

**UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION**

Integration of Variable Energy Resources

Docket No. RM10-11-000

**MOTION TO INTERVENE AND COMMENTS OF THE
CALIFORNIA ENERGY STORAGE ALLIANCE
ON NOTICE OF PROPOSED RULEMAKING ON INTEGRATION OF
VARIABLE ENERGY RESOURCES**

The California Energy Storage Alliance (“CESA”)¹ hereby respectfully submits these comments in response to the *Notice of Proposed Rulemaking on Integration of Variable Renewable Resources* issued in this docket on November 18, 2010 (“VER NOPR”). CESA appreciates the opportunity to comment in this important proceeding, and emphasize the key role energy storage technology will play in advancing integration of VERs.

I. BACKGROUND.

CESA is an industry group advocating for the rapid expansion of use of energy storage, in all of its many forms, to promote growth of renewable energy and a clean, affordable, and reliable and secure electric system. CESA is technology-neutral and supportive of all business models for deployment of energy storage. CESA’s member companies include a diverse range of advanced energy storage technology and manufacturing companies, systems integrators, and wind and solar energy developers and renewable energy component manufacturers. While CESA’s comments here focus primarily on the FERC’s current VERs proposals in this proceeding, they also encompass the range of goals and strategies pursued by CESA’s membership, from providers of the fastest ancillary services, to the longest duration peak shifting, stand-alone applications, and distributed energy storage integrated with renewable energy resources, including VERs. CESA submits these comments while recognizing that

¹ CESA’s member companies are listed at Section 3 below. <http://www.storagealliance.org>.

aspects of energy storage are also presently the subject of two other active rulemaking proceedings at the FERC.²

CESA strongly supports all of the FERC's proposals included in the scope of this proceeding, namely: (1) require public utility transmission providers to offer intra-hourly transmission scheduling; (2) incorporate provisions into the *pro forma* Large Generator Interconnection Agreement requiring interconnection customers whose generating facilities are variable energy resources to provide meteorological and operational data to public utility transmission providers for the purpose of power production forecasting; and (3) add a generic ancillary service rate schedule through which public utility transmission providers will offer regulation service to transmission customers delivering energy from a generator located within the transmission provider's balancing authority area.³

CESA also highlights several policy initiatives that are related to integration of VERs with energy storage that the FERC should expeditiously consider examining further (i) in this proceeding, (ii) in either or both of the other open rulemaking dockets referred to above, or (iii) in the new rulemaking dedicated exclusively to energy storage, as advocated for by CESA.⁴ This proceeding appropriately deals with clarity and transparency of producing and using ancillary services and the allocation of their costs. In CESA's view, the most needed next step is to concentrate on the costs and benefits of grid-connected energy storage to optimize grid-level production and usage of energy, capacity, and ancillary services integrated with both existing generation and new VERs. These steps include incentive pricing, and full compensation for energy, capacity and ancillary services produced by energy storage technologies.⁵

² See, *Notice of Proposed Rulemaking on Transmission Planning and Cost Allocation by Transmission Owning and Operating Public Utilities*, 131 FERC ¶ 61,253 (2010); *Notice of Proposed Rulemaking on Frequency Regulation Compensation in the Organized Wholesale Electric Markets*, 134 FERC ¶61,124 (2010) ("Frequency Regulation NOPR"); See also, *Frequency Response Metrics to Assess Requirements for Reliable Integration of Variable Renewable Generation, Notice Inviting Comments on Report*, January 20, 2011.

³ CESA adopts and concurs with the comments filed by AWEA in response to the FERC's *Notice of Inquiry on Integration of Variable Energy Resources*, 130 FERC ¶61, 053 (2010).

⁴ See, *Motion to Intervene and Comments of the California Energy Storage Alliance on Request for Comments Regarding Rates, Accounting, and Financial Reporting for New Electric Storage Technologies*, filed in Docket No. AD10-13-000, August 9, 2010.

⁵ Each of these subjects should be considered in depth specifically by the FERC or by RTOs ISOs and other balancing authorities, with general guidance and oversight provided by the FERC, in the context of a new energy storage rulemaking with sufficient breadth of scope to capture the full range of costs and benefits of grid-connected energy storage technologies.

