BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

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 (AYK) (Filed December 16, 2010)

REPLY COMMENTS OF SIERRA CLUB CALIFORNIA ON ADMINISTRATIVE LAW JUDGE'S JANUARY 18, 2013 RULING ENTERING INTERIM STAFF REPORT INTO RECORD AND SEEKING COMMENTS

WILLIAM B. ROSTOV
Earthjustice
50 California Street, Suite 500
San Francisco, CA 94111
Tel: (415) 217-2000
Fax: (415) 217-2040
wrostov@earthjustice.org

Attorney for
SIERRA CLUB CALIFORNIA

Dated: February 21, 2013

TABLE OF CONTENTS

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

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 (AYK) (Filed December 16, 2010)

REPLY COMMENTS OF SIERRA CLUB CALIFORNIA ON ADMINISTRATIVE LAW JUDGE'S JANUARY 18, 2013 RULING ENTERING INTERIM STAFF REPORT INTO RECORD AND SEEKING COMMENTS

Sierra Club California ("Sierra Club") respectfully submits the following reply comments on the Administrative Law Judge's Ruling Entering Interim Staff Report into Record and Seeking Comments, dated January 18, 2013.

INTRODUCTION

There is a fundamental issue that should be resolved by Staff that will enable the Commission to further its analysis of energy storage and to fulfill the intent of AB 2514 to promote the use of energy storage in the California electric grid: whether this proceeding seeks to transform the electric system to the low carbon future dictated by the State's clean energy and carbon reduction mandates and goals. Sierra Club agrees with President Peevey that energy storage is a necessary bridge to California's low carbon energy future and that decisions made in this proceeding will set the direction for that future.[1] The Clean Coalition also recognizes energy storage as part of the transition to a sustainable energy system.[2] As such, Sierra Club urges Staff and the Commission to identify the policy objectives for this proceeding that will guide procurement policy. This will capitalize on CESA's observation that "[t]his proceeding is producing comprehensive new thinking on how energy storage can be deployed throughout the

[1] Staff Summary, Energy Storage Procurement Workshop (Jan. 14, 2013) p. 1.
[2] Clean Coalition Comments on Interim Staff Report and Energy Storage Workshops, pp. 3-4.

SB_GT&S_0183524

electric power system to improve system efficiency, and in so doing, enable a more efficient, affordable, cleaner and more reliable electric power system for California."[3]

To form effective policy, the proceeding must set the parameters of what it is seeking to achieve. Without clarity on the proceeding's objectives, effective and measurable results will not be able to be achieved. The various comments provide two competing visions for the outcome of the proceeding. First, Sierra Club along with California Energy Storage Alliance (CESA"), the Electricity Storage Association ("ESA") and Beacon Power advocate for specific procurement targets that will integrate energy storage into the electric system while aiding in the system's transformation to a low carbon grid.[4] Procurement targets will provide measurable benchmarks and a policy commitment upon which the energy storage industry can be firmly established in California. On the other hand, Southern California Edison ("SCE"), Pacific Gas &Electric ("PG&E") and other parties argue that energy storage and conventional natural gas power generation should be allowed to compete on a "technology neutral" basis and that simply removing a specified set of regulatory barriers to energy storage will allow the free market to determine the optimal amount of storage to be employed on the electric system.[5] The de-facto policy embedded in this approach is that energy storage should just be one more tool that fits in the existing market, regulatory structure and power generation mix. This also implies that vitally

[3] Comments of the California Energy Storage Alliance Responding to Administrative Law Judge's Ruling Entering Interim Staff Report into Record and Seeking Comments ("CESA Comments"), p. 2.
[4] *See* Comments of Sierra Club California on Administrative Law Judge's January 18, 2013 Ruling Entering Interim Staff Report into Record and Seeking Comments ("Sierra Club Comments") pp. 1-10; CESA Comments pp. 1-12; Comments of the Electricity Storage Association on Administrative Law Judge's Ruling Entering Interim Staff Report into Record and Seeking Comments ("ESA Comments") pp. 1-4; Comments of Beacon Power, LLC on the Administrative Law Judge's Ruling Seeking Comment on Interim Staff Report and Workshop Topics ("Beacon Power Comments") pp. 14-18.
[5] Comments of Southern California Edison Company (U 338-E) on the Energy Storage Phase 2 Interim Staff Report and Energy Storage Workshops ("SCE Comments"), pp. 2, 7-9; Pacific Gas and Electric Company's (U 39 E) Comments on the Interim Staff Report in Phase 2 ("PG&E Comments"), p. 7; *see, e.g.*, Comments of the Independent Energy Producers Association on the Energy Storage Phase 2 Interim Staff Report ("IEP Comments"), p. 11.

