



April 4, 2022

Liane Randolph, Chair
California Air Resources Board
1001 "I" Street
Sacramento, CA 95814

RE: Sierra Club California Comments on Scoping Plan - March 15, 2022 Workshop

Dear Chair Randolph and Members of the Board:

Sierra Club California, on behalf of our over 500,000 members and supporters in California, appreciates the opportunity to comment on the California Air Resources Board's (CARB) Scoping Plan Workshop held on March 15, 2022.

During the workshop, CARB staff and consultants presented initial results of modeling of various emission reduction scenarios. In this letter, we comment on some concerns we have with the modeling and reiterate our positions on the Scoping Plan overall.

Specifically regarding the March 15, 2022 Workshop:

1. Be exceedingly careful with modeling and consideration of "Renewable Natural Gas"
2. Improve modeling to fully consider the benefits of Distributed Energy Resources (DER)
3. Require all four alternatives to meet AB 32 greenhouse gas emissions requirements before relying on carbon dioxide removal technology
4. All electric sector emissions should reach zero emissions by 2045
5. Alternative 2's assumed electric sector emissions need to be reduced to achieve 10 MMT emissions by 2035 to adequately address EJAC requests
6. All electric sector scenarios should be amended to include no new gas capacity
7. Ensure that forest carbon accounting is accurate

Reiteration of Sierra Club California Scoping Plan Positions:

8. Allow enough time for proper incorporation of EJAC's input
9. Prioritize direct emission reductions and phasing out fossil fuel combustion and production
10. Reframe no-combustion scenario to emphasize social benefits and include assumptions for innovation
11. Strengthen 2030 GHG emission reduction interim target to at least 68% but aiming for 80%
12. Take benefits from rapid electrification (Alternatives 1 and 2) in the transportation seriously and look for opportunities to achieve 100% light duty sales prior to dates in Alternatives 3 and 4

13. Include equity considerations in building decarbonization scenarios
14. Prioritize forest protection from commercial logging operations

Please see our more detailed comments below:

I. Just Because it is Called “Renewable” Doesn’t Mean it is

During the March 15 workshop, there were many commenters urging the state to support so-called “Renewable Natural Gas.” While CARB staff did not wholeheartedly endorse this technology, they did not seem fully aware of the potential consequences of relying on carbon-based fuels in the state’s quest for massive carbon reductions.

“Renewable natural gas” is a catch-all term that encompasses existing technologies such as dairy digesters and landfill-derived biogas as well as theoretical and emerging technologies such as the gasification of woody biomass.

There are reasons to be skeptical about the actual emission reductions achieved by any of these technologies. Dairy digesters, for example, may reduce methane emissions from Concentrated Animal Feeding Operations (CAFOs), but they could also incentivize increases in herd size by paying operations for the methane they produce.

The gasification of woody biomass taken from the forests or agricultural operations is equally suspect. In both cases, the fuel (trees) must be transported from the orchard or forest to a gasifier. If zero emission trucks are not used, this transportation results in carbon emissions.

In the case of orchards, alternative fates of trees must be considered. Given that CARB finally set an end date from open burning in the San Joaquin Valley, CARB can no longer assume that any trees turned into gas would otherwise have been pile burned. With the proper incentives and regulations in place, the bulk of these trees could be reincorporated into the soil, a process with minimal air quality impacts, significant carbon sequestration, and the lowest Global Warming Potential of all potential uses for orchard biomass¹. If this is the alternative fate (and there is no reason it should not be) then gasification and combustion of orchards makes no sense.

With regards to forests, alternative fates should also be considered, but not in the way the biofuel industry argues for. Some trees removed in fuel reduction operations may have otherwise been burned in a wildfire, but this is extremely unlikely for trees removed from a distinct area in forests that spans millions of acres². The most likely scenario is that if left in place, the trees would continue growing and sequestering carbon; the soil, undisturbed by heavy equipment, would also continue to sequester millions of years of carbon.

¹ Climate and Air Emissions. Whole Orchard Recycling. Findings and Impacts. <https://orchardrecycling.ucdavis.edu/environment>.

² A 2017 review by fire scientist Tania Schoennagel and eleven co-authors found that roughly 1% of US Forest Service forest treatments experience wildfire each year, on average. See <https://www.pnas.org/doi/pdf/10.1073/pnas.1617464114> at page 4586.

If biomass removed from the forest is assumed to either be fuel for a wildfire or a pile burn, then almost any alternative fate is going to lead to GHG reductions. CARB's modeling cannot assume these alternative fates for all trees and should alternatively assume and encourage policies that incentivize zero or low emission uses for biomass (such as wood products or mulching) for biomass that is removed from the forest.

In addition to the uncertain reductions achieved by the creation of "renewable natural gas," the end uses for this methane should also be properly considered. California's methane infrastructure is notoriously leaky. Pumping RNG into pipelines will result in methane emissions that must be considered in any scenario involving RNG. Further, the reductions associated with using RNG for transportation are overstated as a recent CARB study confirmed last year.

Of course, the considerations above are only regarding GHG emissions. Burning methane, even that which has been branded "renewable" or "green" or "clean," still emits smog-forming nitrogen oxide ("NOx") and particulate matter in a state that is home to the worst air quality in the country.

II. Improve Modeling to Fully Consider the Benefits of Distributed Energy Resources

CARB's objective to meet GHG targets in the electricity sector is more likely to succeed if least cost strategies are selected. Furthermore, accelerating Distributed Energy Resources (DER) results in more efficient land use, conserving land otherwise lost to remote PV and transmission, local resiliency, and decreased local criteria pollution.

Two recent independent modeling studies and analyses (Vibrant Clean Energy³ and Stanford⁴) show that optimizing distributed energy resources (i.e. energy efficiency, storage, solar and flexible load management on the distribution grid) results in lower costs and decreasing electricity rates over time compared to meeting clean energy goals by investments in utility scale PV—in part by avoiding substantial investments in transmission infrastructure.

A Vibrant Clean Energy model for California shows savings of \$120 billion dollars over 20 years by optimizing DER. Of crucial importance, current modeling to design California electricity sector options does not have the capacity to model optimized distributed energy resources to assess the least cost route to meet California's climate goals. Specifically RESOLVE, the model used in E3's analysis of the electricity sector for CARB can only optimize for utility scale PV without differentiating between PV on the distribution grid and PV requiring transmission.

