

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

Order Instituting Rulemaking to consider policy and implementation refinements to the Energy Storage Procurement Framework and Design Program (D.13-10-040, D.14-10-045) and related Action Plan of the California Energy Storage Roadmap.

FILED
PUBLIC UTILITIES COMMISSION
MARCH 26, 2015
SAN FRANCISCO, CALIFORNIA
RULEMAKING 15-03-011

**COMMENTS OF THE CALIFORNIA ENERGY STORAGE ALLIANCE
ON PRELIMINARY SCOPING MEMO**

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In accordance with the directives provided in the Preliminary Scoping Memo for this proceeding, the California Energy Storage Alliance (“CESA”)¹ Hereby submits these comments on scope and categorization of this proceeding, need for hearings, schedule, and other relevant procedural or substantive issues believed by CESA to be relevant to the purposes of the Order Instituting Rulemaking (“OIR”).

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, Elevation Solar, 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 Resources, SolarCity, Sony Corporation of America, Sovereign Energy, STEM, SunEdison, SunPower, Toshiba International Corporation, Trimark Associates, Inc., Tri-Technic, Wellhead Electric, Younicos. See, <http://storagealliance.org>.

I. INTRODUCTION

CESA commends the California Public Utilities Commission (“Commission”) for its sustained efforts to maintain the momentum achieved in deploying cost-effective energy storage. While much effective work has been done, initiatives such as the multi-stakeholder Energy Storage Roadmap clearly show there is more to do to unlock and deliver the full benefits of energy storage to California ratepayers. Fortunately, learning from procurement authorized by the Commission to date, as well as increased hands-on experience with energy storage gained by utilities and industry stakeholders, will bring considerably more much needed data to this proceeding. With the benefit of valuable new information to inform policy decisions, the Commission and stakeholders can and will better achieve the goals of Assembly Bill 2514. CESA thus applauds the preliminary scope proposed for this proceeding in the OIR. The robust list of topics demonstrates strong commitment to tackle the next round of hurdles facing energy storage deployment. While CESA is highly supportive of the initial list of topics, these comments offer recommendations for further refinement and additional topics that should be addressed by the Commission.

A. Identity and Interest of CESA in this Proceeding.

CESA is a broad advocacy coalition comprised of approximately 90 member companies that are committed to advancing the role of energy storage to enable a more efficient, affordable, clean, and reliable electric power system. CESA’s members represent a significant portion of the energy storage ecosystem, including: technology manufacturers, renewable energy component manufacturers, renewable energy developers, fossil fuel and energy storage project developers, software developers, electrical contractors and systems integrators. CESA is a technology-neutral and business model-neutral association of members who share a common mission, the advancement of energy storage solutions to optimize California’s energy infrastructure.

CESA therefore has a strong interest in the energy storage policy and implementation topics that will be addressed in this proceeding.

B. Proceeding Category and Need for Hearings.

The OIR preliminarily determines that this proceeding is quasi-legislative as defined in Rule 1.3(d). It further states that while it appears that the issues may be resolved through comments and workshops without the need for evidentiary hearings, a final determination on the need for hearings will be made in an assigned Commissioner's Scoping Memo.² CESA agrees with the categorization of the proceeding and also agrees that hearings likely will not be necessary. Workshops, staff, utility and/or third party proposals and filed comments should be sufficient to establish a full record.

II. COMMENTS ON ISSUES RELEVANT TO THE SCOPE OF THIS PROCEEDING.

ISSUE 1: ADDRESS OUTSTANDING FRAMEWORK IMPLEMENTATION ISSUES.

1(a) Develop a Measurement and Evaluation Plan for 2016 Including Determining Which Studies or Other Factors Should be Included in the Evaluation.

CESA Response: More advanced system modeling techniques should be adopted and implemented that appropriately considers the important role of and resulting benefits resulting from deploying energy storage to achieve California's many energy policy goals. Larger targets of 2.6 GW or more should be explicitly considered.

The Commission should take the lead on implementing stochastic portfolio modeling of how to achieve California's energy policy goals. The modeling should proactively consider the use of energy storage as a key enabling resource to achieve low cost greenhouse gas ("GHG") emission reduction system-wide. The resulting findings should help inform the various steps

² See, OIR, p. 17.

dealing with resource review and procurement. Data driven analytics for energy storage can and should be developed in this proceeding, in conjunction with long term procurement (“LTPP”) and resource adequacy (“RA”) proceedings, and the Energy Storage Roadmap and related stakeholder processes at the California Independent System Operator (“CAISO”). The Commission’s cost-effectiveness test should be modeled using a variety of future scenarios, including high renewable scenarios consistent with the Governor’s recently announced energy policy goals. Cost-effectiveness evaluation should include all the benefits from energy storage, including, for example, the value of flexibility, the ability of energy storage to reduce fossil generation unit starts, and the like in a 50% renewable scenario.

