

Rajinder Sahota  
Deputy Executive Officer  
Climate Change & Research  
California Air Resources Board

**RE: Public Workshop on the Initial Modeling Results of the 2022 Scoping Plan Update to Achieve Carbon Neutrality by 2045.**

Dear Ms. Sahota,

Southern California Edison (SCE) appreciates the opportunity to provide comments on the Initial Modeling Results Workshop for the 2022 Scoping Plan Update (2022 SPU), held on March 15 by the California Air Resources Board (CARB). SCE's comments are guided by Pathway 2045, our data-driven analysis of the steps that California must take to meet the state's 2045 carbon neutrality goals. As CARB is well-aware, achieving carbon neutrality will require significant contributions from all sectors, and all Californians must have access to clean energy solutions. As such, SCE urges CARB to select an alternative that is the most equitable, feasible and affordable to achieve our state climate goals.

SCE offers the following comments for consideration as CARB assesses the four carbon-neutral alternatives for 2035 and 2045.

### Initial Modeling Results

SCE applauds CARB's continued efforts in developing modeling scenarios that illustrate how California can decarbonize its economy. However, SCE has several concerns with the initial modeling results of source emissions in the E3 presentation. These concerns include:

#### 1. The need for total cost and affordability metrics

Any greenhouse gas (GHG) modeling efforts should include the total cost for implementation as well as appropriate affordability metrics such as total annual energy costs per household (e.g. cost of electricity, natural gas and transportation fuel) used in their evaluation. This information would allow parties to better understand the cost implications of the four alternatives presented by CARB and their impact on Californians. The cost implications of the four alternatives are especially important given that two scenarios accelerate the achievement of the carbon neutrality goal to 2035, which increases the costs. As the total cost for implementation and the affordability metrics, along with all the scenario details (assumptions like load or end-use electrification, models, and outputs), are critical to understand the scenarios, SCE respectfully requests that CARB release this information and provide an opportunity for all stakeholders to provide feedback before CARB releases the draft 2022 SPU.

#### 2. High projected GHG emissions for the electric sector

In addition to including the total cost and the affordability metrics for the four alternatives, SCE also recommends that CARB model additional sensitivities to the existing scenarios with lower electric sector GHG emissions. In previous studies that explore how California can decarbonize, E3 found the

electric sector's GHG emissions to vary from 0 to 13MMT<sup>1</sup> in high electrification, energy efficient, and clean electric generation scenarios. These previous findings are much lower than the 30MMT contained in alternatives 2, 3, and 4 of the Initial Modeling Results presentation. SCE's own Pathway 2045 analysis shows that the electric sector will contribute 10MMT of GHG emissions in 2045.<sup>2</sup> SCE is concerned that overestimating the emissions from the electric sector will lead to overestimation of emissions and mitigation costs from many other sectors. As the economy becomes more dependent on electricity through electrification, every electric end use produces lower emissions as the grid becomes cleaner and cleaner. Furthermore, overestimation of emissions from the electric sector (and electric end uses) will require the industrial and agricultural sectors to decarbonize more significantly. This will lead to higher anticipated costs as these two economic sectors are generally considered to be the hardest to decarbonize.

SCE recommends that CARB also include the total costs for the additional scenarios with lower GHG emissions from the electric sector, and higher GHG emissions from the industrial and agriculture sectors. This will allow CARB and stakeholders to better understand the cost differences between the alternatives and the additional scenarios.

### 3. Unrealistic land use assumptions for green hydrogen

As noted in the presentation by E3, the amount of solar capacity needed to support electrolysis for green hydrogen production varies from 31GW to 47GW.<sup>3</sup> Then, the total utility-scale solar needed to support the four alternatives would range from 110GW to 170GW. Adding the energy requirements for direct air capture (DAC) would only increase the amount of solar capacity needed to support the four alternatives. At these high levels of solar capacity, land use constraints become a key issue that needs to be considered.

### 4. The need for a risk assessment to implement carbon sequestration from natural and engineered processes

As described by CARB in the Natural and Working Lands (NWL) presentation, GHG emissions expected to be captured by natural sinks are highly optimistic and will be difficult to achieve.<sup>4</sup> SCE also remains concerned about the reliance on carbon capture and sequestration (CCS) and DAC (with CCS). While these two engineered carbon dioxide removal technologies have been demonstrated in pilot projects, both technologies are far from being economically viable. California has the technical capacities to theoretically sequester the needed amount of carbon dioxide to achieve carbon neutrality; however, the state needs to align its actions and priorities to achieve this goal.

