Comments of Powerex Corp. on
Flexible Resource Adequacy Criteria and Must Offer Obligations Phase 2 Draft Flexible Capacity Framework Proposal

Submitted by	Company	Date Submitted
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Powerex appreciates the opportunity to provide comments on the November 20, 2017 Flexible Resource Adequacy Criteria and Must Offer Obligation – Phase 2 Draft Flexible Capacity Framework. In the Draft Flexible Capacity Framework, CAISO sets out a proposed framework for a long-term flexible resource adequacy ("Flex RA") program.

As discussed further herein, Powerex agrees with CAISO regarding the need to enhance the Flex RA framework and supports the conceptual structure outlined in the Draft Flexible Capacity Framework. CAISO has provided ample evidence that it is increasingly having difficulty effectively responding to changes in demand and variable energy resource ("VER") output, including data showing deteriorating CPS1 performance and challenges balancing its system.[1] As the balancing authority ("BA") for its footprint, CAISO's attention to the need to enhance its Flex RA framework is consistent with its responsibility to take steps to ensure that it is able to effectively balance its system and maintain reliability. Absent a re-design of the Flex RA framework, CAISO may have little choice but to limit the schedules that it accepts from renewable resources in order to ensure that it has sufficient flexibility to reliably serve demand. Limiting renewable resource output would increase the costs and challenges associated with achieving California's long-term renewable energy and greenhouse gas reduction goals. For these reasons, Powerex strongly supports CAISO moving forward with its efforts to further refine and clarify the proposed framework.

I. Powerex Strongly Supports the Draft Flex RA Framework Proposed by CAISO

Under CAISO's proposal, load-serving entities ("LSE") would be required to procure three distinct types of Flex RA products on a forward basis. The three proposed Flex RA products are designed to meet both forecast and uncertain changes in demand and VER output, and consist of: (1) 5-minute Flex RA; (2) 15-minute Flex RA; and (3) day-

[1] *See, e.g.,* FRACMOO 2 Working Group at 8-21 (Aug. 2, 2017), *available at* https://www.caiso.com/Documents/Agenda_Presentation_FlexibleResourceAdequacyCriteria_MustOfferObligations.pdf.

ahead shaping Flex RA. While CAISO previously had indicated that it was considering creating a fourth Flex RA product consisting of regulation-certified capacity, CAISO states that it has decided not to define a separate requirement for forward procurement of regulation because CAISO already procures regulation through the day-ahead market.

Powerex strongly supports CAISO's proposal to adopt three distinct Flex RA products. As Powerex previously has explained, Powerex believes that enhancements to the existing Flex RA framework are necessary, because of features of the current program that prevent it from achieving its goals:

- First, the existing Flex RA supply categories – base flexible capacity, peak flexible capacity, and super-peak flexible capacity – have no clear relationship to CAISO's actual commitment of physical resources in its day-ahead and real-time markets. Instead, the current Flex RA program was designed around the characteristics of the existing in-state generation fleet, and the forward procurement requirement was based on the largest expected three-hour net load ramp each month. The result has been a Flex RA program that fails to capture the full range of hourly and intra-hourly flexibility needs experienced by the CAISO.

- Second, the existing Flex RA program focuses solely on one resource attribute – the ability to deploy energy on a 5-minute basis – and fails to appropriately differentiate and value resources based on their relative ability to provide flexibility (*e.g.*, distinguishing between resources with fast ramp rates as opposed to slower ramping resources). Notably, under the existing program, internal resources that have limited ability to meet CAISO's ramping needs—such as resources with long lead times, slow ramp rates, and limited availability—qualify to provide Flex RA. At the same time, external resources that have short lead times and fast ramp rates are categorically excluded from providing flexible RA if they cannot deploy energy on a 5-minute basis.

Powerex believes that the proposal set out in the Draft Flexible Capacity Framework will address these issues by aligning the Flex RA framework with the manner in which CAISO actually positions and deploys resources through its markets to maintain reliability. Specifically, CAISO's proposal would align the assessment of CAISO's flexibility needs, and the products procured to meet those needs, with the operational timeframes in which CAISO positions and deploys resources through its market (i.e., day-ahead, 15-minute, and 5-minute).