We urge CARB to work with CEC and CPUC to optimize storage, generation and demand response on the distribution grid in modeling. For example, the Vibrant Clean Energy model adapted for California could be run in parallel with RESOLVE.

³ Vibrant Clean Energy Executive Summary Why Local Solar For All Costs Less: A New Roadmap for the Lowest Cost Grid, https://www.vibrantcleanenergy.com/wp-content/uploads/2020/12/WhyDERs_ES_Final.pdf.

⁴ Jacobson et al <https://doi.org/10.1016/j.renene.2021.11.067>.

While results from modeling will take time, the Scoping Plan could acknowledge uncertainty around projections of transmission needs and emphasize investments in “least regrets” priorities such as policies to accelerate DER. Selection of scenarios should take into account the need for further information on alternatives.

III. Require all four alternatives to meet AB 32 greenhouse gas emissions requirements before relying on carbon dioxide removal technology.

Alternative 4 does not currently meet the AB 32 requirement to reduce greenhouse gas emissions 80 percent under 1990 levels by 2050 without the use of carbon capture and sequestration (CCS).⁵ While it is critical to explore all avenues of meeting our climate targets, it is risky to have such a small margin of error for Alternative 4 that it risks failing to meet AB 32 requirements without the successful deployment of CDR.

For this reason, we recommend that every alternative reach carbon neutrality considering total emissions by 2050. This would require that Alternative 4 meet the greenhouse gas emissions target of 80 percent under 1990 levels by 2050 without the use of carbon dioxide removal (CDR). Alternatives 2 and 3 could also be further reduced in order to provide additional contrast between the alternatives. We propose that the necessary emissions reduction for the relevant alternatives come from the electric sector for the reasons outlined below.

IV. All electric sector emissions should reach zero MMT by 2045.

A. Planning for electric sector emissions in 2045 is inconsistent with California climate policy requiring multiple pathways to achieving carbon neutrality by 2045.

Three of the four alternatives under consideration in the Scoping Plan include electric sector emissions equivalent to 30 MMT in 2050, despite multiple emphatic legal requirements and directives to accelerate carbon neutrality and reduce our reliance on fossil fuels.

California’s multiple climate laws and policy commitments require CARB to plan to achieve carbon neutrality by 2045 as well as investigating pathways to achieve carbon neutrality by 2035. SB 100 requires that “eligible renewable energy resources and zero-carbon resources supply 100 percent of all retail sales of electricity to California end-use customers and 100 percent of electricity procured to serve all state agencies by December 31, 2045.”⁶ The bill also repeatedly directs various state agencies to achieve “a zero-carbon electric system.” CARB’s interpretation that non-retail loads (such as wholesale or non-retail sales and losses from storage and transmission and distribution lines) are not subject to this law is inconsistent with the text and spirit of SB 100, and accordingly should not accommodate any emissions from the electric sector past 2045.

⁵ SP22 Model Results (Mar. 15, 2022), Slide 8 (showing emissions after carbon capture & sequestration and before carbon dioxide removal technology).

⁶ Pub. Util. Code Section 454.53 (SB 100 De Leon).

In addition, more recent direction from the Governor makes clear the need to accelerate planned greenhouse gas emissions earlier than 2045. Governor Gavin Newsom has directed both CARB⁷ and the CPUC⁸ to accelerate California’s progress toward its nation-leading climate goals by investigating pathways to achieving carbon neutrality by 2035. Governor Newsom specifically asked CARB to “evaluate how to achieve carbon neutrality no later than 2035 as part of its 2022 Climate Change Scoping Plan. The work should include analysis of how to reduce or eliminate demand for fossil fuel in California and end oil extraction in our state.” By asking to “eliminate demand for fossil fuel,” this directive also includes evaluating how to eliminate fossil fuels from the electric sector. It is therefore inconsistent with this directive for Alternatives 2, 3, and 4 to fail to reach zero emissions by 2035, much less 2045.

The CPUC’s work on long term emissions from the electric sector better aligns with this directive than Alternatives 2, 3, and 4 under review in this Scoping Plan and highlight some of the risks involved in the planned Alternatives. The CPUC conducted an analysis that relies on a 15 MMT target in 2045, claiming it is “generally consistent” with the “High Carbon Dioxide Removal” scenario from the E3 report, “Achieving Carbon Neutrality” (“E3 Carbon Neutrality Report”).⁹ Yet that E3 Carbon Neutrality Report acknowledges that even the 15 MMT target for 2045 is risky as it relies heavily “on relatively untested CDR strategies which are not widely commercialized” and “has the highest remaining quantity of fuel combustion, which means the air quality impacts, though far improved relative to today, will likely be highest among the three carbon neutral scenarios evaluated.”¹⁰ Alternatives 2, 3, and 4 all project higher electric sector emissions in 2045—bottoming out at 30 MMT each in 2050. These projected emissions are more risky than the CPUC’s analysis and need to be revised in order to yield the climate and air quality goals required by California law and policy. Accordingly, we urge CARB to require each alternative to achieve zero emissions from the electric sector by 2045.

Furthermore, CARB should ensure that more than one alternative achieves carbon neutrality for the electric sector by 2035, as directed by the Governor in his July 9, 2021 letter. Currently, only Alternative 1 achieves this.

B. Reducing all electric sector emissions assumptions for Alternatives 2, 3, and 4 to zero MMT by 2050 would decrease the need for expensive and unproven CCS technologies.

Each alternative under consideration relies on unproven and potentially cost-prohibitive carbon capture and sequestration (CCS) technologies, while there is existing and, practicable electric generation technology that is renewable, avoids emissions altogether, and is considerably more cost-effective.

⁷ Gavin Newsom Letter to CARB Chair Liane Randolph (July 9, 2021), available at https://www.gov.ca.gov/wp-content/uploads/2021/07/CARB-Letter_07.09.2021.pdf (directing CARB to evaluate how to accelerate the state’s carbon neutrality target to 2035).

⁸ Gavin Newsom Letter to CPUC President Marybel Batjer (July 9, 2021), available at https://www.gov.ca.gov/wp-content/uploads/2021/07/CPUC-Letter_07.09.2021.pdf.

