

Stakeholder Comments Template

Frequency Response Phase 2 Initiative Working Group

| Submitted by | Company | Date Submitted |
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This template has been created for submission of stakeholder comments on the working group for the Frequency Response Phase 2 initiative held on February 9, 2017. Information related to this initiative may be found at:

<http://www.caiso.com/informed/Pages/StakeholderProcesses/FrequencyResponsePhase2.aspx>

Upon completion of this template, please submit it to initiativecomments@caiso.com. Submissions are requested by close of business on **March 17, 2017**.

The ISO includes a summary of the brainstormed options for potential solutions to reference while responding to Question 1 and its subparts. Seven potential options were brainstormed, they include:

1. Annual Forward Procurement - external BAAs
 - a. Only procures incremental amount to cover expected shortfall
 - b. Requires one contract type (TFR)
 - c. Supports bid submission and settlement of that price if procured
 - d. Does not require any day-ahead or real-time market co-optimized constraint
2. Annual Forward Procurement - external BAAs and internal resources
 - a. Only procures incremental amount to cover expected shortfall
 - b. Requires two contract types (TFR and frequency response awards)
 - c. Supports bid submission and settlement of at least that price if procured
 - d. Requires day-ahead and real-time co-optimized constraint
3. Day-ahead or Real-Time Market Product
 - a. Procures amount to meet total requirement
 - b. Requires one contract type (frequency response awards)
 - c. Supports bid submission and settlement of at least that price if procured
 - d. Requires day-ahead and real-time co-optimized constraint
4. Day-ahead and Real-Time Constraint
 - a. Procures amount to meet total requirement
 - b. Does not support bid submissions but would include some type of settlement for service
 - c. Requires day-ahead and real-time co-optimized constraint
5. Combination Annual for externals and Day-ahead/Real-Time Product
 - a. Procures incremental amount in annual forward procurement that would support bid submission and settlement of at least that price if procured

- b. Separately procures remainder of the amount to meet the total requirement that would support bid submission and settlement of at least that price if procured
- c. Requires day-ahead and real-time co-optimized constraint
- 6. Combination Annual for externals and Day-ahead/Real-Time Constraint
 - a. Procures incremental amount in annual forward procurement that would support bid submission for TFRs and settlement of that price if procured
 - b. Separately procures remainder of the amount to meet the total requirement that would not support bid submission for market constraint but would include some type of settlement
 - c. Requires day-ahead and real-time co-optimized constraint
- 7. "Do nothing"
 - a. Take no proactive action including procuring TFR from external BAAs

Questions:

1. The ISO seeks stakeholder input on the brainstormed options for a potential solution to the ISO need to take proactive action to ensure its frequency response is sufficient to support reliability in the event of a loss of two Palo Verde units (BAL-003-1 requirement). These include

- a. Provide description of view of advantages, disadvantages, or position on option 1 - Annual Forward Procurement - external BAAs.

NRG strongly opposes this option, which perpetuates the CAISO's discriminatory practice of providing compensation for frequency response to other Balancing Authority Areas but not to generators providing the same service within the CAISO. The CAISO should end this discrimination as soon as possible.

- b. Provide description of view of advantages, disadvantages, or position on option 2 - Annual Forward Procurement - external BAAs and internal resources.

NRG opposes this option, which, because it would provide compensation only to resources deemed needed to cover a shortfall, would not provide compensation to all resources providing frequency response.

- c. Provide description of view of advantages, disadvantages, or position on option 3 - Day-ahead or Real-Time Market Product.

NRG supports further consideration of this option, but notes that implementing it will be very complicated. Given that existing resources provide frequency response service today, implementing this paradigm would require being able to turn governor response on and off based on the market awards. This option may help transition from frequency response taken from governor-based conventional generators to frequency response taken from inverter-based resources (energy storage and renewables). Inverter-based frequency response is far more effective, and the CAISO would need to carry far less inverter-based response than response from conventional generators, but implementing this kind of market-based approach will require a transition. Perhaps the CAISO could

facilitate such a transition by procuring a set amount of this spot-market product and, at the same time, provide some kind of formulaic compensation to other generating resources that also provide frequency response to a given event.