While certain stakeholders have questioned CAISO's decision to move forward with a re-design of the Flex RA program, Powerex believes that CAISO has now provided ample evidence regarding the need to move forward with this initiative. The CAISO has provided detailed information and numerous examples of the challenges it has experienced maintaining balance between supply and demand in real-time. These challenges are strongly associated with both forecast changes and uncertain changes in the output of renewable resources, particularly solar generation. Accepting renewable

output is not, in and of itself, a reliability requirement. However, once renewable resource schedules are accepted by the CAISO, having access to sufficient flexible capacity to balance deviations from those schedules becomes a requirement for reliable operation of the grid. Moreover, California's environmental policy objectives regarding increased use of renewable energy, reductions in greenhouse gas emissions, and transitioning to a lower-carbon grid all imply that the CAISO should accept output schedules from renewable resources to the greatest extent possible. As CAISO has demonstrated, the current Flex RA framework has failed to provide CAISO operators with access to sufficient flexible resources to balance the grid, even with the existing level of renewable resources; the frequency and severity of these challenges will only grow as California continues to expand its renewable resource fleet.

Finally, it has been suggested that the problem may not be that sufficient flexible resources are not *available* to the CAISO, but that CAISO has not been utilizing available resources in an effective manner. Under this perspective, the solution would not be to increase the forward procurement of flexible resources, but to improve CAISO's ability to position flexible resources in its markets to provide the necessary real-time flexibility. Powerex agrees that enhancements are necessary, especially in the day-ahead market, to ensure that flexible resources are efficiently "set aside" to provide real-time flexibility. But this in no way provides assurance that sufficient flexible resources will be available in the CAISO markets in the first place. Given the reliability need for sufficient flexibility, forward procurement is necessary to ensure that sufficient flexible resources will be made available to the CAISO. If, as some stakeholders may believe, there are ample flexible resources, then the cost to commit these resources on a forward basis should be small. But if, on the other hand, the quantity of flexible resources voluntarily participating in the CAISO day-ahead and real-time markets is not sufficient, or becomes insufficient, to support reliable operation of the grid, then the Draft Flexible Capacity Framework offers the critical means to secure additional flexible resources in advance.

For the reasons stated above, Powerex strongly supports the Draft Flexible Capacity Framework Proposal, and encourages CAISO to move forward with refining the framework and developing implementation details. In the remainder of these comments, Powerex addresses discrete implementation issues.

II. Comments on Specific Implementation Issues

A. 5-Minute Procurement Requirement Should Include Regulation Need

Powerex notes that while it does not oppose CAISO's decision not to define and require forward procurement of a separate regulation product, Powerex believes that it will be critical that CAISO take into account regulation requirements when setting the procurement target for 5-minute Flex RA. Notably, there is likely to be significant overlap between the resources capable of supplying regulation reserve and those capable of supplying 5-minute Flex RA. As a result, it is very possible that resources that are committed to provide 5-minute flexible RA may be positioned in the day-ahead market to provide regulation reserve, potentially leaving insufficient capacity available to

meet CAISO's 5-minute requirement. While this could be addressed through the forward procurement of capacity capable of providing regulation, Powerex believes that a simpler approach may be for CAISO to set the forward procurement target for the 5-minute Flex RA product equal to the need for 5-minute flexibility plus the need for regulation reserve (as defined by the quantity that CAISO procures in its day-ahead and real-time markets).

B. Resource Qualification Requirements

In the Draft Flexible Capacity Framework, CAISO states that it is seeking comment on the requirements that internal and external resources should be required to meet in order to be eligible to supply Flex RA. CAISO states that it expects that any qualification criteria would consider the ramp rate of a resource, but asks whether there are other factors that should be considered. In addition, while CAISO states that it is proposing to permit external resources to provide 15-minute and day-ahead Flex RA, CAISO believes that external resources should only be permitted to supply flexible RA to the extent that they are associated with physical resources.

Powerex supports CAISO's continued effort to establish qualification criteria that focus on the ability of each resource to provide ramping capability. Powerex also supports CAISO developing rules that permit LSEs to comply with the Flex RA forward procurement requirements by contracting with external suppliers, thus greatly expanding the options for meeting the grid's Flex RA needs. Powerex believes that establishing technology-neutral qualification criteria that focus solely on the ability of each resource to be used by CAISO to meet ramping needs in the corresponding market run will help ensure that CAISO's flexibility needs are met using the most efficient and cost-effective combination of resources possible.

