BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

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Application of San Diego Gas & Electric Company (U902M) for Approval of Demand Response Programs and Budgets for Years 2012-2014.	Application 11-03-002 (Filed March 1, 2011)
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RESPONSE OF THE CALIFORNIA ENERGY STORAGE ALLIANCE TO ADMINISTRATIVE ON ADMINISTRATIVE LAW JUDGE'S RULING REQUESTING COMMENTS ON APPLICANTS' RESPONSES TO ENERGY DIVISION DATA REQUESTS

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In accordance with *Administrative Law Judge's Ruling Requesting Comments on Applicants' Responses to Energy Division Data Requests*, issued by Administrative Law Judge Kelly A. Hymes, on August 5, 2011 ("ALJ's Ruling") the California Energy Storage Alliance ("CESA")[1] respectfully submits these comments on the Applicants' Responses to Energy Division Data Requests. These comments are presented in the form of questions and answers to

[1] The California Energy Storage Alliance consists of A123 Systems, Altairnano, Applied Intellectual Capital, Beacon Power Corporation, CALMAC, Chevron Energy Solutions, Debenham Energy, Deeya Energy, East Penn Manufacturing Co., Inc., Enersys, EnerVault, Fluidic Energy, General Compression, Greensmith Energy Management Systems, HDR, Inc., Ice Energy, International Battery, Inc., LightSail Energy, Inc., MEMC/SunEdison, Powergetics, Primus Power, Prudent Energy, RedFlow, RES Americas, ReStore Energy Systems, Saft America, Inc., Samsung SDI, SANYO, Seeo, Sharp Labs of America, Silent Power, Sumitomo Electric, Suntech, SunPower, Sunverge, SustainX, 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. For further information, see: http://www.storagealliance.org

questions related to the documents attached as "Appendix" to the ALJ's Ruling, referred to here as the "Appendix."

I. INTRODUCTION.

As stated in CESA's Response to the Applications ("Response)[2], as they relate to permanent load shifting ("PLS") all of the Applications fall short of the consistently stated intent of the Commission to expand and diversify PLS program offerings by a very wide margin. That unfortunate shortcoming is clearly and forcefully informed by the PLS Study.[3] For the reasons explained in the PLS Study, CESA's Response to the Applications, CESA's Prepared Written Testimony, and the record of the hearings held in July 2011, the Commission should therefore direct the Utilities to submit revised Applications that approximate program budgets of $120 million in aggregate.

II. CESA'S COMMENTS ON APPLICANTS' RESPONSES TO ENERGY DIVISION DATA REQUESTS.

A. Qualifications required by the Form of The Documents Included in the Appendix.

At appears from the documents provided in the Appendix that neither the Energy Division's questions nor responses from PG&E regarding PLS were included. Perhaps this is an omission since several of the questions that are included in the documents in the Appendix apply equally to all three of the IOUs. If PG&E's questions and responses were erroneously omitted from the document intended to be included, then the record is incomplete and a full presentation of comments from all parties is not possible in the context of these comments.

B. Comments on the Responses in the Order in Which They Appear in the Responses.

SCE suggests that the 15 year PLS project life assumed by the PLS Study depicts the average lifetime of HVAC technologies and building energy analysis. As noted in the Testimony of David Nemtzow, PLS installations are distinctly different in characteristics and operation than the technologies mentioned by SCE. In fact, the Ice Bear technology has a life

[2] *Joint IOU Study of Permanent Load Shifting,* submitted to the Commission on December 1, 2010 ("PLS Study").

[3] *Response of California Energy Storage Alliance to Applications for Approval of Demand Response Programs, Pilots, and Budgets for 2011-2014*, filed April 4, 2011.

that is 25 years, not 15 years. If the IOUs were to modify their analysis of PLS to reflect a longer life when computing amortized PLS equipment costs, the cost-effectiveness of the PLS programs would be improved. Ice Energy's filed analysis demonstrates that a 25 year life, as compared to a 15 year life, results in a 25% increase in the incentive rates that can be paid by SCE while still passing the TRC and PAC cost-effectiveness tests. CESA also agrees with Ice Energy that 15 years is too short. Energy storage projects can be designed with a 25 year lifetime which would factor in the necessary preventive and ongoing maintenance to ensure performance throughout the duration. In its report, E3 performed sensitivity analysis on the impact of increasing the project lifecycle to 30 years and found that the lifecycle avoided cost benefits increased by 30%. (Source: E3 report, page 8). Thus, the arbitrary assumption of a 15 year lifetime has significant negative effect on PLS technology avoided cost.