- d. Provide description of view of advantages, disadvantages, or position on option 4 - Day-ahead and Real-Time Constraint.

If the CAISO is going to procure frequency response service in its spot markets, the CAISO should do so through a real market in which suppliers can submit bids. As noted above, this option might prove workable in concert with, but in lieu of, a market-based approach.

- e. Provide description of view of advantages, disadvantages, or position on option 5 - Combination Annual for externals and Day-ahead/Real-Time Product.

The disadvantage of this option is that it provides annual compensation for one set of parties but spot market compensation for another set of parties – for exactly the same service. Further, it presumes that it would be necessary to take FR service from external parties, when, if the CAISO’s market is properly designed and implemented and creates the right incentives, external participation might not be necessary.

- f. Provide description of view of advantages, disadvantages, or position on option 6 - Combination Annual for externals and Day-ahead/Real-Time Constraint.

This option suffers from the flaws noted in d and e above – it provides compensation (and certainty of compensation) over two different time frames for providing the exact same service, and it operates a market in which parties do not submit bids.

- g. Provide description of view of advantages, disadvantages, or position on option 7 - "Do nothing".

The declining frequency response performance within the CAISO’s BAA, coupled with the impending loss of 11-12 GW of gas-fired generation over the next few years, indicates that this is not a viable option.

8. ISO seeks stakeholder input on the proposed frequency response service specifications for fast frequency response, primary frequency response and fast regulation attached separately in the draft frequency control product specifications document found [here](#).

Understanding that the Fast Frequency Response product is not in scope of this initiative, the CAISO should establish a hard duration cap on this product – and all other FR products - instead of a unspecified “until frequency recovers” duration. This cap should be long enough to cover the vast majority of under-frequency events, but should not be left unspecified. The provider of this service should not face having to provide energy for an unspecified duration.

9. ISO seeks stakeholder input on the proposed scope of services for which a procurement mechanism would be designed. The proposed scope shown in the product specification handout is that the ISO only needs to evaluate procurement of primary frequency response whether from external BAAs or internal resource and does not need to procure fast frequency response or fast regulation capable of providing the secondary response shown on slide 47 in the appendices to the working group presentation. If any stakeholders believe that the scope should include the fast frequency response or fast regulation services under its evaluation of a procurement mechanism please provide an explanation.

Given the technical superiority of frequency response from inverter-based resources, and the proliferation of these kinds of resources, the CAISO should not indefinitely postpone serious consideration of these resources, but should scope out a plan and schedule for that consideration.

10. ISO seeks stakeholder input on whether load responsive devices can perform with a proportional response or does it require shedding load at a specific trigger point? Also, whether there has been any exploration of the concept of stopping non-critical processes for short periods has been evaluated?

Load should be able to provide proportional frequency response instead of being held to a “trigger-point” standard, just as generators are. NRG has no answer to the second question.

11. ISO seeks stakeholder input on whether pump storage hydro is pumping rather than generating would frequency control device perform with a proportional response or require shedding load at specific trigger points?

This would depend on the type of resource. If continuously variable pumping resources can provide a proportional response, there is no reason not to allow them to do so.

12. ISO seeks stakeholder input on the statement made on Slide 15 of the ISO presentation, “Frequency control services require reserves above operating reserves that are not procured for RA”. The ISO stated that it believes that resource adequacy or flexible resource adequacy capacity procured to ensure RA to ensure energy deliverability cannot be awarded frequency responsive reserves since these reserves cannot be released by ISO dispatch to ensure deliverability during peak or ramping needs. If any stakeholders hold a different belief, the ISO asks that additional information and explanation be provided to continue to move the dialogue forward.

The bullet on slide 15 reads:

ISO believes that resource adequacy or flexible resource adequacy capacity procured to ensure RA to ensure energy deliverability cannot be awarded frequency responsive reserves since these reserves cannot be released by ISO dispatch to ensure deliverability during peak or ramping needs

NRG agrees with the CAISO that FR reserves must be held in addition to operating reserves, and cannot be dispatched to provide energy. Such frequency response reserves could come from RA capacity, as long as the CAISO committed adequate capacity to ensure they can be held without being dispatched.