

California Energy Commission
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Re: Docket No. 13-IEP-1F
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California Energy Commission

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Re: *Lead Commissioner Workshop on Increasing Demand Response Capabilities in California –
Comments from ENBALA Power Networks*

I. INTRODUCTION

On June 17th, 2013 the California Energy Commission (CEC) held a workshop to gather information on the barriers to market entry and the technical capabilities of Demand Response (DR) in addressing California's need for reliable and flexible resources on the grid. ENBALA Power Networks (ENBALA) participated in that discussion and offered its perspective as an Aggregator of demand-side resources to help guide policy and programs to facilitate a robust market transformation that will allow DR to provide its full value to the California power system.

ENBALA Power Networks is a Smart Grid technology company that continuously connects large electricity users to the grid to deliver grid balancing flexibility to electricity system operators and utilities. ENBALA's innovative Grid Balance platform captures and then intelligently aggregates inherent demand-side process storage from connected loads, to respond to the real-time needs of the power system, increasing its reliability, efficiency and reducing greenhouse gases.

II. FLEXIBLE DR

With the increasing level of renewable generation expected over the next 20 years the California Independent System Operator (CAISO) has identified a set of operational challenges in meeting the ramping requirements of the forecasted net-load curve.

We firmly believe that demand-side resources represent a cost-effective solution in helping California manage these increasing flexibility requirements. However, traditional DR resources and techniques (typically used to reduce the impacts of peak demand) will not be adequate due to the nature of intermittent resources. The operational differences between traditional DR and flexible DR can be highlighted by three distinguishing characteristics of flexibility requirements in California:

- flexibility requirements are highest during the shoulder seasons when HVAC load is not fully available
- automated bi-directional control is necessary (the ability to consume both more and less power, depending on the needs of the grid)
- flexibility events will be much more frequent than traditional DR peaking events.

ENBALA believes that the key to how demand-side resources can provide flexibility in the California system is by utilizing technology that allows the load to participate on *their own* terms. This means that the process that the load serves (e.g. water pumping, chilling, HVAC) cannot be interrupted, but is coordinated in such a way that the underlying function of the load is met while providing flexibility value to the power system.

Certainly automating the communication will allow real-time information exchange with demand-side resources, but successful implementation of a robust flexible DR product needs to focus on defining how the load reacts to a signal while being sensitive to the needs of the load. Traditionally, DR has been focused on relatively infrequent events, where the load determines how best to respond. This is usually fairly intrusive to the load but because the events are relatively rare (certainly less than 10 times per year), the load impact is manageable. For loads to be able to provide flexibility much more frequently, it is important that not only is the communication and reaction path fully automated but also that it is not intrusive to the normal operation of the load because it will be required to react so much more frequently. When this is achieved, the power system really has a whole new degree of freedom to operate and overall power system efficiency and operability is improved cost effectively.

III. COMMERCIALLY AVAILABLE TECHNOLOGY

There is commercially available technology that is currently operating in multiple jurisdictions providing real time flexibility to the power system operator utilizing demand-side resources. In the wholesale market of PJM demand-side resources provide Regulation Service, adjusting electrical power consumption bi-directionally every four seconds to help maintain system frequency. Demand-side resources have also been utilized to demonstrate wind power integration in BPA and are currently in operation at New Brunswick Power, alleviating requirements of traditional generation when wind power ramps in or out. These technologies have been proven to be competitive alternatives to traditional techniques in their cost-effectiveness and far superior environmental impact.

IV. MARKET PRODUCTS

i. Flexibility as a Resource Adequacy Product

On May 28th, 2013 the California Public Utilities Commission (CPUC) released a proposed decision that would include Flexible Capacity in their Resource Adequacy (RA) program. Currently the CAISO is investigating how use-limited resources, including DR and storage, could participate in this market.

ENBALA believes that inclusion of DR in this initial flexible market product is essential to initiate a robust DR market in California.