II. COMMUNICATIONS AND CORRESPONDENCE.

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III. MOTION TO INTERVENE IN DOCKET RM10-11-000.

CESA is an unincorporated association, the membership of which consists of A123 Systems, Altairnano, Applied Intellectual Capital/East Penn Manufacturing Co., Beacon Power Corporation, CALMAC, Chevron Energy Solutions, Debenham Energy, Deeya Energy, Inc., Enersys, Enervault, Fluidic Energy, General Compression, Greensmith Energy Management Systems, HDR, Ice Energy, International Battery, Inc., Lightsail Energy, MEMC/SunEdison, Powergetics, Primus Power, Prudent Energy, RedFlow, RES Americas, Restore Energy Systems, Saft, Samsung SDI, Seo, Silent Power, Sumitomo Electric, SunPower, Suntech, Sunverge, SustainX Energy Storage Solutions, Xtreme Power, and Younicos. The views expressed in these comments are those of CESA, and do not necessarily reflect the views of all of the individual CESA member companies. CESA's intervention in this proceeding is in the public interest, and CESA's interests will not be adequately represented by any other party. CESA therefore respectfully requests that this motion to intervene be granted.

IV. THE FERC SHOULD OPEN A RULEMAKING DEDICATED EXCLUSIVELY TO THE COSTS AND BENEFITS OF ENERGY STORAGE FOR INTEGRATION OF VARIABLE ENERGY RESOURCES AND RELIABILITY OF THE GRID.

A. Focus on reforms that will have near-term effects will reduce some, but not all, barriers to integration of VERs.

The FERC is very direct in stating that the purpose of this proceeding is to achieve progress in a few important, but limited goals.⁶ In CESA's view, there is nothing to be faulted

⁶ “. . . in the Proposed Rule, the Commission has decided to propose a limited set of reforms to existing operational procedures that we preliminarily find to be unduly discriminatory and leading to unjust and unreasonable rates for transmission service.” (p. 2).

with such an approach, provided that it is positioned in a way that explains its relationship to other specific proposals and parallel efforts in other FERC proceedings, and clearly points the way to next steps to advance both energy storage and VERs. The VER NOPR does neither of these things at this point, but the FERC should do both in its final rule when it is issued in this proceeding. Whether or not there may be a need for further policy guidance dedicated specifically to VERs in the near future, the FERC should address the broad range of costs and benefits that energy storage brings to the grid beyond the scope of this proceeding and the Frequency Regulation NOPR.

B. A rulemaking dedicated exclusively to energy storage will accelerate VER integration and advance the goal of firm dispatchable renewable energy resources.

Among many authoritative sources, the United States Department of Energy has highlighting the well-understood (but often overlooked) fact that multiple value streams can be captured by the same energy storage system:⁷ “The cost for certain advanced battery technologies has decreased by more than 50 percent, down to \$2,000/kW for a 7 to 8 hour battery, making it possible for these systems to provide an attractive return on investment when multiple value streams are monetized (e.g., shifting renewables from off-peak to on-peak, credit for capacity with use of a 7-hour battery, shaving daily peaks, increasing T&D asset utilization, etc.).” (p. 3).

In addition to the policy-making proceedings referred to above, of course, the FERC is already addressing aspects of energy storage on a case-by-case basis in tariff filings,⁸ and declaratory Orders.⁹ In addition to frequency regulation, the FERC has begun studying other more global aspects of energy storage such as creating an asset class for energy storage.¹⁰ In this proceeding, and looking forward, the FERC should provide a cohesive vision to give both energy

⁷ *Energy Storage-a Key Enabler of the Smart Grid*, Developed for the U.S. Department of Energy Office of Electricity Delivery and Energy Reliability by the National Energy Technology Laboratory, September 2009.

⁸ See e.g., *Order Conditionally Accepting Tariff Revisions and Addressing Petition for Declaratory Order*, 133 FERC ¶ 61,224 (2010).

⁹ See e.g., *Western Grid Development, LLC*, 130 FERC ¶ 61,056 (2010).

¹⁰ *Request for Comments Regarding Rates, Accounting and Financial Reporting for Electric Storage Technologies*, Docket No. AD10-13-000 (June 11, 2010).

storage and VERs the policy momentum that is needed to advance deployment of both to a higher level as quickly as possible.¹¹

V. DEFAULT 15-MINUTE INTRA-HOURLY SCHEDULING ON A NATIONAL BASIS IS AN APPROPRIATE MANDATE.

A. Generation scheduling flexibility will reduce overall system need for ancillary services and benefit all stakeholders.