Powerex encourages CAISO to develop a process to pre-qualify resources to provide a maximum quantity of each of the proposed Flex RA products, based on the specific operating attributes of each internal and external resource. In particular, each resource should be qualified to provide a maximum quantity of hourly, 5-minute, and 15-minute flexible RA based on the extent to which the resource can be deployed within the relevant timeframe. As part of this analysis, CAISO should consider both the ramp rate of the resource during the relevant time interval and the lead time necessary for a resource to respond to a CAISO dispatch instruction. The eligible 5-minute flexible RA of a resource, for instance, could be defined as the maximum change in output the resource could achieve in 5 minutes (with 2.5 minutes of lead time). Similarly, the 15-minute flexible RA of a resource could be defined as the maximum in change in output the resource at issue could achieve in 15 minutes, with 22.5 minutes of lead-time. In the case of external resources, the capacity qualification should be based on both the characteristics of the underlying resources as well as WECC scheduling practices, to the extent that these practices will limit the schedule changes that are permissible on an hourly, 15-minute, or 5-minute basis.

Powerex believes that such a pre-qualification process, coupled with adopting the proposed standardized Flex RA products, will foster a liquid and competitive market for

Flex RA, ensuring that LSEs have the broadest array of supply options available to meet their Flex RA requirements. In particular, by pre-qualifying both internal and external resources to provide Flex RA, the proposed products can become standardized products that are freely traded by market participants, without regard to whether the underlying resource is an internal or external resource.

Powerex also agrees with CAISO that external resources should only be eligible to supply Flex RA where supported by actual physical resources (*e.g*., a single resource or an electrically connected system of resources). In particular, Powerex agrees that allowing external entities to enter into Flex RA supply contracts without requiring an affirmative demonstration that they have physical capacity and transmission arrangements to support the commitment could undermine reliability and create additional operational challenges for CAISO. For that reason, Powerex recommends that CAISO impose the following additional requirements on suppliers seeking to provide flexible RA from external resources:

- At the time the contract is executed, suppliers should be required to specify the source BA and the actual physical resource(s) from which the Flex RA capacity will be provided, as well as the CAISO intertie scheduling point associated with the delivery; and

- During the term of the Flex RA contract, CAISO should require that suppliers submit a day-ahead e-Tag for every hour of the contract term in which the CAISO is relying on the capacity. The e-Tag must identify the same source BA and generation source that was designated in the RA contract, together with the firm transmission service necessary to deliver this capacity to the relevant CAISO intertie point.

Powerex believes that these additional specifications pose no substantial burden on suppliers, and their inclusion will ensure that flexible RA contracts from external resources represent firm capacity commitments that can be counted upon to meet flexibility requirements during the relevant commitment period. At the same time, since existing e-tagging practices permit the generation source of an e-Tag to be an individual generating unit or group of coordinated generating unit, this framework is sufficiently flexible to permit the participation of both single and multi-unit external resources.

C. Resource Performance Requirements

In the Draft Flexible Capacity Framework, CAISO states that it currently is evaluating the must-offer requirement that would be imposed on resources committed to satisfy flexible RA requirements. Specifically, CAISO states that it is seeking comment on whether resources supplying 5-minute, 15-minute, or day-ahead Flex RA should be required to submit offers in *both* the day-ahead and real-time markets, or in the day-ahead market alone. CAISO also seeks comment on whether resources committed to supply these products should be subject to a 24/7 must-offer obligation or should only be required to be available for a subset of days or hours within a particular commitment period.

Powerex believes that all Flex RA resources that CAISO relies upon to meet real-time needs should be subject to a 24/7 must-offer requirement in both the day-ahead and real-time markets.[2] Powerex believes that limiting the must-offer obligation to only the day-ahead market, or to a subset of days or hours within a commitment period, for these resources has the potential to undermine the benefits of the Flex RA program and impair CAISO's ability to effectively address ramping needs.

As an initial matter, limiting the must-offer obligation to the day-ahead market may undermine the ability of the Flex RA program to ensure that CAISO has sufficient resources to respond in real-time to uncertain changes in load and VER output. As CAISO notes in the Draft Flexible Capacity Framework, CAISO faces significant uncertainty between its day-ahead and real-time markets, with the result that CAISO's day-ahead market may not accurately reflect the full range of operational needs that will arise in real-time. This creates the possibility that a Flex RA resource needed to meet real-time ramping needs and maintain reliability may not receive a schedule in CAISO's day-ahead market. Unless this resource is subject to a requirement to offer its capacity into the real-time market, however, there would be nothing to prevent the resource from selling its capacity to a third party outside of the CAISO markets or deciding not to submit an offer into CAISO's real-time market, thereby rendering the resource unavailable for scheduling and dispatch to meet real-time ramping needs.[3]

