

**Comments of Powerex Corp. on
Day Ahead Market Enhancements
Second Revised Straw Proposal**

| Submitted by | Company | Date Submitted |
|---------------------------|---------------|-----------------|
| Mike Benn 604.891.6074 | Powerex Corp. | August 18, 2021 |

Powerex appreciates the opportunity to submit comments on CAISO’s July 21, 2021 *Day-Ahead Market Enhancements Second Revised Straw Proposal* (“Second Revised Straw Proposal”), and the stakeholder meetings on July 28-29.

I. The Second Revised Straw Proposal Includes Incremental Improvements Over An Untenable Status Quo, But Falls Far Short Of The Modern Market Design Required By A Deeply De-Carbonized Western Grid

Over the course of this stakeholder process, the CAISO has clearly articulated the operational challenges it faces to reliably operate the grid in real-time. California’s ambitious and progressive environmental policy has ushered in the transformation of California’s generation fleet, including the retirement of a large amount of fossil-fueled generation and the installation of a far larger amount of renewable resource technologies. But while California has led the way in terms of the environmental policies underlying this transformation, the market design of the CAISO has clearly not kept pace. The current market design is largely comprised of core elements developed nearly two decades ago, when the concepts of “net demand” and “flexible ramping” were rarely discussed, and market participants could be expected to perform in accordance with their day-ahead energy schedules barring the limited and well-understood risk of forced outages of generation or transmission. The CAISO’s current market was not designed in the context of needing a substantial amount of flexible capacity “on standby” in order to be able to respond to myriad risks that might materialize with little notice; yet that market design remains the centerpiece of how resources are positioned and procured.

The CAISO has identified several of the key shortcomings of the current market design that increasingly leave its operators without the resources they need to reliably operate the grid. Critically, the CAISO has identified that the day-ahead market (including RUC) is designed to meet only *expected* demand, but does nothing to enable the CAISO to respond to changes in conditions between day-ahead and real-time. The CAISO has also recognized that some day-ahead schedules *increase* the need for resources in real-time, whereas as other day-ahead schedules *help meet* this need. The *status quo* has

become untenable, producing solutions that do not ensure reliability and require large (and growing) non-market actions funded entirely outside of the clearing prices of the defined market products

For these reasons, Powerex believes that the concepts being pursued in the Second Revised Straw Proposal, *if efficiently designed and implemented*, offer incremental improvements over the clearly untenable *status quo*. Specifically, the Second Revised Straw Proposal incorporates the procurement of flexible capacity to meet uncertainty and variability explicitly into the day-ahead optimization. It also recognizes flexible capacity procured day-ahead as a stand-alone product that supports grid reliability by being available in real-time, regardless of whether it is actually deployed for energy in any particular interval. And the Second Revised Straw Proposal integrates the procurement of day-ahead flexible capacity into the day-ahead procurement of energy and Ancillary Services. Powerex views each of these as conceptual steps in the right direction.

However, the Second Revised Straw Proposal falls far short of the truly modern market design that will be necessary to reliably and efficiently manage a deeply de-carbonized grid in the west. Specifically, the Second Revised Straw Proposal:

- Perpetuates the fragmented day-ahead procurement of capacity in RUC, which fails to ensure a least-cost solution and inefficiently suppresses market-clearing prices;¹
- Continues to require substantial out-of-market and operator interventions, including exceptional dispatch and load biasing;
- Compensates firm energy as if it were no different than non-firm or virtual supply, despite the fact that non-firm energy and virtual supply directly increase the need to procure additional capacity in RUC;² and

¹ When the same resource can provide multiple alternative products (such as energy or unloaded upward capacity) achieving a least-cost solution requires an optimization that considers these alternative uses simultaneously. This does not occur under the *status quo* or in the Second Revised Straw Proposal. See Appendix A of Powerex Comments on the Day-Ahead Market Enhancements Technical Workshop available at www.powerex.com/sites/default/files/2020-07/Day%20Ahead%20Market%20Enhancements%20Technical%20Workshop.pdf

