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Subject: CESA's Feedback and Recommendations to SLTRP Advisory Group Meeting #10

Re: CESA's Feedback and Recommendations on LADWP 2022 Strategic Long-Term Resource Plan (SLTRP) Advisory Group Meeting #10

Dear LADWP SLTRP Team:

The California Energy Storage Alliance (CESA) continues to appreciate the opportunity to participate in the Los Angeles Department of Water and Power's (LADWP) Strategic Long-Term Resource Plan (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.

CESA recognizes the SLTRP Team's commitment to evaluating different pathways to attain LADWP's ambitious environmental goals while retraining reliability. CESA believes that this commitment must be preserved at every step of the process, as well as in future cycles. As LADWP seeks to accelerate the decarbonization of its system, only the iterative consideration of the challenges faced by and the solutions available to LADWP will yield optimal outcomes for ratepayers. LADWP should use this SLTRP process to identify no- and least-regrets solutions that would maximize reliability while advancing the environmental and social justice goals of the 100% clean energy initiative. Moreover, the current SLTRP cycle should avoid precluding other alternative pathways from being taken in the future, particularly with regards to the need for firm in-basin capacity. In this context, CESA's feedback and recommendations can be summarized as follows:

- The SLTPR team should conduct additional sensitivity analyses representing a New No-Combustion scenario that cost-effectively selects incremental resources that can meet LADWP's environmental goals while preserving reliability.

- The added reliability and the increased NOx reductions resultant from Case 3 relative to Cases 1 and 2 demonstrates investing in distributed energy resources (DERs) is a no-regrets solution to maximize reliability and minimize in-basin combustion.

- The SLTRP team should provide more details on the expected operations of the once-through cooling (OTC) assets expected to be converted to green H2.

1. The SLTPR team should conduct additional sensitivity analyses representing a New No-Combustion scenario that cost-effectively selects incremental resources that can meet LADWP's environmental goals while preserving reliability.

During AG Meeting #9, the SLTRP team shared the findings of a No-Combustion scenario that sought to determine the cost, reliability, and decarbonization implications of eliminating the possibility of using any form of combustion, including that of green H2, to serve LADWP's load. Initially, CESA welcomed consideration of such a sensitivity, particularly considering the findings of the No-Combustion sensitivity explored by the National Renewable Energy Laboratory (NREL) within the LA100 Study, which found that disallowing the use of combustion would necessitate increased development of renewables and storage outside the basin, potentially requiring incremental transmission investments that would bolster LADWP's reliability across all hours. Unfortunately, the SLTRP's No-Combustion sensitivity did not build upon the previous findings, and instead merely substituted the means of utilization of green H2 from combustion turbines to fuel cells.[1] This narrow and flawed analysis obviously concludes that, since the costs of fuel cells are significantly greater than those of thermal capacity and the capacity factor of the thermal assets were "very low" to begin with, a no-combustion pathway is not desirable. The SLTRP team provided no figures, data, graphs, or tables to support this conclusion, neither in AG Meeting #9 nor in AG Meeting #10 despite a significant number of stakeholder questions. This analysis is an instance of the SLTRP team restricting the set of solutions unilaterally to one that is uneconomic and narrowly considers green H2 as a viable solution to retain reliability, despite the fact that prior analyses have noted the potential for other pathways.

Green H2 is part of a wide array of long-duration and seasonal storage solutions that could be deployed to support LADWP's decarbonization efforts while ensuring the reliability of the system. As noted by NREL's analyses, the reliability provided by resources capable of combusting green H2 can be substituted for other solutions that would enable LADWP to end the practice of polluting the areas surrounding the communities they serve. Namely, the LA100 Study finds that disallowing in-basin combustion is feasible and that those resources could be replaced in a cost-effective manner by developing more utility-scale solar-plus-storage resources in-basin, more in-basin transmission, and shifting some of the green H2 combustion capacity out-of-basin.[2] The SLTRP team's No-Combustion sensitivity, unfortunately, does not further develop this pathway, nor does it offer any significant insight on how the LA100 results would be different considering LADWP's preferred target of 100% clean energy by 2035. As such, the No-Combustion sensitivity presented by SLTRP team does not advance the SLTRP process, nor does it answer requests

[1] AG Meeting #9 Materials, page 52.
[2] AG Meeting #9 Materials, page 12.

by stakeholders to consider pathways beyond those centered on the use of green H2. Thus, CESA requests the SLTRP team to evaluate a New No-Combustion case that substitutes the capacity of in-basin green H2-combusting assets with the least-cost portfolio that continues to meet the environmental and reliability targets applicable.

2. The added reliability and the increased NOx reductions resultant from Case 3 relative to Cases 1 and 2 demonstrates investing in DERs is a no-regrets solution to maximize reliability and minimize in-basin combustion.

