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Order Instituting Rulemaking to Oversee The Resource Adequacy Program, Consider Program Refinements, and Establish Annual Local and Flexible Procurement Obligations for the 2016 and 2017 Compliance Years.	Rulemaking R.14-10-010

COMMENTS OF THE GREEN POWER INSTITUTE ON FLEXIBLE CAPACITY REQUIREMENTS TOPICS IN THE PHASE 3 SCOPING MEMO AND RULING

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COMMENTS OF THE GREEN POWER INSTITUTE ON FLEXIBLE CAPACITY REQUIREMENTS TOPICS IN THE PHASE 3 SCOPING MEMO AND RULING

Pursuant to the September 13, 2016, *Assigned Commissioner and Administrative Law Judge's Phase 3 Scoping Memo and Ruling*, in R.14-10-010, the **Order Instituting Rulemaking to Oversee the Resource Adequacy Program, Consider Program Refinements, and Establish Annual Local and Flexible Procurement Obligations for the 2016 and 2017 Compliance Years**, the Green Power Institute (GPI), the renewable energy program of the Pacific Institute for Studies in Development, Environment, and Security, provides these *Comments of the Green Power Institute on Flexible Capacity Requirements Topics in the Phase 3 Scoping Memo and Ruling*.

The September 13, 2016, Scoping Memo poses five Guiding Questions regarding moving from the interim Flexible Capacity Requirement (FCR) rules currently in effect, to a set of more permanent rules that market participants can anticipate will be in effect for an extended period of time. The first two of the Guiding Questions are essentially directed at LSEs and the CAISO. In these Comments the GPI addresses Guiding Question nos. 3, 4, and 5 in the Scoping Memo and Ruling.

Characteristics of Flexible Capacity

Guiding Question no. 3 asks what characteristics of flexible capacity are actually needed on the grid, currently, and in the near future. In fact the grid has been always had to be able to meet both up ramps and down ramps, which are largely predictable, as well as respond to the short-term fluctuations that are only predictable within a bandwidth. What is changing with the transition to clean energy is that a new form of grid uncertainty has been introduced, the uncertainty that is an inherent characteristic of intermittent renewable generating resources. Increasing dependence on intermittent generating resources not only increases the bandwidth of short-term fluctuations that grid operators must be able to

accommodate, it also exacerbates the steepness and duration of the late-afternoon ramp that grid operators need to be able to service, when not only is system-wide demand increasing, but solar generators are shutting down as the sun sets.

In order to meet the increasing late-afternoon ramps, grid operators need to have enough capacity available that can be scheduled to come online when directed, and continue operating through the remainder of the grid's ramp period, and the subsequent peak period. Traditionally this need has been met mainly by the staged startup of simple-cycle, gas-fired peaker plants. With the recent growth of solar, and the associated vertical growth of the afternoon ramp, the capacity of available peaker plants would either have to grow substantially, or other means to service the afternoon ramp need to be mobilized. In keeping with state policy that clearly favors clean energy, the GPI strongly favors the development of clean alternatives to new gas-fired peakers.

There are several obvious choices for alternative means to service the increasing afternoon ramp that is associated with the growth of solar. Targeted efficiency efforts and DR deployment are likely to be among the cheapest of the alternatives. Storage technologies of various kinds are likely to be among the most expensive of the alternatives. In the middle, from a cost-effectiveness basis, are non-fossil-powered generators that are able to vary their output in response to predictable system needs. In particular, these generators must be able to increase their output during the late-afternoon system ramp, not necessarily continuously throughout the year, but at least during the time of year of greatest system need, which occurs during March and/or April. As described in the next two sections below, baseload renewables are able to provide such flexible operations, particularly on an occasional, as-needed basis.

Guiding Question no. 3 concludes by asking whether the interim FCRs address the full spectrum of the flexible capacity needs of the grid. In the opinion of the GPI, a better question is whether the interim FCRs encourage all available alternatives for servicing the late-afternoon ramp, or whether the interim FCRs are limited to mobilizing traditional gas-fired peakers. The answer to this question is that the interim FCRs are limited to

mobilizing traditional gas-fired peakers. The permanent FCRs that are being developed in this proceeding need to be open to all possible alternatives, with incentives offered for clean alternatives.

Flexible Capacity from Baseload Renewables

The original RA program was devised in order to ensure that the utilities have a sufficient amount of generating capacity on hand to satisfy the most demanding peak loads of the year. As the California electric-supply market has transitioned to clean energy sources, the pattern of the daily supply-demand balance has shifted. The hours of key concern for the ability of LSEs to meet the peak demand have shifted to later in the day, and the two or three hours preceding the peak, known colloquially as the afternoon ramp, have aroused as much concern, from a regulatory perspective, as the peak itself. Meeting the peak requires having a certain amount of dependable generating capacity available at the time of need. Serving the afternoon ramp requires having a sufficient amount of generating capacity available that can be scheduled to start up or increase output to both replace the solar energy generation that is disappearing as the sun goes down, and to meet the late-afternoon increase in demand for electricity that ultimately becomes the system peak.