CESA supports the FERC’s proposal to “provide the transmission customer with the option of using more frequent transmission scheduling intervals within each operating hour, at 15-minute intervals, so that they may adjust their transmission schedules to reflect, in advance of real-time, more accurate power production forecasts, load profiles, and other changing system conditions.” (VER NOPR, pp. 16-17). The FERC properly quotes NERC to the effect that reducing the absolute amount of ancillary services for grid reliability and thereby enables greater focus on the relative quality of energy and capacity provided by energy storage.¹² CESA agrees that: transmission customers delivering energy from energy constrained resources, such as flow-limited hydro generators, emission-limited thermal generators, demand response resources and energy storage resources will be better able to schedule transmission to reflect constraints in their operations. In addition, increased scheduling flexibility should help balancing authorities to more closely match scheduled production with actual output, which will enhance their ability to meet NERC Reliability Standards. (VER NOPR, p. 34).

B. Regional Efforts to Integrate VERs Coupled With Energy Storage Should be encouraged.

Since it was actively involved in the stakeholder process leading up to it,¹³ CESA is very gratified to note the FERC’s observation that “Some RTOs and ISOs are actively discussing changes to their frequency regulation markets or stated at the technical conference that changes might be appropriate. For example, CAISO has recently approved a new Regulation Energy

¹¹ “In proposing these reforms, the Commission seeks to ensure that VERs are integrated into the transmission system in a coherent and cost-effective manner, consistent with open access principles.” (NOPR, p. 15).

¹² “NERC claims that while additional system flexibility can come from many sources, such as the availability of flexible conventional resources and non-conventional resources such as storage and demand response programs, an additional contributor to greater system flexibility includes shorter scheduling intervals, for both within a balancing authority area and between balancing authority areas.” (NOPR, pp. 23-24).

¹³ Conference with CAISO staff, January 12, 2010.

Management (“REM”) program (VER NOPR, pp. 8-9).¹⁴ In addition to the Frequency Regulation NOPR public review process, which will take considerable time, programs like the CAISO’s REM should also be encouraged. In view of current events, it will be of great interest to read the CAISO’s report to the FERC on its progress on implementing REM when it is filed in the first quarter of this year.¹⁵

VI. IMPROVED POWER PRODUCTION FORECASTING WILL ACCELERATE INTEGRATION OF VERS.

A. Optimum situation awareness is a clear benefit for all stakeholders.

CESA agrees with the FERC’s proposal to “require public utility transmission providers to amend their *pro forma* LGIAs to incorporate provisions requiring interconnection customers whose generating facilities are VERs to provide certain meteorological and operational to public utility transmission providers to facilitate public utility transmission providers’ development and deployment of VER power production forecast data tools. (VER NOPR, p. 17). CESA supports the FERC’s proposal regarding forecasting because there is no doubt that it will result in incremental progress toward investment that is clearly needed. It is obvious that the greater certainty there is the more the entire system will benefit. CESA agrees with the FERC’s observation that: “the increased use of power production forecasts in transmission systems where VERs are located can provide transmission providers with improved situational awareness, enable transmission providers to utilize existing system flexibility through the unit commitment and dispatch processes, and, ultimately, lead to a reduction in the amount of reserve products needed to maintain system reliability.” (VER NOPR, p. 45).

B. The definition of “VER” should be accompanied by an objective method of determining whether or not a generator meets the definition.

The definition proffered for comment appears generally adequate for the purpose intended. However, the method for determining when a generation resource actually fits the definition may need more development. The NOPR states that: “For the purpose of this proceeding, the term variable energy resource (VER) refers to an electric generating facility that

¹⁴ CAISO, Board of Governors, Decision on Regulation Energy Management (February 3, 2011).