A fresh evaluation of the Storage Framework is needed for the new and emerging energy policy construct. To illustrate this recommendation and to provide constructive input in the Self Generation Incentive Program Assigned Commissioner’s Ruling on updating GHG emission factors for Sell Generation Incentive Program (“SGIP”) eligibility, CESA retained Energy Exemplar to provide production cost model modeling using PLEXOS for the CAISO’s 2014 LTPP scenario of a 40% renewables portfolio standard (“RPS”) by 2020.³ To quantify the system impacts of distributed energy storage, CESA modeled the system impacts with and without 412.5 MW of two-hour energy storage (the minimum duration requirement for SGIP eligibility). The results and quantified system benefit impacts were impressive. This small amount of energy storage (representing a fraction of less than 1% of California’s generation fleet capacity) reduced costly annual generation starts by 7% and reduced annual renewable curtailment by 6%.

More evidence of the cost-effectiveness and utility of energy storage as a superior resource relative to other traditional solutions can be found in the latest Southern California

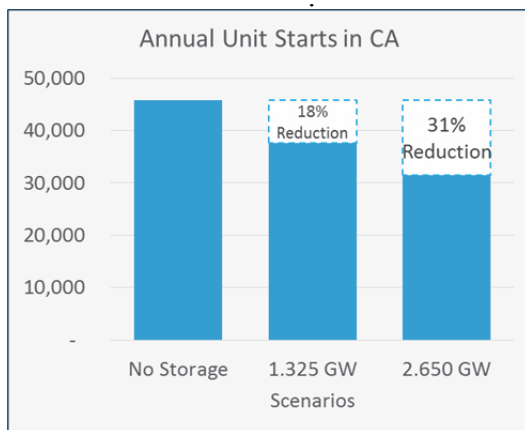
³ CESA recently reported these findings in R.12-11-005.

Edison Company's ("SCE's") Local Capacity Requirement ("LCR") procurement. In procuring 261 MW of energy storage capacity to meet its LCR requirement under an all-source request for offers ("RFO"), SCE exceeded the Commission's 50 MW procurement requirement established in Track 1 of the 2012 LTPP by more than five times. In fact, SCE's application revealed that SCE's LCR modeling results actually optimized for 400-900 MW of in front of the meter energy storage in the Western Los Angeles Basin alone⁴.

Finally, to ascertain the system impacts of expanding the AB 2514 goals and comment effectively in this broader rulemaking on energy storage, CESA retained Energy Exemplar again to model 1.325 GW ('AB 2514 Scenario') and 2.65 GW ('2X AB 2514 Scenario') of storage capacity on the grid and compared that to a base case of zero energy storage. Similar to the scenarios described above, they were modeled in PLEXOS and based on the exact same assumptions built into the same PLEXOS CAISO's used for the Long Term Procurement Plan at a 40% RPS level by 2024, which fortunately did factor in 1.325 GW of a variety of energy storage durations, including 2, 4 and 6-hour energy storage. Compared to a no-storage scenario, the 1.325 GW of energy storage capacity modeling yielded a reduction in approximately 8,000 fewer unit starts per year statewide, or 18% less than the base case. This is significant, as fossil generation unit starts are both costly and emissions producing. The AB 2514 scenario also resulted in a curtailment reduction of 22% per year across the Western Energy Coordinating Council ("WECC"). The 2X AB 2514 Scenario (2.650 GW) simply doubled the energy storage capacity assumptions in the existing CAISO LTPP 40% RPS model. ... and this modeling not surprisingly resulted in further grid benefits. There were an estimated 14,000 fewer fossil generation unit starts per year statewide, or 31% less than the base case. The scenario also

⁴ See, Testimony of Southern California Edison Company On The Results Of Its 2013 Local Capacity Requirements Request For Offers For The Western Los Angeles Basin, November 21, 2014, p. 6 and p. 57.

resulted in a renewable curtailment reduction of 40% per year across the WECC. CESA notes that the cited results were just recently obtained and a full assessment is currently taking place. Additionally, it is well understood that PLEXOS dispatches grid resources for economic benefit and not necessarily for lowest cost GHG emission reduction. Still, despite the fact that this modeling approach is not optimized for this outcome, CESA estimates that significant cost-effective emissions savings are possible. Moreover, the large reduction in unit starts, as depicted in the graph below, can avoid costly cold starts and significantly reduce O&M related expenses for certain fossil generation units.



CESA’s Response: Expedited evaluation of the Storage Framework is required, especially in light of the Governor’s newly announced energy goals, and higher targets should be expeditiously considered. Specifically, this proceeding should formulate recommendations for both the California Energy Commission (“CEC”) and the CAISO for how to evolve current system planning to leverage the tremendous portfolio optimization benefits of energy storage.

