

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

Order Instituting Rulemaking to Develop a
Successor to Existing Net Energy Metering Tariffs
Pursuant to Public Utilities Code Section 2827.1,
and to Address Other Issues Related to Net Energy
Metering.

Rulemaking 14-07-002
(Issued July 10, 2014)

**COMMENTS OF THE CALIFORNIA ENERGY STORAGE ALLIANCE
IN RESPONSE TO ADMINISTRATIVE LAW JUDGE'S RULING
PROVIDING FURTHER INSTRUCTIONS FOR PARTIES' PROPOSALS
AND ACCEPTING INTO THE RECORD CERTAIN
UPDATES TO THE PUBLIC TOOL**

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September 1, 2015

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The California Energy Storage Alliance (“CESA”)¹ hereby submits these comments pursuant to the Rules of Practice and Procedure of the California Public Utilities Commission (“Commission”) in response to *Administrative Law Judge's Ruling Providing Further Instructions For Parties' Proposals And Accepting Into The Record Certain Updates To The Public Tool*, issued July 20, 2015 (“Ruling”).

¹ 1 Energy Systems Inc., Abengoa, Advanced Microgrid Solutions, AES Energy Storage, Aquion Energy, ARES North America, Brookfield, Chargepoint, Clean Energy Systems, CODA Energy, Consolidated Edison Development, Inc., Cumulus Energy Storage, Customized Energy Solutions, Demand Energy, Duke Energy, Dynapower Company, LLC, Eagle Crest Energy Company, East Penn Manufacturing Company, Ecoult, ELSYS Inc., Energy Storage Systems, Inc., Enersys, EnerVault Corporation, Enphase ENERGY, EV Grid, Flextronics, GE Energy Storage, Green Charge Networks, Greensmith Energy, Gridtential Energy, Inc., Hitachi Chemical Co., Ice Energy, IMERGY Power Systems, Innovation Core SEI, Inc. (A Sumitomo Electric Company), Invenergy LLC, K&L Gates, LG Chem Power, Inc., LightSail Energy, Lockheed Martin Advanced Energy Storage LLC, LS Power Development, LLC, Manatt, Phelps & Phillips, LLP, Mitsubishi Corporation (Americas), Mobile Solar, NEC Energy Solutions, Inc., NextEra Energy Resources, NRG Solar LLC, OutBack Power Technologies, Panasonic, Parker Hannifin Corporation, Powertree Services Inc., Primus Power Corporation, Princeton Power Systems, Recurrent Energy, Renewable Energy Systems Americas Inc., Rosendin Electric, S&C Electric Company, Saft America Inc., Sharp Electronics Corporation, Skylar Capital Management, SolarCity, Sony Corporation of America, Sovereign Energy, STEM, SunEdison, SunPower, Toshiba International Corporation, Trimark Associates, Inc., Tri-Technic, Wellhead Electric. 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. (<http://storagealliance.org>).

I. INTRODUCTION.

CESA appreciates the opportunity to provide comments on NEM Successor Tariff proposals submitted by parties (“Proposals”), particularly those of Pacific Gas & Electric (“PG&E”), Southern California Edison (“SCE”), and San Diego Gas & Electric (“SDG&E”). CESA appreciates the efforts of the Investor-Owned Utilities (“IOUs”) and looks forward to engaging on these important matters. In these comments, CESA focuses on how parties likely underestimate the benefit potential and growth trajectory of energy storage, and thus inadequately addresses how energy storage should be reflected or considered in proposed rate structures. CESA urges the Commission to develop a separate track in this proceeding to carefully explore “--plus-energy storage” policy. SCE has also called for a similar examination in this proceeding, which CESA supports. The current lack of consideration for energy storage in a potential NEM successor tariff could send perverse price signals, thus stifling the development of PV solar-plus-energy storage solutions that would provide significant long-term benefits to the grid. Generally, rate design should anticipate and encourage technological advancement and be adaptive to changes. Lack of consideration of potential technological innovation represents a lost opportunity that could benefit ratepayers and society in the long run.

II. PG&E’S ENERGY STORAGE COST ASSUMPTION DOES NOT ACCURATELY REFLECT ENERGY STORAGE PRICES.

CESA appreciates that PG&E explicitly modeled energy storage development into its Public Tool models but disagrees with PG&E’s use of the ‘High’ cost assumptions for energy storage in both Bookend cases. As PG&E notes, active energy storage companies, SolarCity and Tesla, currently produce lithium-ion battery packs that are closer to PG&E’s assumed ‘Low’ case, yet PG&E nevertheless selects the ‘High’ case cost assumptions. PG&E seeks to explain this selection by pointing out that the SolarCity and Tesla costs may “represent the lowest-price

storage available on the market.” CESA believes it is prudent to include a range of price assumptions to provide more reasonable or indicative bookend results.