⁹ See E3, Achieving Carbon Neutrality: PATHWAYS Scenarios Developed for the California Air Resources Board (hereinafter “E3 Carbon Neutrality Report”), p. 4 (Oct. 2020), available at https://ww2.arb.ca.gov/sites/default/files/2020-10/e3_cn_final_report_oct2020_0.pdf.

¹⁰ *Id.*

Lowering the assumed electric sector emissions would reduce the massive reliance on carbon capture and sequestration (CCS) technologies used extensively in Alternatives 2, 3, and 4 to compensate for electric sector emissions.¹¹ There is an indirect relationship between investing in renewable energy and needing to use CCS to negate or reduce electric sector emissions. In other words, investment in CCS specifically steers investment away from renewable energy. CCS technologies are extremely expensive to build and operate and would require significant subsidies to be viable. Within the electric sector, there are multiple less costly, less polluting alternatives to CCS. For example, the cost of building and operating CCS technology at a power plant could cost more than five times as much as building additional wind or solar generating capacity. While these cost impacts may appear in the cost modeling planned for later stages of the Scoping Plan process, the cost considerations emphasize the need for added separation between Alternatives 2, 3, and 4 in order to provide clearer tradeoffs between sector emissions. In addition, there is a risk that CCS could result in increased dispatch for gas plants with the technology, leading to higher costs for customers.

Adding CCS technology could additionally extend the life of gas plants that would have otherwise faced economic pressure to retire by keeping uneconomic gas plants alive for longer. There are recent examples of other states that are specifically considering CCS in order to delay closures of uneconomic coal plants, such as in North Dakota and New Mexico.¹² California could face similar challenges with retiring uneconomic gas plants if CCS technology is added. The alternative pathway is to set a lower electric sector emissions assumption in order to build more renewable energy and reduce the projected need for CCS.

CCS technology can be extremely energy and water intensive. Solvent-based carbon capture technologies, in particular, can require a significant energy penalty to generate the solvent and compress the CO₂ into the pipeline.¹³ This either reduces the efficiency of the host plant (similar to de-rating the plant) or alternatively requires a much larger power plant to achieve the same “net” power generation capacity that would have been available without CCS.¹⁴ CCS consumes large quantities of freshwater and requires substantial amounts of cooling water.

It is also important to recognize that CCS technology could result in increased air pollution from power plants as well as other health risks. CCS technology would enable a power plant to avoid greenhouse gas emissions, but would have no impact on other air pollutants like fine particulates (PM_{2.5}), oxides of nitrogen (NO_x), or water pollution. CCS technology could allow emitting plants to operate more

¹¹ SP22 Model Results, slide 6 (showing Alternative 2, 3, and 4 require 8 MMT, 10 MMT, and 11 MMT of carbon capture and sequestration needs in 2035).

¹² See, e.g., Dan Gearino, “A Lifeline for a Coal Plant Gives Hope to a North Dakota Town. Others See It as a Boondoggle,” *Inside Climate News* (July 17, 2021), available at <https://insideclimatenews.org/news/17072021/north-dakota-coal-energy-transition-jobs-carbon-capture/>. See also Daniel J. Chacón, “Carbon-capture project generates support, skepticism among New Mexico lawmakers,” *Santa Fe New Mexican* (July 13, 2021), available at https://www.santafenewmexican.com/news/local_news/carbon-capture-project-generates-support-skepticism-among-new-mexico-lawmakers/article_8dfcd960-e3ec-11eb-851d-ef8590cfc5c2.html.

¹³ Integrated Environmental Control Model - Technical Documentation: Amine-based Post-Combustion CO₂ Capture (Jan. 2019), p.14, available at https://www.cmu.edu/epp/iecm/documentation/2019Jan_IECM%20Amine-based%20CO2%20Capture.pdf.

¹⁴ *Id.*

frequently and at higher levels, resulting in more pollution than they emit today. Carbon capture technologies that rely on solvents also risk solvent emissions slipping through the flue stack, resulting in new dangerous particulate and chemical emissions spewing into nearby communities and potentially contaminating surface water. Additionally, with the few CO₂ transportation pipelines that exist today, there have already been signs of potential harm from accidents and pipeline ruptures.¹⁵

Due to these impacts, reliance on CCS in the electric sector could worsen environmental injustices in California. Adding CCS to polluting power plants would not address the disproportionate environmental burdens of disadvantaged communities that border these facilities. These potential impacts need to be considered in the forthcoming air quality impacts, but additionally could be avoided or decreased altogether with a lower greenhouse gas emissions assumption for Alternatives 2, 3, and 4.

C. Reducing emissions assumptions for Alternatives 2, 3, and 4 would provide more information on tradeoffs between alternatives.

There is not enough difference between the alternatives to provide the Air Resources Board and stakeholders a meaningful alternative between the three scenarios. For nearly every comparison, Alternative 1 provides a far more ambitious reduction in greenhouse gases than the remaining alternatives, while the remaining three alternatives display relative similarity. For example, Alternatives 2, 3, and 4 all require large and very similar use of gas resources in 2035.¹⁶ On slide 14, Alternative 1 shows dramatic reductions in final energy demand in comparison to Alternatives 2, 3, and 4, all of which include significantly higher final energy demand in addition to large quantities of liquid fossil fuels. Even within the buildings sector, Alternative 1 shows a rapid decline in gas heating appliances in the near term while Alternatives 2, 3, and 4 show near identical decreases in gas heating appliances.¹⁷ This pattern is evident across multiple scenarios where only a single alternative (Alt. 1) presents a rapid and ambitious decrease in the use of fossil fuels, where the remaining three alternatives present gradual transitions with minimal differences between them.

It is not helpful for CARB that only a single alternative is an outlier of ambition for meeting the climate crisis in combination with three additional, minimally varying alternatives (Alternatives 2, 3, and 4), because the entire purpose of this exercise is to understand alternatives and tradeoffs—in costs, air quality, and greenhouse gas reductions. Alternative 1 has multiple facets that result in a far more rapid decline in both direct and total emissions, including a full phase out of oil & gas extraction, rapid building electrification, dramatic increases in vehicle miles traveled, and no combustion in the electric sector by 2035. The remaining alternatives should be made incrementally more ambitious in order to better understand some of the tradeoffs involved between the scenarios. The Board should particularly make Alternatives 2 and 3 more ambitious in order to provide a more reasonable array of choices and to elicit more pronounced comparisons between the alternatives.