As stated in the preliminary scope, the Commission is tasked with determining “whether the energy storage procured meets the stated purposes of optimizing the grid, integrating

renewables, and/or reducing greenhouse gas emissions.”⁵ CESA strongly believes that market data and further technical analysis will reveal that the current 1.3 GW target is far too conservative, particularly given the results of the AB 2514 and 2X AB 2514 PLEXOS modeling described above. In his 2015 inaugural address, Governor Brown proposed an escalation of California’s renewable energy goals to 50% by 2030.⁶ Deployment of cost-effective energy storage is not just an *option* in a 50% renewable scenario – it is an enabling *necessity*. Increased curtailment of zero marginal cost clean energy is certainly not optimal for the state and would inevitably increase prices for new renewable energy utility contracts. Energy storage can help solve the problem of over generation of renewables, while providing ramping and a whole host of other services, (*e.g.* peak shaving, voltage control, frequency response, reactive power) that will improve the system in general. An energy storage target of 1.3 GW is inadequate for a future with addition of the expected large additional amount of renewable generation.

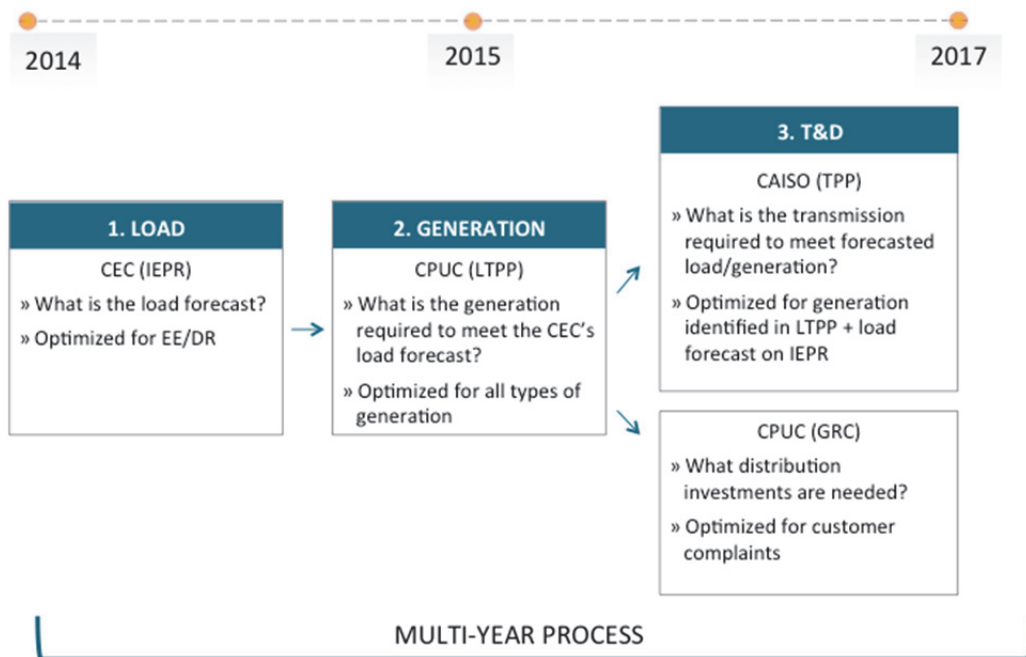
Further, Governor Brown’s stated goal of reducing fossil fuel use in automobiles and trucks by 50% by 2030 also requires energy storage. Electric vehicles are a key alternative to fossil fuel powered vehicles and they represent near-term tremendous potential for optimizing the grid, not only from a demand response (managing charging) standpoint, but also via the utilization of stationary energy storage to help integrate the increasingly higher-power requirements of new vehicles into California’s grid. The use of stationary energy storage to help support vehicle grid integration is already being done today and should be encouraged with oversight from this proceeding.

⁵ *Order Instituting Rulemaking to Consider Policy and Implementation Refinements to the Energy Storage Procurement Framework and Design Program* (D.13-10-040, D.14-10-045) and related Action Plan of the California Energy Storage Roadmap, p 9.

⁶ *See, e.g.*, Governor Jerry Brown's inaugural address reported in the Los Angeles Times January 5, 2015.

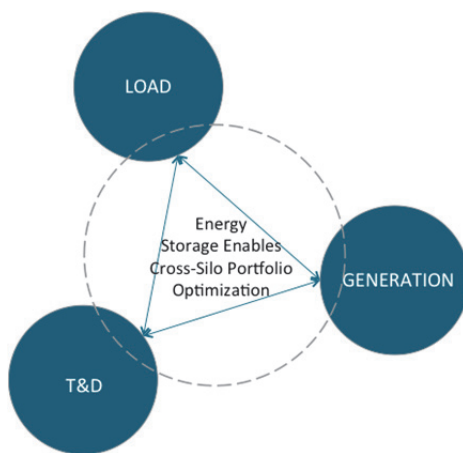
Finally, Governor Brown’s recent Executive Order seeking 40% reduction in GHG emissions by 2030 represents the greatest application for energy storage, in that energy storage has the ability to optimize every part of California’s electric power system, starting with shaping load, increasing the efficiency of traditional generation, reducing curtailment of renewable generation, and optimizing our existing and planned transmission and distribution system.

