

## Comments on Flexible Ramping Product Technical Workshop Topics

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Powerex appreciates the opportunity to provide these comments on the development of this important new product. Powerex continues to be strongly supportive of the CAISO's need to develop the Flexi-Ramp product. The Flexi-Ramp product will provide the CAISO with the ability to acquire, in its IFM and real-time markets, additional 5-minute ramping capacity, to ensure that there is sufficient 5-minute energy available to be dispatched to meet CAISO's intra-hour variation and uncertainty needs, down to 5-minute granularity. Powerex also understands that regulating reserves will continue to be utilized to meet the CAISO's ramping capacity needs within each 5-minute interval.

However, Powerex has significant concerns that the CAISO's cost allocation proposal for the Flex-Ramp product is fundamentally flawed and is in direct and material violation of the CAISO's cost allocation principles including: cost causation, accurate price signals, and incentivizing behavior. Powerex believes the primary problem with the CAISO's approach to cost allocation is that the CAISO is treating variance cost causation drivers and uncertainty cost causation drivers in a similar manner. Powerex believes it is important to recognize that **variance** and **uncertainty** are very different drivers of the Flexi-Ramp product requirement, thereby necessitating distinct and separate treatment within the cost allocation process.

More specifically, variances drive a need for a specific quantity of either 5-minute upward ramping capacity or 5-minute downward ramping capacity to meet a **known energy requirement** for the respective 5-minute interval only. In contrast, **uncertainties** drive a need for an insurance quantity of 5-minute upward ramping capacity and/or 5-minute downward ramping capacity to meet a **potential energy requirement** in every interval in which uncertainty exists, regardless of whether such deviation from expectation actually occurs. This critical difference leads to a necessity for **variances** and **uncertainty** to be treated differently, in the cost allocation process.

Moreover, variances in one direction reduce the need for Flexi-Ramp in the opposite direction, whereas uncertainties do not. For example, if the CAISO requires 500MW of Flexi-Ramp Up to cover a known 5-minute upward variance in load, then any other variance upward (i.e. a known increase in solar output or HASP intertie deliveries) will reduce the need for Flexi-Ramp Up in that interval. Therefore, it is critical when allocating costs to resource variances that drive increased Flexi-Ramp procurement, that CAISO also allocate credits to resource variances when they reduce Flexi-Ramp procurement.

In contrast to variances, uncertainties require Flexi-Ramp Up and Flexi-Ramp Down in every interval, regardless of whether the uncertainty manifests itself in an actual deviation from expected 5-minute performance. For this reason, deviations resulting from uncertainties are generally much more costly from a ramping capacity perspective than deviations resulting from

variances. This cost is mitigated, to some extent, by diversification, provided, such uncertainty is driven by physical factors such as variable resource output, load forecast error, etc. Uncertainty caused by a participant's economic choice not to perform cannot be presumed to be diversifiable and hence requires 100% ramping capacity to backstop every interval.

The problem with the CAISO's approach to treat variances and uncertainties in a similar manner from a cost allocation approach is best illustrated by the CAISO's proposal to systemically allocate costs to non-dynamic intertie resources that ramp from one hour to the next, regardless of whether such ramps are actually reducing overall CAISO Flexi-Ramp costs. More specifically, the CAISO's proposal intends to allocate costs to intertie resources instructed / scheduled ramps without providing a credit when such ramps reduce Flexi-Ramp procurement in the opposite direction. This approach will:

A) Violate cost causation principles, by allocating Flexi-Ramp costs to SCs, whose activities may actually be reducing overall Flexi-Ramp needs. For example, intertie schedules that differ hour to hour will be allocated costs under the CAISO proposal, but will not receive offsetting credits during 5-minute intervals in which the variance they provide reduces CAISO Flexi-Ramp total procurement costs.

B) Violate accurate price signals and violate incentivizes behavior by discouraging intertie schedules which provide net ramping benefits to the grid, relative to those that do not. For example, an SC that provides flat block intertie energy will be exempt from Flexi-Ramp product costs, while an SC who provides an hour to hour shaped schedule, which may actually reduce overall Flexi-Ramp product procurement quantities and costs, will be charged for Flexi-Ramp costs.

In closing, Powerex is strongly supportive of the CAISO's need to develop the Flexi-Ramp product but believes the CAISO's approach to cost allocation is fundamentally flawed as it fails to appropriately recognize the difference between variances and uncertainties, and inappropriately systemically allocates costs to resources which may reduce rather than increase the CAISO's ramping needs. Powerex believes a substantial overhaul of the CAISO's proposed cost allocation methodology is required, with further applicable stakeholder discussions.