CESA
CALIFORNIA ENERGY STORAGE ALLIANCE

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Subject: CESA's Feedback and Recommendations to SLTRP Advisory Group Meeting #8

Re: CESA's Feedback and Recommendations on LADWP 2022 Strategic Long-Term Resource Plan (SLTRP) Advisory Group Meeting #8

Dear LADWP SLTRP Team:

The California Energy Storage Alliance (CESA) continues to appreciate the opportunity to participate in LADWP's SLTRP Advisory Group (AG) and offer our unique insights to help LADWP conduct supplementary modeling and identify the no-regrets investments and actions that can be taken to further the city's goals and requirements.

Altogether, CESA generally supports LADWP's modeling approach, and the cases considered. CESA is particularly supportive of the modeling of storage technologies with different durations, as well as the consideration of cases with aggressive distributed energy resource (DER) buildouts. In this context, CESA recommends the SLTRP Team perform additional sensitivity analyses for Cases 2 and 3, as those are perfectly positioned to underscore the key benefits of an ambitious DER strategy.

While CESA recognizes the SLTRP Team's responsiveness to feedback, important methods and assumptions that may have a profound impact on the preliminary results shared on April 28th have not been detailed and shared with AG participants. Namely, AG participants have not been provided with the cost, availability, and reliability assumptions associated with the candidate resources included in LADWP's capacity expansion modeling. These assumptions are critical to resource selection as the model's key directive is to meet reliability and carbon goals while minimizing costs. In this context, CESA's feedback and recommendations can be summarized as follows:

- LADWP should provide a full inputs and assumptions document detailing the cost, availability and reliability parameters and assumptions used for all candidate resources in their capacity expansion exercise.
- LADWP should clarify how behind-the-meter (BTM) energy storage buildout is reported in the capacity expansion modeling preliminary results.

- LADWP should run additional sensitivities on Cases 2 and 3 to determine the incremental value of pursuing an aggressive DER strategy.

1. LADWP should provide a full inputs and assumptions document detailing the cost, availability and reliability parameters and assumptions used for all candidate resources in their capacity expansion exercise.

During AG Meeting #8, the SLTRP Team and Ascend Analytics presented their preliminary capacity expansion modeling results. This exercise consisted of the usage of a cost-minimization model that seeks to meet a set of binding constraints: a greenhouse gas (GHG) limit; a Renewable Portfolio Standard (RPS) level; and a planning reserve margin (PRM).[1] Given the prioritization of cost-minimization, capacity expansion models are highly susceptible to the cost assumptions utilized. This, in turn, requires capacity expansion models to be fed realistic and reasonably accurate resource availability assumptions in order to minimize the likelihood of unfeasible mixes. Finally, to account for the reliability contributions of these assets, the capacity expansion model must be given a function to determine the contribution of each resource class (or each resource, if the model is more granular) to the PRM. This value might be equal to nameplate capacity in the case of conventional thermal generators; however, it is usually some fraction or percentage for variable and energy-limited resources. Considering the essential nature of these assumptions, CESA urges the SLTRP Team and Ascend Analytics to detail their sourcing and utilization on a candidate technology basis.

The cost, availability, and reliability assumptions utilized are particularly important to understand the tradeoffs perceived by the model when selecting 4-, 8-, and 12-hour energy storage. In the SB 100 Case, the model selects a significant amount of 12-hour energy storage and a smaller amount of 4-hour energy storage.[2] Compared to the SB 100 Case, Cases 2 and 3 have much more stringent RPS and decarbonization targets, resulting in the selection of the same amount of 12-hour storage, some 8-hour storage (more in the case of Case 3), and much more 4-hour storage.[3] These results suggest that the 12-hour storage has been selected to its availability limit in Cases SB 100, 2, and 3; however, considering the heterogeneity of the technologies that could support this need, it is unclear what availability limit was utilized and how it was sourced or developed.

Something similar occurs when considering the continued selection of 4-hour storage relative to 8-hour storage. This difference can be attributed to a variety of modeling choices that have not been shared with the AG, including availability, cost, and operational assumptions. In addition, as explained further below, this could also be attributed to the model's characterization of reliability value as it relates to the PRM. To better understand the drivers behind storage selection, CESA urges the SLTRP Team and Ascend Analytics to share their cost, availability, and operational (*i.e.*, round-trip efficiency, minimum and

[1] Ascend Analytics Agg Meeting #8 Presentation, at 7.
[2] *Ibid,* at 11.
[3] *Ibid,* at 13-14.

maximum durations and sizes) in a detailed document, on a candidate resource basis, for all years modeled.

