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Re: Joint POU Comments on the September 30th Scenario Inputs Technical Workshop

The Southern California Public Power Authority (SCPPA),¹ Northern California Power Agency (NCPA),² and California Municipal Utilities Association (CMUA)³ (collectively, the Joint POU) appreciate the opportunity to provide these comments on the California Air Resources Board's (CARB) September 30th technical workshop on scenario inputs for the 2022 Scoping Plan Update. The publicly owned electric utilities (POUs) represented by our organizations are leaders in clean energy and are committed to meeting the state's clean energy policies while maintaining safe, affordable, and reliable electricity service for the communities they serve. California's electricity sector has been the primary driver of reducing GHG emissions in the last decade, and in 2018, Senate Bill (SB) 100 established a policy of serving 100% of retail electricity sales with renewable and zero-carbon electricity by 2045.

The Joint POU previously submitted comments⁴ on the August 17th technical workshop on scenario concepts. Those comments detail the potential challenges associated with grid reliability and affordability that many POU could face if the state's 100% clean electricity policy is accelerated or the zero-carbon generation technology options are constrained, based on the SB 100 Joint Agency Report⁵

¹ The Southern California Public Power Authority (SCPPA) is a not-for-profit joint powers agency formed in 1980 to facilitate joint power and transmission projects for its local publicly owned electric utility members. SCPPA consists of eleven municipal utilities and one irrigation district – the cities of Anaheim, Azusa, Banning, Burbank, Cerritos, Colton, Glendale, Los Angeles, Pasadena, Riverside, and Vernon, and the Imperial Irrigation District – who collectively serve nearly five million people throughout Southern California.

² The Northern California Power Agency (NCPA) is a nonprofit California joint powers agency established in 1968 to construct and operate renewable and low-emitting generating facilities and assist in meeting the wholesale energy needs of its 16 members: the Cities of Alameda, Biggs, Gridley, Healdsburg, Lodi, Lompoc, Palo Alto, Redding, Roseville, Santa Clara, Shasta Lake, and Ukiah, Plumas-Sierra Rural Electric Cooperative, Port of Oakland, San Francisco Bay Area Rapid Transit (BART), and Truckee Donner Public Utility District—collectively serving nearly 700,000 electric consumers in Central and Northern California.

³ The California Municipal Utilities Association is a statewide organization of local public agencies in California that provide electricity and water service to California consumers. CMUA membership includes publicly owned electric utilities that operate electric distribution and transmission systems. In total, CMUA members provide approximately 25 percent of the electric load in California.

⁴ Joint POU [comments](#) dated September 3rd, 2021.

⁵ CEC, CPUC, CARB, Achieving 100 Percent Clean Electricity in California: An Initial Assessment ("SB 100 Joint Agency Report"), <https://efiling.energy.ca.gov/EFiling/GetFile.aspx?tn=237167&DocumentContentId=70349>.

and several of our members' feasibility studies. Those comments also explained how the electricity sector's central role in economywide decarbonization means that the electricity sector will impact, and be impacted by, other sectors as they electrify, and urged CARB to include holistic assessments of grid reliability and electricity affordability for each carbon neutrality scenario considered for the Scoping Plan. Those fundamental concepts remain true and are incorporated by reference.

The Joint POUs offer the additional comments below to reaffirm the need to incorporate robust feasibility analyses for each carbon neutrality scenario after the initial GHG modeling is completed to ensure that the final preferred scenario provides an achievable path to carbon neutrality. Any scenario that jeopardizes electricity reliability or results in unaffordable rates does not provide a realistic path to meeting the state's emissions reductions goals and should not be considered as a viable option. The Joint POUs also provide input on the proposed carbon neutrality scenarios and assumptions presented at the September 30th workshop.