¹⁵Dan Zegart, “The Gassing of Satartia: Carbon Dioxide Pipeline Linked to Mass Poisoning,” HuffPost, August 26, 2021, https://www.huffpost.com/entry/gassing-satartia-mississippi-co2-pipeline_n_60ddea9fe4b0ddef8b0ddc8f.

¹⁶ SP22 Model Results (Mar. 15, 2022), Slide 13 (showing final energy demand for each alternative in 2035 and 2045).

¹⁷ *Id.* at slide 21 (showing building sector adoption transitions).

The most reasonable starting point for adjusting the alternatives is in the electric sector. Among the alternatives, only Alternative 1 reaches a 0 MMT CO₂ target during the timelines under consideration.¹⁸ Alternatives 2, 3, and 4 appear to remain at or near 30 MMT through 2050. Given the recent impacts of the climate crisis on California and the relatively short timeline to mitigate against the worst possible climate disasters,¹⁹ it is unreasonable to use three scenarios that would achieve no incremental reductions past 2030 or 2045.²⁰ Each of these three alternatives can and should be assumed to be more ambitious than described at the March 15 workshop and reach zero MMT by 2050. In particular, electric sector emissions assumptions for Alternative 2 should be reduced to 10 MMT by 2035, as CARB committed it would be in response to requests from the EJAC. In addition, one or both of Alternatives 3 and 4 should be reduced to reach 10 MMT by 2045.

V. Alternative 2's assumed electric sector emissions need to be reduced to achieve 10 MMT emissions by 2035 to adequately address EJAC requests.

The Scoping Plan modeling must include a reduced electric sector emissions assumption for Alternative 2 because CARB had previously committed to this target in its January 25 presentation. Throughout the Scoping Plan process, CARB has elicited EJAC recommendations to ensure consistent input from frontline communities in hopes of achieving a more equitable Scoping Plan. On January 25, CARB representatives explained that they had incorporated multiple changes to the planned modeling in response to EJAC recommendations. The slides listed one EJAC recommendation to "Achieve a zero-carbon electricity grid by 2035," which CARB then noted that it had responded to this recommendation by: "2035 sector GHG target reduced to 0 MMTCO₂e (Alt 1) and 10 MMTCO₂e (Alt 2) in 2035."²¹ However, the March 15 presentation shows that assumed electric sector emissions in Alternative 2 decrease to approximately 30 MMT in 2030 and remain steady for the next 20 years.²²

CARB staff have suggested that the 10 MMTCO₂e number was a placeholder target based on the 2021 BS 100 Joint Agency Report Accelerated Timelines results and that the Scoping Plan modeling would determine the actual Alternative 2 target and will reflect meeting the SB 100 100% renewable and zero-carbon retail sales target.

However, CARB does not need to set such a bound on the Alternatives. Instead, it has the complete authority and interest in evaluating a varied set of scenarios in order to identify pathways that meet multiple elements, including statutory requirements and requests from environmental justice stakeholders. CARB has rightly engaged the EJAC throughout this process in order to ensure that environmental communities can provide input and raise concerns with the assumptions included in the Scoping Plan.

¹⁸ SP22 Model Results, slide 23 (showing electric sector summary and electric sector GHG emissions by Scenario).

¹⁹ United Nations General Assembly March 29, 2019 Opening Remarks of General Assembly President María Fernanda Espinosa Garcés (Ecuador), <https://www.un.org/press/en/2019/ga12131.doc.htm> ("Eleven years is all we have ahead of us to change our direction," she said, citing the findings of the latest Intergovernmental Panel on Climate Change report).

²⁰ SP22 Model Results, slide 23 (showing Alternative 2 remains at 30 MMT after 2030 and Alternatives 3 and 4 remain at 30 MMT after 2045).

²¹ Update on PATHWAYS Scenario Modeling Assumptions (Jan. 25, 2022), slide 3, available at https://ww2.arb.ca.gov/sites/default/files/2022-01/Scenario%20Slides%20for%20Jan25%20EJAC%20Mtg_01242022.pdf.

²² SP22 Model Results, slide 23 (showing electric sector GHG emissions by scenario through 2050).

The EJAC has engaged with CARB throughout this process in good faith, and it is completely within CARB’s ability to incorporate the EJAC’s feedback into multiple scenarios. Without incorporating the 10 MMTCO_{2e} in 2035 requirement into Alternative 1, CARB has effectively shoe-horned the EJAC recommendation into one alternative, providing very limited ability to evaluate different pathways to address EJ concerns. As a result, the initial modeling has resulted in Alternative 2’s emissions profile for the electric sector very closely resembling Alternatives 3 and 4. This represents a failure to incorporate EJAC feedback and should be remedied by adjusting the Alternative 2 electric sector emissions to equal 10 MMTCO_{2e} by 2035.

All electric sector scenarios should be amended to include no new gas capacity.

All scenarios presented at the March workshop included new gas capacity in the electric sector.²³ Even Alternative 1 included approximately 6GW of new gas build for capacity, with a stated zero percent capacity factor.²⁴ By 2045, every scenario includes new gas build.²⁵ New gas infrastructure is wholly inconsistent with state climate law and would perpetuate environmental injustice, and accordingly, each scenario needs to be amended to include no new gas capacity.

A. New gas capacity is inconsistent with state climate law and policy.

New gas build is not consistent with numerous state mandates, policies, and agency rulings on climate, including SB 100,²⁶ California’s commitment to decarbonization, SB 32,²⁷ and SB 350,²⁸ and other agency decisions. Continued investment in gas is also inconsistent with Governor Newsom’s July 2021 statement on the “Electricity System of the Future,” which emphasizes that: “[w]e must remove carbon emissions from our energy sources to support a sustainable future” and that “[a]lthough California has made great strides in eliminating coal power plants and increasing renewable energy resources, our current electricity system is still producing greenhouse gas emissions and contributing to unhealthy air quality in communities.”²⁹ The direction from the Governor is clear: The Commission must act rapidly now to reduce our reliance on fossil fuels.

