BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Application of San Diego Gas and Electric Company (U902E) for Approval of its 2018 Energy Storage Procurement and Investment Plan.	Application 18-02-016 (Filed February 28, 2018)
And Related Matters.	Application 18-03-001 Application 18-03-002

REPLY COMMENTS OF THE CALIFORNIA ENERGY STORAGE ALLIANCE TO ASSIGNED COMMISSIONER'S AND ASSIGNED ADMINISTRATIVE LAW JUDGE'S RULING REQUESTING COMMENTS ON ISSUES PERTAINING TO ENERGY STORAGE TECHNOLOGY DIVERSITY

Alex J. Morris
Vice President, Policy & Operations

Jin Noh
Policy Manager

CALIFORNIA ENERGY STORAGE ALLIANCE
2150 Allston Way, Suite 400
Berkeley, California 94704
Telephone: (310) 617-3441
Email: amorris@storagealliance.org

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In accordance with the Rules of Practice and Procedure of the California Public Utilities Commission ("Commission"), the California Energy Storage Alliance ("CESA")[1] hereby submits these reply comments in response to the *Assigned Commissioner's and Assigned Administrative Law Judges' Ruling Requesting Comments on Issues Pertaining to Energy Storage Technology Diversity* ("Ruling"), filed by Assigned Commissioner Carla J. Peterman and Administrative Law

[1] 8minutenergy Renewables, Able Grid Energy Solutions, Advanced Microgrid Solutions, AltaGas Services, Amber Kinetics, American Honda Motor Company, Inc., Axiom Exergy, Brenmiller Energy, Bright Energy Storage Technologies, Brookfield Renewables, Carbon Solutions Group, Centrica Business Solutions, Consolidated Edison Development, Inc., Customized Energy Solutions, Dimension Renewable Energy, Doosan GridTech, Eagle Crest Energy Company, East Penn Manufacturing Company, Ecoult, EDF Renewable Energy, ElectrIQ Power, eMotorWerks, Inc., Enel, Energport, ENGIE, E.ON Climate & Renewables North America, esVolta, Fluence Energy, GAF, General Electric Company, Greensmith Energy, Ingersoll Rand, Innovation Core SEI, Inc. (A Sumitomo Electric Company), Iteros, Johnson Controls, Lendlease Energy Development, LG Chem Power, Inc., Lockheed Martin Advanced Energy Storage LLC, LS Power Development, LLC, Magnum CAES, Mercedes-Benz Energy, NantEnergy, National Grid, NEC Energy Solutions, Inc., NextEra Energy Resources, NEXTracker, NGK Insulators, Ltd., NRG Energy, Inc., Parker Hannifin Corporation, Pintail Power, Primus Power, Range Energy Storage Systems, Recurrent Energy, Renewable Energy Systems (RES), Sempra Renewables, Sharp Electronics Corporation, SNC Lavalin, Southwest Generation, Sovereign Energy, Stem, STOREME, Inc., Sunrun, Swell Energy, True North Venture Partners, Viridity Energy, VRB Energy, Wellhead Electric, 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. (http://storagealliance.org).

Judge ("ALJ") Brian R. Stevens on August 8, 2018. Pursuant to ALJ Stevens' *E-Mail Ruling Granting Modification of Motion Requesting an Extension of Deadlines for Comments in Response to 8/8/18 Ruling* ("É-Mail Ruling") on August 14, 2018, granting an extension for parties to file comments, CESA timely files its reply comments here on September 5, 2018.

I. APPROACHES FOCUSED ON USING THE REMAINING ASSEMBLY BILL 2514 PROCUREMENTS SHOULD BE MAPPED INSTEAD TO THE NEW INCREMENTAL ENERGY STORAGE EMERGING TECHNOLOGY PROCUREMENT PLAN ("ES-ETPP").

Some parties' comments supported further pursuing the goal of market transformation for the Energy Storage Procurement Framework and addressing barriers to emerging energy storage technologies. In our comments, CESA recommended that the remaining Decision ("D.") 13-10-040 procurements be conducted as designed, and that an additional incremental Energy Storage Emerging Technology Procurement Plan ("ES-ETPP") be directed in order to build more 'readiness' for a broader array of technologies without doing harm to the ongoing market transformation efforts.