I. The Scoping Plan Must Provide a Feasible, Implementable Path to Carbon Neutrality

Carbon Neutrality Requires Reliable, Affordable Electricity

As described in the Joint POUs' September 3rd comments, reliable and affordable electricity is crucial to the success of any carbon neutrality scenario. Widespread electrification coupled with clean electricity is a key element of the state's carbon neutrality strategy; however, if homes, vehicles, businesses, and industry cannot rely on dependable electric service, customers will not adopt electrification and/or will turn to fossil fuel backup generators. Similarly, rising electricity rates will hinder widespread electrification and adversely impact those customers who are already struggling to pay their bills.

The state has recently reaffirmed the importance of maintaining reliable and affordable electricity to support the clean energy transition. The California Energy Commission (CEC), in consultation with CARB, the California Independent System Operator (CAISO), and the California Public Utilities Commission (CPUC), recently issued a report to Governor Newsom identifying priority actions to accelerate the transition to carbon-free electricity ("Priority Actions Report").⁶ The report, which responds to Governor Newsom's July 30th Proclamation of a State of Emergency, highlights the importance of maintaining electric system reliability and electricity affordability as the state works toward achieving the SB 100 clean electricity goal. Among other key points, the Priority Actions Report explains it is "vital to ensure that the [clean energy transition] is reliable and equitable."⁷ This underscores the important point raised in the Joint POUs' September 3rd comments that electricity reliability and affordability must be overarching considerations for the 2022 Scoping Plan Update.

Feasibility Analyses, Including Holistic Assessments of Electric System Reliability and Electricity Rate Affordability, is Needed After Completion of Preliminary Modeling

Each carbon neutrality scenario incorporates assumptions about all covered sectors of the economy, many of which will be related to the electricity sector through electrification efforts. To determine the

⁶ CEC, *Report to the Governor on Priority SB 100 Actions to Accelerate the Transition to Carbon-Free Energy* ("Priority Actions Report"), September 2021, <https://www.energy.ca.gov/sites/default/files/2021-09/CEC-200-2021-008.pdf>.

⁷ Priority Actions Report p. 1, p. 3.

effect of each of the four carbon neutrality scenarios on electric system reliability and electricity affordability, and thus each scenario's potential to be successfully implemented, the Scoping Plan Update process must incorporate feasibility analyses after the initial modeling. Such feasibility analyses are separate and additional to the GHG, air quality and public health, and economic modeling that is already planned as part of the current process.

While the SB 100 Joint Agency Report found that achieving the state's 100% clean electricity policy by 2045 is technically feasible, as noted in the Joint POUs' September 3rd comments, the analysis did *not* include a reliability assessment to determine whether the modeled resource portfolios can meet demand each hour of the year. This is especially important given the intermittent nature of many renewable resources. The Priority Actions Report notes that there will be a workshop later this year to address the reliability of the portfolios in the SB 100 Joint Agency Report.⁸ The proposed workshop will be a helpful first step, but the Scoping Plan process must ultimately address the impacts on electric system reliability of the specific resource portfolios, load coverage, and load growth assumptions within each of the modeled carbon neutrality scenarios. Moreover, as noted in the Joint POUs' September 3rd comments, the SB 100 Joint Agency Report found that achieving 100% clean electricity could require potentially billions of dollars in annual costs, but additional analysis is needed to determine the impact to electricity rates and affordability. Understanding the potential impacts to electricity affordability and reliability, and identifying accommodations to help protect against unanticipated consequences, will be key to an implementable path to carbon neutrality.

The Joint POUs note that the Scoping Plan Update must also assess the potential for success of the modeled portfolios; it is not enough to merely set out a desired pathway if that pathway is ultimately unable to realize the final objective. Sustained, record-breaking rates of construction will be necessary to achieve the 100% clean energy policy even by 2045, according to the SB 100 Joint Agency Report. However, the Priority Actions Report identifies potential barriers including permitting, supply chain, and project development challenges.⁹ Potential shortages related to equipment procurement, complex engineering, and construction could be exacerbated if multiple sectors of the economy must compete for resources on the same accelerated timeframe. Furthermore, permitting, land-use limitations, and long planning lead times may also pose risks to the new and upgraded transmission needed to support the interconnection of new resources,¹⁰ as well as to connect transmission-constrained regions to clean electricity generation.