B. New gas capacity would exacerbate environmental injustices by worsening air quality in disadvantaged and overburdened communities.

Increased gas capacity would undermine the state’s work on environmental justice by worsening air pollution in already overburdened communities and increasing methane leakage. New gas build would have drastic additional impacts on air quality from increased capacity, even if the new build is more

²³ SP22 Model Results, slide 25 (showing cumulative new resource capacity build in 2035, including Alternative 1 retiring ~7GW of gas capacity and ~6GW of new gas build for capacity (CF: 0%).

²⁴ *Id.*

²⁵ *Id.* at 26.

²⁶ California Renewables Portfolio Standard Program: emissions of greenhouse gases (De León, 2017-2018).

²⁷ California Global Warming Solutions Act of 2006: emissions limit (Pavley, 2015-2016).

²⁸ Clean Energy and Pollution Reduction Act of 2015 (De León, 2015-2016).

²⁹ Governor Gavin Newsom, Electricity System of the Future (July 30, 2021), <https://www.gov.ca.gov/wp-content/uploads/2021/07/Electricity-System-of-the-Future-7.30.21.pdf>.

efficient and includes CCS technology. Even if carbon capture technology were deployed at these new gas plants, this technology does not decrease or alleviate other dangerous air pollutant emissions from gas plants.

Assuming that these plants will be used for flexible load, they are likely to be dispatched more often, resulting in more cycling and increased pollutant emissions. Gas plants emit significantly more air pollution while starting than during steady state operations. The cycling of gas plants produces significant amounts of pollution because emissions control systems are not as effective at capturing pollutants when plants are starting and stopping. In fact, pollution from a single start can be higher than if the plant operated the entire day.³⁰ For example, a single start of the Colusa Generating Station, a combined cycle gas plant, can emit as many NOx emissions as the facility would have emitted in 12 to 38 hours of steady-state operation.³¹ These estimates are based on permitted values, but unfortunately operational monitoring data shows that plant emissions can be even higher. During a start in May 2020, the Colusa gas plant emitted over 900 pounds of NOx during its first three hours of operation, compared to around 10 pounds per hour of NOx after start-up.³² This means that the Colusa facility emitted more than *90 times* its regular rate of NOx emissions during a single start. These startling pollution data demonstrate why the Commission must reject any proposal that would increase the use and cycling of gas plants.

California's air pollution already exceeds national standards, and new gas capacity would only exacerbate this problem. While it is unclear from the Scoping Plan model results where new gas plants will be built, new gas resources would likely increase pollution in air basins that are already in serious, extreme, or severe non-attainment for one or more or more criteria pollutants.³³ Gas-fired power plants emit many harmful pollutants, and the majority of California's gas-fired power plants are located in the state's most disadvantaged communities.³⁴ This injustice results in compounding harms. For example, fine particulate matter emissions from gas combustion are closely connected to decreased lung function, more frequent emergency department visits, additional hospitalization and increased morbidity.³⁵

C. New gas capacity could be dispatched to serve out-of-state loads, causing them to run more often than expected.

It is also possible that new gas build could result in increased dispatch to meet out-of-state loads. When gas resources come online, they can be called upon by other markets as exports, while increasing pollution in California. This increased reliance on gas resources for exports is already evident from

³⁰ Aspen Environmental Group, Cal. Independent System Operator SB 350 Studies, Volume 9, Table 4.4-3, p. 100 (2016), available at <https://www.caiso.com/Documents/SB350Study-Volume9EnvironmentalStudy.pdf>.

³¹ *Id.*

³² See U.S. EPA Clean Air Markets Database, Colusa Power Plant, May 28, 2020 Data (according to the continuous emissions monitor data, the plant emitted 145, 393, and 404 pounds of NOx during its first three hours of operation. After those first three hours, the next 11 hours were between 8 and 10.5 pounds of NOx per hour).

³³ U.S. EPA, Green Book: Current Nonattainment Counties for All Criteria Pollutants (data current as of Dec. 31, 2020), available at <https://www3.epa.gov/airquality/greenbook/ancl.html>.

³⁴ Brightline Defense, Winding Up for Offshore Wind, p. 2, <https://www.offshorewindnow.com/brightline-defense-report/> (“78% of gas-powered plants [in California] are located in frontline environmental justice communities”).

³⁵ American Lung Association, *Particle Pollution*, <https://www.lung.org/clean-air/outdoors/what-makes-air-unhealthy/particle-pollution>.

market patterns in recent years, and it is likely to worsen if California continues to invest in gas plants rather than retiring them.

D. New gas capacity would worsen methane leakage, creating additional intense greenhouse gas impacts.

Finally, continued reliance on gas capacity also increases the risk of methane leakage. Methane has significantly more intense global warming potential over a short-term, posing intense climate damage, and methane leakage can cause severe health impacts, as witnessed by the community living near the Aliso Canyon gas storage facility. Between October 2015 and February 2016, the facility released at least 109,000 tons of methane, forcing the relocation of thousands of residents for several months. A UCLA study found that many community members living around Aliso Canyon experienced elevated indoor levels of air toxins and persistent health impacts following the leaks.³⁶ These residents exhibited headaches, nausea, stomach aches, dizziness, and trouble breathing following the leak, and a local physician found signs of bone marrow suppression, which can lead to anemia and leukemia.³⁷ In light of these health risks, then-Governor Jerry Brown directed the Public Utilities Commission to start identifying alternatives to Aliso. However, Aliso Canyon and other gas storage facilities cannot close if new gas-fired generation is dependent on it. Building new gas capacity risks another massive, dangerous, and climate-damaging leak again.

New gas build within Alternative 1 is inconsistent with even the stated bounds of the Alternative 1 scenario. CARB presented Alternative 1 as a 100 percent no combustion target by 2035 scenario. Building 6GW of new gas capacity continues to be inconsistent with climate law and the “no-combustion” framework, even if the model predicts that it will never be used. In the event that it is used and cleaner alternatives are not deployed, Californians will be forced to pay for a resource that is never used and would only further damage the climate and public health.

E. A clean, renewable California grid without new gas capacity can be just as or even more reliable than the alternative.

