BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Application of SAN DIEGO GAS & ELECTRIC COMPANY (U902M) for Approval of its Energy Storage Procurement Framework and Program As Required by Decision 13-10-040.	Application 14-02-006 (Filed February 28, 2014)
Application of Pacific Gas and Electric Company (U39E) for Authorization to Procure Energy Storage Systems during the 2014 Biennial Procurement Period Pursuant to Decision 13-10-040.	Application 14-02-007 (Filed February 28, 2014)
Application of Southern California Edison Company (U338E) for Approval of Its 2014 Energy Storage Procurement Plan.	Application 14-02-009 (Filed February 28, 2014)

CLEAN COALITION COMMENTS ON JUNE 2, 2014 STORAGE WORKSHOP RELATED QUESTIONS

Kenneth Sahm White
Economics & Policy Analysis Director
Clean Coalition
16 Palm Ct
Menlo Park, CA 94025
sahm@clean-coalition.org

Stephanie Wang
Policy Director & Attorney
Clean Coalition
16 Palm Ct
Menlo Park, CA 94025
steph@clean-coalition.org

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I. INTRODUCTION.

Pursuant to the Scoping Memo and Ruling of Assigned Commissioner and Administrative Law Judge dated May 27, 2014, regarding the utilities' 2014 energy storage procurement applications A.14-02-006, A.14-02-007 and A.14-02-009, the Clean Coalition offers the following comments on the June 2, 2014 Storage Scoping Memo and Workshop Related Questions:

- 7. Should pre-bidding interconnection requirements be consistent across utilities?
- 11. Do the definition of storage and/or related eligibility rules need to be clarified.
- 13. Does the consistent evaluation protocol (CEP) need to be augmented? Is the quantification of benefits adequately addressed in protocols? and -
- 15. Should the standard for deferment of the biennial procurement target be clarified?

The Clean Coalition is a California-based nonprofit organization whose mission is to accelerate the transition to renewable energy and a modern grid through technical, policy, and project development expertise. The Clean Coalition drives policy innovation to remove barriers to procurement, interconnection, and realizing the full potential of integrated distributed energy resources, such as distributed generation, advanced inverters, demand response, and energy storage. The Clean Coalition also works with utilities to develop community microgrid projects that demonstrate that local renewables can provide at least 25% of the total electric energy consumed within the distribution grid, while maintaining or improving grid reliability. The Clean Coalition participates in numerous proceedings in California agencies and before other state and Federal agencies throughout the United States.

II. June 2, 2014 Storage Workshop & Supplemental Questions:

7. Should pre-bidding interconnection requirements be consistent across utilities?

Yes, interconnection requirements should be consistent across utilities, and should reflect coordination between the RFO process and interconnection process tariff deadlines.

As noted in the workshop, PG&E is requiring an interconnection application be submitted prior to contract execution. In contrast, SCE is requiring a Phase 1 study or its equivalent to be completed before a Final Offer. These requirements are not adjusted for project size or completion date (COD), both of which are significant factors and warrant attention. The balance between PPA and interconnection is very important and the steps should be coordinated to address the respective schedules, study implications, and large financial commitments of each. The current proceeding on Rule 21 (R.11-09-011) is scoped to address issues specific to the interconnection of storage later this year, with the intention of harmonizing FERC jurisdictional interconnection within California to these same standards.

Interconnection rules aimed at avoiding inactive projects in the interconnection queue limit the time an applicant can wait before committing to an interconnection agreement (IA) or withdraw their application once the interconnection application process has started. These times vary greatly depending on the review process and results, and are not necessarily predictable at the time of application.

As a result, a contract should preferably be firmly available to a bidder (offered or reserved) before they have to make major financial commitments associated with distribution or network upgrades or Phase I studies. However, where there is limited PPA capacity on offer, we do not want a bidder to tie up the capacity for years before getting study results and deciding to withdraw, as may well happen with the cluster studies. Therefore we do support a time limit on holding a contract reservation before committing either a development deposit or an Interconnection Agreement deposit, as well as development milestones (such as signing an IA).

The procurement rules need to address Fast Track interconnection storage that needs to commit within as little as 90 days from submitting an application, as well as cluster study dependent projects that may require as much as 18 months and upwards of $50,000 to even get phase 1

study results. As such, interconnection requirements should appropriately differentiate between project sizes. The Clean Coalition generally favors PG&Es approach, but prefers that the focus be on completing an Interconnection Agreement within a specific period following the offer of a contract, and conforming to subsequent financial milestones. Coordination is important between interconnection deadlines and procurement, especially with the extended RFO timelines for short listing, negotiations, final offers and Commission approval of contracts, and distant COD requirements.

