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April 4, 2022 | Submitted electronically

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RE: March 15th Scoping Plan Workshop on Preliminary Modeling Results

The Southern California Public Power Authority[1] (SCPPA) appreciates the opportunity to provide comments on the California Air Resources Board's (CARB) March 15th workshop on the preliminary modeling results for the 2022 Scoping Plan update. SCPPA recognizes the tremendous amount of work that has already gone into the Scoping Plan update and thanks CARB staff and panelists for the detailed presentations on the greenhouse gas (GHG) modeling results, natural and working lands (NWL) modeling results, and efforts to develop a climate vulnerability metric. SCPPA offers the following input for CARB to consider in developing the draft Scoping Plan:

Each carbon neutrality scenario must be evaluated in context of the complete modeling efforts as well as feasibility and cost effectiveness assessments. The preliminary GHG modeling results provide helpful, informative insights on the four carbon neutrality scenarios CARB is studying for the Scoping Plan. However, these results must be viewed as directional until the air quality, public health, and economic modeling is completed, as well as the feasibility and cost-effectiveness assessments that SCPPA urges CARB to ensure are incorporated in the Scoping Plan development process. Without that complete picture, it will be difficult to determine which carbon neutrality pathways are achievable statewide and if any rely on unrealistic assumptions.

As presented at the March 15th workshop, the preliminary GHG modeling results show that all four carbon neutrality scenarios, in their current form, meet the Senate Bill (SB) 32 mandate to reduce GHG emissions 40% below 1990 levels by 2030, and all but Alternative 4 meet the goal to reduce emissions 80% below 1990 levels by 2050.[2] All four scenarios, including the "no combustion" Alternative 1, rely heavily on the use of engineered carbon removal to address residual emissions. The reliance on engineered carbon removal may even exceed the current GHG modeling estimates, given that the preliminary NWL modeling shows, at least in the near term,

[1] SCPPA is a joint powers authority whose members include the cities of Anaheim, Azusa, Banning, Burbank, Cerritos, Colton, Glendale, Los Angeles, Pasadena, Riverside, and Vernon, and the Imperial Irrigation District. Each Member owns and operates a publicly-owned electric utility (POU) governed by a board of local officials. Our Members collectively serve nearly five million people throughout Southern California. Together they deliver electricity to over two million customers throughout Southern California, spanning an area of 7,000 square miles.

[2] See E3's March 15th presentation on preliminary modeling results for AB 32 source emissions.

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that the state's lands will be a source, rather than sink, of emissions.[3] Throughout the four scenarios, as major sectors of the economy electrify to reduce emissions, the GHG modeling shows substantial increases in electric load, most markedly in Alternative 1. However, these projected load increases are also likely underestimates, as they do not reflect the additional energy needed to support engineered carbon removal and hydrogen production in each scenario.

While these preliminary modeling results can help inform directional conclusions about the carbon neutrality scenarios in their current forms, they do not incorporate cost and economic impacts, feasibility assessments, or the public health and air quality modeling results. This fuller context is needed to help ground individual models in reality and assess each scenario's ability to actually achieve the state's objectives. For example, in Alternative 1, the GHG modeling requires all existing gas power plants to retire, but paradoxically builds 6 GW of new gas capacity for resource adequacy that is never dispatched – an illogical outcome that would not occur in practice.

SCPPA reiterates the importance of incorporating feasibility analyses that consider barriers to the achievement of each potential carbon neutrality scenario in the Scoping Plan development process, as outlined in prior comments. SCPPA recognizes that some elements of feasibility will be captured in the cost and economic modeling, which will be presented at a workshop later this month. However, it will also be necessary to assess the impact of each scenario on electric grid reliability and electric rates, as failure to maintain reliable, affordable electric service could hinder the state's ability to achieve its electrification and emissions reduction goals and negatively impact individual families, businesses, and communities. As part of this assessment, CARB should include additional modeling focused on electric system reliability. More broadly, CARB's feasibility analyses should also consider the impacts of permitting, land use needs and limitations, and project development challenges on the necessary renewable energy, storage, and transmission build rates for each scenario, and the potential uncertainty associated with relatively nascent technologies like engineered carbon removal and green hydrogen for each scenario timeline.