Zero-emitting resources can and should be deployed to meet future energy needs and can provide system reliability as well as or better than gas-fired resources. The California Energy Commission’s Mid-Term Reliability (MTR) Analysis consisted of a loss-of-load-expectation analysis and provided new insight to the reliability benefits of battery storage. The analysis demonstrated that “relying on non-emitting resources like renewable generation and energy storage did not diminish reliability compared to portfolios that contained differing or additional amounts of thermal resources.”³⁸ The analysis specifically shows

³⁶ Diane A. Garcia-Gonzales, et al., *Associations among particulate matter, hazardous air pollutants and methane emissions from the Aliso Canyon natural gas storage facility during the 2015 blowout* (Nov. 2019), available at <https://www.sciencedirect.com/science/article/pii/S0160412018327314?via%3Dihub>.

³⁷ Sharon McNary, *What Did Porter Ranch Residents Breathe During the Massive Gas Leak? Here’s What One Doctor’s Quest Revealed*, LAist (Nov. 5, 2019), <https://laist.com/2019/11/05/aliso-canyon-porter-ranch-gas-leak-blowout-health-benzene-nordella.php>.

³⁸ CEC August 30 Analysis on Mid-Term Reliability Presentation, Slide 33 (Aug. 30, 2021), available at <https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=21-ESR-01>.

that a system without new gas build can maintain reliability. New clean energy development can produce a resilient, reliable electric grid and should be the default assumption for all Scoping Plan scenarios.

New gas build is a perverse and unacceptable assumption for this Scoping Plan, and new gas infrastructure should be categorically excluded from every alternative to meet our climate, environmental justice, air quality and reliability needs .

VI. Forest Carbon Accounting

Wildfire emissions are very difficult to quantify as are emissions from logging and thinning operations. In the past, CARB has overestimated the carbon emissions associated with wildfire and underestimated the carbon losses associated with logging and thinning.

CARB's current wildfire emission estimates rely on satellite imagery which can assume that the entirety of a tree was turned into CO₂ in a wildfire when, in fact, only needles, bark and small diameter portions were emitted as CO₂. The remainder of the tree can remain in place sequestering carbon for years to come.

Additionally, satellite imagery can underestimate the carbon losses of thinning operations because these operations leave the canopy of the forest (the only portion visible from above) largely intact. CARB should continue to develop improved ways of accounting forest carbon and should allow for public input on whatever models it uses to determine the impacts of interventions.

VII. Environmental Justice Advisory Council (EJAC) Must Be Given Sufficient Time to Provide Input.

We are concerned about the process for which the Environmental Justice Advisory Council (EJAC)'s input is being considered in the Scoping Plan. During the workshop, multiple members of the EJAC expressed feeling "blindsided" and "frustrated" by the current process and that the complex material presented at the September 30th meeting was the first time they were seeing it. This is not the first workshop during this Scoping Plan update where EJAC members have voiced their concerns over process and transparency. It is clear that more time is needed for both CARB to have meetings with EJAC to have in-depth discussions about its scenarios and for EJAC to collectively work through its own process for providing input. Thus, Sierra Club California supports EJAC's request for an extension of the statutory deadline for the 2022 Scoping Plan update.

CARB is required to take into consideration input from the Environmental Justice Advisory Council (EJAC).³⁹ Inclusion of EJAC's input ensures that community voices are being represented and incorporated into the scoping plan. This type of sufficient and meaningful community engagement takes time, especially when the information being discussed is complex and highly technical. There have already been delays in this process due to the impacts of COVID-19 and extreme wildfires.

³⁹ The California Global Warming Solutions Act of 2006 (AB 32; Stats. 2006, ch. 488).

Therefore, we support the EJAC request for CARB to extend the timeline for the Scoping Plan update so that EJAC's input can be properly incorporated. This extra time will allow the EJAC sufficient time to analyze the information, conduct additional deep-dive meetings with CARB staff, and conduct meaningful outreach and engagement with community members.

VIII. CARB Must Prioritize Direct Emission Reductions and Phasing Out Fossil Fuels Rapidly

We urge CARB to prioritize direct emission reductions and phasing out fossil fuels. Both are statutorily required and could provide air quality improvements and public health protection for vulnerable communities.

The Scoping Plan is required to prioritize rules and regulations that result in direct emission reductions at large stationary sources and mobile sources.⁴⁰ Thus, CARB must maximize reductions in air pollution and health harms, especially for low-income and disadvantaged communities. This can be done by reducing GHG emissions through requiring and achieving greater direct emission reductions and phasing out fossil fuel production and consumption as soon as possible.

Therefore, we appreciate inclusion of strong climate and environmental proposals in Alternative 1 that aims to achieve carbon neutrality by 2035 with a complete phaseout of combustion and production, with minimal reliance on engineered carbon removal. Carbon removal technology has not yet advanced sufficiently to be a reliable, reasonable tool for reducing our greenhouse gas emissions. While it might eventually develop into an important tool, it is inappropriate wishful thinking for CARB to rely on an unproven technology to meet our climate targets. Phasing out fossil fuel combustion and ending oil and gas extraction and petroleum refining by 2035 provides multi benefits for both public health as well as combatting the climate crisis. Moreover, this scenario is directly aligned with the requirements under AB 197 (E. Garcia, 2016) to reduce direct emission reductions as well as the Governor's request that CARB pursue carbon neutrality by 2035.⁴¹

However, certain proposals under Alternatives 2-4 seem to violate AB 197, which requires CARB to prioritize direct emission reductions and consider social costs when adopting regulations to reduce greenhouse gas (GHG) emissions. Under these scenarios, there will be an increase in pollution in impacted communities and/or a failure to reduce direct emissions. For example, inclusion of biogas or carbon capture with combustion resources are not appropriate options. These options are not carbon neutral, and they will also contribute to worsening local air quality and public health impacts in frontline communities. We are also concerned that these "solutions" may be employed as an alternative to eliminating fossil fuel combustion which is unacceptable and violates AB 197.

Therefore, we urge CARB to focus on the existing clean, zero-emissions solutions that are available to achieve direct emission reductions and phase out reliance on fossil fuels without contributing to health and air quality impacts in environmental justice communities.

⁴⁰ Assembly Bill 197 (AB 197), Cal. Health and Safety Code § 38562.5.