In light of these comments, the Commission should 'map' ideas from parties into the ES-ETPP approach, rather than using some of the remaining planned AB 2514 procurements for market transformation. ESS Tech, Hydrostor, MegaWatt Storage Farms, National Fuel Cell Research Center ("NFCRC"), Small Business Utility Advocates ("SBUA"), and the San Diego County Water Authority ("SDCWA") all provided recommendations for how to modify existing procurement plans to support various market transformation goals or concepts. Most, but not all, of these approaches can readily 'map' to the CESA proposed ES-ETPP. CESA's recommended ES-ETPP would authorize 180 MW to be spread smartly across the three investor-owned utilities ("IOUs") and across an array of 'emerging' technologies. The sizing and rationale for this

procurement reasonably helps address and further the market transformation goal while avoiding disruption to the current ongoing market transformation efforts.

Total Incremental Procurement	Minimum Number of Discrete Emerging Technologies Each IOU Must Procure Under This Incremental Procurement	Solicitation Timing and Size	Other Considerations to be Met in Some or All Solicitations
180 MW (60 MW per IOU)	4	Dec 2019 (30 MW per IOU) Dec 2021 (30 MW per IOU)	TBD

CESA reiterates its goal to 'do no harm' to the ongoing market transformation efforts underway through the D.13-10-040 procurements. CESA does not support using the remaining procurements under this order to also address the emerging technology goals. The current efforts have led to promising market transformation elements, along with competition from many energy storage solutions, including sub-classes of lithium-ion technologies. Such solutions have much promise, and the transformation efforts to date are noteworthy and should not be interrupted. Further, these resources are working or already are managing their deployments or manufacturing to address risk and any performance challenges across time.

II. ASSEMBLY BILL 2514 GOALS RIGHTLY FOCUS ON NEAR-TERM LEAST-COST, BEST-FIT OUTCOMES BUT SHOULD ALSO TARGET BROADER MARKET TRANSFORMATION TO PREPARE FOR FUTURE GRID CONDITIONS.

Some parties oppose any further market transformation goals based on the view that current procurements and solicitations are properly oriented toward least-cost, best-fit ("LCBF") outcomes. CESA respects that LCBF is an important lens for utility solicitations but disputes that broader market transformation goals have been fully achieved. Generally, LCBF translates to a Net Present Value ("NPV") calculation that can be subject to reasonable diminutions or qualitative criteria. LCBF promotes competition in helpful ways. Current outcomes show strong competitiveness. One challenge, however, is that current conditions and market rules can greatly

inform the valuation and selection process so that potential future grid needs may not be as easy to value. This is illustrated perhaps most clearly by the fact that all AB 2514 procurements have linked to Resource Adequacy ("RA") compliance – *i.e.*, a four-hour energy duration. Comments from Pacific Gas and Electric Company ("PG&E") highlights how near-term rules may not reflect future expect rules:[2]

> "Today, capacity value for storage products is based on the California independent System Operator's ("CAISO") definition of RA with a 4-hour Must-Offer Obligation. Therefore, the additional duration that a 4+ hour duration energy storage device provides would not result in additional capacity value for PG&E's customers in PG&E's current evaluation model. To the extent that the CAISO modifies its RA tariffs in the future or adds new products that value longer duration storage, PG&E would incorporate those value streams into its storage evaluation model."

Market transformation for energy storage is more complex than for some other technologies. Southern California Edison Company ("SCE") compares energy storage market diversity with that of the solar industry, where 90% of the generation resources are a single technology type (*i.e.*, crystalline-silicon panels).[3] Solar generation, however, has relatively fewer goals and trade-offs,[4] such as efficiency and degradation. Most solar is designed to maximize production at the least cost. Energy storage, by contrast, can be optimized for many services. Maximizing production might equate to maximizing overall energy delivery capability, a long-duration outcome. This differs from the applications of energy storage being selected, which appear to primarily include minimizing costs while meeting RA capacity 'counting' rules.

Market transformation goals should focus on future grid conditions, and such conditions may not be fully reflected in the current solicitations or current rules for grid services such as RA

[2] PG&E's comments at p. 3.

[3] SCE's comments at p. 4.

[4] CESA understands that there are many key components and features of solar technologies and developments. CESA is not oversimplifying the developments of this generation sector.

capacity. CESA thus recommends further 'emerging technology' solicitations that seek to prepare the energy storage toolkit not only for today's needs but for near-future needs, some of which may involve longer-duration goals too.

III. EMERGING TECHNOLOGY DEFINITIONS SHOULD BE MODIFIED TO SOLUTIONS AVAILABLE FOR FIVE YEARS.

CESA proposed its ES-ETPP with an eligibility criteria based on ten years of commercial availability. This selection was intended to avoid technology support that is better suited for research and development ("R&D") stage funding, preserve grid reliability through established technologies, address barriers for commercially-available but 'emerging' technologies, and leverage Commission precedent. Based on other parties' comments, CESA believes further adjustments to this definition may be appropriate.