CESA also disagrees with PG&E’s claim that the Public Tool may be overly aggressive in its projections for battery cost declines. CESA instead contends that the Public Tool is in fact conservative. A recent Brattle Group report cited vendor quotes for installed costs of energy storage systems of \$350/kWh by 2020.² Navigant has stated that the Tesla could be producing cells as low as \$110/kWh upon completion of the “GigaFactory.”³ Findings from the reports cited above stand in stark contrast to the cost estimates included in the Public Tool. By 2020, E3 assumes that the installed cost of storage will be approximately \$600/kWh in their High case.⁴ This is far from the installed cost included in the Brattle Group’s study, and is higher than the costs to many vendors today. Therefore, PG&E should have used the Public Tool’s Low case in its modeling.

III. ALL OF THE PROPOSALS INADEQUATELY ADDRESS ENERGY STORAGE.

CESA notes that there is little mention in the Proposals regarding cost-effective energy storage paired with PV solar even though AB 327 requires it. Party proposals reported model results of distributed solar deployment levels as requested by the Commission, but CESA recommends that the Public Tool also be used to show the impact on energy storage adoption levels. Specifically, this information was called for in the Public Utilities Code (P.U.), Section 2827.1(b)(1) definition of “customer-sited renewable distributed generation” because P.U. Code Section 769(a) defines “distributed resources” as including energy storage. Otherwise, the

² *The Value of Distributed Electricity Storage in Texas: Proposed Policy for Enabling Grid-Integrated Storage Investments*. The Brattle Group. Nov 2014, pp. 1.

³ Jaffe, Sam (2014). *Energy Storage Supply Chain Opportunities*. Navigant Research. Sep 2014.

⁴ E3. *Advanced DER Inputs*. NEM Successor Tariff Public Tool. Microsoft Excel file. 17 Jul 2015.

parties may propose charges and tariff structures that inadequately address their impact on energy storage deployment or that undervalue the roles of energy storage solutions.

CESA believes that the lack of consideration of energy storage in the Proposals could lead to flawed proposals and designs. For instance, each of the IOUs propose some combination of fixed charges, demand charges, and time-of-use rate plans that would be introduced for to the residential and small commercial customer classes, overlooking a potential role for energy storage in each of these cases. While CESA is not taking a position or endorsing any of the Proposals at this time, CESA's view is that the proposed retail market designs could be improved through better consideration of the roles and value-added of energy storage. CESA recommends the three ways discussed below to allow for energy storage additions and value-added.

IV. FIXED CHARGES SHOULD BE ELIMINATED IN SOME INSTANCES.

CESA disagrees with the parties proposing blanket fixed charges to recover their fixed investment costs because they reduce the incentive to adopt new energy technologies contrary to P. U. Code Section 2827.1(b)(1) that calls for a NEM successor tariff structure that “ensures that customer-sited renewable distributed generation continues to grow sustainably.” Fixed charges proposed by SCE and SDG&E do not send the proper price signals and reduce the amount of electricity usage the customer can offset with on-site distributed PV solar generation paired with energy storage. Fixed charges are a blunt instrument which can fail to encourage customer-sited Distributed Generation (“DG”) deployment to address time-variant grid needs and can fail to account for the benefits of avoided T&D infrastructure investment costs attributed to distributed PV solar and energy storage technologies.

V. **MORE NUANCED DEMAND CHARGES SHOULD BE DEVELOPED TO BETTER SUPPORT SYSTEM OPERATIONS.**

CESA does not take a position on the Proposals or on the reasonableness of requiring customers deploying behind-the-meter DG to take service under rates that include demand charges. CESA believes solar industry participants are better positioned to speak to the implications on customer solar economics and on adoption were such proposals to be pursued.

Regarding demand charges, CESA observes that the cost recovery goals for these rate-design features, should they be pursued, should generally work in concert with system needs. To CESA, proposed demand charges are not well designed to address system cost drivers or to direct customer responsiveness towards system needs. For instance, the demand charges proposed by PG&E and SDG&E are not time-variant and therefore are not aligned to peak system needs. Instead they treat power used at 6:00 pm in the evening as the same as power used at 3:00 pm in the morning. Such a demand charge should therefore not seek to recover system costs that are unrelated to the time of energy usage, e.g. transmission charges. Such an approach could potentially violate cost-of-service rate design principles and hinder adoption of new technologies like energy storage.