⁴¹ Governor Gavin Newsom, Letter to Liane Randolph, Chair of California Air Resources Board (July 9, 2021), available at https://www.gov.ca.gov/wp-content/uploads/2021/07/CARB-Letter_07.09.2021.pdf.

IX. CARB Must Reframe its Representation of No-combustion Scenarios to Reflect Social Benefits and Encourage Use of Non-combustion Alternatives.

As encouraged as we were to see some strong climate aspects in Alternative 1, we were equally as disappointed in the framing of these proposals in the presentation. For example, under the no-combustion scenario, there is reference to the fact that hard to decarbonize sectors—such as cement and aviation—would be phased out in California and that certain industry facilities will need to be closed.⁴² This framing provides a false choice: that California cannot achieve the strongest and most protective environmental policies without economic hardship.

There is also an imbalance among the different scenarios. All of the alternatives, *except for the no-combustion scenario (Alternative 1)*, include assumptions for various technological developments which are not guaranteed to materialize. CARB should correct this imbalance and reframe Alternative 1 to include assumptions around innovative advancements or investments in clean, zero-emission technology and uplifting current non-combustion transition strategies. There is already a plethora of clean, zero-carbon technology available to achieve direct emission reductions as well as other sustainable practices and strategies for reducing emissions. Zero-emission, battery-electric options are available in nearly every sector from light-, medium-, and heavy duty vehicles to off road vehicles to yard equipment. This technology is on the shelf today and improving everyday. Further, while green hydrogen is not a solution for every problem, Sierra Club has supported the use of green hydrogen (defined as hydrogen produced by the electrolysis using exclusively renewable electricity) to decarbonize some hard-to-electrify industries, like heavy industry and aviation.

In addition, CARB must be considering the full range of social costs associated with its scenario proposals and the various methods of achieving GHG reductions. CARB must include in its analysis the significant co-benefits for air quality, health, and quality of life of no-combustion scenarios. Alternatively, CARB must ensure its other scenarios reflect the full societal damages from continued pollutant emissions and any other physical, economic, or environmental impacts due to reliance on biofuels or other alternatives that would prolong the life of fossil fuel activities.

X. CARB Must Strengthen the State’s Outdated 2030 GHG Reduction Targets.

We urge CARB to bear in mind the statutory obligations that require significant emission reductions by 2030 under Senate Bill 32 (SB 32).⁴³ It is more important for CARB to maximize near-term progress rather than focusing on carbon neutrality dates further in the future. SB 32 requires CARB to focus on 2030 to make significant direct GHG emission reductions. Given that California is already feeling the impacts of climate change, failure to meet the 2030 climate goal is not an option.

California’s current target of 40% below 1990 levels by 2030 is outdated and does not reflect the present practice being employed by other countries around the world. Several major climate leading nations have

⁴² 2022 Scoping Plan Update - Scenario Inputs Technical Workshop (Sept. 30, 2021) at slides 11 & 15, https://ww2.arb.ca.gov/sites/default/files/2021-09/carb_presentation_sp_scenarioinputs_september2021.pdf.

⁴³ SB 32, California Global Warming Solutions Act of 2006.

increased their 2030 target. For example, Denmark’s target is now 70%, the United Kingdom has a target of 68%, and Germany has a current 2030 target of 65%.⁴⁴ So while we appreciate that CARB is proposing something higher than 40%, these proposals are still exceedingly low for a state that claims to be an international climate leader. California should at the very least match the United Kingdom’s 68% target but should aim for hitting an 80% GHG emission reduction target based on the recommendations from leading climate and social scientists.⁴⁵

Furthermore, the most recent report from the Intergovernmental Panel on Climate Change (“IPCC”) makes alarming findings about the current and future dangers of a changing climate. It warns that climate change is happening more rapidly than previously predicted. The report says that “hot extremes” will continue to become more intense and more frequent.⁴⁶ The same is true for drought⁴⁷ and extreme flooding.⁴⁸ These findings make clear that we are facing the prospect of immense social disruption and humanitarian disasters at a scale we have not yet grappled with as a civilization.

We cannot put all of our focus onto end date targets of 2035 or 2045 because there is an urgent need to decrease greenhouse gas emissions now in order to avoid compounding crises. CARB must strengthen its interim targets if we are going to hit our 2030 goals. If California wants to be a leader, it must strengthen its 2030 goal to at least 68% while aiming to hit an 80% GHG reduction target. This updated target goal will position California as an international climate change leader and also bring focus back to near-term direct emission reductions that will benefit Californians across the state.

XI. CARB Must Prioritize Rapid Electrification of the Transportation Sector and Substantial VMT Reductions

Sierra Club California appreciates CARB’s decision to evaluate 100% light-duty ZEV sales by 2025 and 100% heavy-duty ZEV sales by 2030. This analysis will undoubtedly show the immense climate and public health benefits associated with the rapid phase out of fossil-fuel powered vehicles. CARB should use this scenario to see what strategies are most effective for a rapid transition to light-duty ZEVs and implement them as quickly as possible.

⁴⁴ Earthjustice & Sierra Club California, Comments on Air Resources Board Scoping Plan Update (Sept. 3, 2021), <https://www.arb.ca.gov/lists/com-attach/68-sp22-concepts-ws-UTQHYFwvVnEHaQZs.pdf>; *Denmark’s Ambitious Green Vision*, IMF (Jan. 11, 2021), <https://blogs.imf.org/2021/01/11/denmarks-green-vision-a-model-for-other-countries/>; *Outcomes and Next Steps from the Climate Ambition Summit*, WRI (Dec. 17, 2020), <https://www.wri.org/insights/outcomes-and-next-steps-climate-ambition-summit>; *Germany’s greenhouse gas emissions and energy transition targets*, Clean Energy Wire (Aug. 16, 2021), <https://www.cleanenergywire.org/factsheets/germanys-greenhouse-gas-emissions-and-climate-targets>.

⁴⁵ Daniel Kammen et al, Accelerating the Timeline for Climate Action in California (Apr. 2021) <https://arxiv.org/ftp/arxiv/papers/2103/2103.07801.pdf>.

⁴⁶ https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report.pdf, SPM-19.

⁴⁷ *Id.*

⁴⁸ *Id.* at SPM-25.