Upon further review, CESA believes the ten-year look-back for commercial availability may be too long, and this could instead be reduced to five years of commercial availability. This change, in addition to 'doing no harm' to the remaining AB 2514 procurements and adopting other 'readiness' practices recommended by CESA in its comments, helps ensure that emerging technologies can compete without barriers. The ten-year definition, by contrast, was well suited to the Self-Generation Incentive Program ("SGIP") where program operations would continue for some time and technologies could build for the program and then participate across time. SGIP yielded smaller projects and was in part intended to provide consumer protections, so SGIP is a fundamentally different model than that of the ES-ETPP and its two proposed rounds of competitive solicitations as suggested by CESA. Obviously, further specificity and refinement of the definition on eligibility will be appropriate to ensure outcomes meet the goals of the ES-ETPP.

IV. LONG-DURATION ENERGY STORAGE SEEMS PRUDENT TO FURTHER DEVELOP IN THE RANGE OF ENERGY STORAGE CAPABILITIES AND TECHNOLOGIES.

MegaWatt Storage Farms and others highlight how future grid conditions, particularly in light of the passage of Senate Bill ("SB") 100, will likely require large volumes of energy storage. Much of this may be met with the available suite of energy storage solutions, including the four-hour products being contracted for today. Still, further consideration of longer-duration energy storage readiness seems appropriate as a goal an incremental procurement. CESA notes that the CAISO has indicated it may see a reliability need for resources with longer duration in local pockets.[5] CESA believes that the ES-ETPP could include or be augmented to focus in part on long-duration goals to some degree. Both emerging and established energy storage solutions may be appropriate to compete in these longer-duration solicitations, so CESA recommends this goal be approached in a way that does not undermine emerging technology goals – *e.g.*, through an incremental long-duration energy storage solicitation.

V. THE REMAINING AMOUNTS OF ENERGY STORAGE PROCUREMENT OBLIGATIONS PURSUANT TO D.13-10-040 SHOULD BE CLARIFIED.

Comments by the IOUs indicate that further AB 2514 procurements may be very limited. SCE indicates its 2018 energy storage procurement obligations will be filled pending further development of the Preferred Resources Pilot ("PRP") 2 projects.[6] PG&E's procurements may be 'full' based on recent announcements associated with their 2018 Local Sub-Area Energy Storage Request for Offers ("RFO") results designed to support local capacity area operations and to avoid 'backstop' reliability-must-run procurements.

[5] This issue is being discussed in the RA proceeding. The matter has not yet been studied, but the CAISO has raised the idea of caps on the amount of local or sub-local RA from energy-limited resources.

[6] SCE's comments at p. 5.

San Diego Gas and Electric Company ("SDG&E") also indicates they are 'full' on energy storage procurements pursuant to D.13-10-040. CESA appreciates SDG&E's efforts but also notes that there appears to be different views regarding how and where the 50% utility-ownership cap across all domains applies. According to our calculations, SDG&E still needs to procure 65.6 MW of third-party-owned energy storage interconnected in the transmission and distribution domains.[7] CESA has raised this issue before in our protest to the 2018 Energy Storage Applications[8] and respectfully requests clarification from the Commission and SDG&E on this matter in order to support timely compliance on all AB 2514 procurements.

VI. CONCLUSION.

CESA appreciates the opportunity to submit these comments to the questions posed in the Ruling and looks forward to working with the Commission and stakeholders in this proceeding or a potential successor Rulemaking.

Respectfully submitted,

Alex J. Morris
Vice President, Policy & Operations
CALIFORNIA ENERGY STORAGE ALLIANCE
2150 Allston Way, Suite 400
Berkeley, California 94704
Telephone: (310) 617-3441
Email: amorris@storagealliance.org

Date: September 5, 2018

[7] CESA tracks energy storage procurement announcements based on IOU compliance filings, applications for approval, etc. As CESA understands it, SDG&E may be counting some Aliso Canyon Energy Storage ("ACES") procurements against its AB 2514 target. While this is reasonable, the D.13.10-040 also restricts the amount of utility-owned energy storage that can meet its AB 2514 procurement. See Attachment 1 at the end of these reply comments.