SB_GT&S_0183525

important emerging technologies should be required to compete out of the gate with a long established incumbent technology.

The "technology neutral" approach fails to look at the State's ambitious plans to transform the grid and instead implies that the status quo is adequate for integrating energy storage technologies. The recent decision in the Long-Term Procurement Plan Proceeding on Local Capacity Requirements ("LTPP decision") states that "[u]nder California Governor Brown's June 2010 Clean Energy Jobs Plan, approximately 3000 MW of energy storage would be added to the grid to meet peak demand and support renewable energy generation."[6] The IOU approach will almost certainly fall far short of this amount of storage, since it rejects establishing the Governor's goal—or any significant goal—as a formal policy, and it provides no mechanism for determining how much storage will even occur by the statutory milestones of 2015 and 2020. Failing to make a firm policy commitment to increasing storage will also make it more difficult for storage technologies to compete, an approach that is far from "technology neutral."

I. Procurement Targets Will Advance California's Climate Goals and Benefit Electric Utility Customers.

Sierra Club reiterates its support for procurement targets that can provide a meaningful contribution to reducing GHG emissions in California. If built to sufficient scale, energy storage could even save money, as California transitions from a fossil fuel-based to renewable energy-based electrical grid. Focusing on fossil-fuel-fired plants to integrate renewables and provide other services to the grid is unnecessary given the viability of energy storage technology.[7] For example, ESA describes the system benefits of incorporating more storage into the system

[6] D.13-02-015, p. 60.
[7] R.12-03-014, AES Southland, LLC's Reply Comments on the Proposed Decision Authorizing Long Term Procurement for Local Capacity Requirements (Jan. 22, 2013), p. 4 (AES has deployed 72 MW of energy storage globally.); *see also* Beacon Power Comments, pp. 3-4; SCE Comments, pp. 3-4; ESA Comments, p. 4.

SB_GT&S_0183526

including maximizing the air pollution benefits of the 33% RPS.[8] Procurement targets will spur development of energy storage; as a result, utilities will need to purchase less regulation to maintain system reliability, and electric utility customers will benefit.[9] ESA argues that "[s]mart procurement policy . . . that includes energy storage would benefit by setting targets at a relevant scale, in the hundreds or thousands of megawatts, to drive and benefit from these economies of scale."[10]

This proceeding, which was created by the legislature to focus on energy storage policy, should not adopt a "technology neutral" approach. This recommendation by the IOUs fundamentally defeats the purpose of this proceeding, namely, to create energy storage policy and procurement targets. The IOUs have provided no evidence that eliminating a selected list of regulatory barriers to energy storage and allowing energy storage to compete in the market will facilitate the amount of storage necessary for California's clean energy future. Moreover, this approach creates no assurance of, or timeline for, implementation because it is dependent on multiple proceedings, none of which is solely focused on storage, as this one is.

To effectively develop procurement targets, Staff needs to establish the objectives for the targets. Sierra Club urges the Commission to adopt storage procurement objectives that focus on integrating the current 33% RPS mandate as well as looking forward to integrating the much higher level of renewables that will be necessary to meet to the State's goal of 80% GHG reduction by 2050.[11] Within this context, Sierra Club supports the CESA in the general notion of having a balanced mix of storage that supports both central and distributed generation.

CESA mentions an optimal 1:3 ratio for "Behind the Meter" storage based upon integrating 12,000 MW of distributed generation ("DG") proposed by Governor Brown, which

[8] ESA Comments, pp. 2-4; *see also* Beacon Power Comments, p. 7
[9] Beacon Power Comments, pp. 7-8.
[10] ESA Comments, p. 5.
[11] *See* Executive Order S-3-05, http://www.dot.ca.gov/hq/energy/ExecOrderS-3-05.htm (as of Feb. 4, 2013).

