Submitted by	Company	Date Submitted
Vladimir Chadliev, Director-Global Grid Integration	First Solar, Inc.	December 13, 2017
1 (602) 414-9349		
VChadliev@firstsolar.com		

Stakeholder Comments Template

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.

First Solar, Inc. (First Solar) appreciates the opportunity to provide comments on the CAISO's November 20, 2017 Draft Framework Proposal in the Flexible Resource Adequacy Capacity Must Offer Obligation Phase 2 (FRAC MOO 2) initiative. As the CAISO has demonstrated, the grid today is experiencing new challenges given the success of California's policy initiatives to reduce the GHG emissions associated with the generation fleet serving California load. In the CAISO's presentation to the working group meeting for this initiative in September, the CAISO demonstrated that 3-hour flexible capacity is relevant but insufficient to meet flexible ramping needs going forward, and concluded that additional speed is needed to meet grid operation needs.¹ The CAISO also showed a significant jump in maximum upward and downward ramps between 2016 and 2017 as more variable energy resources came onto the system. This jump has created a new urgency for the need to drive requirements that all resources affecting the CAISO grid be controllable so they can be managed to support grid reliability. These issues will continue to be exacerbated as the load grows due to increased electrification, and thus finding a solution now will become even more critical managing the grid effectively.²

The stakeholder process that the CAISO has launched to identify the optimal market and performance solutions to the demonstrated operational needs is critically important. We applaud the CAISO for being proactive and taking the time now to design a grid and market structure that meets the emerging needs. We believe this will avoid having to take more precipitous action later. We also believe that the time is right to examine what market products and associated pricing structures are necessary to support greater grid-related flexibility and controllability so that renewable generators can provide these services.

The CAISO's Board has outlined a vision for the future that positions the CAISO as a leader in grid modernization through the implementation of policies that require all resources to operate flexibly and allows renewable resources to supply an increasing share of Essential Reliability Services.³ First Solar asks that the CAISO evaluate this Draft Framework Proposal in light of the vision proclaimed by the Board. Adding procurement requirements for flexibility without evaluating the full suite of capabilities offered by utility-scale solar does not optimize the existing resources or create a durable framework for new renewables connecting to the grid to maximize their potential for providing these grid services. We are encouraged that the CAISO is looking at changes to the timeframe for the must-offer obligation and a different cap on effective flexible capacity for variable energy resources, among other changes.

California's ambitious RPS goals have already begun to fundamentally alter the generation portfolio and it is imperative for both reliability and to minimize costs to ratepayers to ensure that renewables are incentivized to provide grid services. The CAISO's FRAC MOO 2 Framework Proposal begins to contemplate these possibilities, and we suggest that additional refinement, including more concrete eligibility requirements and an analysis of market solutions that can optimize the existing fleet.

¹ CAISO, FRAC MOO 2 Workshop, September 26, 2017.

² See, for example, California Energy Commission, Draft 2017 Integrated Energy Policy Report, Pg. 180, showing increased consumption in the forecasts for light-duty EV.

³ See CAISO Board Vision Discussion Paper, pg. 10-12.

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:

First Solar agrees that the CAISO has identified operational needs and we support addressing these issues now, rather than waiting for an emergency event or decreased reliability of the grid to trigger a response in the future. However, the CAISO should also focus on market-based solutions that take advantage of the existing fleet of renewable resources, rather than only attempting to solve operational issues with incremental procurement.

We believe that the requirements may be reduced by better assessing and incorporating the capabilities of utility-scale solar. First, the net load should be calculated as *load – non-dispatchable resources* rather than *load – solar – wind* as it will allow for a more accurate characterization of the flexible needs of the grid. How the CAISO defines net load fails to recognize the operability of utility-scale solar and underscores a persistent failure to recognize that the capabilities of deployed solar assets vary between distributed generation and dispatchable utility-scale solar generation.