Further, if the PLS incentive/program is truly performance based, and factors in a lifecycle of 25 or 30 years, then by definition any participating technology that cannot cost effectively perform PLS during that project pro forma will not be economically attractive.

PLS Question 2 (beginning at PDF pg 35 for SDG&E and pg 43 for SCE):

Please provide further details on how the PLS program would work? For example, please address the following (or some close variation of these):

a. Which technologies would be eligible for incentives?
b. Would there be some type of pre-testing or qualification required for a technology to be eligible?
c. How will PLS performance (load shift kW) be measured or verified to determine incentive level due to a customer?
d. Would the PLS project be eligible for TA (technical audit) funding under IDSM (in case there are EE benefits associated with the PLS project)?

CESA continues to recommend a funding framework that would include two budget categories; one for mature PLS technologies and one for emerging PLS technologies. These categories maybe further defined by the energy storage technology class that would be eligible under each. CESA recommends that thermal storage would be eligible under the mature category and that non-thermal, including mechanical and chemical storage, be eligible in the emerging category. There are several reasons for this distinction. First, thermal storage has been in commercial use for far longer for grid applications than non-thermal storage. Further, thermal

storage, both large and small will have similar measurement and verification methodologies whereas non-thermal, electricity storage solutions will have a different set of measurement and verification.

PLS Question 3 (beginning at PDF pg 36 for SDG&E and pg 45 for SCE):

If different technologies are allowed (which may have substantially different project lifetimes and round trip efficiencies, for example), would it [be] reasonable to provide different levels of incentives corresponding [t]o the total avoided cost benefit provided by the different technologies (for example, higher incentive for 25 year technology vs. 15 year technology), assuming other factors being [the] same.

Please discuss the merits of this technology type-specific approach vs. a single proposed incentive level for all mature PLS technologies together.

SDG&E Response (paraphrased):

SDG&E programs developed using the E3 calculator. SDG&E is open to considering differential PLS technology benefits if the Energy Division will set statewide assumptions.

SCE Response (paraphrased):

SCE support a technology neutral approach/incentive. The market and customers will then determine which technology is desirable. Emerging technologies would need higher incentive to create incentive for innovation.

Comments

1. In its response, SDG&E states "The ability to capture differential PLS technology benefits, like energy savings, should be incorporated into the CE calculator. This is one area where statewide consistency is critical and if differential benefits exist, SDG&E requests that Energy Division set statewide values for these additional benefits." CESA supports SDG&E's intent to evaluate different PLS technologies and recommends that SDG&E identify and develop program designs and incentive levels specific to each PLS technology class. CESA would support the development of standardized assumptions for these separate PLS technologies. It should be noted that there should be a different incentive level between large and small thermal storage solutions, as they have different market acceptance hurdles, different underlying cost structures and serve fundamentally different customer classes.

2. In its response, SCE states: "SCE advocates a technology neutral policy approach to let the market determine the best technology that best meets the customer's needs. By,

offering a uniform incentive for a specified per-kilowatt of demand shifted, the customer will choose the most cost-effective technology for factors it values most…." As noted by many in this proceeding, PLS technologies provide value to both customers and the utility other than just demand reduction. PLS technologies avoid utility costs for capacity (generation and T&D), but they also shift load from high-cost periods to low-cost periods, providing an avoided energy cost benefit to the IOUs. These avoided costs are readily quantified by the DR Reporting Template and are reflected in the IOU's filings. However, because each IOU analyzed only a single set of assumptions for PLS, the value of PLS computed by the IOUs does not quantify the full value of those PLS technologies that are more efficient than the conservative assumptions that were modeled. Without modeling actual characteristics for different technologies, SCE cannot assess the level of incentives that are cost-effective for each technology and cannot design programs that provide customers full incentives for the value they provide the SCE system. Thus, CESA recommends modeling categories of technologies, namely: small and large thermal for the mature category, and chemical and mechanical storage for the emerging category.

PLS Question 4 (beginning at PDF pg 36 for SDG&E and pg 46 for SCE):

PG&E has proposed different levels of incentive depending the hours of load shift. Please discuss the merits of SDG&E/SCE's single incentive level approach vs. SDG&E/SCE adopting PG&E's multi-level approach.

SDG&E Response (paraphrased):

SDG&E will offer higher incentives for customers on targeted circuits. And will offer lower incentive levels for customers that cannot meet the 7 hour peak period requirement but can provide at least 3 hours of load reduction.

SCE Response (paraphrased):

SCE states that less than 6 hours would have reduced system benefits and anything more than 6 hours would have "rapidly decreasing marginal benefits."