SB_GT&S_0183527

implies up to 4000 MW of distributed storage.[12] Behind the meter storage from small distributed facilities would help greatly in deploying large amounts of generation on distribution circuits. However, this will also—without question—require a different regulatory and market structure than is ordinarily used for contracting with natural gas central power plants.

The specific barriers and needs may differ according to the type of distributed generation. While CESA refers to the renewable DG in the Governor's goal as "Behind the Meter", this is not actually the case, since there are thousands of megawatts of wholesale distributed generation that are not behind the meter. Furthermore, the Commission should consider whether procurement targets might include specifications for a portion to be utility-owned storage, on a cost plus profit basis, as in the RPS and IOU PV programs. This might incentivize the utilities to be more supportive of procurement targets for storage, if they can directly profit from this grid resource.

CESA also mentions that it expects 2000 MW to 3000 MW of pumped storage facilities to be potentially on line by 2020, given the right policy support. Pumped storage would be normally connected to the transmission system, and support central station solar and wind power. This is related to the ancillary services need for the transmission grid projected by CAISO.[13] While Sierra Club supports integrating storage with central station renewables, we note that pumped hydro is not the only—or even necessarily the best—storage option for supporting remote renewable generation. For example, General Electric's new wind turbines come with the option of 15 minutes of on-site storage. On-site storage reduces or avoids several issues related to moving wind power to a remote storage facility, including additional cost, transmission, efficiency losses, and problems with load balancing.

[12] CESA Comments, pp. 9-10.
[13] CESA Comments, pp. 9-10.

SB_GT&S_0183528

By setting the first procurement target for energy storage resources, the LTPP decision provides an important step in the right direction, but the energy storage proceeding needs to further that work and establish the contours of energy storage procurement for each of the IOUs. The LTPP decision requires the procurement of 50 MW of the most cost-effective and best-located energy storage projects to meet local capacity requirements in the Western Los Angeles Basin, as well as authorization to procure up to an additional 750 MW of energy storage resources or preferred resources to meet local capacity requirements.[14] Although D.13-02-015 sets initial procurement targets for energy storage resources, it contemplates that further mandates may result from this proceeding. [15] The LTPP decision requires Southern California Edison ("SCE") to "continue to obtain resources which can be used in these local reliability areas through processes defined in energy efficiency, demand response, renewables portfolio standard, **energy storage** and other relevant dockets."[16] This proceeding should build on the momentum for procurement targets created by the LTPP decision.

While CESA does not directly propose a procurement target specifically for pumped hydro storage, they do suggest that the Commission set storage targets keeping in mind the potential for 2000 to 3000 MW of storage projects to come on line by 2020. While Sierra Club supports ambitious targets for storage, we also urge the Commission to insure that this program is not dominated by pumped storage technology. Pumped hydro raises a potential host of environmental and planning issues that are categorically different from other forms of energy storage. About 4000 MW of pumped hydro storage is already deployed in California, and new pumped storage would be subject to extensive environmental analysis. In addition, it raises a different set of procurement issues compared to other forms of storage. For example, the lead

[14] D.13-02-015, pp. 2, 62.
[15] D.13-02-015, pp. 2, 117
[16] D.13-02-015, p. 2 (emphasis added).

SB_GT&S_0183529

time of pumped hydro is much longer and does not have the same optionality as battery projects. CESA even notes that the statutory timeframes may not fit the timing of pumped hydro project capacity, which can take a decade or more to develop.[17] In addition, pumped hydro would not accomplish the same market transformation and specific support of distributed generation as other storage technologies. Given the additional host of issues raised by pumped hydro, Sierra Club recommends that this specific technology not be the primary focus of the energy storage program in this proceeding.

II. The Record Is Replete with Existing Energy Storage Projects; Only Requiring Demonstration Projects Would Be a Step Backwards.