Solar procurement in California will need to increase significantly to meet RPS goals while being a low-cost best-fit solution for the overall system. In turn, this will lead to increased curtailment of solar, especially during low load conditions. Therefore, curtailment should be considered an economic choice when necessary to manage higher levels of solar on the system. Given the low cost of utility-scale solar PV generation and its contributions to GHG reductions, we encourage a re-framing of the reliability-supporting tools like curtailment to account for the cost savings and GHG benefits of optimizing use of this resource among the portfolio of resources on the CAISO system. Greater amounts of controllable solar generation will open up opportunities to use utility-scale solar to provide additional flexibility to the grid, such as through using targeted curtailment. By managing the afternoon ramp-down of solar output, utility-scale PV can reduce the overall net-load ramping requirement in the afternoon as it is currently defined by the CAISO. Whether or not such a capability falls within the scope of the FRAC MOO 2, it is certainly a capability that can reduce the need for afternoon-evening net load ramping flexibility, thereby reducing the overall system cost. In addition, grid solar can be utilized to provide reliability services, thereby further reducing the need of those services from other generation resources. We urge the CAISO to consider these types of solutions in conjunction with their FRAC MOO 2 proposal by addressing market and regulatory barriers to participation.

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:

First Solar again urges the CAISO to investigate market solutions while finalizing a framework that establishes the new flexible RA requirements. Though the CAISO has announced a plan to implement changes to the day-ahead markets in parallel to FRAC MOO 2, First Solar believes there are additional changes to the real-time market that must also be explored. As described above, accurate consideration of the capabilities of utility-scale solar may also decrease the quantity of flexible capacity needed.

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:

First Solar is supportive of the CAISO's consideration of both changes to the 24/7 mustoffer obligation and of the CAISO's consideration of new counting rules for VERS that are willing to bid into the ISO markets. We believe these changes are critical steps in allowing renewables to participate in the flexibility solution. However, we have additional questions about how the CAISO sees the fifteen-minute and five-minute products being implemented, as it is unclear whether this is an obvious framework for renewables and other resources to fit into.

First Solar supports a more granular approach to the must-offer obligation, rather than a 24/7 requirement. The CAISO has already stated they are seeing the largest operational issues during the daytime and sunset hours. This observation lends itself to the creation of a tiered must-offer obligation that can take advantage of all generation capable of providing these grid services. As demonstrated by the CAISO, NREL and First Solar in a recent study,⁴ utility-scale solar can provide grid services, but must be incentivized to do so. Providing a tiered must-offer obligation not only helps to incentivize operation in this way, but also allows these variable resources to participate when they are producing.

⁴ NREL, CAISO, and First Solar, *Using Renewables to Operate a Low-Carbon Grid* (January 2017), available at <u>http://www.caiso.com/Documents/UsingRenewablesToOperateLow-CarbonGrid.pdf</u>

Similarly, First Solar supports new counting rules for VERS that bid economically. Capping EFC at the NQC value does not make sense when the resource has much higher output potential during times of the day when ramping is needed. We appreciate the CAISO making this much-needed change to ensure that renewable resources are able to use their full potential to provide these services.

Finally, while First Solar understands and agrees with the operational issues identified by the CAISO, we seek additional clarification on how the 15-minute and 5-minute products will be dispatched. Utility-scale solar is capable of providing ramping faster than traditional generation, but requires a reservation of head-room to do so. Incentivizing generators to reserve this head-room will depend on how the market selects which resources to dispatch for this service. If resources bid in at 15-min intervals in the RTM, how will the CAISO dispatch in the 5-min interval? How will the CAISO determine who is eligible for 5-min product from the bids in the 15-min interval? Will the CAISO reserve that generation for needs in the 5-min?

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:

First Solar offers no comments at this time.

<u>Other</u>

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

Comments:

Finally, First Solar reiterates our previous comments in this initiative, calling on the CAISO to take a more active role in advocacy at the CPUC. Though the CAISO has stated that it will be focusing on operation issues and stepping away from questions related to resource procurement, we ask the CAISO to be thoughtful about timing issues, both in terms of providing input to the CPUC and in ensuring the FRAC MOO 2 proposal thoroughly assesses the capabilities of utility-scale solar before being finalized.

First Solar appreciates the CAISO's consideration of these comments and we look forward to providing feedback on the next proposal.