Comments

CESA supports targeting PLS on specific regional locations, or circuits for maximum system benefit. CESA also supports differentiated payments depending on total number of hours shifted. What will be key to PLS technology development, particularly if incentives are performance based, is to have consistency on the targeted total hours shifted and for certain technologies, such as thermal storage, on particular hours during the day (where thermal storage

is specifically off-setting air conditioning load). Other storage technologies may not require specific times of day, just required dispatch/availability on a daily or annual basis in hours.

PLS Question 5 (PDF pg 37 for SDG&E and pg 47 for SCE):

Rather than having a fixed incentive level, have you considered a declining incentive level that starts out higher (to stimulate the market) and gradually drops in steps tied to cumulative installed volume reaching certain levels (similar to the CSI model)? Please discuss the merits of such an approach and how it might affect market transformation and customer adoption vs. the currently proposed approach.

What consideration, if any, has been given to aligning the three IOU PLS programs in terms of common program design elements, including incentive levels (since the currently proposed incentives by the JUs are quite similar)?

Please discuss the feasibility and merits of having some level of uniformity in program design across the IOUs (that is, standardizing some program elements - such as those discussed above in #2, 3, 4 – among the JUs)?, including potential advantages (such as better third party & customer education, reduced costs for industry, higher customer acceptance, etc) vs. potential disadvantages of standardizing some program elements.

SDG&E Response (paraphrased):

SDG&E is against and, by comparing the solar CSI program, suggests that incentives must be managed dynamically to match market conditions. SDG&E believes aligning PLS incentives with SDG&E tariffs/costs is more important than consistency across the utilities.

SCE Response (paraphrased):

SCE states that mature technologies do not require incentives. "SCE focused on creating a ratepayer- and technology-neutral incentive program." SCE does not support standardized program design/incentives.

All such programs that encourage adoption of new grid-connected technologies are by definition market-transformational. However, given the anticipated duration of the resulting program, it is premature at this time to decide upon a specific incentive decline schedule. Rather, the level of incentive – and it may be decreased OR increased over time – should be periodically reviewed and adjusted based on customer demand for funds. For example, if

demand greatly exceeds program budget for a specific time period, then the incentive levels maybe decreased.

CESA continues to recommend that certain program design elements be consistent across IOU service territories. The primary reason for this is to minimize transaction costs for project developers within California. For example, it would be tremendously inefficient if there where three entirely different PLS programs in California, each requiring a different application process, funding mechanism and ownership model. CESA recommends that the PLS program 'framework' be consistently applied across IOU service territories, but that the framework be flexible enough to accommodate the pricing and other regional requirements of each IOU. For example, SDG&E's goal of targeted PLS projects at specific circuits should be allowable within the framework even if SCE and PGE choose not to do so.

PLS Question SCE 6 (PDF pg 48):

In PG&E's Rebuttal (Chap. 3A, A2 (2)), PG&E indicates that part of the rationale for the proposed PLS program budget level is that this level provides "a reasonable level of market transformation to technologies that are near maturity." Please explain or discuss any available data or other basis to suggest that the incentive levels proposed by you would be attractive enough to stimulate sufficient industry interest and customer adoption to enable market transformation.

SCE Response:

"SCE created a ratepayer neutral incentive program based on the ratepayer neutral incentives provided by the Permanent Load Shifting Study. The Study does not specify either program size or incentive levels required for market transformation. The PLS vendors have made statements regarding program size and incentives required for market transformation. However, data requests of the vendors have not produced analysis or research supporting the statements (see attached files)."

CESA has consistently asked for a total program budget of $120 million, split evenly between mature and emerging technologies. This budget is a larger than historic pilot program funding, but not exorbitantly so. This budget is also sufficiently large to provide the funding and program consistency necessary to encourage market transformation of PLS technologies, including energy storage. Specifically, it will encourage investment to begin in training,

partner/channel development and hopefully (if the incentive levels are set correctly) financing mechanisms that are necessary to deploy PLS technologies on the customer side of the meter now and in the future.

PLS Question SDG&E 6 / SCE 7 (PDF pg 39 for SDG&E and pg for SCE):

The PLS CE analysis shows TRC ratio to be significantly less than one. The CE protocols require that "Non-energy/monetary benefits" (perceived by customers, for example) be considered in TRC analysis. Do you agree that this factor, while it may be difficult to quantify, could be an important element in customer's decision to install PLS equipment? Please explain your answer.

SDG&E Response (paraphrased):

No data.

SCE Response (paraphrased):

Difficult to quantify.

If the customers consider electrical energy storage as a means to perform PLS other benefits that maybe possible include: better integration/value proposition of onsite renewable generation, ability to provide emergency back up power for key loads in the event of a blackout, greater control over their energy costs as we phase in more time of use/real time electrical tariffs.