¹⁵ See, *Cal. Indep. Sys. Operator Corp.*, 98 FERC ¶ 61,327, *order on compliance*, 99 FERC ¶ 61,309 (2002); *Cal. Indep. Sys. Operator Corp.*, 131 FERC ¶ 61,087 (2010);

is characterized by an energy source that: (1) is renewable; (2) cannot be stored by the facility owner or operator; and (3) has variability that is beyond the control of the facility hydrokinetic generating facilities.” (NOPR, p. 1, footnote 2).¹⁶ This definition has the virtues of simplicity and reference to an authoritative source of origin, some guidance as to its method of implementation may be useful.¹⁷

VII. A GENERIC ANCILLARY SERVICE RATE SCHEDULE IS NEEDED TO ASSURE CERTAINTY OF COST RECOVERY.

CESA supports the FERC’s proposed guidelines under which public utility transmission providers may assess generator regulation reserve charges to transmission customers based on traditional cost causation principles. Moreover, CESA specifically agrees with the proposition that: “To the extent a public utility transmission provider proposes to require transmission customers who are delivering energy from VERS to purchase, or otherwise account for, a different volume of generator regulation reserves than it proposes to charge other generating resources, such differing volumes must be shown to be commensurate with the variability that the VERs exhibit on the transmission providers system. Furthermore, the public utility transmission provider must show that it has adopted measures to mitigate the total amount of regulation reserve necessary to manage the variability through the implementation of VER power production forecasting and intra-hourly scheduling.” (VER NOPR, pp. 19).

CESA also agrees in principle with AWEA that “before imposing any specific generator regulation reserve costs to VERs, public utility transmission providers should first implement the following: fast intra-hour markets and intra-hourly scheduling; a robust ancillary services market; the option for third-party or self supply of ancillary services; dynamic transfer capability out of the balancing authority area; and Area Control Error (ACE) diversity interchange or an Energy Imbalance Service market.” (VER NOPR, pp. 74-75).

¹⁶ “The Commission proposes to define a Variable Energy Resource as a device for the production of electricity that is characterized by an energy source that: (1) is renewable; (2) cannot be stored by the facility owner or operator; and (3) has variability that is beyond the control of the facility owner or operator. The Commission believes this definition is consistent with NERC’s characterization of variable generation.” (NOPR, pp. 51-52)

¹⁷ See NERC, *Accommodating High Levels of Variable Generation*, 13-14 (2009), available at http://www.nerc.com/files/IVGTF_Report_041609.pdf.

While the Frequency Regulation NOPR is limited to RTOs and ISOs and to Schedule 3, not the proposed Schedule 10, it is also relevant in this VER NOPR.¹⁸ In the RTOs and ISOs regions which have frequency regulation markets, any reforms proposed for compensation under Schedule 3 should also be included in the proposed Schedule 10.¹⁹

VIII. VERS SHOULD HAVE THE OPTION TO CHOOSE THE LEAST COST OPTION, INCLUDING ENERGY STORAGE, IN ORDER TO FIRM, SHAPE OR DISPATCH THEIR AGGREGATE OUTPUT

The FERC proposes that a transmission provider may require VERs to purchase a greater quantity of regulation reserve after demonstrating that “VERs impose a different per unit impact on overall system variability than conventional generating units.”²⁰ If different types of generating units can impose different amounts of variability on the system, then different types of regulating reserve resources can differ in their ability to address system variations. As discussed in the Frequency Response NOPR, fast energy storage resources can “provide more effective regulation capacity than most other resources.”²¹ The Frequency Response NOPR also notes that each MW from a fast storage system can provide regulation equivalent to 1.43 MWs from hydro or 24 MWs from a steam turbine. Clearly, a MW of regulation reserve capacity from a fast storage system should not be treated as an equivalent to a MW of capacity from a traditional generator.

CESA therefore recommends that a transmission provider may not impose a unique volumetric requirement for specific generator types unless the provider also allows for a performance-based credit against the requirement. For example, a transmission provider may determine that each MW from a VER must procure 0.5 MW of regulation capacity, based on the transmission provider’s provision of regulation capacity from a combustion turbine. In this hypothetical example, the same amount of variability could be achieved by procuring 0.3 MW of

¹⁸ In other regions, frequency regulation is provided by the transmission provider on a cost-of-service basis through Schedule 3, with the transmission provider selecting the mix of resources it uses to provide frequency regulation service.

¹⁹ The proposed Schedule 10 should include a methodology that specifically determines the amount of regulation reserve capacity required to be self-supplied based on the ramp-rate being provided.

²⁰ VER NOPR, p. 95.