11. Do the definition of storage and/or related eligibility rules need to be clarified. If so, how?

Legislative and Decision Definitions of Storage and their Application to Technologies and Procurement Targets

Diversity in Storage Technology Procurement

D.13-10-040 recognized[1] that "the Legislature intended to encourage a broad range of energy storage technologies. In order to do so, we must adopt policies and procedures that would provide opportunities for the cost-effective deployment of all types of energy storage technologies." In order to achieve this, the Decision limited the size of pumped hydro storage systems eligible to participate in this procurement.

The sheer size of large-scale pumped storage systems could prevent the procurement of other storage technologies. Such an outcome would be contrary to the intent of AB 2514. Accordingly, as permitted under AB 2514, the Decision adopted a policy to limit the size of pumped storage projects that are eligible to participate in the Storage Framework.

While no other storage technology is foreseen in projects comparable in scale to large-scale pumped storage, there remains the possibility that one or more technologies will dominate the procurement contracts to the detriment of emerging technologies that offer greater value in the long run.

As such, the Clean Coalition recommends technologically balanced procurement, including consideration of procurement limits for one or more technologies. For example, it may be

[1] D.13-10-040 at 31

appropriate to initially limit any single technology to 65% of procurement, any two technologies to 85%, and any three to 95% of procurement. Such an approach emphasizes the most cost effective procurement while ensuring some source diversity by providing a limited market opportunity in which only the remaining alternative sources will compete.

Legislative and Decision Definitions of Storage

The workshop raised questions regarding the definition of storage and eligibility of various technologies presented in the listed Use Cases or absent from that list. The Clean Coalition finds the more narrow Proposed Definitions presented in the Workshop to be reasonable and preferable.

An energy storage system shall:

1. Absorb generated energy from:
    1. The grid,
    2. A renewable energy source, OR
    3. A mechanical process,

    AND
2. Store above energy:
    1. Via a mechanical, chemical, thermal process AND
    2. In an asset procured, built, or maintained primarily for:
        1. Function 1 (above) during some time interval AND
        2. Function 3 (below) in some other interval,

    AND
3. Discharge above energy to affect the state of the grid by:
    1. Directly supplying energy to the grid OR
    2. Directly or indirectly reducing the load on the grid.

The specificity of the Proposed Definitions and Use Case example offer substantially greater clarity addressing eligible technologies and differentiation between ES procurement and programs developing related Demand Response and Electric Vehicle deployment, and we support further refinement. We address two technologies and technology balance in procurement.

EVs

EV charging control and pricing incentives are properly categorized as DR/Load Modification, not storage procurement. EVs may be properly categorized as storage devices only with the

addition of capabilities to discharge stored energy to the grid, and only to the extent that an appropriate Capacity Factor is applied. While grid management operations are functionally agnostic toward these categorizations, they must be respected within the separate procurement processes.

Concentrated Solar Power

While CSP does not in of itself constitute storage, the storage of energy produced from CSP does, regardless of whether it is stored as thermal energy (TES) for later electric production for the grid or as electric energy for later delivery to the grid.

Although there was no Use Case listed for CSP + TES among the nineteen presented for consideration at the June 2nd workshop, it is comparable to Use Case 14 (PV+ES enhanced generator) except that CSP + TES does discharge to the grid, consistent with qualified definitions.

D. 13-10-040 provides CSP as a Storage Use Case Example under the category of Co-Located Energy Storage.[2] As discussed in the CEC commissioned 2020 Strategic Analysis of Energy Storage, Thermal Energy Storage is an addition to CSP to provide storage functions for electric production that would not otherwise be available:

> "One advantage of CSP is the potential for storing solar thermal energy to use during non-solar periods and to dispatch when needed. As a result, thermal energy storage (TES) allows CSP to achieve higher annual capacity factors—from 25percent without thermal storage up to 70 percent or more with it (NREL). TES can also provide backup energy during periods with reduced sunlight caused by cloud cover (Sioshansi and Denholm, 2010).
>
> Adding TES provides several additional sources of value to a CSP plant. First, unlike a plant that must sell electricity when solar energy is available, a CSP plant with TES can shift electricity production to periods of highest [value and] prices. Second, TES may provide firm capacity to the power system, replacing conventional power plants ...

[2] D. 13-10-040 Table 1, at 12

Finally, the dispatchability of a CSP plant with TES can provide high-value ancillary services such as spinning reserves."[3]

Based on PUC §2835(a) storage associated with CSP would qualify because storage allows energy to be used at a later time when the facility otherwise could not be in operation. For other forms of generation not limited in their hours of operation, storage would only qualify if the energy were stored in a manner that could supply electrical energy to the grid additional to and complimenting that generated at the same time by the generating facility.[4]

Likewise, based on the Potential Clarified Definition of ES presented at the workshop (slide 15), CSP with any type of storage would qualify, as would other generation with the same qualifications as above.