The current serial approach to system planning depicted below; starting with CEC modeling load, then the Commission takes that load and models new generation to support the load, then the CASIO and utility modeling transmission and distribution requirements to support the forecasted generation and load will not result in an optimal outcome, because it fundamental ignores the potential of energy storage to shape and influence each step. Energy storage can serve as load, and also be used as a transmission or distribution asset. The current serial process, takes many years and will not result in a GHG emission or cost optimized solution.



The only way to properly evaluate the system efficiency benefits of grid assets is to conduct full-system portfolio modeling over the time frame of the GHG emission or RPS targets.

Considering and optimizing for specific outcomes using alternative portfolios of resources especially including energy storage, is necessary to achieving California’s reliability, GHG emission and RPS goals in the most cost effective way. The results of such modeling efforts should guide the Commission, CEC, and the CAISO’s integrated planning efforts, and the results should inform the specific targets in this proceeding as well as many other related rulemakings and other proceedings at the Commission, including, for example, LTPP, RA, SGIP, and demand response.



1(b) Assess Best Practices and Challenges Within the Procurement Process In the Context of a Future Proceeding.

CESA Response: RFO structure is of utmost importance when seeking to procure the most cost-effective energy storage.⁷ Going forward, the Commission should consider ways to leverage energy storage procurement processes and existing programs to factor in two strategically key aspects of energy storage:

⁷ For example, this proceeding should consider examining lessons learned from SCE's LCR RFO, including the valuation of ancillary services benefits from energy storage and the potential impacts of energy storage procurement on debt equivalence and how risks of capital lease treatment can be minimized – before, rather than in the middle of – the next AB 2514 procurement.

1. Newly commercialized and earlier stage technologies are essential to ensure the market transformation goals of R.10-12-007 and AB 2514 are met, and to expanding the potential uses and applications and cost-effectiveness of energy storage solutions.
2. The modular, and flexible nature of energy storage coupled with widespread innovation is resulting in creative new ways of realizing energy storage benefits under various business models and existing Commission programs.

CESA applauds the efforts of the utilities in the tremendous progress they have achieved in the last year developing and implementing energy storage procurement processes and practices. As with any new activity, there will surely be lessons learned along the way. CESA also appreciates the focus of this proceeding in enhancing and improving energy storage procurement going forward, and the ability to offer constructive feedback.

First, it should be acknowledged that procurement process flaws and/or inadequate RFO practices can limit the number of qualified bids. Establishing uniform best practices will yield lower costs for ratepayers, more technological competition, and less developer uncertainty. The utilities should be encouraged to utilize low cost ways to install energy storage without regard to the ultimate ownership structure. Since many energy storage technologies have very manageable physical footprints, and have the ability to be co-located with existing power plants, T&D facilities, and even sited on the customer side of the meter, it should be noted that underutilized utility properties can yield significant savings to the balance of system costs of an energy storage installation.

Second, more should be done to ensure market transformation objectives are consistently being pursued in the various California policy venues, consistent with the goals of R.10-12-007. While many energy storage systems are mature and commercially proven, new energy storage

technologies are rapidly developing. This is a good thing for California's economy and will be important in achieving the aggressive longer term clean energy goals being set by the state. To illustrate the point, 15 years ago we could not have imagined the power of the smart phones being commercialized today. At that time, cellphones were merely cellphones did not do much else. As a result of a healthy competitive market, investment, and innovation everyone now has a mini computer in their pocketor on their wrist! As a regulated industry, it is critical that the Commission encourage similar innovation and the market introduction of new technologies. It is in the state's and ratepayers' interest to ensure that these new technologies have a reasonable, accelerated pathway to be catalyzed into deployment.

CESA is concerned that there are still significant barriers faced by early stage technologies and recommends examining creative options for encouraging utilities to proactively aid in the commercialization process by testing and verifying early stage energy storage technologies. Currently, early stage technologies in the larger market of utility applications do not receive adequate support. For example, there is no effective SGIP equivalent for such applications. While there is CEC EPIC funding, it is not sufficient both in scope or size to catalyze the broad range of promising technologies coming to fruition, and EPIC applications face extremely long project cycles. In practice, the utilities appear to be setting a high bar, or avoiding forward looking approaches – perhaps because existing policies are seen to discourage risks, preventing developing technologies from being considered, even for pilots or R&D projects. For example, utility pilot requirements that a potential technology contender to be already proven at scale at a single site creates a market entry impasse for certain early stage technologies and seems contrary to the intent of exploring new solutions. Therefore, this proceeding should provide recommendations to the CEC, and consider exploring new

procurement pathways, policies and programs to help developing technologies gain market validation..