The comments that advocate that the proceeding require demonstration projects rather than procurement targets are advocating for less than the status quo. ESA, Beacon Power and SCE list a number of energy storage projects that are in operation or under development. Although there are operational issues to work out as storage is installed on the grid, these issues are not insurmountable and appear to be normal issues arising from integrating new technologies.[18] ESA lists 200 MW of energy storage projects, primarily batteries that can provide a wealth of information about storage operation.[19] SCE lists several projects that it is currently developing and deploying.[20] Beacon is deploying its flywheel technology.[21] In addition, AES Southland has already deployed 72 MW of cost-effective storage. [22] Moreover, the LTPP requires procurement of 50 MW of energy storage resources in the Western L.A. Basin. The Commission has set "this [target] as a reasonable and modest level of targeted procurement of an emerging resources [sic], and as an opportunity to assess the cost and performance of energy

[17] CESA Comments, pp. 11-12.
[18] Jack Ellis Comments, p. 18.
[19] ESA Comments, p. 4.
[20] SCE Comments, pp. 3-4.
[21] Beacon Power Comments, pp. 3-4.
[22] R.12-03-014, AES Southland, LLC's Reply Comments on the Proposed Decision Authorizing Long-Term Procurement for Local Capacity Requirements (Jan. 22, 2013), p. 4.

SB_GT&S_0183530

storage resources."[23] Since this proposed objective has already been covered by Commission action, this proceeding should focus on determining the right mix of energy storage for each of the IOUs.

After the Staff sets the policy goals for energy storage procurement, as recommended by Sierra Club above, Staff should hold additional workshops to develop the details of specific procurement targets. These workshops can build on the existing projects and determine how to have additional procurement targets complement and enhance the target already set in LTPP. This process should also include consideration of the following policies recommended by CESA:

> (1) establish energy storage procurement goals for resources that are designed specifically to provide frequency regulation and other ancillary services; (2) adopt rules that cause utilities to look to energy storage systems to provide ancillary services before looking to fossil-fired generation for such services; and (3) allow utilities to utilize a portfolio approach that enables them to procure energy storage systems that provide one specific service to the grid, such as frequency regulation, if utilization of those resources in the utility's portfolio provide a benefit to ratepayers.[24]

III. The Proceeding Should Dedicate Remaining Time to Valuing the Benefits of Energy Storage.

Much more work can and should be done within this proceeding to value the benefits that energy storage can provide to the electrical grid. AB 2514 requires that the Commission consider viable and cost-effective procurement targets, and to this end, "the commission may consider . . . refinement of existing procurement methods to properly value energy storage systems."[25] Sierra Club argues that this consideration is necessary given the valuation challenges identified in the Use Cases.[26] The central question, then, becomes: how will cost effectiveness modeling, which is quickly becoming the preeminent task in Phase 2, move us closer to the directives laid out in AB 2514? Rather than modeling Use Cases, the Sierra Club proposes, as stated in Pacific Gas & Electric's (PG&E's) opening comments, that "the Commission focus on defining the

[23] D.13-02-015, p. 62.
[24] CESA Comments, pp. 2-3.
[25] Cal. Pub. Util. Code §2836(a)(1)
[26] CESA Comments, pp. 12-13; Beacon Power Comments, pp. 9-10.

SB_GT&S_0183531

methodology and determination of valid benefits associated with storage, rather than focusing on a specific cost-effectiveness model."[27]

A. Relying on the Market to Value Energy Storage Is Unwise.

Some parties claim that the market will accurately value the benefits of energy storage; if an energy storage project is cost-effective, the market will demonstrate it to be so, and it will be selected to meet need.[28] The Independent Energy Producers Association (IEP) suggests that the Commission rely upon "existing procurement mechanisms to determine the cost effectiveness of energy storage resources" since California has already taken some steps toward valuing benefits provided by non-conventional (i.e. non-fossil-fueled) resources.[29] IEP specifically mentions "multi-year contracting for Resource Adequacy (RA), defining flexible capacity, and removing barriers to participation in the CAISO markets."[30] This proceeding should dismiss the notion that, since California has made a bit of progress in valuing these resources, nothing more is required to allow energy storage to enter the market on a level playing field. Energy storage provides unique benefits to the system.[31] Even accounting for the progress California has made in this arena, not all of these benefits are valued adequately in the market. For example, Southern California Edison (SCE) joins IEP in describing the ways in which many benefits of storage can be captured in the market, yet even SCE notes that optionality has not been valued in the market and that valuation of optionality would require changes to current procurement methods.[32] CESA explains that "none of the methods proposed seem to take into consideration the unique benefits of energy storage in reducing emissions and increasing grid fleet efficiency. If the unique