13. Does the consistent evaluation protocol (CEP) need to be augmented? If so, how can it be augmented to enhance storage program goals? Is the quantification of benefits adequately addressed in protocols?

&

15. Should the standard for deferment of the biennial procurement target be clarified?

Bid Evaluation Protocols / Standard for Deferment of Biennial Procurement Target

As we noted in prior comments[5], the Commission should ensure that the application of utility bid evaluation methodologies reasonably reflects net value to ratepayers, and enables the Commission to fairly and objectively evaluate any utility's claim that it is appropriate to defer its procurement target due to the lack of cost-effective bids.

[3] 2020 Strategic Analysis of Energy Storage, California Energy Commission 2011, at 56

[4] PUC §2835(a) (1) "Energy storage system" means commercially available technology that is capable of absorbing energy, storing it for a period of time, and thereafter dispatching the energy. … AND (4) (c) Use mechanical, chemical, or thermal processes to store energy generated from renewable resources for use at a later time.

[5] Clean Coalition Comments on 2014 Energy Storage Procurement Applications, April 7, 2014

We share the opinion expressed by numerous parties that the full range of costs and benefits to ratepayers should be considered in utility bid evaluation protocols, addressing the range of services and values previously identified in the Use Case Studies, and that the Commission should further incorporate costs benefits extending beyond ratepayer issues in the Consistent Evaluation Protocol (CEP), including GHG and other criteria emission reduction, water use, and other societal and environmental factors.

Believing these subjects to be adequately addressed by other parties, we focus our comments on specific cost effectiveness, avoided cost, and grid support factors that have not been sufficiently addressed.

At the Workshop, Southern California Edison noted that the Commission can look at their confidential bid evaluation protocol info to evaluate any claim that they should be allowed to defer their storage target due to a lack of cost-effective bids.

Commission review of confidential bid evaluation info will address the question of legitimate claims for procurement deferral only if the Commission applies appropriate full ratepayer valuation assessment in determining cost effectiveness. As such, the Commission should affirm and adopt valuation standards such as the Consistent Evaluation Protocol (CEP) for use in reviewing cost-effectiveness determination by utilities, and such standards should incorporate all significant factors impacting ratepayers. While the specific valuation of such factors in each utility's confidential bid evaluation will likely differ from the CEP, the Commission should be in a position to determine whether the utility valuation is appropriate, and to make adjustments as needed. We discuss several specific factors below.

Both the CEP Net Market Value Calculations and the confidential IOU bid evaluation protocols should include all quantifiable differentiating values of storage in competitive bid evaluation and award of contracts in order to ensure the greatest ratepayer benefit relative to cost. However, determination of cost effectiveness must also including values that may be consistent across all bids and therefore not used in bid comparison, as such, the bid ranking criteria may not be sufficient to also determine cost effectiveness without the inclusion of additional factors. Before negative determination of cost effectiveness can be made, methodologies should include all quantifiable transmission and distribution benefits,

including (i) transmission upgrade deferral or avoidance value, (ii) avoided transmission access charges, and (iii) avoided line losses and congestion costs, and (iv) voltage support.

It's also important for the consistent evaluation protocol to include all quantifiable values so that the public reporting will show the full value of storage.

Our comments will focus on locational value and voltage support value.

Locational value

> CAL. PUC. CODE § 2835(a)(3) An "energy storage system" shall be cost effective and either reduce emissions of greenhouse gases, reduce demand for peak electrical generation, defer or substitute for an investment in generation, transmission, or distribution assets, or improve the reliable operation of the electrical transmission or distribution grid.

Deploying appropriately located ES projects that alleviate energy transmission constraints during peak demand periods avoids the need to increase transmission capacity, which allows existing transmission investments to depreciate and, in combination with energy efficiency and Distributed Energy Resources, defers future investments in transmission. While individual ES projects will not replace and may not defer a transmission project, they will contribute proportionately to avoiding or deferring other projects and this value should be recognized. CAISO transmission planning is based upon scenarios including all planned procurement in each load area, including ES.

PG&E plans to include this value to the extent quantifiable in their bid evaluation. SCE's protocols fail to do so. All utilities should adopt comparable approaches, building upon PG&E's approach. We offer the following average transmission deferral valuation to illustrate the significance of such factors, and to suggest a potential default valuation where individual assessment is not practical.

Reduced demand on transmission will reduce or defer the need for additional investment to expand transmission capacity, slowing the growth in TAC rates that is driven by the need to recoup new investment costs. Reducing the need for new investment in transmission will reduce charges across the board for all energy utilizing the system in a Merit Order Effect.