California continues to lag behind many European countries in ZEV sales in large part due to our lack of aggressive rulemaking⁴⁹. The current proposal in Advanced Clean Cars II regulation sets ZEV sales targets far lower than those in the Mobile Source Strategy which itself does not set targets that will meet California's climate goals and federally mandated clean air standards⁵⁰. The Scoping Plan must aim to actually achieve emission reduction goals and mandates in the transportation sector and current rulemakings should align themselves with a strong Scoping Plan.

Sierra Club California also supports CARB analyzing a 12% and 15% VMT reduction between 2019 and 2030. E3's *Achieving Carbon Neutrality in California* report calls for a 17% reduction in VMT between 2020 and 2045⁵¹. Even with aggressive vehicle fleet electrification, VMT reduction will be critical to achieving carbon neutrality in the state.

XII. Building Decarbonization Strategies Should Be Uplifted and Must Incorporate Equity Concerns.

Sierra Club California supports CARB's strong proposals for building decarbonization strategies. Decarbonizing the building sector is a critical element to achieving our state's climate goals. But even then, programs, policies, and/or strategies for building decarbonization must include equity considerations and ensure that they will not increase barriers and burdens on low income communities.

We would like to echo the comments raised by our environmental justice partners and ensure that CARB prioritizes energy democracy in building decarbonization strategies. This includes: (1) ensuring affordability and removing barriers to access electric appliances, (2) promoting high-road jobs, workforce development and family-sustaining wages, and (3) protecting lower income households against harms such as rent increases and displacement.⁵²

We look forward to CARB hosting a workshop specific to building decarbonization where these policies and strategies can be discussed in more detail.

XIII. Prioritize Forest Protection From Commercial Logging Operations

In its initial scoping plan workshops, CARB focused on limiting wildfires as a component of protecting the carbon storage in California's forests. The state must work to manage its fire-adapted forests in a way that prioritizes ecosystem and watershed health and protects communities. These priorities are often in

⁴⁹ International Energy Agency's global data explorer covers most countries' annual plug-in sales. Available at <https://www.iea.org/articles/global-ev-data-explorer>.

⁵⁰ CARB 2020 proposed Mobile Source Strategy at page 68. Available at https://ww2.arb.ca.gov/sites/default/files/2021-09/Proposed_2020_Mobile_Source_Strategy.pdf.

⁵¹ Energy+Environmental Economics, *Achieving Carbon Neutrality in California* (Oct. 2020), at 39, available at https://ww2.arb.ca.gov/sites/default/files/2020-10/e3_cn_final_report_oct2020_0.pdf.

⁵² Asian Pacific Environmental Network, et al., *Initial Response to Scenario Concepts Technical Workshop* (Sept. 3, 2021), <https://www.arb.ca.gov/lists/com-attach/62-sp22-concepts-ws-UDISOGdvUnVRPgRI.pdf>; RMI, *Decarbonizing Homes: Improving Health in Low-Income Communities through Beneficial Electrification*, (2021), <https://rmi.org/insight/decarbonizing-homes/>.

conflict with the goal of carbon sequestration. Therefore, for sequestration purposes, the state should refocus its efforts on limiting emissions from forest activities that it can control: logging.

Wildfires are difficult to predict and scientists continue to debate the effectiveness of fuel treatments in reducing wildfire emissions. Additionally, many fuel reduction projects generate large amounts of woody biomass that is often either burned onsite or transported on diesel trucks to a bioenergy facility where it is burned. Neither scenario is ideal for air quality nor the climate.

A much more certain approach to forest carbon sequestration is controlling the activities that we 1) know are carbon intensive and 2) are able to be regulated. California should encourage logging practices (such as uneven aged management) that leave more larger trees in place. The state should also take action to ban environmentally destructive practices such as clear cutting and even aged management that remove acres worth of carbon storage all at once.

Eliminating destructive and carbon intensive logging practices and incentivizing stewardship is a much more straightforward and effective way to guarantee forest carbon sequestration than attempting to guess where a fire will occur and hoping that whatever management practice one chooses is effective.

Of course, there will be small-diameter trees that are removed in logging operations, thinning operations, defensible space treatments, and in the creation of fuel breaks. The state must prioritize utilization pathways for this material that minimizes carbon emissions.

Further, the state should not pick up the tab for utilization of logging waste. Currently, under the BioMAT and BioRAM programs, California ratepayers are required to purchase electricity from expensive bioenergy facilities. Today, these facilities overwhelmingly burn logging waste and do not facilitate the state's forest management objectives⁵³. State programs should be reworked to sequester carbon and incentivize ecology- and climate-friendly forest management practices. California should require private industries that cut down our limited carbon sinks to sequester carbon to the maximum extent possible in sustainable wood products.⁵⁴

Conclusion

Sierra Club California urges CARB to continue to prioritize direct emission reductions as well as strengthen the 2030 GHG emission reduction targets. In addition, while Sierra Club California appreciates the inclusion of strong climate policies in the Alternative 1 proposal, urges CARB to make Alternatives 2 and 3 more ambitious in order to provide a more reasonable array of choices and to elicit more pronounced comparisons between the alternatives. We also support the reframing of Alternative 1 to highlight the importance of innovation and non-combustion alternatives that either exist or are on the horizon. We also strongly recommend that CARB categorically exclude all new gas infrastructure in any

⁵³ MB&G, High Hazard Fuels Availability Study (2019), at 92
https://fmtf.fire.ca.gov/media/2312/hbzfuelstudy_final_20190613.pdf

⁵⁴ For an analysis of alternatives to biomass incineration see *Moving Beyond Incineration* report. Sierra Club California, *Moving Beyond Incineration* (Nov. 2019),
https://www.sierraclub.org/sites/www.sierraclub.org/files/sce/sierra-club-california/PDFs/SCC_MovingBeyondIncineration.pdf.

modeling assumptions as it is inconsistent with the state's climate goals and commitment to environmental justice in the Scoping Plan.

Thank you for your consideration of our comments. We look forward to working with you as this process continues.

Sincerely,

A handwritten signature in black ink, appearing to read "BDawson", followed by a long horizontal flourish.

Brandon Dawson
Director

A handwritten signature in black ink, appearing to read "D Barad", with a stylized, circular flourish.

Daniel Barad
Senior Policy Advocate