The draft Scoping Plan must select an alternative that charts an implementable path to achieve carbon neutrality. SCPPA believes that it is not sufficient to model theoretical paths to carbon neutrality; any path that CARB selects for the Scoping Plan must be grounded and achievable. Based on the current information available, SCPPA continues to believe that the 2045 carbon neutrality timeframe is likely the most implementable statewide, given the needed scope of the economywide transformation, extraordinary build rates for zero-carbon resources and transmission, expected heavy reliance on relatively nascent technologies like engineered carbon removal and green hydrogen, and the diverse circumstances and challenges that individual utilities may experience, among other factors. While SCPPA emphasizes that the full modeling results, along with feasibility and cost effectiveness assessments, are needed to validate each alternative in context, the preliminary GHG modeling suggests the following directional results:

[3] See CARB's March 15th presentation on preliminary modeling results for NWL.

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- *Alternative 1 does not appear to provide a feasible path to achieve carbon neutrality.* SCPPA remains deeply concerned that the no-combustion approach to Alternative 1, as detailed in prior comments, fails to account for electric system reliability needs or the significant cost impacts, borne by ratepayers, that are more likely to occur by restricting zero-carbon technology options. Dispatchable generation is necessary for electric system reliability and resiliency, and as noted in prior comments, green hydrogen may serve a key role. However, Alternative 1 eliminates the option for green hydrogen combustion as a zero-carbon fuel for local dispatchable electricity generation.

  In addition, rapid electrification of other economy sectors simultaneously in an accelerated carbon neutrality timeframe statewide may exacerbate electricity affordability and reliability concerns for some utilities as electricity usage increases, usage patterns change, and multiple sectors compete for the same labor and materials. Moreover, the projected 80-90% increase in load estimated for Alternative 1 is likely an underestimate, as the modeling does not account for the energy demand to support engineered carbon removal or produce hydrogen, the latter of which is especially important for Alternative 1. SCPPA is also concerned the accelerated carbon neutrality timeframe does not recognize the lengthy time horizons needed to permit, site, and build new transmission, distribution, storage, and generation resources statewide, which will be essential for providing reliable electric service to the new load. As outlined in prior comments, SCPPA believes that failure to sufficiently consider electricity reliability and electricity affordability may jeopardize the success of electrification and, by extension, the achievement of the state's emissions reduction goals.

- *Alternative 2 may not provide a realistic timeframe for achieving carbon neutrality statewide.* While Alternative 2 does not impose the same restrictions on zero-carbon technologies as Alternative 1, SCPPA is concerned that the accelerated timeframe may not reflect the practical timelines needed to build out new resources and could compound challenges related to supply chain and labor availability, as noted above. In addition, Alternative 2 could still have a limiting effect on zero-carbon technologies in practice because it compresses the opportunities to develop and mature emerging technologies that could otherwise play an important role in achieving carbon neutrality.

- *Alternative 3 may represent a realistic path to achieve carbon neutrality statewide, but further analysis is needed*. SCPPA believes that Alternative 3 may represent an achievable path forward because, in its current form, it is consistent with emissions reduction mandates and goals, recognizes the need for a full suite of zero-carbon and renewable resources to help maintain electricity affordability and grid reliability, and provides a more realistic timeframe to address practical barriers such as the timeframes for permitting, demand for supplies and labor, and resource buildout. However, further analysis will be needed to determine cost effectiveness and feasibility of this scenario.

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- *Revisions to Alternative 4 may be needed.* While SCPPA generally believes the assumptions in Alternative 4 may be the most realistic, the current modeling results indicates that this scenario would not achieve the 2050 emissions reduction goal, an outcome that is inconsistent with CARB's criterion for Scoping Plan scenarios to meet Executive Order targets. SCPPA recommends that CARB adjust Alternative 4 to assess whether it can support the 2050 emissions reduction goal in addition to carbon neutrality by 2045.

SCPPA reiterates that further analysis of cost effectiveness, feasibility, and air quality and public health impacts will be needed to fully evaluate each alternative.

Climate vulnerability metric may be a powerful tool to guide future Scoping Plan implementation. SCPPA appreciates the research efforts by UC Santa Barbara to develop a climate vulnerability metric (CVM) that examines the differential impacts of climate change on individual communities.[4] While the effort is still in the early stages and is intended to help substantiate the federal social cost of carbon, the CVM has the potential to play a critical role in implementation of the Scoping Plan and other state clean energy policies, such as by helping to identify the optimal locations to target investments and programs. SCPPA looks forward to learning more about the CVM as the research develops.

Conclusion. Thank you for the opportunity to provide feedback on the March 15th workshop. SCPPA looks forward to continuing to work with CARB to develop this Scoping Plan update and charting an achievable path to carbon neutrality through feasible, cost-effective measures.

[4] See the March 15th UCSB presentation on developing a climate vulnerability metric.