



## Comments of Pacific Gas & Electric Company

### Flexible Resource Adequacy Criteria and Must Offer Obligation – Phase 2 Supplemental Issue Paper

Submitted by	Company	Date Submitted
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Pacific Gas and Electric Company (PG&E) offers the following comments on the California Independent System Operator’s (CAISO) Flexible Resource Adequacy Criteria & Must Offer Obligation (FRACMOO) Phase 2 Supplemental Issue Paper. Overall, PG&E recommends a comprehensive review of flexibility needs to define clearly the reliability problems the CAISO is trying to solve before the development of program changes.

**1. PG&E is supportive of a comprehensive review of the flexible RA program and refining the definition of flexible RA to address specific flexibility needs if they are based on identified reliability issues.**

PG&E appreciates CAISO’s efforts to assess the effectiveness of the existing flexible RA product and consider what changes are needed. This assessment should consider the interaction of the RA program with energy market designs and determine which operational issues are best addressed by the CAISO’s energy markets and unit commitment processes versus forward RA requirements. PG&E believes that a core issue to assessing the need for forward flexible RA requirements is the ability of incentives from energy markets to provide the required operating flexibility and maintain reliability and thus it is not a foregone conclusion that all issues related to operational flexibility should be addressed with forward RA requirements. PG&E thinks that attempting to address all operational needs through the RA program will lead to significant costs with little incremental benefit in improving reliability.

Flexible RA requirements should address specific flexibility needs that are based on identified reliability issues. To that end, CAISO should conduct thorough data analysis using the best available data to identify reliability issues and justify flexibility requirements. In its November 9, 2016 presentation at the CPUC Flexible Capacity Workshop and its subsequent comments at the CPUC, PG&E presented data needs that would be useful in determining flexible capacity requirements.<sup>1</sup> The following data could help answer whether a requirement based on ramping needs is necessary:

- total bids and self-schedules by hour;
- total bids and self-schedules by hour, categorized by resource type;

<sup>1</sup> PG&E presentation and comments in CPUC RA proceeding (R.14-10-010):  
<http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M170/K705/170705146.PDF>

- total bids and self-schedules by hour, categorized by RA and non-RA resources;
- total bids and self-schedules by hour, categorized by flexible RA and system RA resources, and;
- total bids and self-schedules of renewable resources by hour, categorized by resource online date.

An important element of the review of the flexible RA program that was discussed at the December 9, 2016 stakeholder call is the amount of renewable resources that are currently economically bidding into the CAISO energy markets. In its 2015 Annual Report, the CAISO's Department of Market Monitoring (DMM) reported on the percentages of wind (20%) and solar (26%) resources that were economically bidding into the real-time market in 2015.<sup>2</sup> The CAISO should build off of this assessment and present data to identify trends with renewable resource bidding, including hourly bid data to understand the impact on net load ramps. If the CAISO keeps the three hour net load ramp as the basis for its flexible RA requirements, it makes sense to examine how to take renewable resources that are economically bidding into CAISO markets out of the CAISO's calculation of net load ramps and flexible RA requirements, especially if it is clear that the amount of renewable resources economically bidding is trending upwards. The CAISO should revisit its concept of net load in the energy market context as well. The assumption that all renewables will produce at their day-ahead forecast quantities should be re-examined particularly in light of the willingness of renewable capacity to participate in the energy markets by providing bids.

**2. As part of the comprehensive review of the flexible RA program, CAISO should look at whether the three hour ramping requirement is the right metric for forward flexibility requirements.**

The current method for establishing flexible RA obligations based on three hour ramps may not be accurately identifying the CAISO's operational flexibility needs. As PG&E presented at the November 9, 2016 CPUC Flexible Capacity Workshop, actual ramps were consistently below the forecasted ramps in 2014 and 2015, leading to over-procurement. In 2016, actual ramps exceeded the forecasted ramps, and the requirements in some months, without any observed reliability impacts. Additionally, as the CAISO points out and as the DMM noted in its 2015 Annual Report,<sup>3</sup> the maximum net load ramp often occurs on a holiday or weekend. CAISO notes that because mid-day net load is lower on weekends, but evening peaks are similar, the net load ramps are likely greater on weekends.<sup>4</sup> The fact that CAISO was not able to accurately forecast the weekend ramping needs highlights how difficult it is to forecast the three hour net load peak ramp.