In AG Meetings #9 and #10 the SLTRP team shared key insights regarding how the three Core Cases compare across relevant metrics, such as total resource cost, expected rate impacts, emissions, and reliability. Regarding the latter, the SLTRP team noted that all cases, including the SB 100 case, achieve at or below the reliability industry standard of 2.4 loss-of-load hours (LOLH) per year.[3] Importantly, the materials for AG Meeting #10 show that, relative to the SB 100 Cases and Cases 1 and 2, Case 3 attains an even greater standard of reliability.[4] The information provided in AG Meeting #9 further demonstrates this finding. As stated in said materials, Case 3 minimizes the average duration and magnitude of shortfall events in both 2025 and 2035, relative to Cases 1 and 2. While Cases 1 and 2 see outage lengths between one and nine hours in 2025, all outages for Case 3 are limited to 4 hours in the same year. Moreover, the magnitude of outages in 2025 reaches between 500 and 600 MW for Cases 2 and 1, respectively. In contrast, the magnitude for Case 3 is less than 400 MW in the same year. These results indicate that a strategy that includes aggressive deployment of DERs across LADWP's territory represents a least-regrets solution to minimize the potential impacts of loss-of-load events.

The overall results regarding CO2 and NOx emissions also demonstrate that Case 3 should be LADWP's preferred approach. The materials shared for AG Meeting #10 show that Case 3 attains the most significant CO2 emission reductions the quickest. By 2034, for example, Case 3 would result in half the emissions of Case 1.[5] While the differences between these Cases in terms of CO2 diminishes starting 2035 as all of them assume the conversion of in-basin thermal capacity to 100% green H2, variations regarding NOx emissions remain through the study period. In the materials shared for AG Meeting #9, the SLTRP team notes that pursuing Case 3 would significantly reduce more NOx emissions associated with the use of in-basin thermal capacity, relative to the other Cases. In fact, Case 3 results in approximately double the NOx emission reductions than Case 2, and almost four times as much as Case 1.[6] As such, CESA urges the SLTRP team to recognize the material benefits of pursuing a portfolio that includes aggressive DER deployment, as it is aligned with the need for reliability and the environmental justice goals of LADWP's transition to 100% clean energy.

[3] AG Meeting #10 Materials, page 42.
[4] *Ibid*.
[5] *Ibid,* page 39.
[6] AG Meeting #9 Materials, at 54.

Based on the results, one of the "downsides" or risks with pursuing a strategy informed by Case 3 would be the significant incremental costs relative to the other cases. However, CESA hopes to further investigate and get more transparency on the drivers of these higher incremental costs, but more importantly, we believe that the costs associated with green hydrogen blending in combustion turbines raise some questions about the speculative nature of the costs for an emerging technology. Such benefit of the doubt is not similarly afforded to alternatives such as long-duration energy storage (LDES) and maximization strategy for DERs. By keeping options open in this regard with no-regrets pursuit of these alternatives, LADWP may be able to avoid reliability issues and mitigate risks in case the green H2 strategy is not realized as expected in terms of economics, environmental controls, etc., while allowing alternative technologies and strategies to potentially emerge as commercially viable and well-tested options.

3. The SLTRP team should provide more details on the expected operations and timeline of the OTC assets expected to be converted to green H2.

During AG Meeting #10 a number of stakeholders asked questions regarding the performance and operational assumptions behind the SLTRP's estimates of future capacity factors for in-basin thermal generation and their associated NOx emissions. In particular, AG members questioned the operational assumptions related to minimum run-times and minimum power outputs, and how these might differ from the current operational realities of the Harbor, Haynes, Scattergood, and Valley power plants. CESA echoes these calls for clarity. As LADWP rapidly moves towards enabling the use of green H2 in its system, transparent information regarding the foreseen operations of these assets is fundamental. In addition, CESA requests the SLTRP team to also provide detail on the potential timeline for introducing hydrogen blends, and the factors that could affect the feasibility of said timeline.

To date, the SLTRP team has worked under the assumption that the aforementioned in-basin thermal assets will convert fully to burning green H2 by 2035, with no intermediate blends or upgrade costs reflected beforehand. This simplification does not help inform the discussion around alternatives as it banks on the assumption that these upgrades will be feasible to achieve in a single calendar year, allowing all the assets to simply switch their fuel by 2035. Moreover, this simplified assumption regarding the conversion of these assets to green H2 does not provide any clear timeframe as to when investments would be pursued and what effect they would have on local community's health and electric bills. Thus, CESA requests the SLTRP team provide additional details on the expected operations of the assets that are expected to be converted to burning green H2, particularly regarding the minimum run-times and minimum power outputs of the Harbor, Haynes, Scattergood, and Valley power plants, and how these might change in the next 25 years. Moreover, CESA requests the SLTRP team provide an overview of the potential timeline for introducing hydrogen blends, and the factors that could affect the feasibility of said timeline.

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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