² The key driver of RUC procurement is the difference between IFM awards to non-VER physical resources and the CAISO's forecast of net demand. Thus a key determinant of the cost of RUC actions is whether IFM energy schedules are awarded to firm physical resources, non-firm physical resources, or to virtual supply. The Second Revised Straw Proposal ignores this distinction both in determining which resources clear the market, and in the market compensation paid to cleared energy schedules. *Ibid.*

- Creates systemic differences between day-ahead and real-time energy prices, which will likely be exploited by virtual sellers to reap systemic profits while largely negating the reliability benefits of capacity procured day-ahead.³

Successfully integrating high levels of variable energy resources while simultaneously maintaining reliability and minimizing costs to ratepayers will require further—and likely more far-reaching—changes to the CAISO market design. Indeed, many of these key elements were previously proposed by the CAISO in this initiative.⁴ The discussion of these more far-reaching proposals highlighted an unavoidable fact: procuring the mix of energy, capacity and flexibility needed to ensure reliability is necessarily more costly than a market designed to procure only energy (and even then, only to the extent that California LSEs elect to purchase it day-ahead). Regrettably, despite the CAISO having clearly and accurately identified the deficiencies in the *status quo*, and despite the CAISO having developed what could have been a genuinely state-of-the-art market design suited to the needs of a de-carbonized grid, resistance primarily from California load interests appears to have limited the CAISO to putting forward a diminished set of incremental enhancements.

II. Specific Elements Of The Second Revised Straw Proposal Raise Numerous Concerns

The Second Revised Straw Proposal includes multiple elements that appear rooted in administrative pricing and/or bid mitigation, raising concerns regarding whether the market design will lead to efficient and competitive market outcomes. As described below, Powerex believes CAISO should re-evaluate several design choices that are likely to distort market prices downwards, discourage voluntary participation, and cause CAISO operators to continue the same out-of-market actions that CAISO is seeking to eliminate.

Bid mitigation appears to be significantly expanded

³ The procurement of IRU in the day-ahead market increases demand above the expected level in real-time; this is fundamental to ensuring sufficient supply to cover the range of *potential* real-time conditions. But this also means that, in the majority of cases, IRU procured day-ahead will be more than enough to cover changes between day-ahead and real-time conditions, with the “surplus” IRU being available in real-time to economically displace other resources, leading to lower real-time prices. It should be expected that this structural price difference will attract additional virtual supply, which will increase the amount of physical capacity that needs to be available in real-time (*i.e.*, to backstop more virtual supply), undermining the capacity “cushion” that the proposal is intended to provide. *Ibid.*

⁴ In particular, the CAISO’s February 3, 2020 Straw Proposal contemplated a single co-optimized day-ahead solution that cleared bid-in demand for energy, physical supply to meet CAISO’s demand forecast, and flexible upward and downward capacity to meet uncertainty and variability. The recognition of key product attributes would have appropriately compensated firm physical supply for *not* requiring additional stand-alone capacity to be procured to backstop potential non-performance.

Powerex recognizes the need for market power mitigation measures to ensure competitive market outcomes. Powerex believes, however, that an appropriate mitigation framework must also provide sufficient flexibility for sellers to accurately incorporate their own estimates of costs (including opportunity costs) in offers for energy and capacity. Powerex is concerned that the CAISO's proposal adopts a significantly expanded scope of bid mitigation that is likely to result in over-mitigation to both energy and capacity offers:

- Energy bids will continue to be mitigated to the extent LMPs reflect congestion on uncompetitive transmission constraints in the “base scenario” (*i.e.*, in which resources are scheduled to meet bid-in demand), and will also be subject to mitigation due to congestion under the new “deployment up” and “deployment down” scenarios. This would result in bid mitigation being applied even if the uncompetitive transmission constraint was only identified under a relatively low-probability (*i.e.*, P2.5 or P97.5) scenario.
- Bids for Imbalance Reserve and Reliability Capacity will be subject to new mitigation based on a generic “default capacity bid,” based on a percentile of historical spinning reserve bid prices (the CAISO previously proposed the 90th percentile, or \$30, but now asks whether this should be modified in recognition of its revised “higher of” mitigation approach). Even if prices of spinning reserve were a reasonable proxy for capacity availability, ensuring resources are available during the critical conditions they are needed will be undermined if bids are capped at prices that exclude those very conditions.
- Resources will be ineligible to receive Imbalance Reserve or Reliability Capacity awards if their *energy* bid exceeds the CAISO's forecast of prices under p97.5 demand scenario (see related discussion below).