The state's Priority Actions Report also highlights the need to fund emerging technologies, such as long-duration energy storage and green hydrogen, as a critical step to supporting California's efforts to decarbonize its energy system.¹¹ There are also potential risks to realizing the development of emerging technologies that are expected to play a significantly greater role in ensuring electricity reliability as the state transitions to 100% clean electricity. In general, these technologies are currently in their pre-commercial stages and are not yet commercially viable or scalable at a utility level. (The

⁸ Priority Actions Report, p. 6

⁹ Priority Actions Report, pp. 9-11

¹⁰ Priority Actions Report, p. 12.

¹¹ Priority Actions Report, p. 21.

challenges of technology commercialization of these resources were recently the focus of a hearing by the California Assembly's Select Committee on California's Clean Energy Economy.¹²⁾

To support the equitable maturation of these technologies and protect electricity affordability for ratepayers, the Priority Actions Report recommends that the state consider providing non-ratepayer funding to accelerate the deployment and scale of these resources. Consistent with this viewpoint, the federal government has also recognized the need to support the development of long-duration energy storage and green hydrogen. The U.S. Department of Energy recently announced its Long Duration Storage Energy Earthshot¹³ and its Hydrogen Earthshot¹⁴ to support the acceleration of breakthroughs in these technologies in the next decade. Given the time and resources needed to mature long-duration energy storage and green hydrogen technologies, the Joint POU's recommend that the Scoping Plan recognize the potential of these important resources not being commercially available for the next decade, and the potential long-lead time to invest, permit, and build these resources once they become economically viable at a utility scale.

The Joint POU's appreciate the Priority Actions Report's efforts to identify recommendations to help overcome potential barriers. However, recognizing the relative risk potential associated with each of the carbon neutrality scenarios is important to position the state for success to achieve carbon neutrality.

The Scoping Plan Update Must Present a Realistic Pathway to Success and Protect Against Unintended Consequences

Incorporating feasibility assessments after the completion of initial modeling will help minimize the risk of adverse consequences. However, the Scoping Plan's final assessment must allow for new information and changing planning needs, as well as protect against unintended consequences to electric system reliability and electricity affordability. For example, current electricity generation and transmission resource planning processes have limitations and will continue to evolve. Planning scenarios and planning horizons may differ between agencies based on their objectives. In addition, reliability needs may change as the electricity resource mix shifts to higher percentages of renewable energy, loads are added from other sectors, and we gain a better understanding of climate change and extreme weather risks. These reliability needs may look very different in the near-to-mid-term versus the long-term.

The Priority Actions Report recommends that the state adapt long-term planning, including the Scoping Plan, to support SB 100 goals and reliability, as well as make analytical modeling enhancements to reflect impacts from climate change and better characterize reliability needs in the 10- to 25-year timeframes.¹⁵ The Joint POU's support these recommendations. The Joint POU's also believe that flexibility and protection against unintended consequences are essential to an implementable Scoping

¹² Refer to [https://www.assembly.ca.gov/sites/assembly.ca.gov/files/2021.08.17 through the valley of death background final.pdf](https://www.assembly.ca.gov/sites/assembly.ca.gov/files/2021.08.17%20through%20the%20valley%20of%20death%20background%20final.pdf)

¹³ https://www.energy.gov/sites/default/files/2021-07/Storage%20shot%20fact%20sheet_071321_%20final.pdf

¹⁴ <https://www.energy.gov/eere/fuelcells/hydrogen-shot>

¹⁵ Priority Actions Report pp. 13-15, pp. 18-19.

Plan, and recommend that the Scoping Plan Update recognize not only a preferred path, but also allow for alternative paths, to achieve the state's goals.

II. Comments on Proposed Modeling Scenarios

The Joint POUs believe successful scenarios must provide a feasible path to carbon neutrality. We support modeling of scenarios that recognize and provide options to address barriers, which will be needed to ensure a successful transition. In general, the Joint POUs believe that scenarios that achieve carbon neutrality by 2045 will provide the most options to overcome these barriers and ensure the greatest likelihood of success. We strongly believe that restricting technology options for zero-carbon electricity generation would exacerbate challenges related to electricity reliability and affordability for many POUs, as described in our September 3rd comments. Feasibility analyses will be key in evaluating any of the carbon neutrality scenarios CARB models.

