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)

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

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Sierra Club California ("Sierra Club") respectfully submits the following comments on the Administrative Law Judge"s Ruling Entering Interim Staff Report into Record and Seeking Comments, dated January 18, 2013. These comments address the January 14, 2013 workshop on procurement targets as well as the issues in the Interim Staff Report.

INTRODUCTION

With the passage of AB 2514, California positioned itself as a leader on energy storage. Although other jurisdictions are now beginning to address energy storage, the energy storage industry is proverbially waiting with baited breath to see if California will provide the requisite policies to enable storage to be procured and placed on the grid in a timely manner. A final decision that creates a procurement strategy that integrates renewables and reduces greenhouse gas emissions will develop a robust market for energy storage resources and broadcast broadly that energy storage can play an important role in a low carbon future. On the other hand, if California fails to take action and fiddles around the margins as suggested by the IOUs, California may be in the unenviable position of sending negative signals to the energy storage marketplace and promoting an unsustainable business as usual.

The Long-Term Procurement Proceeding"s proposal to require 50 MW of energy storage to meet local capacity requirements in the Western Los Angeles Basin and allowing additional energy storage to meet local capacity requirements[1] is a good starting point, but this proceeding must build on that momentum. Governor Brown"s June 2010 Clean Energy Jobs Plan reportedly requires 3,000 MW of energy storage by 2020 to integrate its proposed renewable generation.[2] Similarly, the California Energy Commission"s Public Interest Energy Research (PIER) Program energy storage report also states that "[s]tudies indicate that California may require between 3,000 to 4,000 megawatts of fast-acting energy storage by 2020 to integrate the projected increase in renewable energy."[3]

Throughout this proceeding, Sierra Club has maintained that the major impediments to adequately incorporating energy storage resources into the California electric system are the lack of procurement targets and the lack of a methodology for valuing the costs and benefits of energy storage.[4] The proceeding is finally at the fork in the road where both of these issues are on the table for discussion and decision, but more needs to be done. First and foremost, Staff has not developed a proposal for cost-effectiveness, which is a major regulatory barrier and a component for evaluating procurement targets. Second, Staff finally held its first workshop on procurement targets two years after the proceeding commenced even though the dispute regarding

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[1] R.12-03-014, Proposed Decision Authorizing Long-Term Procurement for Local Capacity Requirements (Dec. 24, 2012) ("LTPP PD") p. 80.

[2] Brown, Edmund G., *Clean Energy Jobs Plan* (June 2010), http://gov.ca.gov/docs/Clean_Energy_Plan.pdf (as of Feb. 1, 2013), as cited in Powers, Bill, Prepared Direct Testimony of Bill Powers on behalf of the California Environmental Justice Alliance, CEJA-01 in R.12-03-014, p. 3 ("The Plan calls for energy storage equivalent to 5 percent of peak load. California peak load is approximately 60,000 MW. Five percent of 60,000 MW is 3,000 MW").

[3] 2020 Strategic Analysis of Energy Storage in California, Public Interest Energy Research (PIER) Program Final Project Report, November 2011, CEC-5000-2011-047 ("PIER Report"), http://www.energy.ca.gov/2011publications/CEC-500-2011-047/CEC-500-2011-047.pdf, (as of January 30, 2012), p. 6.

[4] *See, e.g.*, R.10-12-007, Reply Comments of Sierra Club California on Administrative Law Judge's July 21, 2011 Ruling Entering Documents Into Record And Seeking Comments (Sept. 16, 2011) pp. 1-2; R.10-12-007, Opening Comments Of Sierra Club California On Administrative Law Judge"s December 14, 2011 Ruling Entering Initial Staff Proposal Into Record And Seeking Comments (Jan. 31, 2012) p. 15.

procurement targets has permeated the proceeding. Staff now cautions that the statutory mandate for a decision may not allow sufficient time to address all the issues in this proceeding. Sierra Club once again reiterates its position that a cost-effectiveness methodology and the adoption of a procurement target are the two essential outcomes of this proceeding and both should be the focus of the remaining time.