[27] PG&E Comments, p. 7.
[28] IEP Comments, pp. 3, 5-6; SCE Comments, pp. 11-13.
[29] IEP Comments, p. 6.
[30] IEP Comments, p. 5.
[31] Comments of BrightSource Energy, Inc. on the Administrative Law Judge's Ruling Entering Interim Staff Report into Record and Seeking Comments ("BrightSource Energy Comments") p. 4.
[32] SCE Comments, p. 14.

SB_GT&S_0183532

benefits of energy storage cannot be adequately represented in the models, the cost-effectiveness analysis would undervalue the benefits of energy storage."[33]

The Commission should consider changes to procurement that value optionality.[34] The Commission should continue its efforts to accurately value all the benefits energy storage contributes. Furthermore, cost-effectiveness analysis, and existing procurement mechanisms, will tend to rely on current storage technology costs, and therefore fail to incorporate the longer term benefits of market transformation and the potential for reducing future costs through current investments. As a result, any cost-effectiveness analysis will likely err on the side of being overly conservative.

B. Use Cases Will Not Advance the Proceeding's Goals and Should Not Be the Focus.

Use Cases can provide useful information about the costs associated with specific energy storage applications and the barriers those applications face in entering the market. Were there more time available in this proceeding, dedicating resources to further evaluation of the Use Cases would be a worthwhile endeavor. But, given the time and resources available, focusing on Use Cases of limited import is unwise. Many parties noted that the Use Cases are helpful but far from comprehensive in their valuation of benefits.[35] A more broadly applicable cost-effectiveness methodology is needed than what will result from the EPRI/E3 or KEMA model. For example, these models do not account for portfolio impacts.[36]

---

[33] CESA Comments, p. 12-13.
[34] *See* Cal. Pub. Util. Code §2836(a)(1)
[35] Opening Comments of the Consumer Federation of California on the Energy Division Staff Interim Report (Phase 2) on Energy Storage in Rulemaking R.10-12-007 ("CFC Comments"), pp. 1, 2 (Use Cases provide useful information but are "not a sound foundation for permanent, widespread state mandates or Commission procurement goals."); Clean Coalition Comments on Interim Staff Report and Energy Storage Workshops ("Clean Coalition Comments"), p. 8 ("Use Cases are a necessarily limited tool to frame the Commission's thinking on these issues.); CESA Comments, pp. 12-13 ("It is important to recognize that to determine cost-effectiveness for energy storage use cases all the benefits should be considered and included."); Beacon Power Comments, pp. 9-10 ("[T]he Use Case fails to adequately address other issues, especially describing the Other Beneficial Attributes and whether they are captured by current or planned market mechanisms".).
[36] CESA Comments, p. 16.

SB_GT&S_0183533

IV. The Question of Whether Energy Storage Is a Preferred Resource Does Not Need to be Addressed in this Proceeding.

Sierra Club agrees with CESA that the approach in the LTPP proceeding is sufficient for the time being.[37] In that proceeding, the Commission authorized procurement of "preferred resources consistent with the Loading Order in the Energy Action Plan, or energy storage resources."[38] Procurement authorization in this proceeding can simply set energy storage goals and not get bogged down in the thorny issues of whether energy storage or certain types or functionalities of energy storage should be considered a preferred resource.

CONCLUSION

For foregoing reasons and the reasons in Sierra Club's Comments, Sierra Club requests that the Commission adopt procurement objectives and targets and develop a cost-effectiveness methodology that sufficiently values energy storage resources.

Respectfully submitted,

/s/ WILLIAM B. ROSTOV
By: William B. Rostov

WILLIAM B. ROSTOV
Earthjustice
50 California Street, Suite 500
San Francisco, CA 94111
Tel: (415) 217-2000
Fax: (415) 217-2040
wrostov@earthjustice.org

Attorney for
SIERRA CLUB CALIFORNIA

Dated: February 21, 2013

[37] CESA Comments, p. 14.
[38] D.13-02-015, p. 2

SB_GT&S_0183534