# **Stakeholder Comments Template**

Submitted by	Company	Date Submitted
Cody Hill, <u>chill@lspower.com</u>	LS Power	12/13/2017
Sandeep Arora, <u>sarora@lspower.com</u>	Development, LLC	

Please use this template to provide your comments on the FRACMOO Phase 2 stakeholder initiative Draft Framework Proposal posted on May 1, 2017. Submit comments to InitiativeComments@CAISO.com Comments are due December 13, 2017 by 5:00pm

The Draft Framework Proposal posted on November 20, 2017 and the presentation discussed during the November 29, 2017 stakeholder web conference may be found on the <u>FRACMOO</u> webpage.

Please provide your comments on the Draft Framework Proposal topics listed below and any additional comments you wish to provide using this template.

# Identification of ramping and uncertainty needs

The ISO has identified two drivers of flexible capacity needs: General Ramping needs and uncertainty. The ISO also demonstrated how these drivers related to operational needs.

# Comments:

LS Power agrees with the ISO's identification of Ramping and Uncertainty as the key drivers of need for operational flexibility that should appropriately drive the design of the Flexible Resource Adequacy product. CAISO has identified the need to focus on 15-minute and 5-minute ramping capability to complement the existing 3-hour focused load shaping product. The construct is simple, logical, and clearly a good fit for integrating into the ISO's existing market for real time security constrained economic dispatch, which already runs on 15 minute and 5 minute periods.

Although addressed in more detail in the <u>Eligibility criteria and must offer obligations</u> comment section, we emphasize that for Flexible Capacity to be most effective, then, in order to qualify as a 5-minute or 15-minute Flex Resource, a resource should be required to have a bid in the Real Time market 24/7, without regards to any awards in the Day Ahead market. Qualified real time Flex quantities should be based on the MW ramp rate over the prescribed time period and Eligibility criteria should be strict, including high Pmax/Pmin ratio, low Pmin and fast start times.

In support of CAISO's needs analysis, we respectfully submit CESA and LS Power's own related work on Ramping requirements, looking at the expected resource makeup in the CPUC's IRP 2030 Proposed Reference System Plan Scenarios. The CPUC's baseline scenario indicates an enormous daily need for ramping capability in the future if we are to avoid curtailing a significant portion of the solar power that California has invested in to meet RPS and GHG goals. The following figures scale the actual Solar Generation data from the CAISO OASIS system from their 2017 values in Figure 1, to what would be expected under the CPUC's 2030 baseline scenario for the same level of load in Figure 2. This is a challenge that demands large quantities of flexible resources be made available every day of the year to operate the grid.



Figure 1: Actual Solar, Wind, and Net Load in May 2017 (Source: CAISO OASIS data)



Figure 2:The same Net Load from Figure 1, with the CPUC's expected level of Solar generation in 2030 (Source: CAISO OASIS, IRP Proposed Reference System Plan Scenario).

The CAISO and CPUC should consider whether the changes to Flexible Resource Adequacy program will properly incentivize the type of investment needed to meet the magnitude of the daily operational challenge that is evident both in the above figures and in those that the CAISO presented in the Revised Straw Proposal and Stakeholder Meeting slides. California's location, solar resources and aggressive GHG goals create both a great challenge and a great opportunity. The design of the Flexible Resource Adequacy market is one of the key policy tools available to incentivize long term investment in the right mix of resources which can unlock California's renewable potential.

# Quantification of the flexible capacity needs

The ISO has provided data regarding observed levels of uncertainty, in addition to previous discussion of net load ramps.

#### Comments:

It is compelling to see the new data showing the thousands of megawatts worth of daily volatility that the CAISO faces every month. It is clear that the operators and staff at CAISO have

done thorough diligence in assessing and quantifying the sources of the challenge, and they should move forward quickly in redefining the Flexible Resource Adequacy product to address these problems.

LS Power proposes that the CPUC and CAISO should use their operational data to forecast, communicate, and drive procurement of sufficient resources for the expected flexibility needs at least 3-5 years out. This is prudent given the timelines for interconnection and development processes surrounding significant electrical infrastructure projects. We think that the CAISO should develop (and CPUC should implement) the Flex RA requirements based on the operational challenges it has witnessed and can reasonably extrapolate forward as more intermittent zero carbon resources are added to the grid.

# **Eligibility criteria and must offer obligations**

The ISO has outlined the need for three different flexible RA products: Day-ahead load shaping, a 15-minute product, and a 5-minute product. Additionally, the ISO has identified a preliminary list of resources characteristics and attributes that could be considered for resource eligibility to provide each product. Additionally, the ISO is considering new counting rules for VERs that are willing to bid into the ISO markets.

# Comments:

The choice to focus on 15-minute and 5-minute ramping capability to complement the existing 3-hour focused load shaping product is a good one. The construct is simple, logical, and clearly a good fit for integrating into the ISO's existing systems for real time security constrained economic dispatch, which already runs on 15 minute and 5 minute periods. We trust that the CAISO's existing market infrastructure could readily handle the intra-hour challenges of ramping and uncertainty if there were a sufficient number of resources with bids in the real time market every day, and therefore a most critical part of FRACMOO is the design of the Must Offer Obligations to make sure that flexible capacity is available.

