Comments of ENBALA

(Formerly known as SEMPA Power)

On the importance of allowing Loads to offer system regulation to CAISO

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Submitted by

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Summary

Load participation in Ancillary Service markets is a critical element of the natural evolution of electricity markets and grid maturity. Load based services have the potential to facilitate the integration of renewable energy at a lower cost than other resources and should be considered as readily available, low-cost resource for renewable integration. Implementing full participation of load in the regulation market should therefore be given a high priority in the Market Design Initiatives on par with other renewable integration stakeholder processes.

The Draft Catalogue of Market Design Initiatives does not reflect the important role that load can play in renewable integration and improperly focuses predominately on the renewable generators themselves or refinements to traditional generation supplied services. Both the **Renewable Integration: Market and Product Review** and the **Rules to Encourage Dispatchability of Intermittent Resources** are categorized as a high priority. However, the implementation of the **Participating Load Refinements** that will allow load based regulation was delayed in 2010, is not integrated with the **Renewable Integration: Market and Product Review** and is not scheduled to be implemented until September 2011. The draft catalogue does not make any mention of the **Ancillary Market Product Review** that was to commence in the Fall of 2010.

ISONE, MISO, NYISO and PJM all allow some form of direct load participation in regulation markets *today*. Pilots demonstrating load based regulation are currently underway in IESO, ISONE, and PJM. In

contrast, both the 2009 Participating Load Pilot Programs and investor owned utility DR programs scheduled to participate in CAISO markets in 2011 are event-based DR programs limited to providing spinning and non-spinning reserves or real-time energy load reduction. These programs will not provide the on-the-ground experience needed to design effective load based regulation tariffs in a timely manner. Nor will they address the regulation and load following requirements that have been identified by the CAISO as critical for renewable integration. The active participation and demonstration of load based regulation services that is currently ongoing in other markets will be essential to successfully implementing Participating Load Refinements (in contrast to PJM, which has had a Demand Response Regulation Market defined since 2006, but only seen participation the Synchronized Reserves Market). Pilot or demonstration projects prior to September 2011 will be essential to ensure well designed, robust load-based regulation product in 2012, when regulation and load following requirements are expected to have increased by roughly 30% as compared to 2006.[1]

Key Recommendations

1) Market rule changes should be based on CAISO system needs rather than the capabilities of individual generation and non-generation technologies.
2) CAISO should place a higher priority on implementing direct load participation in regulation markets as a key strategy supporting the integration of renewable resources.
3) Load can provide substantial ancillary services with minor or no changes to current market rules and definitions. Just 2% of 2012 Commercial and Industrial load in California represents 600 MW coincident peak demand, more than the expected regulation requirements of 502-569 MW identified by the CAISO for 2012 . [2]
4) Aggregated and coordinated loads can provide measured and verified response that is both auditable and viewable in real-time.
5) Facilitating load participation in regulation markets will be less, not more complicated than the implementation of the Proxy Demand Resource (PDR) product.
6) Absent the Ancillary Services Product Review, load based regulation should be given high priority consideration as a potential low-cost resource in the Renewable Integration Market and Product Review stakeholder process

Ancillary Services by Load Networks

ENBALA is building the world's first network of demand side assets and carefully managing them in real time to provide highly responsive, resilient and robust ancillary services to the electricity system

[1] CAISO, *Integration of Renewable Resources: Operational Requirements and Generation Fleet Capability at 20% RPS*, August 31, 2010. Table ES-1, p. vii.
[2] California Energy Commission. *California Energy Demand 2010-2020 Adopted Forecast* (CEC-200-2009-012-CMF), 2012 Coincident Peak Demands from Form 1.3 p. 41 & CAISO.*Renewable Integration: Market and Product Review Discussion Paper*, July 8, 2010, Table 1, p. 10

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operator. We are offering regulation services but we envision that as our network grows and matures to offer other services such as ramp, operation reserve, spinning reserve, price responsive demand, etc. Unlike typical aggregators, our system intelligently manages assets taking into account their operational constraints and responds quickly to the AGC signal.

We are currently conducting pilots in three ISO regions: PJM (Demand Response Regulation Market), ISO-NE (Alternative Technology Regulation Pilot Program) and IESO (Smart Grid Pilot Program). One Pilot is expected to be completed this fourth quarter and the other two in the first quarter of 2011. All three markets have modified their rules to allow for aggregated load to participate in their ancillary markets. Load is also permitted to provide regulation services in MISO (Demand Response Resource – Type II) and NYISO's Demand-Side Ancillary Service Program.