The modular, and flexible nature of energy storage coupled with widespread innovation is resulting in creative new ways of realizing energy storage benefits under various business models. For example, as was demonstrated in SCE's LCR procurement, local capacity from energy storage was delivered from behind the meter. This required an innovative new contracting mechanism, not only between SCE and the contracted bidders, but also between the bidders and host customers. A project such as this has the potential to affect, or be affected by other Commission programs on the customer side of the meter. Another key example is how energy storage maybe affected by the outcomes of the Commission's Distributed Resources Plans proceeding.⁸ This proceeding should identify and prioritize key applications for energy storage – and for those priority applications, it should also explore the complex interaction of other Commission programs, including the important impact of retail rate design. Another example can be found from SCES's procurement – where it became clear that the Commission and the CAISO's resource adequacy rules are outdated with respect to the RA benefits that can be provided by storage. The Commission should carefully watch and keep track of these proceedings. CESA recognizes that several areas have been identified in the Storage Roadmap but also encourages the Commission to go a step further – specifically, to have this rulemaking provide the governance and leadership necessary to harmonize and clarify the role of energy storage in various related proceedings for high priority energy storage applications, and to coordinate with other jurisdictions such as the CAISO and the CEC. Clarity on the interaction of various related programs, and greater specificity for program metrics and goals will certainly help accelerate the success of behind the meter and in front of meter market transformation

⁸ R.14-08-013.

efforts. The Storage OIR is in the best position to serve as an ‘umbrella’ rulemaking in which to track, coordinate and ensure progress in all related proceedings at the Commission.

1(c) Consider Revising Allocation/Flexibility of Targets Within Grid-Domains.

CESA Response: The energy storage framework established in D.13-10-040 can be improved by clarifying treatment of aggregated customer-sited energy storage for purposes of meeting the utility’s T&D domain procurement requirement to allow such projects to count toward the utility’s T&D domain requirement.

One area of improvement should be how to treat aggregated customer-sited energy storage for T&D domain needs and provide clarification of minimum participation levels. These resources should explicitly be allowed to participate and compete in all-source utility solicitations, as they have not been allowed to uniformly do so to date. If the customer-domain systems are selected in RFOs, those winning projects should count toward the utilities’ procurement targets even if the utility has already fulfilled its customer-domain target amount, say through SGIP implementations. Given the current domain definitions, moving capacity from the distribution domain bucket into the customer-domain bucket (at a level equal to the capacity of the winning bids) would be most appropriate. However, procurement requirements should not be shifted away from customer-sited to T&D domain requirements because one transmission project could effectively swamp the entire customer-side target. Most importantly, CESA strongly encourages the Commission to consider raising the procurement targets as stated earlier because of the significant system benefits that are possible, and the ability of energy storage to help meet California’s expanding energy goals.

1(d) Examine Utility Safety Standards and Certifications.

CESA Response: The Commission should proactively address energy storage safety concerns and work with industry and stakeholders to develop best practices that are consistent with national standard setting efforts underway.

A number of entities (*e.g.*, EPRI, Sandia, DOE) are working on safety initiatives and cohesive frameworks that should be integrated into the Commission's thinking and considered before initiating any new safety procedures. Because there are so many energy storage safety efforts underway at the national level, CESA encourages the Commission to incorporate and tailor as many of these stakeholder processes products and guidelines as possible into this proceeding. One example is EPRI's Energy Storage Integration Council's ("ESIC") soon-to-be-published guideline for safety considerations in utility scale energy storage procurement. The gap analysis in that effort - a draft document is expected in June 2015 - should greatly assist the Commission in further narrowing the safety focus areas that are not being addressed in other California venues.

At a minimum, CESA urges the Commission to explore and prioritize the following safety-related topics in this proceeding:

- First responder awareness and training.
- Permitting, installation, and operations and maintenance.
- Electric vehicle charging infrastructure.

CESA therefore recommends that one or more workshops should be scheduled to bring together various stakeholders (both state and nationally-focused) to review these topics holistically.

ISSUE 2: ADDRESS POLICY ISSUES RAISED IN D.14-10-045.

2(a) Clarify Rules On Storage Technology Eligibility And Definitions.

CESA Response: The Commission should seriously consider clarifications that could include more technologies consistent with the statutory definition of energy storage systems.

ISSUE 3: ADDRESS ACTION PLAN ITEMS RAISED IN THE CALIFORNIA ENERGY STORAGE ROADMAP.

3(a) Examine and Clarify Opportunities for Energy Storage to Defer/Displace Transmission and Distribution Upgrades.