In our view there are no significant known issues with insufficient "Day-ahead load shaping" type capacity to date, as many thousands of MW submit Day Ahead bids to the CAISO every day. As such we do not propose any changes from the status quo Flex RA Must Offer Obligations in the day-ahead market, although CAISO may wish to review the and adjust the allowed technical parameters (Pmin, start time, etc.) required for eligibility.

Real time flexibility is a much more challenging issue as CAISO staff has made clear, because if a given resource has not been picked up in the Day Ahead it then tends not to offer capacity into the Real Time market due to long start times and high Pmin values that are uneconomic for short duration dispatches.

The simplest solution is to define the 5 and 15-minute Flex RA Must Offer Obligations as follows:

- 1. *Must Offer Obligation:* In order to qualify as a 5-minute or 15-minute Flex Resource, a resource should be required to have a bid in the Real Time market 24/7, without regard to any awards made in the Day Ahead market.
- 2. Eligibility Criteria:
  - a. The resource owner promises to meet the Must Offer Obligation, or refund the capacity payment to procure flexible capacity elsewhere.
  - b. The quantity of MW that a resource can qualify for in the 5-minute and 15minute Flex RA products is the number of MW allowed by its ramp rate over 5 and 15 minutes, respectively.
  - c. Qualifying resources that can offer 15 and 5 minute product should be able to meet much stricter standards than resources that can offer Day Ahead product, including:
    - i. Pmax/Pmin ratio should be high, such as greater than 10, or Pmin should be low, such as close to 0 MW, in order to avoid bringing on more inflexible generation that would exacerbate the problem
    - ii. Start time should be less than 15 minutes to allow for real time unit commitment

The effect of this requirement will be to ascribe value in the market to resources which can be available every day, start fast, ramp quickly and accurately, and do not significantly add to the quantity of inflexible megawatts in the generation stack. The Real Time Flex RA capacity market should be open to all resources which are willing and able to ramp their output over 5 and 15 minute periods, are dispatchable and can offer into the Real Time market whether or not they have a Day Ahead market schedule. The simplicity of this MOO structure keeps CAISO, the CPUC, and stakeholders technology agnostic and lets the market determine the appropriate mix of flexible resources that can best meet the needs of the grid at lowest cost to ratepayers.

For clarity, we present two hypothetical examples for different resource types and how much Flex RA they could qualify for under the MOO and Eligibility Requirements above.

**Example 1:** Gas Peaker. Technical parameters: Pmax = 100 MW, Pmin = 20 MW, Ramp Rate: 10 MW/min. This resource is capable of ramping 50 MW in 5 minutes (the lesser of 100 – 20 and 5 \* 10), and 80 MW in 15 minutes (the lesser of 100 – 20 and 15 \* 10), and should therefore qualify for that 50 MW of 5-minute Flex RA and 80 MW of 15-minute Flex RA.

**Example 2:** Battery Energy Storage. Technical parameters: Pmax = 100 MW, Pmin = -100 MW, Ramp Rate: 1000 MW/min. This resource is capable of ramping 200 MW in 5 minutes (the lesser of 100 – (-100) and 5 \* 1000), and 200 MW in 15 minutes (the lesser of 100 – (-100) and

# 15 \* 1000), and should therefore qualify for 200 MW of 5-minute Flex RA and 200 MW of 15-minute Flex RA.

# Equitable allocation of flexible capacity needs

Equitable allocation of flexible capacity needs is a critical element of a new flexible RA framework. The ISO seeks comments on potential allocation methodologies.

#### Comments:

Other parties such as the IOUs, LSEs, CCAs, and ratepayer advocates will surely have important input to this question, and we look forward to their comments. LS Power wishes only to highlight here that multi-year contracts and product showings are the surest way to incentivize investment in building cleaner and more flexible resources. It is very hard for an existing resource owner or project developer to make an investment case for upgrades or new construction based on the expectation of value in a 1-year forward regulatory capacity product.

#### <u>Other</u>

Please provide and comments not addressed above, including any comments on process or scope of the FRACMOO2 initiative, here.

#### Comments:

In response to CAISO's proposal to allow VERs and Interties to provide Flexible Capacity, LS Power generally supports that all resources which can provide flexible capacity should be able to provide it, but cautions CAISO to carefully consider eligibility criteria for these resources. One of the key criteria should be dispatchability. For instance, in order to meet the 15 min and 5 min real time Flex Capacity requirements, Solar VERs would need to be dispatchable up and down. If VERs are not dispatchable or not available when CAISO needs them then that defeats CAISO's purpose of managing real-time uncertainty and variability. Similarly, only intertie resources that can be dispatched by CAISO should be eligible to participate. Such resources should have firm transmission up to CAISO boundary station and must be either a Dynamic resource or a Pseudo Tie resource.