I. The Commission Should Adopt Procurement Targets.

Sierra Club strongly supports the California Energy Storage Alliance"s ("CESA") position that procurement targets will successfully develop energy storage resources. The alternative proposed by each of IOUs of only attempting to fix regulatory barriers provides a very uncertain future for energy storage resources and does not fulfill the legislative intent of AB 2514 to promote the use of energy storage in the California electric system. Under their proposals, the IOUs were unable to identify the amount of energy storage that would be in place by 2020 and the role that it would be playing. PG&E and SCE candidly admitted during the workshop that each did not know how much energy storage would result from their proposals. Staff should adopt CESA"s criteria for determining whether procurement targets should be adopted. CESA explains:

> Procurement goals for a technology class make sense when:
>
> 1. All benefits are not monetized through existing rules and policies, but un-captured benefits demonstrate the technology"s cost-effectiveness.
> 2. Widespread deployment creates net benefits for society and ratepayers.
> 3. Increasing scale improves cost-effectiveness compared to business-as-usual alternatives.
> 4. The inertia of business-as-usual procurement must be overcome.
> 5. Near-term inaction will risk incurring substantial lost opportunity costs."[5]

[5] CESA, Successful AB 2514 Procurement Target Evaluation, Powerpoint (Jan. 14, 2014) ("CESA PP") p. 8. *See also* CESA PP, pp. 9-13 (these slides provide more detailed explanation of the factors).

Sierra Club agrees with CESA"s conclusion that "procurement goals for energy storage should be set now; to help realize a robust, reliable, sustainable grid of the future."[6]

To pick effective procurement targets, the Commission should construct targets based on AB 2514 policy goals and California"s clean energy mandates. In its opposition to procurement targets, SDG&E argued, *inter alia*, that storage is a means to end and should not be considered as an end in and of itself.[7] Sierra Club agrees that a procurement target should not established for its own sake, and that is why a procurement target should be tied to concrete state policy goals and mandates.

The legislature set out the relevant benchmarks for creating procurement targets based on policy goals. In AB 2514, the legislature found that the expansion of energy storage systems could assist load-serving entities in "integrating increased amounts of renewable energy resources into the electrical transmission and distribution grid in a manner that minimizes emissions of greenhouse gases," "optimize the use of the significant additional amounts of variable, intermittent, and off peak electrical generation from wind and solar energy," reduce "the need for new fossil fuel-powered peaking power plants," avoid or reduce peak load from "high carbon-emitting electrical generating facilities," and provide "ancillary services otherwise provided by fossil-fueled generating facilities" reducing the emissions of carbon dioxide and criteria pollutants.[8] These functions of energy storage should provide the context for establishing procurement targets. This recommendation is consistent with the recommendation in the California Energy Commission"s PIER Program report on energy storage which states: "Should the CPUC determine targets to be appropriate, it could structure the targets to support the

[6] CESA PP, Slide 14.

[7] Staff Summary, Energy Storage Workshop (Jan. 14, 2013) ("Staff Summary") p. 4.

[8] AB 2514, Stats. 2010, ch. 469 Section 1(a-e).

legislature"s initial emphasis on renewables integration, as demonstrated by the opening text of AB 2514."[9] In a similar vein, "Germany views energy storage as integral to its national plan for deployment of intelligent smart grids and demand-side load management."[10]

More fundamentally, the energy storage procurement targets should be consistent with and back calculated from the State"s long-term target of reducing emissions to 80% below 1990 levels by 2050[11] which likely requires the transition to a zero carbon energy supply.[12] In some parts of the state such as the LA Basin, replacing fossil fuel generation with energy storage will be an important component to reducing persistent, unhealthy air. According to the South Coast Air Quality Management District, "a transition to zero- and near-zero emission technologies is necessary to meet 2023 and 2032 air quality standards and 2050 climate goals."[13]

The Phase 1 decision indicated that the scenarios were "intended to align with existing state and Commission policy objectives particularly those related to increasing renewables and distributed generation, reducing greenhouse gas emissions, limiting peak growth and modernizing the grid."[14] The same criteria should be used for procurement targets. These are key roles that energy storage can and should play in the future energy grid. The PIER report explains

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[9] PIER Report, p. 159.

[10] "Energy Storage: The Road Ahead," Todd Alexander and Shelka Arora, Chadbourne & Parke, LLP, p. 3 http://www.chadbourne.com/files/Publication/890bc1bb-bcb0-43ab-92ad-c534393fdda2/Presentation/PublicationAttachment/95d5fa2d-fdcb-4301-8e18-c82426491acb/EnergyStorageRoadAhead_Alexander_Nov12.pdf (as of Feb. 2, 2013).

[11] *See* Executive Order S-3-05, http://www.dot.ca.gov/hq/energy/ExecOrderS-3-05.htm (as of Feb. 4, 2013).