In addition, limiting the must-offer obligation to a particular subset of hours creates a risk that CAISO may not have sufficient flexible capacity available to effectively respond to ramping needs when they arise. As California's resource mix has continued to evolve in recent years, it has become increasingly difficult to predict when CAISO's need for ramping capability will be greatest. For instance, while resources supplying super-peak Flex RA under the existing Flex RA program currently are required to be available on non-holiday weekdays, CAISO has explained that this requirement is no longer consistent with the nature of CAISO's flexibility needs, with CAISO experiencing many of its largest three hour net-load ramps on weekends.[4] As a practical matter, the nature and timing of CAISO's ramping needs are likely to continue to evolve with changes in the resource mix within California and the CAISO markets more broadly. The result is that a must-offer requirement that is limited to a particular subset of hours or days within a commitment period may not correspond to the periods in which CAISO will actually need the flexible capacity at issue to meet operational needs.

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[2] Powerex anticipates that CAISO would clarify the appropriate treatment of outages.

[3] Powerex notes that the specific provisions of the must-offer requirement for Flex RA resources must be carefully aligned with enhancements to the day-ahead market, which Powerex understands are the subject of another stakeholder policy initiative under consideration. Such enhancements could conceivably allocate flexible capacity to resources other than those under a forward Flex RA contract, in which case it may be appropriate to reconsider the extent of the must-offer requirements of Flex RA resources.

[4] CAISO FRAC-MOO Revised Straw Proposal at 20.

Thus, in order to ensure that CAISO consistently has sufficient flexible capacity to reliably operate its system, Powerex recommends that CAISO impose a day-ahead and real-time must-offer obligation as described above.

III. Next Steps

Powerex believes that the Draft Flexible Capacity Framework sets out a sound conceptual structure for a long-term flexible RA product. In particular, Powerex believes that the proposed structure has the potential to support California's long-term public policy goals by ensuring that CAISO is able to efficiently and cost-effectively address the challenges of VER integration. Powerex therefore supports CAISO proceeding with efforts to further define and finalize the proposed Flex RA framework.

Powerex notes that, in order for the proposed framework to fully achieve its objectives, certain complementary changes will be necessary to other aspects of CAISO's market rules and processes. For that reason, Powerex recommends that CAISO areas articulate its plan for addressing the following related areas:

- **Day-ahead flexible reserve product.** Powerex believes that the lack of a day-ahead flexible reserve product creates a gap in the day-ahead optimization that prevents it from taking into account the real-time flexible capacity needs of the CAISO grid.[5] Unless this gap is addressed, there is a risk that resources committed on a forward basis to supply flexible RA will be scheduled to provide energy in the day-ahead market rather than being positioned to provide flexibility in the 15- and 5-minute markets. Such a result would significantly undermine the benefits of the framework outlined in the Draft Flexible Capacity Framework.

- **Holistic review of CAISO's existing maximum import capability ("MIC") framework**. As Powerex has explained in detail in this and other proceedings,[6] Powerex believes that the existing MIC framework impedes the efficient and least cost-procurement of RA capacity from external resources by effectively stranding large amounts of intertie capacity and artificially constraining the quantity of external resources that can compete to satisfy RA requirements. Failing to address the deficiencies of the existing MIC framework will not only undermine the efficiency benefits associated with CAISO's proposals in this proceeding, but will artificially limit—and may largely exclude—external resource participation in the Flex RA program.

- **Clean RA and Clean Flex RA requirements.** Powerex encourages CAISO, together with the California Public Utilities Commission ("CPUC"), to consider enhancing the RA and the Flex RA requirements to specify that a certain portion

[5] Comments of Powerex Corp. on Draft 2018 Policy Initiatives Catalog at 10 (Nov. 29, 2017).

[6] *Id.* at 11.

of the requirements be met through forward contracts with non-emitting resources. In the long-term, Powerex believes that the CAISO's need for capacity and flexibility will be driven both by the need to integrate additional VERs and the need to replace existing flexible capacity provided by in-state fossil resources that retire.[7] Because flexible capacity requirements are currently permitted to be satisfied without regard to the type of resource, it is likely that the growing need for flexible capacity will be met through the construction of additional fossil resources within California or by contracting with fossil resources located outside of California. Ultimately, failure to take steps to ensure that capacity and flexibility needs are met using non-emitting resources may hamper California's ability to achieve the very environmental goals that its Flex RA program is intended to support. For that reason, Powerex believes that CAISO, together with the CPUC, should consider specifying that a portion of its RA and Flex RA requirements be met from clean, non-emitting resources, such as in-state storage resources and Northwest hydro resources.

[7] Comments of Powerex Corp. on Electricity 2030: Trends and Tasks for the Coming Years Discussion Paper at 13.