[8] *Protest of the California Energy Storage Alliance to the Application of San Diego Gas and Electric Company (U 902-E) for Approval of its 2018 Energy Storage Procurement and Investment Plan*, filed on April 6, 2018, pp. 4-6. http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M212/K860/212860223.PDF

ATTACHMENT 1:
CESA's Energy Storage Procurement Tracker
(Updated July 2, 2018)

		Total (MW)	Transmission (MW)	Distribution (MW)	Customer (MW)	*Notes*
PG&E	**Total Procurement**	770.43	692.50	36.50	41.43	
	Utility-Owned Procurement	209.00	182.50	26.50	0.00	
	AB 2514 Target	580.00	310.00	185.00	85.00	
	Utility-Owned Limit (50%)	290.00				*No re-allocation since utility ownership limit not exceeded*
	Domain Count	-190.43	-382.50	148.50	43.57	
	Residual Target	**57.35**	**0.00**	**0.00**	**57.35**	*Transfer of 148.5 MW from transmission domain to distribution domain; all can be UOG or 3rd party*
SCE	**Procurements**	575.82	120.00	134.03	321.79	
	Utility-Owned Procurement	44.26	20.00	24.20	0.06	
	AB 2514 Target	580.00	310.00	185.00	85.00	
	Utility-Owned Limit (50%)	290.00				*No re-allocation since utility ownership limit not exceeded*
	Domain Count	4.18	190.00	50.97	-236.79	
	Residual Target	**84.03**	**35.00**	**49.03**	**0.00**	*Transfer of 170 MW from customer domain to T&D domain (assume split equally); all can be UOG or 3rd party*
SDG&E	**Procurements**	168.31	110.00	57.15	1.16	
	Utility-Owned Procurement	148.07	110.00	38.07	0.00	
	AB 2514 Target	165.00	80.00	55.00	30.00	
	Utility-Owned Limit (50%)	82.50				*65.57 MW of utility-owned storage procurement in T&D does not count toward AB 2514*
	Domain Count	-3.31	-30.00	-2.15	28.84	
	Residual Target	**62.27**	**2.79**	**30.64**	**28.84**	*Add back 65.57 MW from T&D domain (assume split equally); all must be 3rd party*
TOTAL	**Procurements**	**1514.56**	**922.50**	**227.68**	**364.38**	
	Residual Target	**203.65**	**37.79**	**79.67**	**86.19**	
					117.46	
		Total remaining T&D (a	58.73			

Footnotes

1. Minimum floor of 100% deployment in customer domain (i.e., T&D systems may not be used to fulfill the minimum customer domain targets (D.16-01-032, p. 32)
2. Ceiling of 200% of existing customer domain projects may be used to meet T&D targets (D.16-01-032, p. 32)
3. Utility ownership should not exceed 50% of storage projects proposed to count toward the MW target, regardless of whether it is interconnected at transmission, distribution, or customer domain (D.13-10-040)
4. SGIP-funded projects will count towards LSE's target at time of SGIP incentive payment, and credit will be split 50-50 between IOUs and CCAs/ESPs for unbundled customers (D.16-01-032, p. 43-44)
5. No restrictions on transferability between transmission and distribution domains
6. Note that the MW reported above shows procured quantities, not the inverter rating of the MW or strictly the MW of RA capacity (as not all procured MW count for RA)

Updated: July 2, 2018

Utility	RFO / Program	Capacity (MW)	Duration (Hours)	Domain	Developer	Storage Tech Type	COD	Contract Term (Yrs)	Ownership
SDG&E	2012 GRC Energy Storage Program	5.58		Distribution					
SDG&E	2016 ACES RFO	30.00	4.0	Distribution	AES Energy Storage	Li-ion battery	1/31/2017	10	Utility
SDG&E	2016 ACES RFO	7.50	4.0	Distribution	AES Energy Storage	Li-ion battery	1/31/2017	10	Utility
SDG&E	2016 Preferred Resources LCR RFO	4.00	4.0	Distribution	Advanced Microgrid Solutions	Li-ion battery	12/1/2019	20	Third Party
SDG&E	2016 Preferred Resources LCR RFO	30.00	4.0	Transmission	RES Americas	Li-ion battery	12/31/2019	20	Utility
SDG&E	2016 Preferred Resources LCR RFO	40.00	4.0	Transmission	AES Energy Storage	Li-ion battery	3/31/2021	20	Utility
SDG&E	2016 Preferred Resources LCR RFO	6.50	4.0	Distribution	Powin Energy	Li-ion battery	6/30/2021	10	Third Party
SDG&E	2016 Preferred Resources LCR RFO	3.00	4.0	Distribution	Enel Green Power	Li-ion battery	12/31/2021	15	Third Party
SDG&E	Borrego Springs Microgrid Projects	0.57		Distribution			Online		Utility
SDG&E	Lake Hodges PHS	40.00		Transmission			Online		Utility