[12] *See, e.g.,* "Report Maps California's Energy Future to 2050" (May 2011), http://www.ccst.us/publications/2011/2011energy.php (as of Feb. 4, 2013) (meeting 2050 target requires that "the electricity generating capacity of the state [] be almost entirely replaced and then doubled, and all with near zero-emission technology."); California Council on Science and Technology, California"s Energy Future: The View to 2050, p. 35, http://www.ccst.us/publications/2011/2011energy.pdf (as of Feb. 4, 2013); Staff Summary, pp. 1-2 (President Peevey statement citing this study); *see also* European Wind Energy Ass"n, EU Energy Policy to 2050: Achieving 80-95% emissions reductions (Mar. 2011) at 7 (finding that achieving similar 2050 reduction target in Europe "is only certain if the power sector emits zero carbon well before 2050.") http://www.ewea.org/fileadmin/ewea_documents/documents/publications/reports/EWEA_EU_Energy_Policy_to_2050.pdf (as of Feb. 4, 2013).

[13] Final 2012 Air Quality Management Plan, South Coast Air Quality Management District (December 2012) pp. 1-20.

[14] D. 12-08-016, p. 25.

that "[s]tudies indicate that California may require between 3,000 to 4,000 megawatts of fast-acting energy storage by 2020 to integrate the projected increase in renewable energy."[15] In addition, the need for energy storage will be greater by 2020, because it will play a role in the clean energy future, which necessitates a move away from fossil fuels and towards more renewable power. To achieve California"s goal of an 80% reduction in carbon emissions by 2050, the amount of storage on the grid will have to increase dramatically.[16]

Sierra Club generally agrees with CESA that procurement targets should be based on directed procurement based on end uses rather than on a statewide mandate.[17] However, the analysis of the directed procurement should be expanded beyond end uses to include the State"s carbon reduction goals as well as the clean energy mandates. For example, the State is required to meet the 33% RPS mandate by 2020. The directed procurement should focus on end uses that facilitate renewable integration and carbon reduction. This proceeding needs to incorporate these goals as procurement benchmarks.

The various state legislation and Commission policies for distributed generation, such as GoSolar, the RAM, the IOU PV program, as well as the Governor"s overarching goal to develop 12,000 megawatts (MW) of distributed generation by 2020, can be the foundation for addressing procurement targets. Rather than backing up this new generation with natural gas, the Commission should maximize the environmental benefits of the distributed generation goals and policies by encouraging the development of new low carbon energy storage systems that will integrate this increase in distributed generation. The current business as usual model of relying

[15] PIER Report, p. 6.

[16] *See* Cal. Energy Commission, Renewable Power in California: Status and Issues, CEC-150-2011-002 (Aug. 2011) p. 52; *see also* Staff Summary, p. 1 (President Peevey"s statement at the workshop: "I believe the Commission"s energy storage policy is the bridge to our long-term future, not only 10 years from now, but 40 years from now and beyond. And we must start building that bridge or we will never reach our 2050 goals to reduce greenhouse gas emissions by 80% from 1990 levels.")

[17] CESA PP, p. 21.

on new natural gas plants for renewable integration needs to end, but the regulatory process that would successfully integrate energy storage resources into the electric system and provide part of the solution does not effectively include energy storage resources. As President Peevey explained, procurement of energy storage resources will facilitate the long-term transition to a low carbon future and address the pressing problem of climate change.[18] If sufficient targets for energy storage resources are effectively set, energy storage will also play an important role in the current grid integrating the 33% renewables that are required to be in place by 2020.

Sierra Club reiterates its proposal for procurement targets from the Opening Comments Of Sierra Club California On Administrative Law Judge"s December 14, 2011 Ruling Entering Initial Staff Proposal Into Record And Seeking Comments (Jan. 31, 2012), pp. 11-12. Those comments stated:

> Setting initial, minimal procurement objectives, for example, goals of 500 megawatts each for PG&E and SCE and 100 megawatts for SDG&E by December 31, 2015, would at least get the program moving with low risk to billpayers. More complex questions about market systems can be postponed by simply allowing IOUs to obtain cost recovery for a modest amount of early storage facilities built in the first year. The initial targets would represent about 20% storage capacity relative to the approximately 5,000 megawatts of renewable distributed generation that is currently planned by 2016 in the IOU territories programs such as the RAM, IOU Solar program, GoSolar, SB 32 FiT, and legacy programs.[19] These storage goals could then be increased as needed in future phases for years beyond 2016. . . . The proceeding should also consider a target for distributed electricity storage facilities[20] including an analysis of EES targets that would meet the needs of the Governor"s Clean Energy Jobs Plan.
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> Sierra Club agrees with the PIER report that "targets under AB 2514 are a likely driver for energy storage technologies."[21] The PIER report explains that "[t]he state can boost appropriate deployment of energy storage by setting targets for procurement under AB 2514, ideally in a two-phase process with short-term

[18] Staff Summary, pp. 1-2.