Transmission costs vary widely between projects, but if an average figure of $1 Million is used as the marginal cost per Megawatt of new transmission capacity (based on approved CA new or completed transmission projects since 2009), the savings are seen to accrue rapidly. With approximately $20 Billion in currently planned future capital investments, 1 GW of aggregated avoided new transmission capacity resulting from procurement of ES represents a 5% reduction in the basis for future TAC rates, or 0.005% per fully qualifying MW. Taking a levelized 20 year TAC rate of 2.4¢/kWh, a 0.005% reduction results in a savings of 0.0012¢/kWh. This appears a very small number, but this savings would be realized by virtually all of the 254,000 GWh[6] consumed within CAISO transmission system electricity by 2020 which is subject to TAC charges. These Merit Order cost savings in TAC charges at 0.0012¢/kWh would equal $30,540 in annual CAISO wide ratepayer savings for each MW reduction in required transmission capacity, assuming a 1:1 peak annual capacity reduction, over $300,000 in savings over a ten year contract.[7]

While it may be impractical to calculate the value of savings attributable to each individual bid, cost-effectiveness reporting should include estimates of the average avoided costs.

AB 327 requires California investor owned utilities to proactively plan for distributed energy resources, and guide these resources to optimal locations on the grid, supporting integrated T&D grid planning.

Section 769 of the Public Utilities Code:

- By July 1, 2015, each regulated utility shall submit to the CPUC a proposed distribution resources plan to identify optimal locations for the deployment of distributed energy resources.
- Each plan must "evaluate locational benefits and costs" of distributed energy resources to the electric grid and ratepayers.
- Propose methods to maximize locational benefits and minimize costs of distributed energy resources in existing programs.

[6] California Energy Demand 2012-2022 Final Forecast Volume 1: Statewide Electricity Demand and Methods, Mid Energy Demand

[7] Testimony of Kenneth Sahm White in SB 43 Implementation Hearings, January 10, 2014, A.12-01-008/A.12-4-020, at 6.

- Propose utility spending to integrate cost-effective distributed energy resources into distribution planning, with the goal of yielding net benefits to ratepayers.

Calculating the optimal level of avoided transmission investments is an essential step for complying with the intent of AB 327 to maximize ratepayer savings based on locational value of distributed energy resources.

Distribution Resources Plans should include the optimal uses, amounts and locations for storage to avoid or defer transmission investments. Plans should determine the most cost-effective balance between local and remote resources, after accounting for avoided or deferred transmission costs for addressing transmission constraints or remote renewable generation. Utilities should procure distribution storage in alignment with the Distribution Resources Plan and the Storage Procurement Targets. Distribution level storage should be assigned a proportionate share of the avoided or deferred costs of transmission, based on an average value per unit of capacity.

Voltage support

Energy storage with advanced inverters can provide voltage support services, including:

- Increased grid resilience and reliability by providing reactive power where it is needed most during a contingency, e.g. when a transmission path is lost
- Integration of higher levels of intermittent distributed renewable generation by smoothing out voltage fluctuations
- Enabling conservation voltage reductions by maintaining consistent voltage levels along feeder lines, allowing operators to reduce average voltage

The Commission and IOUs are in the process of developing and implementing advanced inverter standards within the Rule 21 Proceeding, R.11-09-011, with the intention of harmonizing FERC jurisdictional interconnection within California to these same standards. These standards include voltage support functionality.

As the use of advanced inverter capabilities are implemented, the value of these services provided through ES deployment, such as local voltage support, should be recognized in evaluating cost effectiveness of ES procurement.

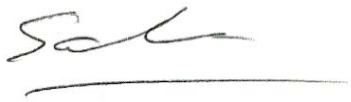
Where it is impractical to calculate the precise value of such services for each individual bid, cost-effectiveness reporting should include estimates of the average savings and avoided costs of providing such services against alternative voltage support resources, such as capacitor banks.

Where there are differences in the capabilities and likely application of these functions by competing bids, these differences should be considered in bid evaluation, either through individual evaluation of value or the use of applicable average values.

Conclusion

We appreciate the opportunity to offer comments on these topics. For the foregoing reasons, the Clean Coalition respectfully requests that the Commission adopt the above recommendations associated with the proposed utility energy storage procurement plans.

Respectfully submitted,



Kenneth Sahm White
Economics & Policy Analysis Director
Clean Coalition
16 Palm Ct
Menlo Park, CA 94025
sahm@clean-coalition.org

Stephanie Wang
Policy Director
Clean Coalition

16 Palm Ct
Menlo Park, CA 94025
steph@clean-coalition.org

Dated: June 12, 2014