



**BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF CALIFORNIA**

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Order Instituting Rulemaking Pursuant  
To Assembly Bill 2514 to Consider the  
Adoption of Procurement Targets for  
Viable and Cost-Effective Energy Storage  
Systems.

Rulemaking 10-12-007  
(Filed December 16, 2010)

**OPENING COMMENTS OF THE VOTE SOLAR INITIATIVE**

**ON THE DECEMBER 12, 2011 STAFF PROPOSAL**

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January 31, 2012

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Pursuant to the December 14, 2011, *Administrative Law Judge's Ruling Entering Initial Staff Proposal Into Record and Seeking Comments*, The Vote Solar Initiative (Vote Solar) submits the following opening comments.

**I. GENERAL COMMENTS**

Vote Solar supports policies designed to ensure that storage plays a role in enabling the grid to transform into a new, more flexible, responsive and dynamic system. This emergent system will be capable of intelligently using assets at all levels from utility-scale projects to individual meters. In turn, renewable energy resources will be fully optimized, moving from fulfillers of a renewable portfolio standard (RPS) mandate to robust grid assets, capable of providing reliable, clean, climate change avoiding, power that meets least cost/best fit scrutiny. Similarly, leveraging other investments in electricity infrastructure, demand-response and end-use efficiency will be enabled.

On the other hand, Vote Solar seeks to avoid policies that essentially treat storage as nothing more than an expensive band-aid for the "problem" of renewable variability. Such an approach does little more than entrench the current fossil fuel and nuclear based

paradigms for managing the electric grid. Storage is not an end in itself, but rather one of a number of potential building blocks in the emergent grid system. Accordingly, as is the case with other possible resources, storage should be evaluated in the context of the Commission Preferred Loading Order and then on a least cost/best fit, technology neutral basis. Under this approach, Votes Solar anticipates storage will be an important part of a carbon-free grid, increasing in importance as penetration of variable renewables increase and other lower-cost sources of flexibility are played out.

## **II. COMMENTS ON IDENTIFIED BARRIERS AND PROPOSED NEXT STEPS**

- (1) *Lack of definitive operational needs*: Vote Solar favors an incremental approach with a broad experimental initial investment that includes analysis of non-storage alternatives.
- (2) *Lack of cohesive regulatory framework*: Vote Solar recommends the addition of AB32 and the California Air Resources Board to the regulatory framework, and analysis of trade-offs over alternate uses of electricity for transportation and heating that might reduce aggregate green house gas (GHG) emissions.
- (3) *Evolving markets and market product definitions*: Vote Solar supports Staff's conclusions.
- (4) *Resource adequacy accounting*: The Commission recently indicated that storage should be address in Phase 2 of R.11-10-023.<sup>1</sup> Nevertheless, to ensure that storage is, in fact, addressed in Phase 2 of R.11-10-023, Vote Solar urges Staff to remain diligent about coordinating this proceeding with R.11-10-023.
- (5) *Lack of cost-effectiveness evaluation methods*: Vote Solar supports both marginal and global methods for evaluating benefits.
- (6) *Lack of cost-recovery policy*: Vote Solar suggests amplification of the proposed next steps in this area, including analysis that includes both cost-based and market-based rates for storage cost-recovery.

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<sup>1</sup> December 27, 2011 *Phase 1 Scoping Memo and Ruling of Assigned Commissioner and Administrative Law Judge* at p. 7; <http://docs.cpuc.ca.gov/efile/RULC/156371.pdf>

- (7) *Lack of cost transparency and price signals (wholesale and retail)*: Vote Solar considers these issues more in terms of long-term goals and lessons learned, as opposed to issues subject to command and control, short term policy making solutions.
- (8) *Lack of utility operating experience*: Vote Solar supports Staff's proposal
- (9) *Lack of well-defined interconnection process*: Similar to the comments regarding Resource Adequacy, Vote Solar supports Staff's proposal regarding addressing storage interconnection I R.11-09-011, but with the same caveat that Staff remains diligent about coordinating this proceeding with R.11-09-011.