[19] "Renewable Power in California: Status and Issues," Lead Commissioner Report, California Energy Commission, December 2011, CEC-150-2011-LCF-Rev1 ("Renewable Power in CA"), pp. 48-49.

[20] *See Id.*, p. 75.

[21] *Id.*, p. 114.

> and long-term targets. Setting procurement targets would ensure that conventional energy storage technologies do not have an unfair advantage over newer or less proven options that may nonetheless become more cost effective over time."[22] The long-term targets should promote the development of EES as emerging technologies. As more technologies are developed and integrated into the grid, the costs will go down.[23]

The procurement target should also include a directive for each IOU to site energy storage resources in the most preferred locations. There is precedent for this approach. The recent Local Capacity Requirements Proposed Decision in LTPP required consideration of most effective locations for filling LCR needs. [24] There should be a similar requirement for energy storage resources. At the beginning of this proceeding, Sierra Club requested locational information be provided by CAISO and the IOUs[25] but Staff has not pursued this avenue. As a result, the record does not contain this type of information even though certain locations would be more effective than others for certain energy storage resources. Instead of deferring decisions because of lack of information, the Commission can require effective locations to be considered as part of procurement targets. Alternatively, the cost-effectiveness methodology can include an additional value for effective locations.

The IOUs" call for more demonstration projects as a substitute for procurement targets is inconsistent with the intent of AB 2514. The statute requires the Commission to consider information from existing pilot programs; it does not require additional study. Section 2836.2 states: "In adopting and reevaluating appropriate energy storage system procurement targets and policies pursuant to subdivision (a) of Section 2836, the commission shall do all of the following: (a) Consider existing operational data and results of testing and trial pilot projects

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[22] *Id.*, p. 10.

[23] *Id.*, p. 183.

[24] LTPP PD, p. 85

[25] *See* R.10-12-007, Comments of Sierra Club California on Administrative Law Judge's July 21, 2011 Ruling Entering Documents into Record and Seeking Comments (Aug. 29, 2011) pp. 7-8.

from *existing* energy storage facilities."[26] The legislature adopted AB 2514 to spur action; it wants the Commission to promote policies that result in the commercialization and widespread use of energy storage. Concluding that more demonstration/pilot projects are necessary would be inconsistent with legislative direction. Staff should reject proposals that promote demonstration/pilot projects as the major outcome of this proceeding. However, Sierra Club does agree with CESA that pilot programs are appropriate where cost-effectiveness for certain types of energy storage cannot be shown, in order to move those projects towards market transformation or commercial readiness of certain emerging technologies.[27]

It is important to note that cost-effective energy storage does exist. In comments on the Proposed Decision on Local Capacity Requirements in the LTPP, AES rebutted arguments questioning the cost-effectiveness of energy storage and explained that grid size storage projects are economically viable.

> Over the past five years, AES Southland affiliates have deployed 72 MW of cost-effective energy storage in the United States and abroad, including an installation of 32 MW, and proposed additional projects of the type that would meet LCR needs in the 100 to 400 MW range. Energy storage technology is ready for deployment at a scale of 50 MW and above, and its inclusion in SCE"s LCR procurement would establish a foundation for energy storage deployment under a commercial structure similar to traditional capacity resources while promoting a diverse capacity portfolio in Southern California.
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> The cost-effectiveness concerns raised by parties (SCE at p. 5; PG&E at p. 4) related to the energy storage requirement are overstated. Energy storage technology costs have declined steadily, and are expected to continue to decline . . . .[28]

[26] AB 2514, Stats. 2010, ch. 469 section 2836.2 (emphasis added).

[27] CESA PP, p. 25.

[28] 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.

These comments further confirm AES"s presentation at January 14th workshop. The time to act on procurement targets is now.

II. Sierra Club Responses to Question in Interim Staff Report.

1. Use Cases In and Of Themselves Are Insufficient for Addressing The Key Issues in the Proceeding.

- Do the Use Cases provide an adequate representation of the range of valuable applications that energy storage currently provides to the electric grid?
- Besides the section on cost-benefit analysis, which is still a work-in-progress, is there some critical element missing from the Use Cases?