CESA Response: Energy storage can be a least cost solution to meet T&D needs, and the Commission should ensure that utilities fully evaluate non-wires alternatives when seeking to upgrade system infrastructure. . During evaluation, utility planners should do more to consider third party-owned energy storage solutions, as well as other distributed energy solutions as potential alternatives to more traditional investments in utility-owned infrastructure. Utilities should also view market services from energy storage as an added source of ratepayer benefits when evaluating alternatives. This is especially important when considering the benefits that bulk energy storage facilities (both single-location bulk storage such as pumped hydro as well as distributed storage aggregated into bulk-scale) can provide in the context of transmission planning.

The scale of pumped hydro storage (“PHS”) can make a meaningful difference in deferring the need for more transmission as well as contributed to significantly reducing renewable curtailment by shifting very large quantities of energy from one time period to another. Distributed energy storage can also provide very large amounts of energy shifting and grid services when aggregated.

The Commission should work with the CAISO to create a planning regime that appropriately considers the interaction of utility-scale energy storage and transmission planning,

such that transmission upgrades are effectively built to optimize operation of bulk energy storage projects and ensure maximum GHG emission reductions and ratepayer savings achieved. In addition to a more rational, portfolio planning approach (as described in CESA's response to Topic 1a above), CESA recommends that the Commission develop policy with more "teeth", or specific consequences, to ensure that utilities fully examine non-wires alternatives first, before committing to traditional upgrades, provided that those non-wires alternatives are deemed to be more cost-effective. There is precedent for this from Arizona regarding examining alternatives first and pursuing them if cost-effective.⁹

3(b) Define and Develop Models and Rules for Multiple-Use Applications.

CESA Response: CESA strongly supports prioritization of this topic area and highlights related interconnections and tariff issues that are inhibiting energy storage market and project development.

Issues have been raised in the Commission's Distributed Generation and Storage Interconnection (Rule 21) proceeding¹⁰ that may be outside of the scope of that docket but need to be addressed in this proceeding. Serious interconnection barriers are becoming increasingly apparent as a key roadblock for cost and time-efficient energy storage deployment. Issues include excessive fees, unneeded studies, and inaccurate bill estimates to developers. The time stakeholders invest in designing the parameters and rules concerning multiple-use participation will be wasted if interconnection hurdles prevent the market from developing; and often, the interconnection issues are far more complex for multiple-use participation applications.

⁹ A recent resource procurement policy was adopted between the consumer advocate and Arizona Public Service, which included a requirement for competitive all source RFO's that are independently monitored, and should the utility decide to move forward with a traditional peaking resource then they must procure at least 10% of that capacity in cost effective energy storage.

¹⁰ R.11-09-011.

The Commission must streamline opportunities for distributed, aggregated behind the meter energy storage systems to deliver system benefits on a statewide basis; including telemetry, streamlined interconnection, access to wholesale markets and retail rate design. Behind the meter energy storage systems can deliver valuable system-wide benefits, if they are allowed to do so. A more streamlined pathway (that is consistent across utility service territories) to interconnection and access to wholesale markets is needed to fully take advantage of behind the meter energy storage's capabilities, including fair compensation to utilities for use of their T&D assets, to ensure that cost recovery for existing infrastructure is preserved.

For example, the Commission should direct utilities to implement a retail tariff reconciliation process for distributed, behind the meter energy resources that also seek to participate in the CAISO's wholesale markets. Charging with the intent of storing power for resale in CAISO markets should be expressly excluded from the definition of retail load because it is not an end use of power.

Multiple-use assets on the customer side of the meter that can provide demand charge management, for example, as well ancillary services, demand response and wholesale market participation should have a clear interconnection process/metering platform that is consistent statewide. The development of these processes will be critical for future cases and consistency will not only help accelerate progress, but also to reduce cost. Clarity on multiple use applications' interconnection, metering and rate treatment should be developed and explained in advance by the utilities – as opposed to mid-way through the RFO process for greatest efficiency.

3(c) Consider Refinements to Common Evaluation Protocol and Valuation Methodologies Used by IOUs to Support Commission Decisions on Storage Procurement and Make Models Publicly Available.

CESA Response: Streamlining and defining policies and processes to increase certainty in the procurement process is needed, particularly for bulk pumped hydro storage and small aggregated behind the meter storage used for bulk applications.

CESA supports stakeholder review and greater transparency in procurement evaluations. The Commission must also ensure that a valuation methodology exists that can be appropriately applied to pumped hydro storage resources. Currently there is no explicit methodology for utilities to evaluate PHS above 50 MW in a way that is deemed sufficient by the Commission, and there has been no recent procurement that provides contemporary guidance. To be clear, CESA is not recommending the inclusion of PHS technology in the procurement target. However, some consideration must be made concerning the unique challenges facing very large scale bulk storage like PHS. Unlike small-scale energy storage, pumped hydro storage entails longer lead times, transmission interconnection, and longer-duration storage capabilities (8-10 hours) which require explicit consideration and inclusion in the adoption of new valuation methodologies. As with the evaluation of any energy storage resource, the valuation should encompass all meaningful ancillary services offered by PHS. Development of this process is critical to successful implementation of PHS, even if such resources are not and will not be explicitly included in the energy storage procurement requirement.