Further, CAISO should be able to meet much of the three-hour ramp through the day-ahead market and Residual Unit Commitment (RUC) process and thus real-time bidding should not be necessary to meet the entirety of the ramp. CAISO's concerns about real-time flexibility seem to be associated with day-ahead forecast and unit commitment challenges. Day-ahead optimization solutions will more directly and accurately resolve both of these concerns. For instance, PG&E encourages the CAISO to

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<sup>2</sup> CAISO Department of Market Monitoring 2015 Annual Report on Market Issues and Performance, p.92:  
<http://www.caiso.com/Documents/2015AnnualReportonMarketIssuesandPerformance.pdf>

<sup>3</sup> CAISO Department of Market Monitoring 2015 Annual Report on Market Issues and Performance, pp.212-213:  
<http://www.caiso.com/Documents/2015AnnualReportonMarketIssuesandPerformance.pdf>

<sup>4</sup> CAISO Supplemental Issue Paper, p.13

explore enhancing the design of the Flexible Ramping Product (FRP) by extending the FRP into the day-ahead market, allowing CAISO to better commit slower-start flexible resources in the day-ahead time frame. By incorporating uncertainty into the day-ahead market and committing slower-start flexible resources in the day-ahead time frame, the CAISO would ensure sufficient faster-start flexible capacity is available to respond in real-time. The ability to de-commit resources or swap short-start resources for long-start resources in RUC could have similar positive benefits. Fifteen-minute scheduling in the day-ahead market could also provide benefits in reducing day-ahead uncertainty by aligning the time periods between the day-ahead and real-time markets. Another market modification is to extend the unit commitment look-ahead to more efficiently commit resources over the day. This is currently part of the Real-Time Market Enhancements Initiative slated to start in Q2 2017 per the CAISO's Draft Final 2017 Policy Initiative Roadmap.<sup>5</sup>

The CAISO's concerns related to long-start resources and Pmin to Pmax ratio indicate that the three hour ramping requirement and/or the current criteria for the Flexible RA MOO are not aligned with the CAISO's flexibility needs. If the CAISO is concerned about real-time flexibility and a significant portion of the flexible RA fleet is exempted from bidding in real-time, then the current flexible RA program is not effective at meeting the stated flexibility needs. This argues in favor of a refined flexible RA definition that considers both the flexible RA requirements and eligibility criteria in tandem that are based on the ability to resolve forecast uncertainty.

### **3. The CAISO should focus on real-time forecast uncertainty for flexible RA requirements.**

The CAISO identifies one specific reliability issue in its Supplemental Issue Paper regarding CPS1 violations.<sup>6</sup> PG&E recommends that the CAISO focus on this reliability issue in refining the flexible RA requirements. The issue is related to real-time forecast uncertainty associated with intermittent resources and load. When CAISO has actual net loads that occur during real-time intervals that are significantly different than what the real-time forecasts were for that interval, there can be quicker ramps than expected and potential CPS1 violations. CAISO discussed this issue in depth at the July 21, 2016 Market Planning and Performance Forum.<sup>7</sup>

The day-ahead solutions mentioned earlier should help to address this issue. PG&E encourages the CAISO to explore whether these energy market enhancements would be more effective in meeting this flexibility need as compared to forward flexible RA requirements. However, because there is a link between real-time net load forecast error and the CPS1 scores the CAISO has recently experienced, PG&E supports considering whether this particular reliability issue justifies a forward capacity product.

In our analysis of day-ahead and real-time load forecast errors, PG&E has recognized an unusual negative load bias. In order to better understand the range of net load forecast errors and determine a formula for calculating flexible RA requirements based on forecast error, PG&E requests that the CAISO provide information to explain this unusual bias.

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<sup>5</sup> CAISO Draft Final 2017 Policy Initiatives Roadmap, p.3:

[http://www.caiso.com/Documents/DraftFinal\\_2017PolicyInitiativesRoadmap.pdf](http://www.caiso.com/Documents/DraftFinal_2017PolicyInitiativesRoadmap.pdf)

<sup>6</sup> CAISO Supplemental Issue Paper, p.10

<sup>7</sup> [http://www.caiso.com/Documents/Agenda-Presentation-MarketPerformance-PlanningForum-Jul21\\_2016.pdf](http://www.caiso.com/Documents/Agenda-Presentation-MarketPerformance-PlanningForum-Jul21_2016.pdf)

**4. It is important that the CAISO's and the CPUC's efforts to refine the flexible capacity program be coordinated.**

It is important that the CAISO's and the CPUC's RA programs be consistent and complementary. PG&E will participate actively in both this initiative and the CPUC's RA proceeding. PG&E encourages the CAISO and the CPUC to coordinate to ensure that this initiative and the CPUC's RA proceeding are closely aligned, so that the outcomes are consistent and complementary. In the CPUC's RA proceeding, PG&E has agreed with other stakeholders that it is not feasible to target adoption of a durable flexible RA program for the 2018 RA year and has encouraged the CPUC to work towards adopting a more durable framework in time for the 2019 year. This will provide more time to collect and present the data that PG&E and other stakeholders have identified as important to determine flexible RA requirements.

Furthermore, PG&E encourages both the CAISO and the CPUC to pursue simplicity in refining the flexible RA program as opposed to layering on more complex and incremental changes to the program that would lead to difficulty tracking, administering and assessing the effects of the changes. A refined flexible RA definition based on a clear reliability issue that the CAISO has identified will move us in this direction. Other benefits of a less complex RA program and clear requirements include making it easier for resources to participate in CAISO's markets, potentially lowering transactional and resource costs and helping to better value the RA aspects of new procurement. It is also important to note that a simpler flexible RA structure is likely to be more easily adopted in a Regional ISO.