Although the Use Cases serve a valuable function, they are not the appropriate starting point to fulfill the mandate of this proceeding. The Use Cases represent a range of possible energy storage applications that should be considered during procurement. However, these Use Cases should not be an end in and of themselves. In this proceeding, the Commission is tasked with determining "appropriate targets, if any, for each load-serving entity to procure viable and cost-effective energy storage systems."[29] The Use Cases were developed to aid in this process by "identify[ing] with some specificity the monetized and non-monetized benefits of storage, barriers impeding market implementation, and potential policy options for removing those barriers."[30] However, the proceeding has not established a methodology for valuing benefits associated with the various Use Cases, particularly those that are difficult to monetize, as noted in multiple Use Case documents.[31] Because the proceeding has yet to establish such a methodology, solely focusing on the Use Cases is insufficient. The Commission should take a

[29] AB 2514, Stats. 2010, ch. 469 section 2836(a)(1).

[30] R.10-12-007, Energy Storage Phase 2 Interim Staff Report (ISR), p. 8.

[31] Demand Side Management, Storage co-located with EV charging station, p. 11; Transmission Connected Energy Storage Use Case, p. 19; Distributed Energy Storage: Substation, p. 9.

broader view that incorporates the State"s policy goals and incorporates benefits that are not currently monetized.

The Use Cases presented do provide the proceeding with important information about specific energy storage applications, but to address energy storage adequately, a more comprehensive perspective must be examined. The Use Cases examine specifics without drawing a relationship to the State"s policy goals. The Use Cases have helped identify benefits of specific applications, and can be used to make decisions about which energy storage systems to pursue once priorities for energy storage have been identified. The problem is that the Commission has not taken steps to identify these priorities. The cost-effectiveness challenges detailed in many of the Use Cases cannot be resolved until the Commission identifies and clearly communicates its priorities for cost-effectiveness evaluation, particularly the valuation of complicated benefits.

The Transmission Connected Use Case provides an example of the challenges inherent in valuing energy storage without an established understanding of how benefits should be valued. The Transmission Connected Use Case includes modularity and faster build time as benefits whose value can be captured through the offer price.[32] However, modularity also benefits ratepayers, in that they receive the value of flexibility in procuring the right amount of energy as needed, rather than a forecasted amount.[33] Because the benefit accrues to ratepayers rather than to the utility or asset owner, it is difficult to value, and the Commission has not resolved questions around the valuation of benefits like these. The Transmission Connected Use Case suggests that "[t]he energy storage OIR proceeding could define a list of benefits that storage

[32] Transmission Connected Energy Storage Use Case, p. 13.

[33] *Id.,* p. 50.

provides and explain how they could be captured in a cost-effectiveness methodology."[34] This proceeding cannot arrive at a well-reasoned conclusion regarding procurement targets without a methodology that establishes how to evaluate benefits like modularity and faster build time.

Similarly, in the Distributed Energy Storage at Substation Level Use Case, valuation of benefits is uncertain because there is not a clear methodology for addressing benefits that accrue to non-asset owners. The Use Case states that "[s]ome of the benefits identified are difficult to monetize with no clear opportunities to establish a framework for realizing the benefits."[35] In this Use Case, benefits that do not have a clear financial value include mitigation of risk related to high penetration of photovoltaics and reliability improvements.[36] It would be inappropriate to ignore the value of these benefits because market prices do not yet exist, especially given that this Use Case is relevant to California's goals for distributed generation, reductions in greenhouse gas emissions, and meeting the Renewable Portfolio Standard.

2. *This Proceeding Should Not Engage in the Time Consuming of Exercise of Determining Whether Energy Storage Should be Considered a Preferred Resource*

- Why should Energy Storage be considered a "preferred resource"?
- Does the Commission need to work with Joint Agencies to modify the Loading Order or will a Commission policy statement suffice?
- What are the implications of designating Energy Storage as a "preferred resource" in this Proceeding for other procurement proceedings?

The proceeding puts the cart before the horse with these questions. The first question should be whether the proceeding should devote valuable bandwidth to address this issue. At the workshops in December and January, Staff described the limited amount of time before a proposed decision in this proceeding will need to be issued. In December, Staff also explained

[34] *Id.*, p. 19.

[35] Distributed Energy Storage: Substation, p. 9.

[36] *Id.*, p. 7.

that exploring whether energy storage should be a preferred resource would be complex and time consuming. Spending limited resources and time on this issue would become an unnecessary distraction from the core issue that need to be determined by this proceeding: How much cost-effective energy storage should be targeted for implementation in the California electric grid? Since the beginning of this proceeding and during its two years of process, Sierra Club has continually argued that the proceeding should focus on the core issues of a procurement target and cost-effectiveness methodology. Staff has finally started addressing these issues as part of the workshop process. Now, that these two issues are front and center, the Staff should avoid introducing time-consuming, distracting issues of limited import for the procurement of energy storage.

The PD on Local Capacity Requirements in LTPP has sufficiently addressed this issue for the time being. In that decision, the Commission proposes to consider preferred resources and energy storages resources simultaneously.[37] Energy storage resources are designated as part of the mix that can meet the LCR need.