While PG&E claims to “encourage adoption of new technologies such as storage” by proposing demand charges instead of fixed charges, its proposed 24-hour demand charge fails to reduce the main system cost drivers facing ratepayers. Customers with PV solar, energy storage, or solar plus energy storage would still fall into higher demand classes due to the 24-hour demand charge and as a result reduce the value proposition of having these customer-sited distributed assets. While it would be economically challenging to site and size energy storage to shave a customer’s demand over a 24-hour period, it would alternatively be possible for an energy storage plus PV solar system to provide value if demand charges were defined over

certain hours that aligned with system peak demand needs and more closely followed cost-based pricing principles.

VI. PV SOLAR PLUS ENERGY STORAGE REALITIES SHOULD BE ACCOUNTED FOR IN SETTING TIME OF USE RATES AND TIME PERIODS.

While CESA welcomes the shift toward time-of-use (“TOU”) rate structures generally, as with demand charges, CESA does not at this time take a position in the this proceeding on whether the specific proposals of parties that would require customers deploying behind-the-meter generation to take service under a prescribed TOU tariff is appropriate or reasonable. However, to the degree the Commission does consider TOU rates, it must carefully consider the effects of TOU price differentials and time periods on solar and energy storage deployment. Large enough spreads are needed to encourage the intended shift from peak to off-peak energy consumption, but overly large spreads with improper temporal alignment could unduly reduce the value gained from installing rooftop PV solar. By comparison to a leading residential energy storage market in Japan where the peak/semi-peak price differentials are approximately \$0.22/kWh,⁵ some of the proposed severely flattened spreads by the utilities may inadvertently discourage energy storage solutions and do not reflect the near-term reality of negative pricing in shoulder months. This situation appears particularly true for the proposals related to commercial rates.

Overall, energy storage has the potential to reduce cost for ratepayers by charging during low-cost, off-peak periods and discharging during high-price, peak periods. More nuanced charging regimes can provide additional system value and cost-savings. However, the

⁵ Tokyo Electric Power Company. *Customer Communication: Rate Calculation*. <http://www.tepco.co.jp/en/customer/guide/ratecalc-e.html>

Commission must carefully determine the right combination of price differentials and TOU time periods that incentivize the load shaping behaviors that are in the best interest of the grid overall.

VII. SOLAR-PLUS-ENERGY STORAGE POLICY SHOULD BE EXPLORED IN A SEPARATE TRACK OF THIS PROCEEDING.

CESA strongly urges the Commission to pursue a separate track in this proceeding or in either the Distributed Energy Resource proceeding (“DER”),⁶ or the Integrated Demand Side Resource Management (“IDSR”) proceeding⁷ to explore PV solar-plus-energy storage policy. Energy storage is the perfect complement to solar energy and can carry forward its value to peak times. Energy storage can also provide other high-value services such as ramping, spin, and flexible capacity. Capturing the combined benefits of PV solar-plus-energy storage, however, creates a challenge in the current market framework. It is important that as the Commission looks at ways to expand the deployment and effective utilization of distributed energy resources (“DERs”) the Commission should explore solar-plus-energy storage rate design and tariffs.