Historically, the power system has been developed with the following accepted assumptions:

- Loads are somewhat predictable but subject to large variation beyond the control of the utility
- Generation is a stable, dispatchable resource under the direct control of the utility
- Most generation is power rather than energy limited
- Balancing load and generation can only be performed with the direct control of generator power output via Automatic Generation Control (AGC).

Implementing renewable energy and greenhouse gas policy goals is turning this paradigm on its head. As compared to increasing intermittent renewable generation, load can be a reliable and robust resource. Moving forward:

- Load will be increasingly visible and controllable with AMI and Smart Grid initiatives.
- Intermittent renewable generation will add large variations to the generation portfolio, exacerbating load following challenges.
- Many generation and non-generation resources will be energy rather than power limited.
- Increasing amounts of regulation that is responsive and accurate will be required to balance load and generation.

FERC has recognized that load based regulation as key resource and issued order 719 requesting all ISOs to enable them as viable elements of ancillary markets.

With California moving forward to meet its 33% RPS target, there will be an increased need for Regulation services as the penetration of renewable (variable energy) resources increases on the CAISO's system. A resource that can provide Regulation at a lower cost than many existing and emerging resources is load. While individual devices may not be capable of responding to regulation signals, aggregated devices when properly managed can provide fast and accurate response to CAISO, helping to maintain grid reliability. Loads are currently able to participate in Regulation markets in other ISOs, and

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SEMPA strongly encourages the CAISO to consider load participation in Ancillary Service markets as a robust and readily available resource for renewable integration.

The benefits of using load as a Regulation resource are three-fold:

1. It can provide regulation at lower cost than other resources;
2. It can seamlessly handle an offset in the ACE that has been observed, and
3. It can be quickly implemented under CAISO's current regulations with minimal modifications. By aggregating and intelligently coordinating existing loads to provide Regulation.

ENBALA's network is able to provide a resilient, robust and intelligent network of assets that can respond quickly to automatic generation control signals. This is done by utilizing existing resources on the network efficiently without large upfront investment costs. This allows load to provide Regulation at a lower cost than many existing and emerging resources are capable of providing.

Another benefit of using load as a Regulation resource is that it can be quickly integrated into the Regulation market with few changes to the current market rules. Further clarification of aggregation standards is needed, however. If these standards are clarified, aggregated loads could be participating in CAISO's Regulation market early next year. ENBALA's network includes the direct monitoring, measuring and auditing of each network resource. The ISO is able to view the response of each individual resource in real-time and audit their historical performance.

The three pilots of ENBALA's network in PJM, NYISO and IESO are in process to assure the ISOs that load networks are cost effective and responsive.

Initiatives at many levels are promoting the development and implementation of AMI, smart grid, advanced generation and new non-generation technologies. Such initiatives are important in developing a portfolio or resources than will enable us to meet long-term greenhouse gas reduction goals. The development of CAISO Ancillary Service market rules and definitions certainly cannot be made in a vacuum. The CAISO must consider the current and potential capabilities of these resources as it reviews Ancillary Service products. However there should be a clear distinction between the initiatives that support the development of new technologies and the rules by which they participate in CAISO markets. CAISO market rules should be designed solely based on the needs of the CAISO system. Those rules should facilitate and allow participation by a variety of generation and non-generation resources. However the design of those rules must stop short catering to the capabilities of one or more types of technology. Any support the CAISO wishes to provide to technology development and implementation should be done outside the market rules and product definition.

Other ancillary services needs could include ramp and firming.

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Market Design

The non-generator Ancillary Service tariffs that are being modified and submitted this year should allow aggregation of loads for the provision of Ancillary Services without requiring direct telemetry between the CAISO and each individual resource. As has been discussed in the Proxy Demand Resource product development, such requirements are costly overkill when it comes to load participation. ENBALA has a patent-pending method to provide auditable and traceable measurement and verification that is cost effective. The ISO's to which this methodology has been presented have been uniformly impressed and some are considering ENBALA's approach for their load based products.

ENBALA's network pilot projects in PJM, ISO-NE and IESO are demonstrating that aggregated load can provide a robust response that is both viewable in real-time and fully auditable.

The pilot projects have also demonstrated that load can participate in CAISO regulation markets in the near-future without extensive tariff or rule changes. Implementation of load based regulation will not be nearly as complicated as the development and implementation of the Proxy Demand Resource over the last year and a half. Many of the issues related to load participation have been addressed in that stakeholder process. Furthermore, regulation that is provided bi-directionally through energy management can be designed to avoid the 'missing money' settlement issues posed by Demand Response. In addition load based regulation as implemented by ENBALA's network provide any scheduling or baseline gaming incentives.

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