The CAISO initially proposed three different flexibility products that addressed separate flexibility characteristics: maximum continuous ramping, load following, and regulation. ENBALA supports the CAISO and strongly encourages the continued development of future procurement requirements for load following and regulation as these products would likely align with the operational characteristics of demand-side and storage resources more closely, allowing a broader participation by these resources to address identified system requirements.

ii. Flexible Ramping Product

The CAISO initiated the stakeholder process to develop a flexible ramping product in November, 2011. Although further development is on hold due to FERC order 764, ENBALA believes that alternative technologies need to be included in the development of the flexible ramping product definition as they are technically capable of providing this service while reducing GHG emissions and improving the efficiency of the grid.

iii. Ancillary Services

Demand-side resources are well suited to provide ancillary services in the CAISO market. Further work needs to be completed to address market barriers that are currently preventing alternative technologies from becoming competitive participants. Some of the known market barriers are discussed in more detail in the following section.

iv. Include DR in Planning Process

Demand Response is a valuable asset that has proven operational characteristics and reliability through years of program participation in California and other jurisdictions. It is crucial that these resources be included in the planning process in order to ensure that a reasonable proportion of future system resources come from DR. In the absence of this planning, flexibility resources will be procured in different (more traditional ways), rate-based (at significant cost to the rate payer) and will tend to preclude the development of a robust DR ecosystem in California. The Flexible Capacity product being developed could be a characterization for CEC's planning studies, however there currently is no clear indication of how DR resources will be able to participate in this product.

V. MARKET BARRIERS

i. Aggregation Boundaries and Fleet Response

One of the most important market barriers to address is the concept of allowing (and encouraging) aggregation of loads and treating the aggregated resource as a single resource for the system operator. Aggregation has always been important in traditional DR products as it helps manage performance risk due to the fluctuating availability of individual loads as well as allowing smaller residential loads to be

offered as a portfolio product. However, traditional DR typically experiences limited event calls annually and has advanced notice so there can be some coordination on site. With the paradigm changing to real-time and more continuous control for flexibility products, aggregation will become increasingly important in managing performance risk and even in the ability to actually react to real time signals as there is limited to no advanced notice and the potential for thousands of events per year.

As the product definitions for DR, Flexible Ramping, Flexible RA and Ancillary Services are developed or refined, we support a detailed look at the congestion constraints for each product and whether the aggregation restrictions for certain products can be relaxed. For example, in other jurisdictions demand-side resources can provide Regulation Service as a group, responding as a fleet that is able to be dispersed across the entire ISO.

We encourage further open-minded investigation into the true requirements of the market products and if they are determined to be system wide products, then to allow demand-side resources to provide a fleet response from across the ISO boundary.

ii. Sub-metering

Sub-metering uses installed meters that measure the electrical power consumption of specific equipment at an end-use customer facility. In many cases, electrical equipment within the facility that has flexibility, and can provide a service to the grid operator, may only represent a fraction of the total load at the facility. Sub-metering allows the ISO to account for equipment specific metering and load data used to validate the service that load is providing. Currently, sub-metering rules are not in place in the CAISO market and would need to be developed in order to access the full potential of demand-side resources in California.

VI. PILOT PROGRAMS

We support the CEC in investigating the cost and operational characteristics for demand-side loads providing flexibility services through demonstration projects. While other jurisdictions have had good experiences with DR programs, certainly every power system has some differences. Particularly in California, there is valuable learning that can be accomplished through pilot projects to gain experience with the technology in regards to operational characteristics, costs, M&V, market structure, and customer feedback. California has important needs for flexibility, in the relative near term -- as early as 2015. ENBALA feels that California would really benefit from piloting and this is likely a necessary first step in order to facilitate a new paradigm for flexible DR in California. We encourage the CEC to start developing these programs, now.

VII. CONCLUSION

ENBALA highly supports the collaborative effort being undertaken by the CAISO, CPUC, and CEC to further the development of demand participation in California. We are encouraged by the CEC's interest in helping to facilitate automated and flexible DR in California's resource mix of the future.

ENBALA believes that DR is a proven technology, highly reliable, cost-effective, and can be adapted to help manage the flexibility requirements California is currently facing. We encourage the development of the Flexible Capacity product to include provisions for DR participation and support a continued effort into implementing load following and regulation future procurement requirements. Furthermore, market barriers should be examined and eliminated where possible to broaden DR participation in current and potential market products. Lastly, ENBALA believes that the first step in facilitating a market transformation for flexible DR is based on Pilot Projects, initiated both by the CEC and LSEs, in order to gain operation experience, examine the cost-effectiveness of the technology, and develop the necessary framework to facilitate a robust DR market in California.