CESA also believes it is necessary to look at best practices and lessons learned from the RFO process for behind the meter resources that will be bidding into competitive solicitations to ensure clarity and hence, greater efficiency for all participants. When a specific use case is sought, the utilities should ideally more fully develop the procurement process/use cases for a competitive solicitation *prior to* launching a RFO. Clear definition of the types of products

utilities would like to procure up front (or at least clear guidance) leading into the RFO will greatly assist potential bidders with the information they need to adequately assess their capability to bid into the process. While it is normal to have specific bilateral discussions as part of the process, a clear road map should be developed as part of the initial solicitation guidelines.

ISSUE 4: ADDRESS EMERGING POLICY AND IMPLEMENTATION ISSUES NOT COVERED IN D.13-10-040 AND D.14-10-045 OR THE STORAGE ROADMAP.

4(a) Distinguish Station Power from Wholesale Charging Energy Used by Distribution Connected Energy Storage Participating in Wholesale Markets.

***CESA Response:* CESA does not feel that this issue needs to be addressed.**

This issue has been adequately addressed in other Commission proceedings.

4(b) Explore Use of Non-Utility Energy Storage by Third Parties to Provide Services to Multiple Customers.

CESA Response: CESA wholeheartedly supports exploring this concept, particularly to expand the use of energy storage for behind the meter multi-tenant apartment buildings and their occupants, representing approximately 40% of California's resident population.

CESA believes that shared storage can play an important role in advancing distributed resources and providing cost effective grid benefits. This concept, which includes either shared ownership or shared use of a single energy storage asset, is essential in ensuring that policy benefits or options available to residential/commercial customers who are able to install storage onsite behind the meter are also available to customers who are not able to do so due to space constraints and/or other structural site ownership issues. A key example of this is the case of multi-tenant buildings where any single tenant may not have the space nor the necessary contractual relationship with the local distribution utility to install energy storage. Enabling this sector of the distributed ecosystem is of utmost importance for several reasons:

1. 40 percent of the state's population lives in multi-tenant buildings. Not considering the needs of this population would be unfair and significantly hamper the widespread deployment of cost-effective energy storage.
2. The same issues and rationale that drove state's efforts encouraging community solar apply to energy storage relative to multi-tenant units as well. Many policies and initiatives have been established to foster community solar and should be developed for storage.
3. Many commercial enterprises are located in multi-tenant buildings. Unlike the single premise enterprises, they are not able to leverage energy storage to manage demand charges and integrate solar. Shared energy storage may allow new business models to address this customer segment while offering grid benefits.
4. Managing the coming proliferation of electric vehicles cost effectively, and cleanly, will require combinations of many technologies, shared storage being one of them. Multiple electric vehicle charging stations for residential buildings would normally be treated as commercial efforts subject to demand and other interconnection charges, thus creating barriers for wider deployment of charging stations at multi-tenant buildings and potentially slowing down electric vehicle adoption by those residents.

While the utility is a prime actor in this market segment, third party initiative and creative business models (which could also involve the utilities) should also be encouraged. Innovative approaches, shaped by competition, can help unlock the benefits of shared storage and drive down costs and provide support for faster distributed energy resource penetration.

4(d) Other Topics That Should be Considered.

CESA Response: As issues develop, this proceeding the Commission must default to inclusiveness rather than exclusiveness and serve as the key umbrella proceeding to help

prioritize and guide activities in all other related Commission efforts. The rapid learning taking place through near term implementation may yield additional issues to solve. The importance of timely solutions to market challenges is very important. If an issues arises that is not explicitly stated in the scope of this proceeding but is relatable to a core subject area, consideration should be given. In other words, CESA recommends that the Commission be open to a policy of inclusion when it comes to matters, including alternative policies beyond utility procurement targets, that fall under one of the general issues listed in the preliminary scope.

In these comments, CESA has put forward several large and important items for consideration in this proceeding. These issues need to be addressed in a timely manner and this proceeding provides the optimal vehicle. As mentioned at the outset of these comments, the energy landscape has changed since R.10-12-007. The challenges that lie ahead demand that California look not only at market transformation objectives when setting policy and procurement targets, but also focus on system wide efficiency and cost-effective attainment of the Governor's goals, in particular, attainment of the recent Executive Order to reduce GHG emission levels by 40% in 2030. With this context in mind CESA would like to summarize the following prioritized suggestions discussed above as additional topics to be considered in the scope of this proceeding:

1. Adopt more advanced, system modeling techniques to consider cost- effective expansion of California's energy storage procurement target to achieve the Governor's goals, as indicated by advanced, multi-jurisdictional system modeling techniques to reflect substantially changed landscape (rapid cost reductions of energy storage, aggressive targets for renewables, distributed energy resource penetration and GHG emission reduction) since the original targets were set. Preliminary

modeling shows the possibility of attaining significant system benefit of at least double the current target.