The results for Cases 2 and 3 show significant levels of 4- and 8-hour storage being deployed starting 2028. Interestingly, the magnitude of selection for both of these resources is greater in Case 3.[4] This could be due primarily to the modeling of a more aggressive DER buildout in Case 3: as more BTM solar is built, more storage is needed to maximize value. Nevertheless, the results also show that the pace of deployment for both 4- and 8-hour storage flattens rather quickly. While this could be due to the selection of 12-hour storage, this could also be largely driven by the assumptions utilized to determine each candidate resource's contribution to the PRM.

CESA has encountered several penetration curves that seek to model storage's contributions to the PRM across a number of years. Oftentimes, these curves do not recognize the impact of the variable energy resource (VER) mix on the storage contribution to the PRM. For example, the curve developed by Astrape Consulting for the California Public Utilities Commission's (CPUC) Integrated Resource Planning (IRP) proceeding does not incorporate an essential dimension for evaluating the effective load carrying capability (ELCC) of storage assets: the availability of energy for charging.[5] As National Renewable Energy Laboratory (NREL) studies have shown, the ELCC of storage is positively correlated to the availability of renewable energy.[6] In the particular case of California, the level of solar penetration is key to determine the ELCC of storage assets. NREL's analysis demonstrates that when solar composes a higher portion of the overall resource mix (35% or more), up to 8 GW of 4-hour of energy storage could be included without them experiencing significant ELCC derates.[7] For these reasons and to ensure a fair valuation of these assets, CESA requests additional information on the methodology used by the capacity expansion model to assess the contributions to the PRM of each candidate resource, for all years modeled.

2. LADWP should clarify how BTM energy storage buildout is reported in the capacity expansion modeling preliminary results.

In AG Meeting #8, the SLTRP Team and Ascend Analytics noted that the key difference between Cases 2 and 3 is the level of DER deployment assumed, with Case 3 pursuing a more aggressive strategy. CESA understands that this aggressive DER approach consists of forcing resources into the capacity expansion model, either in the baseline or by requiring their selection across a number of years. Unfortunately, the preliminary results shared do not make a distinction between BTM resources and all other resources, making it difficult to recognize trends and provide feedback. Moreover, the table describing the

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[4] *Ibid,* at 14.
[5] CPUC, 2020. "Inputs & Assumptions: 2019-2020 Integrated Resource Planning", at 92.
[6] NREL, 2019. "The Potential for Battery Storage to Provide Peaking Capacity in the United States." https://www.nrel.gov/docs/fy19osti/74184.pdf
[7] *Ibid,* at 20.

different cases mentions the level of local solar in each but makes no mention of the assumed BTM storage adoption.[8] As such, CESA requests that the SLTRP Team and Ascend Analytics present the results in a manner that clearly identifies BTM solar, storage and solar-plus-storage apart from their in-front-of-the-meter (IFOM) counterparts.

3. LADWP should run additional sensitivities on Cases 2 and 3 to determine the incremental value of pursuing an aggressive DER strategy.

During AG Meeting #8, the SLTRP Team and Ascend Analytics requested feedback on which Cases should be analyzed further via sensitivity runs. The three cases considered differ on four key dimensions: (1) the RPS target; (2) the total clean energy penetration achieved by 2035 and 2045; (3) the level of DER deployment; and (4) transmission upgrades. Importantly, Cases 2 and 3 are equal, except for their assumed level of DER deployment.

CESA supports continued exploration of Cases 2 and 3 as they will provide the most relevant insights regarding the accelerated attainment of LADWP's goals and the impacts of energy efficiency, demand response, and DER deployment in the achievement of said targets. The incremental analysis of these cases will allow LADWP to better understand the value of enhancing or developing local strategies, some of which could further reduce the usage of local thermal generation. Thus, CESA supports continued sensitivity analysis for Cases 2 and 3.

CESA appreciates the opportunity to provide these recommendations and hopes they are helpful. Please do not hesitate to reach out if you have any follow up questions or would like to discuss further.

Sincerely,

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[8] *Ibid,* at 5.