To address these concerns, SCE recommends that CARB provide a risk assessment for each of its alternatives to describe the potential barriers to implementing carbon sequestration that would impede achieving carbon neutrality.

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<sup>1</sup> E3's *Deep Decarbonization in a High Renewable Future* study demonstrated about 13MMT of electric sector GHG emissions in 2045 for the high electrification scenario. E3's *Achieving Carbon Neutrality in California* study showed that the electric sector was 95% to 100% zero-emission generation or 0 to 9MMT in 2045.

<sup>2</sup> Pathway 2045: Update to the Clean Power and Electrification Pathway. Southern California Edison. November 2019. <https://www.edison.com/home/our-perspective/pathway-2045.html>

<sup>3</sup> CARB Draft Scoping Plan: AB32 Source Emissions Initial Modeling Results. Energy+Environmental Economics (E3). March 15, 2022. <https://ww2.arb.ca.gov/sites/default/files/2022-03/SP22-Model-Results-E3-ppt.pdf>

<sup>4</sup> Initial Modeling Results. Natural and Working Lands. CARB. March 15, 2022. <https://ww2.arb.ca.gov/sites/default/files/2022-03/SP22-Model-Results-CARB-NWL-ppt.pdf>

## Climate Vulnerability Metric

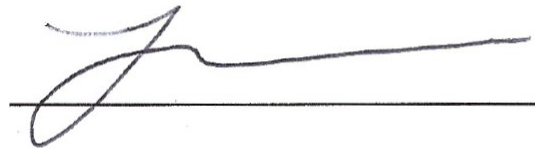
SCE welcomes and appreciates the presentation by UC Santa Barbara.<sup>5</sup> SCE acknowledges that the outcomes of this exercise, if implemented, could have significant positive impacts on the state's climate policies. SCE expects that the findings of this study may support complementary policies and additional allocation of resources to enable the needed adaptations to local climate impacts.

SCE also encourages CARB to align with past and current initiatives at the state, federal and international levels, as appropriate. For example, when selecting an appropriate global warming scenario and a time period for forecasting, SCE recommends using RCP 8.5<sup>6</sup> and the priority time period of now until 2050. These selections are consistent with the directives of the California Public Utilities Commission (CPUC) Decision (D).20-08-046<sup>7</sup>, which guides Investor-Owned Utilities' climate adaptation vulnerabilities assessments to be filed with the Commission over the next 6 years, starting with SCE's being filed this coming May. Additionally, at the federal level, CARB should take into account the studies and analyses conducted by the Interagency Working Group on the Social Cost of Greenhouse Gases, under Executive Order 13990, on Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis.<sup>8</sup>

## Conclusion

SCE thanks CARB for taking into consideration the above comments on the Initial Modeling Results Workshop of the 2022 Scoping Plan Update. Please do not hesitate to contact me at (626) 302-6984 with any questions or concerns you may have. I am available to discuss these matters further at your convenience.

Sincerely,



Laura Renger  
Director, Electrification & Customer Services Policy

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<sup>5</sup> Unequal Climate Impacts in the State of California: Developing a Climate Vulnerability Metric. Dr. Tamma Carleton, UC Santa Barbara. <https://ww2.arb.ca.gov/sites/default/files/2022-03/SP22-Model-Results-UCSB-ppt.pdf>.

<sup>6</sup> Representative Concentration Pathways 8.5 Global Warming Scenario, or RCP 8.5 is a reference to the concentration of carbon in the atmosphere that delivers global warming at an average of 8.5 watts per square meter across the planet.

<sup>7</sup> Order Instituting Rulemaking to Consider Strategies and Guidance for Climate Change Adaptation. Rulemaking 18-04-019. Decision 20-08-046 August 27, 2020. Date of Issuance: September 3, 2020. California Public Utilities Commission. <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M346/K285/346285534.PDF>.

<sup>8</sup> Executive Order on Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis. The White House Briefing Room. January 20, 2021. <https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/20/executive-order-protecting-public-health-and-environment-and-restoring-science-to-tackle-climate-crisis/>

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