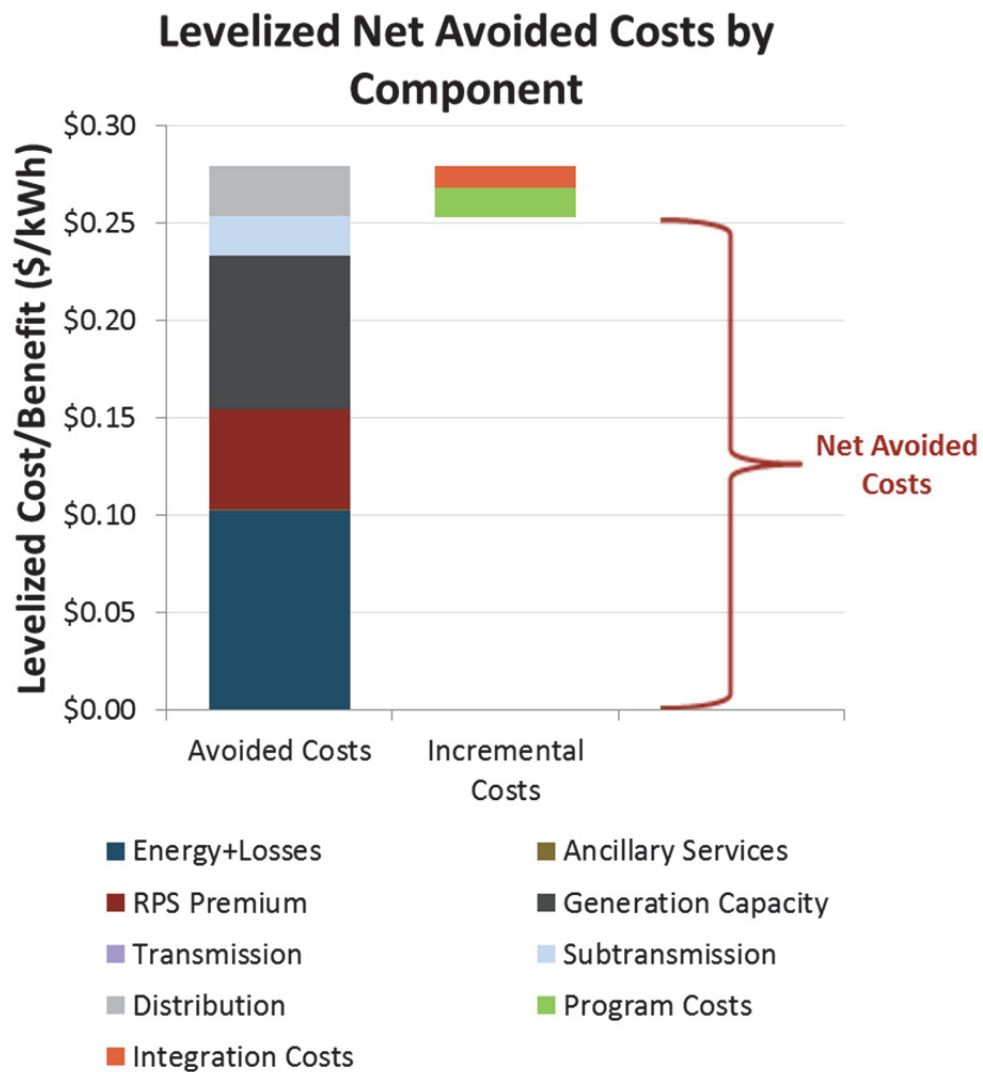
To illustrate the value of energy storage paired with solar PV, CESA ran the Public Tool mostly with default assumptions,⁸ but changed only two assumptions: (1) a 50% RPS; (2) a

⁶ See, *Order Instituting Rulemaking to Create a Consistent Regulatory Framework for the Guidance, Planning, and Evaluation of Integrated Demand-Side Resource Programs*, R.14-10-003, filed October 2, 2014.

⁷ See, *Order Instituting Rulemaking Regarding Policies, Procedures and Rules for Development of Distribution Resources Plans Pursuant to Public Utilities Code Section 769*, R.14-08-013, filed August 14, 2014.

⁸ CESA is not endorsing the default assumptions or inputs in the model at this time. These model results, however, highlight the incremental or relative improvement that can be anticipated with the addition of energy storage. The Public Tool’s default assumptions do not include locational adders when determining avoided energy costs. It’s possible that disproportionate amount of new DER will be in location-constrained areas with higher than average marginal energy costs. In fact, CESA believes this is likely to occur since utility distributed resource plans will enable better geotargeting of DER resources. Therefore, it is logical to consider scenarios with greater DER in high cost locations. Moreover, locating solar with storage resources in these locations provides significantly enhanced value to ratepayers than what is suggested by the Public Tool’s default assumptions (which simply use average energy costs). For this analysis we used a multiplier of 150%, which is representative of certain high-LMP locations on the CAISO network.

marginal avoided energy cost locational multiplier. The E3 model generated a sizable benefit stack of \$0.25/kWh in levelized value when PV solar is combined with three hours of energy storage (see chart below). These findings are telling because the conservative E3 model undervalues energy storage in a variety of ways, such as in adding no flexible capacity value, minimal temporal granularity, and low transmission saving values, as well as in assuming high levels of overgeneration and curtailment with higher Renewables Portfolio Standard (“RPS”) levels, which energy storage can address.



Despite these benefits, the IOUs included little or no mention of energy storage in their proposals or modeling exercises. CESA recommends the Commission establish a forum to understand the hurdles and opportunities presented by PV solar-plus-energy storage, including potential tariffs to unlock their combined value.

VIII. CONCLUSION.

CESA thanks the Commission for the opportunity to provide these comments in response to the Proposals. Given the substantial potential value of pairing energy storage with PV solar, CESA urges the Commission to pursue a separate track, either in this proceeding or in either the DR or IDSR proceeding, to explore PV solar-plus-energy storage policy.

Respectfully submitted,



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Date: September 1, 2015