The FCR program was devised to ensure that LSEs have sufficient capacity available to meet the increasing rigors of the steepest afternoon ramps. Meeting the ramp requires having both sufficient capacity online that can be depended on to continue operating through the ramp and subsequent peak without diminishing or wavering, **and** sufficient capacity available that can be dependably brought online at scheduled times to meet the increasing level of demand during the ramp and following peak. In the opinion of the GPI the interim FCR program concentrates on the latter category, resources that can be turned on as needed over the course of the ramp, and ignores resources in the former category, resources that can both continue operating steadily through the ramp, and those that can actually ramp-up their output over the course of the ramp, and then maintain through the duration of the peak. A permanent FCR needs to include incentives for both categories of generators.

Question no. 4 asks what characteristics of flexible operations are not currently supplied through the interim FCR program. Baseload renewables, such as biomass, biogas, and geothermal, are capable of providing a form of flexible-capacity operation to LSEs in which they reduce their output during the midday hours, ramp their output back up to full capacity during the afternoon ramp, and maintain at full capacity, at least through the hours of the system peak. This mode of operation would be particularly appropriate in the spring, when low demand and abundant solar and hydro are beginning to cause curtailment conditions on the grid during the midday, typically followed by the steepest sustained ramps of the year during the late afternoons. The flexible operation of baseload renewables, in which the generators reduce their level of generation during the day, when curtailment conditions are in effect, and then ramp-up their output in conjunction with the afternoon ramp needs of the utility, has not been included in the interim FCR program.

Biomass, in particular, has the potential to operate in a flexible-capacity mode as described above for a relatively modest cost. The reason is that biomass is the only renewable that has a significant fuel-cost component to its total cost of generation. As a result, biomass generators have a higher threshold price than any other renewable at which they are motivated to voluntarily decrease their output level. Biomass generators vary significantly with regards to their particular operating parameters, but generally they are able to reduce their output to approximately 50 percent of full capacity without undue loss of efficiency. Biomass generators who reduce their daytime output are able to ramp back up to full capacity during the afternoon ramp, and maintain at full capacity through the subsequent peak-demand period. At the present time no biomass generator in California has a PPA that includes incentives for the provision of flexible-capacity operations as described above during critical days in March and April.

Barriers to Accessing Flexible Capacity from Baseload Renewables

Question 5 in the Scoping Memo and Ruling asks: "What, if any, contractual, economic, or structural barriers exist that hamper the ability of existing or planned resources capable of providing flexibility from doing so?" The GPI's answer is that current PPAs for

baseload renewables do not provide any incentive whatsoever for the delivery of flexible operations of the kind that we have described above. In fact, many existing RPS contracts provide incentives for maximizing output during the very hours when curtailment conditions are occurring on the grid. Contractual barriers are a massive impediment to the ability of existing and planned baseload renewable resources to provide flexible-capacity operations to the grid.

A major problem with existing RPS PPAs with respect to their ability to provide flexible operations is their use of antiquated time-of-delivery (TOD) factors, which are based on more than 30-year-old system supply-demand curves. TOD profiles are under active investigation at this Commission in Rulemakings R.15-12-012, R.15-02-020, R.16-02-007, as well as elsewhere. In order to send accurate and actionable price signals to generators, TOD differentiation of energy rates has to be brought up-to-date to be reflective of current and expected future market conditions, and the granularity of the time differentiation needs to be increased to at least the hourly level, with 24-hourly profiles constructed for weekdays and weekend/holidays for each month of the year.

It should be noted that the same kinds of TOD profiles that are capable of stimulating flexible operations on the part of baseload renewable generators during the times of the year when, for example, curtailment conditions are being experienced on the grid, are also the kinds of price signals that could incentivize generators to add integrated storage systems of various kinds into their facilities, or, for that matter, developers of stand-alone storage systems to develop projects in a particular utility's territory. Modernizing TOD differentiation of energy prices is the most important action that could be taken by the Commission to manage the structural changes in the integrated electric system that are occurring in conjunction with the conversion to a system based primarily on preferred resources.

Conclusion

The interim FCR rules address only a fraction of the generators that can supply flexible capacity services to the grid. The permanent FCR rules should include measures and incentives for all kinds of generators that are capable of providing flexible operations, with the largest incentives going to preferred resources, including baseload renewables. We look forward to resolving the issues connected with developing permanent flexible-capacity requirements in Phase 3 of R.14-10-010.

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Respectfully Submitted,

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