²¹ Frequency Response NOPR, p. 24.

capacity from a fast storage system. A VER should be free to utilize 0.3 MW of energy storage if the option is more economic. The obligation of a VER to procure regulation reserve capacity should be based on its ability to dampen variability across its portfolio, rather than an inflexible factor based solely on the VER's nameplate capacity.

If a transmission customer subject to the proposed Schedule 10 chooses to self-supply its regulation reserve capacity, the amount of capacity self-supplied should account for the fact that a MW of reserve capacity from a fast-ramping resource provides more regulation value to the grid per MW than a slow-ramping resource. Thus if a VER resource chooses to self-supply its regulation service from a fast-ramping flywheel storage plant it should be able to self-supply a lower volume of reserve capacity than if it were to choose to self-supply from a slow-ramping traditional resource. Thus, we recommend that FERC allow the proposed Schedule 10 self-supply requirements to vary based on the ramp-rate of the resource or resources providing the service.²²

IX. ENERGY STORAGE INTEGRATED WITH VERS LOCATED OUTSIDE AND WITHIN LOAD CENTERS SHOULD BE COMPENSATED FOR THEIR FULL VALUE.

Solar and wind are renewable energy resources that supply electricity without consuming fuel, producing emissions, or consuming water. Therefore, increased penetration of solar and wind will significantly increase our energy independence while also improving our environmental security. The disadvantages of solar and wind resources are the variability of supply and the variability of their correlation to high demand periods.²³

Similarly, energy storage systems have the ability to provide regulation and balancing services for the grid in general without consuming fuel, producing emissions, or consuming water. Energy storage systems are therefore highly synergistic with wind and solar resources.... incentivizing energy storage systems that increase the surety and correlation of electricity from solar and wind resources provides substantial strategic value to our nation and will enable greater

²² Thus, we recommend that FERC allow proposed Schedule 10 self-supply requirements to vary based on the ramp-rate of the resource or resources providing the service. Faster-ramping resources provide more ACE correction to transmission operators than slower-ramping resources, so Generators should be given credit for this additional service provided.

²³ “. . . intra-hour scheduling intervals also could lay the groundwork for the development of flexible energy and/or capacity products, thereby reducing the need for public utility transmission providers to rely on ancillary services to manage the variability of VEs.” (p. 35).

energy independence and security. Appropriate incentives to consider include accelerated regulatory and interconnection approval processes, federal tax credits, grants in lieu of the investment tax credit, and uplifting the emissions offset accrued from stored VER electricity to compensate for storage losses.²⁴

Energy storage located inside load centers increases transmission line capacity factors while making the overall transmission and distribution network more stable and efficient. It has been shown that maximum benefit comes from a network of smaller energy storage systems at facilities with high electricity demand during peak times as opposed to a large, single energy storage system of the same aggregate rating²⁵ Therefore, a VERS developer with a project design that includes installing energy storage systems near commercial and industrial facilities with high peak electricity consumption should be able to have the energy storage systems qualify for the above incentives and store off-peak VERS generation without having to pay transmission or distribution charges.

X. CONCLUSION.

CESA appreciates this opportunity to submit these comments in response to the NOPR and looks forward to continuing to work with the FERC and stakeholders going forward.

Respectfully submitted,



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²⁴ See, Integrating VERs NOI, 130 FERC ¶ 61,053 at P 2 (citing Div. of Energy Market Oversight, Fed. Energy Regulatory Comm'n, *Renewable Power and Energy Efficiency Market: Renewable Portfolio Standards*, 1 (2009); and see American Recovery and Reinvestment Tax Act of 2009, Pub. L. No. 111-5, sec. 1101, 123 Stat. 115, 319 (2009).

²⁵ (A. Nourai, IEEE Transactions on Power Delivery 23(2008)2168).

CERTIFICATE OF SERVICE

I hereby certify that I have this day served a copy of the *Motion to Intervene and Comments of the California Energy Storage Alliance on Notice of Proposed Rulemaking on Integration of Variable Energy Resources* on all parties of record in proceeding *RM10-11-000* by serving an electronic copy on their email addresses of record and by mailing a properly addressed copy by first-class mail with postage prepaid to each party for whom an email address is not available.

Executed on March 2, 2011, at Woodland Hills, California.



Michelle Dangott

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