Proposed penalty prices will result in market prices inconsistent with competitive outcomes

The Second Revised Straw Proposal appears designed to ensure that resources offered into the CAISO markets are used *first* to meet the CAISO BAA's need for Imbalance Reserve capacity, and only *then* to support low-priority exports. It does this by assigning a higher penalty price to the Imbalance Reserve constraint (\$1,600) than it does to export self-schedules (\$1,050) in the scheduling run that determines which bids and offers will clear the market. In the subsequent pricing run—which determines the prices for those cleared bids and offers—however, the penalty price for Imbalance Reserve capacity drops to \$247. This appears to potentially lead to results in which a generator that *could* be dispatched for energy at a higher price (*e.g.*, \$1,000/MWh) is instead held back to provide Imbalance Reserve at a fraction of the price (*e.g.*, \$247/MW).

Powerex believes that to the extent the CAISO will design its market to place a higher value on meeting the needs of the CAISO BAA than on the needs of external BAAs, it should ensure that market prices actually reflect these choices.

The Proposal unnecessarily limits eligibility to provide Imbalance Reserve and Reliable Capacity

The Second Revised Straw Proposal identifies the challenge of distinguishing between two resources with identical capacity bids but different energy bids. It would limit capacity awards to resources with an energy bids at or below a CAISO-projected price corresponding to a p97.5 demand scenario. As an initial matter, this appears to be yet another form of price mitigation (see discussion above). But the proposal also fails to solve the problem the CAISO has identified, as it still leaves the market optimization unable to distinguish between two eligible capacity offers.

Perhaps more problematic, this approach will also restrict the available pool of otherwise-qualified capacity offers, potentially preventing the CAISO from procuring its target quantity of Imbalance Reserve and/or Reliability Capacity, particularly during tight system conditions. The Second Revised Straw Proposal provides an example in which 175 MW of capacity is rendered ineligible due to energy offer prices that exceed \$400/MWh. While Powerex agrees that consideration of underlying energy bids can allow CAISO to select the most cost-effective resources to provide Imbalance Reserve and Reliability Capacity, it seems to make little sense to accept a deficiency of day-ahead capacity—which the CAISO deems necessary to ensure reliability and implicitly values at \$1,600/MW—in order to avoid awarding capacity to a resource that could make energy available at a price above \$400/MWh. It is also likely that such a restriction will cause CAISO operators to seek to address those capacity shortfalls using the same out-of-market actions that this proposal is intended to prevent.

Real-time FRU prices do not reflect the value of undelivered day-ahead IRU or RCU.

To help ensure that resources awarded day-ahead capacity (IRU or RCU) actually provide that capacity in real-time, the Second Revised Straw Proposal includes settlement rules in which any undelivered day-ahead capacity is effectively “bought back” at the higher of the original day-ahead price or the real-time (RTPD or RTD) FRU price. Powerex supports strong measures to ensure performance on day-ahead capacity commitments, but believes the proposal will fall short of this requirement, for several reasons:

- By definition, capacity procured day-ahead will exceed the capacity needed in real-time, in all but a small number of cases; this is the nature of an “insurance-type” product. In most intervals, then, the CAISO proposal amounts to a no-pay provision, which is really no (net) downside at all.

- The potential for financial losses occurs in the few cases in which real-time conditions are sufficiently tight to require nearly all of the day-ahead procured capacity, in which case non-performance could, in theory, result in high real-time prices. But it is well established that FRU prices often fail to accurately reflect tight real-time conditions. And CAISO operator actions taken to ensure reliability will have the unintended consequence of further dampening the financial consequences.
- Conceptually, it also appears that FRU is not the right “replacement product” for non-delivered day-ahead IRU. The point of IRU is not merely the forward procurement of real-time FRU; rather, it represents the forward procurement of capacity to be available to meet the load forecast in either FMM or RTD. IRU is procured for the purpose of managing differences in *energy* demand between day-ahead and real-time. For this reason, it perhaps is more appropriate to settle non-delivered day-ahead capacity relative to real-time energy prices.