholders to reject the arguments put forward by certain California LSEs and other parties that seek to perpetuate the use of speculative RA. It should be recognized as flatly inconsistent for these California LSEs to both lobby for new rules to reduce price spikes in the CAISO markets while their own actions are a direct *cause* of those price spikes, both by:

- Failing to support requiring all RA contracts to be supported by the forward commitment of identified physical resources at the time of RA showings; and
- Continuing to procure RA from marketers that the LSE knows—or ought to know—will rely on short-term energy market purchases to supply any delivery obligation that arises.[11]

[11] A purchaser of purportedly "firm" energy can often readily observe from e-Tag data if the marketer is merely procuring supply in the day-ahead or real-time markets, as the source of the deliveries will change each day (instead of consistently being delivered from the same one or two sources, for instance).

The alternative solutions advanced by these defenders of speculative RA should also be recognized as failing to address the root cause of the problem—the lack of committed physical supply on a forward basis—and instead focusing of suppressing the price-related symptoms of it. In particular, proposed new requirements to compel marketers to self-schedule energy to the CAISO grid in the day-ahead and real-time timeframe does not break the reliance on the residual supply in the short-term markets. The reliability of the CAISO BAA will still be at risk on days of critical supply conditions (because real physical supply has not been committed); all the proposal would do is depress prices in the CAISO markets on the days when critical conditions are *not* encountered.

Meaningfully addressing the risks of energy market price spikes and the risk of the CAISO BAA experiencing a reliability event requires increasing the physical resources that are committed and available to meeting the needs of the CAISO BAA. This requires procuring the capacity needs of the CAISO BAA in the timeframe within which external forward sales decisions and external forward operating decisions are being made that can actually increase the available supply. Continued advocacy for—or even tolerance of—RA rules that merely re-package a reliance on residual supply that happens to be available in the day-ahead market is contrary to this objective, and should be rejected.