3. The Proceeding Should Develop a Cost-Effectiveness Methodology

- What models should be pursued for running the cost-effectiveness test?
- Is there a simplified approach to cost-effectiveness that would meet the Commission needs?
- To address Staff's concern that it may not be the best use of resources to run all of the Use Cases through cost-effectiveness models, is there a priority criteria or prioritized list of Use Cases that can be utilized?
- If not, how can we ensure that the analysis gets done for all the Use Cases in a timely manner?

A cost-effectiveness methodology should provide guidelines to evaluate the costs and benefits of storage systems. The workshop process has confused collecting data and designing

[37] LTPP PD, pp. 2, 80.

models with creating a cost-effectiveness methodology that shapes the debate. Data and models focus on specific uses, while a cost-effectiveness methodology must use a broader lens. Sierra Club opposes the use of models in lieu of the development of a cost effectiveness methodology, but recognizes the value models can contribute when used in the appropriate context. The focus should be on creating a streamlined cost-effectiveness methodology that applies to projects without time-intensive, often inaccessible computer modeling tools. Developing this methodology begins with guidance on quantification of benefits from energy storage.

The Customer-Sited Distributed Energy Storage indicates that computer modeling would be less productive than focusing energies on creating a cost-effectiveness methodology so that all benefits can be valued. In the Barriers section, the authors recommend that the Commission "should focus on creating a framework that defines what the sources of value are and the beneficiaries."[38] Use of a computer model will not meet this need. The results of the models would be inconclusive because the proceeding has not addressed valuing non-monetized benefits.

The outcome of this proceeding is dependent on the way the cost-effectiveness methodology values the benefits that storage systems provide.[39] Commentators aptly summarize the valuation issue that has been identified in this proceeding:

> Wholesale energy markets do not provide a framework to evaluate costs and benefits of energy storage. The markets are increasingly recognizing the value of these benefits, but valuation mechanisms are almost non-existent, and a critical challenge is how to allocate the costs and benefits of storage across the range of services that are affected, including generation, transmission, distribution and regulation.[40]

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[38] Customer-Sited Distributed Energy Storage, p. 18.

[39] *Id.,* pp. 14, 18, 26-27.

[40] "Energy Storage: The Road Ahead," Todd Alexander and Shelka Arora, Chadbourne & Parke, LLP , p. 4 http://www.chadbourne.com/files/Publication/890bc1bb-bcb0-43ab-92ad-c534393fdda2/Presentation/

The Use Cases illustrate the valuation problems. In the Customer-Sited Distributed Energy Storage, Storage Co-located with EV Charging, and Permanent Load Shifting Use Cases, the benefits of storage systems have not been valued appropriately. There is not yet a way to value the benefits customer-sited distributed energy storage can provide to the distribution and transmission systems, in addition to utility customers.[41] In the Storage Co-located with EV Charging Use Case, the challenges include valuing modularity and allowing energy storage systems to reap their full financial benefits by participating in markets.[42] In the Permanent Load Shifting Use Case, major barriers include ability to participate fully in markets and the valuation of avoided cost benefits as accrued to all parties involved, not just asset owners.[43] Staff recommends that the E3/Strategen Consulting study be used as a starting point to develop a more robust cost-effectiveness methodology that will lead to a more equitable valuation of energy storage"s benefits.[44] If the Commission pursues modeling Use Cases before it addresses these pressing issues, it may unfairly disadvantage those applications whose Use Cases were not modeled, as their particular valuation challenges will not have been fully addressed.

The Commission should develop and adopt an energy storage specific cost-effectiveness methodology based on the Total Resource Cost test that includes analysis of societal benefits. [45]

PublicationAttachment/95d5fa2d-fdcb-4301-8e18-c82426491acb/EnergyStorageRoadAhead_Alexander_Nov12.pdf (as of Feb 2, 2013).

[41] Customer Sited Distributed Energy Storage, p. 18.

[42] Demand Side Management, Storage co-located with EV charging station, p. 8 ("[S]maller amounts of storage may be able to eliminate the need for a traditional fossil generator. The value of these resources can thus be greater than the traditional per-MW value of a resource."); Demand Side Management, Storage co-located with EV charging station, p. 9 ("New revenues: this could be achieved by letting the energy storage element at EV charging stations to [*sic*] participate in a number of markets (Demand Response, Ancillary, etc.).")

[43] CPUC Energy Storage Use Case Analysis, Permanent Load Shifting, pp. 8, 12.