2. Explore ways to leverage energy storage procurement processes to encourage newly commercialized early stage technologies and creative new business models and contracting mechanisms in support of market transformation.
3. Consider enabling aggregated customer-sited behind the meter energy storage to satisfy utility T&D domain requirements if cost-effective to do so.
4. Coordinate Commission-required safety standards with existing national standards setting efforts already underway
5. Establish consequences for insufficient consideration of non-wires alternatives for utility proposals to upgrade T&D infrastructure.
6. Place very high priority on resolving specific interconnection issues that have the potential to stall market development, particularly for multiple-use applications.
7. Streamline and define policies and processes to increase certainty in the procurement process for bulk PHS as well as small aggregated behind the meter energy storage used for bulk applications. A workshop may be the best place to begin this discussion.
8. Develop new policies and programs for California's multi-tenant building residents to be able to access the benefits of energy storage, and to help facilitate electric vehicle charging for this population .
9. Continue to leverage this proceeding as the umbrella rulemaking for high priority applications of energy storage that are affected by or impact other related rulemakings at the Commission and the CAISO.

Tackling the above issues is essential continued market development for energy storage. However, there are four additional high priority policy topics that also deserve consideration and CESA believes that this proceeding is the appropriate place to house the discussion. In fact, Section 2836(a)(1) of AB 2514 states “...the commission may consider a variety of possible policies to encourage the cost-effective deployment of energy storage systems.” CESA encourages reference to this Section when considering the inclusion of the policy concepts introduced below. The OIR’s *Issue 4* provides a master “umbrella” that could incorporate the following policy topics:

RPS and Energy Storage Considerations – Of utmost importance is how to cost-effectively deploy energy storage to support a 50% RPS. CESA recommends getting out in front of the issue with an initial examination of how the utilities factor in the resulting value of renewable energy that is firmed, shaped, smoothed or shifted by energy storage. Specifically, CESA recommends that this proceeding work in collaboration with the RPS OIR to develop more appropriate least cost best fit methodologies to use to evaluate proposed RPS projects.

Storage-Friendly Tariff Options – For customer-sited technology, a new tariff/compensation structure that optimizes an energy storage system’s benefits to the grid should be considered. In addition to developing a retail/wholesale reconciliation process, the Commission should direct the utilities to develop bi-directional retail tariff options for distributed energy resources. These designs should align pricing with local and bulk system conditions, either dynamic “demand response” based pricing, or through bi-directional pricing that assists with static load shaping. The Commission should lead the country by putting in place an optional and complementary tariff for customer-sited energy storage. CESA also recommends

preserving the option to stay with existing tariffs while allowing energy storage adopter to interface with the CAISO.

Pumped Hydro – Explore procurement pathways for large pumped hydro resources to contract with utilities, independent of the AB 2514 framework and targets. Large pumped hydro has the ability to cost-effectively provide large scale energy shifting and ancillary services, and potentially even some seasonal storage capabilities. However, there are no suitable existing procurement mechanisms for utilities to contract with such resources. Large pumped hydro faces all of the same challenges as other utility-side energy storage but also faces issues that are different in both scope and kind from other resources, due to their large size and very long project development lead times (measured in decades).

For example, due to their large capacity and operating characteristics, which allow rapid and long-duration charging and discharging, pumped hydro storage projects can integrate renewable energy at a massive scale and provide low-carbon electricity around the clock, and thus should be integral aspects of the State’s energy infrastructure that will carry us to 2030, 2050 and beyond. In recognition of this, it is incumbent on the Commission to address head on development and procurement pathways for this technology, separately and in parallel to the storage procurement targets discussed in this proceeding.

Interconnection Streamlining – The Energy Storage Roadmap placed a high priority on actions to streamline the interconnection of energy storage resources. While both the Commission and the CAISO have initiated activities to improve interconnection tariffs, the major risk to and uncertainty in interconnection comes from each utility’s interpretation and implementation of the tariffs, the actual business practices of each utility.

This proceeding should address the need to streamline and standardize these business practices across all utilities, resulting in a document that allows future bidders into energy storage RFO's to appropriately structure their bids. Without such efforts and documentation, future RFO's will not procure the most cost-effective resources. Similar to the CAISO Business Practice Manuals, each utility should be required to publish and submit to the Commission an interconnection Business Practice Manual, well in advance of the next Energy Storage Procurement in 2016.

Where there is a single point of interconnection for storage and generation, that point should be used to assess maximum output capacity of the paired system, rather than separately counting individual generator and energy storage capacities

III. CONCLUSION.

The Commission's proposed topic list, together with CESA's proposed refinements and additions, will help surmount existing and new of hurdles facing energy storage deployment. CESA looks forward to working with all parties to ensure this proceeding accomplishes the goals established by the California legislature and the Commission.

Respectfully submitted,



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