### **III. COMMENTS ON KEY NEXT STEPS**

- (1) *Regulatory Framework*: Vote Solar recommends that Staff consider adding utility General Rate Cases (GRCs) and R.11-10-003 (Public Goods Charge (PGC)) to the list of storage related proceedings. GRCs should be added because utilities have sought, or may seek, cost recovery for storage pilot programs in their GRCs. PGC should be added because authorization for storage research or emerging technology funding may be made in the PGC. With respect to regulatory framework issues in general, Vote Solar urges the Commission to keep in mind the fragility of new entrants into the electricity system as another barrier. New technologies specializing in single functional niches (i.e. end-uses) are vulnerable to large fluctuations in valuation for their products due to market and regulatory conditions. Beacon Power<sup>2</sup> is a cautionary tale here, and so initial costs may be higher to offset risk either explicitly via higher capital costs or implicitly through the requirement of long-term pricing agreements.
- (2) *Cost Effectiveness*: Vote Solar recommends Staff also consider (i) that cost-effectiveness of storage as a stand-alone product in a given analytic framework should also incorporate competing solutions for any given "end-use" such as demand response or renewable energy curtailment, and (ii) the development of

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<sup>2</sup> See generally <http://docs.cpuc.ca.gov/efile/CM/130255.pdf> and <http://www.bloomberg.com/news/2012-01-23/evergreen-energy-files-for-bankruptcy-liquidation-1-.html>

proper methods for valuing storage with “stacking”<sup>3</sup> benefits. Consideration of stacking benefits could ensure that proper cost-recovery accrues to a storage solution that supports simultaneous multiple end-uses, and (iii) that storage and various power-electronics in a smart grid have the potential to contribute usefully to the grid in very small units. For example, the aggregate response of storage involved in residential and commercial uninterrupted power supply (UPS) systems could help prevent expensive distribution outages in the <5 second interval<sup>4</sup>. Similarly, the coordinated response of many inverters can improve voltage support and power quality.

- (3) *Roadmap*: Fundamentally, a greater understanding is needed about how much storage will cost, how it will integrate into the functioning of the grid and what it can offer overall. Nevertheless, the only way to move forward with incorporating the storage “wildcard” into the complexity of the grid is by learning by doing: performing careful experiments and focusing intently on lessons learned for feedback into regulatory policy making. This means that in the near term (1-3 years) Vote Solar supports promoting the deployment of storage in as many interesting applications as possible, within a fairly generous cost envelope. This includes taking best advantage of the substantial sums already and currently being deployed on storage projects with ARRA support (\$635M in total with \$6.44M coming from PIER)<sup>5</sup>. At the same time, Vote Solar believes it important to note that because this is essentially a demonstration phase, this phase does not lend itself to productive cost effectiveness analysis. In the medium term (3-5 years), important new functional niches will remain to be explored and demonstrated. The storage focus should, however, now start moving to effectiveness studies and comparative analysis of the cost/benefits of various types of storage, of different

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<sup>3</sup> Stacking refers to a situation when a storage device can be paid multiple times for providing the same capacity for a stack of different services. E.g. Denholm, P., E. Ela, B. Kirby, M. Milligan. (2010). *Role of Energy Storage with Renewable Electricity Generation* NREL Report No. TP-6A2-47187 at p. 11.

<sup>4</sup> LaCommare, Kristina Hamachi; Eto, Joseph H. (2004) *Understanding the cost of power interruptions to U.S. electricity consumers* at p. 6; <http://escholarship.org/uc/item/1fv4c2fv>

<sup>5</sup> Andris Abele, Ethan Elkind, Jessica Intrator, Byron Washom, et al (University of California, Berkeley School of Law; University of California, Los Angeles; and University of California, San Diego) 2011, **2020 Strategic Analysis of Energy Storage in California**, California Energy Commission. Publication Number: CEC-500-2011-XXX at p. 109.

models for cost-recovery of performance requirements for assets coupled to storage, and of comparison with alternate sources of flexibility. In the long term, Vote Solar hopes that a regulatory framework can emerge which allows storage solutions to flourish: 1) in an environment with clear business propositions for storage entrepreneurs, and 2) in a technology neutral subsidy regime (i.e. any subsidies that exist don't refer to storage explicitly, but support filling in specific functional gaps necessary to enable system wide goals like a 33% RPS, which have been characterized in the learning phase). Further, Vote Solar expects that the long-term regulatory regime for storage will increasingly merge with that for smart grid deployment.

(4) *Procurement Objectives*: CAISO reports estimated need of about 3-4,000 MW of storage in bulk system for 2020 in a 33% RPS scenario<sup>6</sup>. Vote Solar believes 15% of this estimated need, or 450-600 MW, is a good threshold for demonstration and experiential learning in the near term (1-3 years). Vote Solar recommends splitting the 450-600 MW need roughly equally between the bulk transmission system and the distribution grid. Vote Solar also supports pilot demonstrations over a broad set of options, and multiple package combinations of storage paired with variable renewable resources.

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<sup>6</sup> KEMA, *Research Evaluation of Wind Generation, Solar Generation, and Storage Impact on the California Grid* at p.4; <http://www.energy.ca.gov/2010publications/CEC-500-2010-010/CEC-500-2010-010.PDF>

**WHEREFORE**, Vote Solar respectfully requests the Commission consider the above stated comments.

Respectfully Submitted,

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