At the September 30th workshop, CARB presented four proposed scenarios for modeling – two that achieve carbon neutrality by 2035 and two that achieve carbon neutrality by 2045. The Joint POUs generally support carbon neutrality scenarios that are consistent with the 2045 SB 100 target. The SB 100 Joint Agency Report determined that policy is technically achievable, but numerous challenges must be overcome, and significant work is needed to realize the state's goal. Fast-tracking that goal to achieve economy-wide carbon neutrality by 2035 will require drastic changes in other sectors on an accelerated timeframe, adding additional challenges and complexity for the state as a whole. The Joint POUs understand that CARB has neither the funds nor time to model unlimited scenarios. For that reason, the four scenarios that CARB does select to model must be carefully assessed to ensure that they inform viable and realistic options that can be successfully implemented. The Joint POUs thus urge CARB to model one option looking at accelerating carbon neutrality to 2035, one option to achieve carbon neutrality by 2040, and two different options for reaching the stated 2045 goal.

The Joint POUs make this recommendation in the interest of facilitating a successful path to carbon neutrality based on the most recent studies and assessments available. For example, the Priority Actions Report identifies multiple challenges to meeting and accelerating the 100% clean energy policy; these challenges include permitting timelines, transmission availability, potential supply-chain issues, and adverse rate impacts. Furthermore, the report noted that technology development for long-lead time and emerging firm zero-carbon resources, such as green hydrogen, that are expected to play an important reliability role as the state moves closer to the 2045 SB 100 target is still needed. Accelerating the 100% clean electricity policy to 2035 would make addressing these barriers more difficult for many utilities and potentially infeasible, especially if zero-carbon electricity generation technologies are also restricted. In addition, as described in the Joint POUs' September 3rd comments, an accelerated clean energy target may preclude many utilities from realizing reliability and cost benefits associated with emerging firm zero-carbon resources and the buildout of new transmission, both of which require long lead times.

Challenges associated with realizing the SB 100 clean energy policy for many utilities will be compounded by the rapid transition of other economy sectors to electrification by 2035, including significant addition of load from the transportation and building sectors, and potential competition for resources including construction materials, semiconductors, battery manufacturing, and labor, at the

same time that the build rate for clean electricity generation and transmission must be accelerated. While the Joint POU's comments are primarily focused on electricity sector impacts, the actions of other sectors affect the electricity sector, so the feasibility and impacts to electric grid reliability and electricity affordability must be assessed for each carbon neutrality scenario as a whole.

The Joint POU's offer the following specific feedback on the modeling scenarios presented at the September 30th workshop:

Carbon Neutrality by 2045

- **Alternative 4:** The Joint POU's believe the inclusion of Alternative 4 allows for a meaningful assessment of achieving the state's goals. The electricity generation assumptions appear to be consistent with the SB 100 policy to serve 100% of retail sales to end-use customers with clean electricity by 2045. Importantly, the generation resources specified in Attachment B¹⁶ recognize the importance of a full suite of zero-carbon generation technology options and the potentially significant contributions of emerging technologies to assist with electricity affordability and reliability issues. In addition, the 2045 carbon neutrality timeframe provides the most flexibility to adapt for challenges associated with multiple sectors decarbonizing at the same time. It also better recognizes the lead times for utilities to upgrade or develop new transmission. Furthermore, a 2045 timeframe allows utilities that can achieve the 100% clean energy goal earlier to do so without undue restrictions. At this time, the Joint POU's believe Alternative 4 represents the most implementable path to achieving economywide carbon neutrality.
- **Alternative 3:** Alternative 3, which also appears to be consistent with achieving 100% clean energy by 2045 but adds total load coverage which includes electric grid transmission and distribution losses, would likewise allow for a realistic evaluation of the likelihood of successfully achieving carbon neutrality. The Joint POU's note that total load coverage is more stringent than SB 100's requirements and may limit options to maintain reliability while achieving 100% clean electricity, so the additional feasibility analyses detailed above for this scenario as a whole will help determine the impacts and viability. The Joint POU's again appreciate the inclusion of emerging zero-carbon generation technologies.