[44] *Id.*

[45] "The Total Resource Cost (TRC) Test (and its variation, the Societal Test) measures the net costs of the program as a resource option based on the total costs of the program, including both the participants and the utility"s costs. The Societal Test differs from the TRC test in that it includes the effects of externalities (e.g., environmental concerns, national security), excludes tax credit benefits, and uses a different (societal) discount rate." (D.09-08-026, p. 22)

The Total Resource Cost test, or a variation on it, is appropriate for this proceeding because it encompasses all benefits that energy storage systems provide, regardless of the benefit recipient.[46] This test will yield a more accurate depiction of the benefits energy storage systems can provide to the state as a whole. Most importantly, this approach to cost-effectiveness will answer two pressing questions:

1. Do benefits beyond those that accrue to asset owners (i.e. societal benefits) count?
2. Are benefits that cannot be valued in the energy and ancillary services markets relevant?

Developing the Total Resource Cost test or a variation of it will require the Commission"s staff to develop methodology, which staff are reportedly reluctant to do. The Energy Storage Phase 2 Interim Staff Report (ISR) explains that "determining a global cost-effectiveness methodology for storage, under these tests is very challenging because of the wide variety of storage technologies, applications and location specific, operational specific, factors that impact measurement of costs and benefit streams."[47] Though this process is complicated and challenging, the Commission can draw upon its decisions on cost-effectiveness methodologies for energy efficiency and distributed generation. In those decisions, the Commission found that benefits from a utility investment that accrue to other parties should be included in cost-effectiveness evaluations. In the Decision Adopting Cost-Benefit Methodology for Distributed Generation, the Commission notes that the Total Resource Cost test, a test that includes costs to all parties and considers externalities, is one of two tests that it relies upon to assess the cost-effectiveness of utilities" energy efficiency programs.[48] The same decision also states that the

[46] D.09-08-026, p. 22.

[47] ISR, p. 20.

[48] D.09-08-026, pp. 11-12

Commission includes reliability benefits from distributed generation in its methodology.[49] The Commission should make a similar finding in this proceeding, and use the Total Resource Cost test or a variation on it to determine the full scope of benefits that energy storage systems provide.

Running Use Cases through cost-effectiveness models will not advance progress toward determining procurement targets. Running computer models would provide detailed information about a few Use Cases, while creating a methodology that explains how to quantify benefits would allow developers and utilities to produce cost-effectiveness valuations for a wider range of energy storage systems. As stated in the Phase 1 Final Decision, "analyzing each individual end use is not intended to eliminate analysis of energy storage comprehensively. „[By] focusing on the specific „end uses" it will become apparent which aspects of energy storage are unique to specific applications and which aspects of storage are common across all uses.""[50] Focusing exclusively on specific Use Cases at the expense of a comprehensive evaluation of energy storage represents a severe departure from the mandate of this proceeding. Sierra Club recommends that this proceeding focus on developing a cost-effectiveness methodology that will support full valuation of the benefits of energy storage, in each Use Case. If priorities do need be chosen, the analysis should focus on policy goals of renewable integration and greenhouse gas emissions reductions.

There is an additional modeling of benefits and costs that has not been described by the computer models. That is, how does this scenario we have used in this example compare for meeting a larger-scale objective set in policy, such as meeting RPS requirements, or distributed PV targets? It seems that some quantification of the total system costs of different supply

[49] D.09-08-026, pp. 38-39.

[50] D.12-08-016, p. 24.

scenarios can be used to answer another of the system needs. Specifically, this comparison would consider the total projected costs and benefits for a resource supply plan with associated transmission that emphasizes remote bulk renewable generation, with the total projected cost and benefits from a resource supply plan that included distributed storage and PV, as well as the carrying capacity of the distribution system. The novelty here for this purpose is to properly recognize the benefits of such a large supply plan consideration. Were this to be done in a manner that allowed a comparison of different approaches to meeting a large-scale system need, such as the RPS, the analysis could capture the benefits of accommodating large amounts of renewable supply which have little or no incremental cost for grid.

4. Policy Options

- Does Staff's priority listing of Policy Options accurately represent the most important issues facing storage in the identified proceedings?
- Are suggested actions for resolution of barriers the best approach to advancing energy storage deployment?

As discussed above, Sierra Club maintains that cost-effectiveness and procurement targets should be the focus of this proceeding, but this may entail addressing issues that also arise in the Long-Term Procurement and Resource Adequacy Proceedings. Staff proposes to narrow the scope and focus of this proceeding by encouraging that energy storage decisions be made in these other proceedings. This undermines a fundamental purpose of AB 2514 in creating a specific proceeding to tackle the cross-cutting issue of energy storage. This proposal also circumvents the statutory deadline set in this proceeding by potentially pushing analysis and decisions past the October, 2013 deadline. This current LTPP will not be completed by October and Resource Adequacy has no current plans to address the NQC of energy storage.