PLS Question SDG&E 7 / SCE 8 (PDF pg 39 for SDG&E and pg 50 for SCE):

In SCE's Rebuttal (Section VII.D), SCE (Wood) summarizes a finding from E3's report as "customers have been unwilling to make the investment because of TOU risk." We did not find any discussion in the JU proposals re how to address this issue and ask you to comment on the following:

One option to address the TOU risk is to transfer the value of the avoided cost benefit (net of the up-front incentive and other program costs) to the customer in the form of a "guaranteed" TOU differential for the life of the project, regardless of how the actual rates might change over time (essentially a PLS specific tariff or "rider", somewhat similar to having a EV-specific tariff).

Please comment on the feasibility and/or other concerns (or advantages) of such an approach.

SDG&E Response (paraphrased):

Retail rate design is critical to capturing [generic] grid benefits. Accurate rates are first step. PLS benefits could be undermined by fixing TOU rates for current conditions. TOU rates and PLS operations must be flexible to change with future grid and market conditions.

SCE Response (paraphrased):

Locking in the current TOU price differential "would violate the CPUC's cost allocation and pricing principles." Could be burden to other customers is conditions change. A locked-in tariff might could also become disadvantageous to the PLS customer.

CESA appreciates the issues that inflexible tariffs may create for all stakeholders. A key aspect of any such 'tariff rider' would be that it is voluntary. In other words, customer should be allowed to change tariffs in the future, but should they stop performing PLS then they should also stop receiving PLS incentives. From a system perspective, should utilities require PLS during a different time of day (e.g. If driven by the implementation of more distributed renewables or plug in EV's) it is conceivable that the tariff could be amended so that the load shifting that previously was encouraged during 12pm – 6 pm is now encouraged between a different calendar time. This is one of the great advantages of energy storage as a permanent load shifting technology – they are flexible and can accommodate changes in their operations. What is of critical importance to successful energy storage project development is the differential between peak and off peak pricing and consistency in magnitude of on peak demand charges (relative to off-peak or all-hours demand charges), not necessarily the timing of when these charges occur.

PLS Question SCE 9 (PDF pg 52 for SCE):

In SCE's Rebuttal (Section VII.E), SCE (Wood) indicates that T&D O&M "is not avoided by DR." Is this statement specific to "event-based DR" or does it apply to a PLS based program involving long-term, "permanent" demand reduction as well?

a. If the former, please indicate what the revised D-factor would be for PLS?
b. If the latter, please explain why T&D and the associated O&M would not be avoided (or deferred) if demand is reduced "permanently" via PLS?

SCE Response (paraphrased):

SCE repeats their basic argument that DR/PLS does not reduce the number of facilities, therefore O&M [which SCE appears to claim is labor only] is not avoided.

Potential Ice Energy Comments:

The testimony of David Nemtzow describes how demand reductions from PLS result in T&D facilities being avoided and how facilities that are avoided do not incur associated O&M costs. In its response, SCE makes the argument that demand reductions could result in benefits from deferred substation transformers, but that general substation equipment, poles and wires would not be avoided. SCE further states that the quantity of facilities is unchanged and the cost to patrol and inspect T&D facilities is not reduced.

However, the example presented by SCE only addresses a very narrow example of avoided T&D system costs. Programs that permanently reduce peak demands on the T&D system, such as PLS, can have many positive impacts on the T&D system. In addition to deferred transformers, PLS can avoid the following T&D facility costs.

- Avoidance of transformer upgrades
- Avoidance or deferral of circuit reconductoring
- Avoidance or deferral of substation upgrades required to meet load growth in existing areas
- Avoidance or deferral new circuits required to meet load growth in existing areas
- Downsizing of planned circuits and substations
- Downsizing of T&D facilities at time of replacement

In cases where PLS avoids the construction of facility upgrades required for load growth (facilities that represent incremental additions to the T&D system), these facilities are fully avoided and any O&M that otherwise would have been incurred for these facilities is avoided by PLS. Furthermore, T&D O&M costs can include costs other than labor to patrol and inspect facilities, such as those for materials and labor costs for equipment repair. As facilities are avoided, deferred, and downsized, costs for materials and labor rates will decrease in proportion to the reduced size and complexity of the T&D facilities, resulting in avoided O&M costs attributable to PLS.

Additionally, strategically targeted PLS in certain locations may help facilitate the integration of localized renewable energy, where feeder circuits are either aging or at capacity. PLS should be considered a key tool for distribution circuit upgrade and deferral and a high priority one since host customers are helping to share the cost!

III. CONCLUSION.

CESA hopes the foregoing responses are helpful to the Commission in reaching a sound decision on the Applications.

Respectfully submitted,

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