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The CAISO requests market participant feedback on this question: do the current market design or tariff requirements produce effective price signals and compensation for sufficient frequency response capability and provision?¹

The obvious answer – supported by the chart on page 27 of the FR2 Issue Paper, which indicates that the CAISO is not expected to meet its Frequency Response Obligation (FRO) for 2016 – ***is that they do not.***

The existing frequency response paradigm – in which frequency response is implicitly acquired from conventional generators without compensation simply by requiring that such machines have governor controls with specified droop settings – has, for a number of reasons, run its course.

First, The CAISO's data shows that the CAISO's frequency response is deteriorating.

Second, the CAISO is compensating some entities for allowing the CAISO to count their excess frequency response towards meeting the CAISO's FRO, but not compensating resources within the CAISO's Balancing Authority for providing the exact same service – frequency response that helps the CAISO meet its FRO, a blatantly discriminatory practice that provides no benefit to the interconnection other than allowing the CAISO to meet its FRO – on paper.

Third, the nature of energy supply is changing, opening the door to new ways of providing frequency response. Studies indicate that frequency response that can respond in cycles instead of in seconds (e.g., the frequency response that can be provided by inverter-based machines instead of turbine-based machines) can significantly improve system frequency recovery, and that adequate frequency response can be achieved with far fewer MW of response if the response comes from fast responding machines. However, providing frequency response requires compensating the owners of those machines for the opportunity cost of not providing energy, but holding "headroom" to be able to respond in an under-frequency event.

It is past time to move towards a new, non-discriminatory paradigm in which all entities that help the CAISO meet its FRO are compensated for doing so, and for the CAISO and market participants to craft a frequency response product that intentionally and explicitly provides the services the CAISO needs to meet its obligations as the operator of the largest Balancing Authority within the Western Interconnection.

The CAISO has proposed to adopt the following design principles in the design of a frequency response procurement mechanism:

- Produce market outcomes that enable the ISO to position its fleet to respond sufficiently to frequency disturbances in the post-event measurement period;

¹ FR2 Issue Paper at page 21.

- Allow all technology types to participate in the procurement mechanism through ensuring there are no barriers to entry;
- Produce price signals that incentivize capital investments on resources to be capable of primary frequency response; and
- Ensure compensation of capital investments made to meet the required capability if frequency response capabilities become an interconnection requirement.²

NRG offers these additional principles:

- The product should not discriminate among all entities providing that product, except in terms of performance (e.g., technically superior performance should earn superior compensation).
- The product must provide adequate compensation for all aspects of providing the product, including opportunity cost and recovery of capital cost (even if the frequency response capabilities do not become an interconnection requirement).

In sum, NRG urges the CAISO to:

- End its discriminatory practice of compensating some, but not all, entities that help the CAISO meet its FRO;
- Work expeditiously with market participants to design and implement a market-based frequency response that meets the CAISO's operational needs, is transparently acquired, provides adequate compensation, and rewards technically superior performance.

² December 15, 2016 Frequency Response Phase 2 Issue Paper ("FR2 Issue Paper") at pages 5, 21.