Carbon Neutrality by 2035

- **Alternative 2:** Relative to Alternatives 3 and 4, this alternative would reduce the lead time and available technology options to achieve 100% clean energy and carbon neutrality, posing potential feasibility challenges for many POU's. The electricity sector assumptions for Alternative 2 strive to achieve 100% clean electricity in 2035, ten years ahead of the SB 100 policy. It also applies the 100% clean electricity requirement to total load coverage (including transmission and distribution losses), which is outside the scope of the SB 100 policy. While the Joint POU's appreciate the recognition of emerging zero-carbon resources within Alternative 2, the availability of such resources to contribute to achieving the accelerated target may be limited for most utilities under a

¹⁶ Attachment B of CARB's [draft scenario assumptions](#) specifies the generation technologies to be included in the modeling, including RPS-eligible resources, existing nuclear and large hydro, drop-in renewable fuels, and natural gas generation with CCS.

2035 carbon neutrality timeframe due to long lead times for project development, permitting, demonstration, and technology cost reductions. It may not be possible for some utilities to achieve the proposed GHG target on this timeframe while maintaining electric system reliability. The Joint POU's suggest CARB modify Alternative 2 to retail load coverage only, consistent with the SB 100 policy, and stress that feasibility analyses will be key in determining viability.

- **Alternative 1:** The Joint POU's have significant concerns about the feasibility of Alternative 1, which would ban all combustion while also accelerating the 100% clean electricity target to 2035 and driving rapid electrification and significant infrastructure changes in other sectors of the economy. As described in detail in the Joint POU's' September 3rd comments, accelerating the carbon neutrality timeline while restricting use of zero-carbon electricity generation technologies would have significant impacts on electricity reliability and affordability. It may not be possible for some utilities to achieve the proposed GHG target in Alternative 1 while maintaining electric system reliability. Furthermore, banning combustion of even renewable fuels ignores the state's recognition that emerging zero-carbon resources like green hydrogen combustion are expected to play a significant role in maintaining electric grid reliability.¹⁷ The Priority Actions Report recommends additional funding mechanisms to support the transition of natural gas plants to green hydrogen and POU's are already making significant investments in this technology.¹⁸ Alternative 1, as currently proposed, conflicts with the Priority Actions Report's recommendation to support funding for green hydrogen, counter to federal, state, and local efforts to support green hydrogen, would result in stranded assets (e.g., existing electricity generating units that could be converted to use renewable fuels), and eliminate an important reliability resource for achieving our clean energy goals. In light of this, a feasibility analysis of this proposed option will be essential.
- **Alternative 1.A - Carbon Neutrality by 2040:**

The Joint POU's recommend CARB replace the proposed Alternative 1 with a scenario that achieves carbon neutrality in 2040 using all available technology options and with retail sales load coverage for the electricity sector. The Joint POU's believe such an interim carbon neutrality scenario would be beneficial to evaluate the feasibility of achieving carbon neutrality earlier than 2045. This is consistent with the Joint POU's recommendation that CARB only model scenarios that will inform feasible and implementable paths to achieve carbon neutrality.

¹⁷ Refer to Priority Actions Report, p. 18.

¹⁸ Priority Actions Report, p. 21.

III. Conclusion

The Scoping Plan is foundational for charting the state's path to carbon neutrality and the final preferred scenario will set the course for years to come. It is crucial that the Scoping Plan update process incorporate electric system reliability and electricity affordability assessments for each scenario to ensure that the final preferred scenario is achievable and protects affordability and reliability. The Joint POU's look forward to working with CARB to help preview the modeling results and evaluate feasible scenarios that advance the state's important climate, environment, and health goals.