October 22, 2021

Rajinder Sahota
Division Chief
Industrial Strategies Division
California Air Resources Board

RE: Scenario Inputs Technical Workshop 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 Scenario Inputs Technical Workshop of the 2022 Scoping Plan Update to Achieve Carbon Neutrality by 2045, held on September 30, 2021, by the California Air Resources Board (CARB).

SCE comments are guided by Pathway 2045[1], our data-driven analysis providing a feasible and economical route to realize California's greenhouse gas (GHG) reduction goals by 2045, as well as Mind the Gap: Policies for California's Countdown to 2030[2], Edison's analysis of the policy changes and additions needed to ensure that California meets its goal of reducing GHG emissions by 40% by 2030. SCE offers the following comments for consideration as CARB develops the four carbon-neutral alternatives for 2035 and 2045 that will be modeled to illustrate the effectiveness of the deployment of different technologies and clean energy in achieving the state's climate goals.

I. Carbon Neutrality Alternatives

SCE recommends that CARB adopts a scenario that achieves carbon neutrality by 2045. This scenario would achieve compliance for both the 40% GHG emissions reduction from 1990 levels by 2030[3] and carbon neutrality by 2045[4] executive order goals while also building upon previous decarbonization efforts such as the 2017 CARB Scoping Plan and the SB100 Joint Agency Report[5].

SCE recommends that CARB consider only technologically feasible scenarios in the 2022 Scoping Plan. As currently described in CARB's 2022 Scoping Plan Update - Draft Scenario Inputs Technical Workshop presentation on September 30, 2021[6], SCE believes the assumptions in Alternative 1 make it an infeasible scenario and it should not be considered for modeling purposes. SCE's areas of concern include the limited amount of time to reduce GHG emissions given the need for long lead time development of infrastructure (e.g., transmission), the assumption that does not allow for engineered carbon dioxide removal technologies, the far-reaching implications of phase-out of hard to decarbonize sectors (e.g., cement and aviation)[7], as well

[1] Pathway 2045: Update to the Clean Power and Electrification Pathway. Edison International. November 2019. https://www.edison.com/home/our-perspective/pathway-2045.html.
[2] Mind the Gap: Policies for California's Countdown to 2030. Edison International. October 2021. https://www.edison.com/home/our-perspective/mind-the-gap.html
[3] California Global Warming Solutions Act of 2006 – SB 32
[4] California Executive Order: B-55-18
[5] SB100 Joint Agency Report. California Energy Commission.
[6] 2022 Scoping Plan Update – Draft Scenario Inputs Technical Workshop. September 30, 2021. https://ww2.arb.ca.gov/sites/default/files/2021-09/carb_presentation_sp_scenarioinputs_september2021.pdf
[7] 2022 Scoping Plan Update – Draft Scenario Inputs Technical Workshop, September 30, 2021, p 11.

as the cost associated with the early retirement of vehicles, gas appliances, and industrial equipment. Additionally, as CARB noted in their presentation[8], Alternative 1 may not reach carbon neutrality since it does not allow for engineered carbon dioxide removal technologies to compensate for non-combustion emissions which would not comply with the carbon neutrality executive order.

II. Vehicle Fleet Electrification

Addressing climate change and improving air quality requires a large-scale transformation of the transportation sector to zero emissions. SCE suggests modeling Alternatives 2, 3, and 4. There are important notable constraints that are heightened when realizing earlier, accelerated ramps to 100% statewide targets, including vehicle turnover and replacement life, upfront costs of vehicles, and the need for increased supportive infrastructure deployment.

III. Carbon Free Electricity Grid

As mentioned in SCE's previous comments[9], SCE recommends CARB consider a modeling approach that would provide the amount of carbon-free resources rather than defining the amount of carbon-free electricity as an input. CARB has previously used an economy-wide GHG emissions model for the 2017 Scoping Plan and assessing carbon neutrality; this analytical process should be leveraged to determine the electric sector GHG emissions targets for both 2030 and 2045. Once the GHG emissions for the electric sector are established, a capacity expansion model can be utilized to determine the optimal amount of carbon-free resources needed to meet the GHG target while serving the demand and meeting renewable portfolio standard requirements and SB100 clean energy goals. Thus, the electric sector modeling would determine how much carbon-free electricity is needed to meet the GHG emission targets, eliminating the need to predetermine an assumption.

SCE also recommends that CARB, the California Energy Commission, the California Public Utilities Commission, and the California Independent System Operator work together to model and compare the costs and reliability of a zero-carbon electricity grid system versus a net-zero carbon electricity grid system. Balancing affordability while maintaining electric system reliability may require some remaining combustion resources from natural gas and low-carbon fuels.

IV. Residential and Commercial Building Decarbonization

SCE believes that the set of goals under Alternative 1 for the Residential and Commercial Building Decarbonization sector are achievable and therefore, SCE recommends that CARB run its models on this first Alternative. Alternatives 3 and 4 should not be considered. SCE estimates that 25% of the emissions reduction gap needs to be closed through the electrification of buildings to reach state targets by 2030; therefore, Alternatives 3 and 4 are too conservative and will likely require even more electrification in the longer term to meet the 2045 carbon neutrality goal.

In order to reach carbon neutrality by 2045, we urge CARB to adopt aggressive modeling scenarios for building decarbonization and to propose a quantifiable electric heat pump adoption target and a timeline for

[8] Ibid.

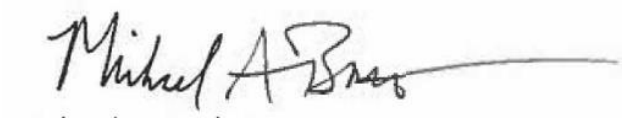
[9] SCE comments on AB 32 2022 Scoping Plan Update Scenario Concepts Workshop held on August 30, 2021. Submitted September 3, 2021. https://www.arb.ca.gov/lispub/comm2/bccomdisp.php?listname=sp22-concepts-ws&comment_num=17&virt_num=15

adoption of heat pump technologies within the Scoping Plan Update. Due to the long useful life of the equipment such as tankless water heaters and furnaces, which can run for approximately 20 years, it is important to set a target of 80% new electric appliance sales by 2025. The state cannot wait for appliances to be replaced at end of life, and incentives are needed to promote the early retirement of polluting equipment. Customers will be less likely to replace fossil fuel appliances with clean electric appliances at the end of the appliance's useful life, when an emergency replacement is needed. There must be time to accommodate any necessary infrastructure upgrades for switching from gas to electric in a building retrofit (e.g., panel upgrades, wiring, etc.); therefore early retirement is necessary to drive adoption.

V. Conclusion

SCE thanks CARB for taking into consideration the above comments on the Scenario Inputs Technical Workshop and looks forward to its continued partnership with CARB and stakeholders in the development of the 2022 Scoping Plan Update. Please do not hesitate to contact me at (626) 302-8442 with any questions or concerns you may have. I am available to discuss these matters further at your convenience.

Sincerely,



Michael A. Backstrom
Vice President, Regulatory Policy
Southern California Edison
8631 Rush Street, Rosemead, CA 91770
T. 626-302-8442
Email: michael.backstrom@sce.com