Sierra Club urges Staff to change its determination that LTPP and Resource Adequacy "represent the best forums for dealing with issues related to energy storage within their context.

For example, determinations of market need for new resources, which may include energy storage, is best left to the LTPP proceeding."[51] This statement is contrary to the statements in LCR PD in LTPP. After setting a "modest" 50 MW procurement target for energy storage resources, the PD explains that the procurement proceedings will not be able to do more with energy storage resources until there are further decisions in the energy storage proceeding. The PD states that in the energy storage proceeding "no decisions have been made concerning the viability, cost-effectiveness or public interest nature of energy storage technologies in that docket. If and when such action is taken, the role of energy storage technologies in the procurement process can be considered."[52] LTPP needs decision-making to occur in this proceeding in order to make additional decisions about energy storage. As Sierra Club has argued in this proceeding, procurement targets established in this proceeding can feed into the analysis in the LTPP.[53]

During the course of this proceeding, Sierra Club has continually expressed its concern that Staff"s inclination to divide the energy storage decision into a variety of proceedings will lead to inaction. [54] Sierra Club has urged that this proceeding address all the relevant storage issues. For example, there appears to be a consensus that energy storage applications need NQCs, but the NQC for energy storage has not been addressed in this proceeding nor in the Resource Adequacy, and it appears that it won"t be addressed by the statutory end of this nearly three-year proceeding. The Interim Staff Report incorrectly claims that Phase I "provided a

[51] ISR, p. 22.

[52] LTPP PD, p. 113.

[53] Rulemaking 10-12-007, Reply Comments of Sierra Club California on Administrative Law Judge's July 21, 2011 Ruling Entering Documents Into Record And Seeking Comments (Sept. 16, 2011) pp. 5-6.

[54] *See, e.g., id.* p. 6; Rulemaking 10-12-007, Reply Comments of Sierra Club California on Proposed Decision Adopting Proposed Framework for Analyzing Energy Storage Needs (July 30, 2012) pp. 2-3; Reply Comments of Sierra Club California on Administrative Law Judge"s December 14, 2011 Ruling Entering Initial Staff Proposal into Record and Seeking Comments (Feb. 21, 2012) pp. 3-4.

Regulatory Framework for addressing storage related issues in other proceedings, particularly the Resource Adequacy (RA) and Long-Term Procurement Planning (LTPP) rulemakings."[55] This proceeding has identified other proceedings where energy storage decisions could be made, but it has not facilitated that decision-making.

5. Related Proceedings

- Does the list of issues in related proceedings capture the work being done in the other proceedings described?
- Is there more that should be done in the identified proceedings to advance energy storage deployment, aside from establishing procurement targets?

What is missing Staff"s proposal is an analysis of how energy storage can further the State"s energy and environmental mandates and goals, and an analysis of the environmental outcomes of different scenarios of storage integration into the electric system.

III. Government Reports Related to Energy Storage Should be Made Part of the Record.

California energy agency reports have addressed energy storage resources and potential positive effects on the grid. As part of these comments, Sierra Club makes the following reports part of the record. Since there is no set procedure for adding documents to record, Sierra Club is providing the link for each report.[56]

1. "California Clean Energy Future: An Overview on Meeting California"s Energy and Environmental Goals in the Electric Power Sector in 2020 and Beyond, CEC-100-2010-002 http://www.cacleanenergyfuture.org/documents/CACleanEnergyFutureOverview.pdf (last viewed Feb. 2, 2013).

2. 2020 Strategic Analysis of Energy Storage in California, Public Interest Energy Research (PIER) Program Final Project Report, November 2011, CEC-5000-2011-047 http://www.energy.ca.gov/2011publications/CEC-500-2011-047/CEC-500-2011-047.pdf (last viewed January 30, 2012).

[55] ISR, p. 6.

[56] Sierra Club will provide paper copies if requested.

3. "Renewable Power in California: Status and Issues," Lead Commissioner Report, California Energy Commission, December 2011, CEC-150-2011-LCF-Rev1, <http://www.energy.ca.gov/2011publications/CEC-150-2011-002/CEC-150-2011-002-LCF-REV1.pdf> (last viewed Feb. 2, 2013).

CONCLUSION

For foregoing reasons, Sierra Club requests that the Commission adopt procurement targets and develop a cost-effectiveness methodology.

Respectfully submitted,

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