July 9, 2021

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

RE: Sierra Club California Comments on Air Resources Board Scoping Plan Update

Dear Chair Randolph and Members of the Board:

We are thankful for this opportunity to comment on the opening round of scoping plan workshops. As you move through this process, we urge you to bear in mind the statutory obligations that require significant emission reductions by 2030.

Additionally, we urge you to include the Environmental Justice Advisory Council (EJAC) and all frontline communities every step of the way. Community voices must be heard and incorporated into each aspect of the scoping plan. "Solutions" that achieve greenhouse gas reductions or sequester carbon but do not meaningfully improve air quality and the livelihoods of disadvantaged communities should not be included in the final scoping plan. We look forward to working with you to find solutions that work for *all Californians.*

Please see our more detailed comments below:

The Environment and Communities Cannot Afford Transition Technologies

Throughout the transportation workshop, presenters and members of the public suggested that the state should continue to support bridge technologies such as "near zero," methane-powered heavy-duty vehicles. The state should not support any transportation technologies that emit greenhouse gases or criteria pollutants.

A 2019 study of methane gas and diesel truck emissions found that even though the emitted particle mass from certain gas engine technologies is lower, the emitted particle *number* is much higher,

meaning the particle size is much smaller, potentially creating new health concerns.[1] Moreover, biofuels proponents at the workshop also advocated for near-zero heavy duty vehicles. Biofuels, while allegedly "carbon neutral," still emit criteria pollutants and carbon emissions.

Representatives from the Central Valley Air Quality Coalition and the Leadership Counsel for Justice and Accountability, two organizations that represent communities overburdened by toxic air pollutants, advocated for the state to support exclusively zero-emission heavy-duty transportation technologies. We agree with this recommendation. Voices of impacted community members must carry great weight in the development of the Scoping Plan.

Investing in and supporting the adoption of new gas trucks means locking in greenhouse gas and criteria emissions well beyond any conservative projection of when zero-emission trucks will be available, and beyond the targets in CARB's Mobile Source Strategy for transitioning all heavy-duty trucks to zero-emissions.

Transitioning to a fully zero-emission heavy-duty transportation future is critical for achieving breathable air in California and for slowing the climate crisis. The transition is also completely possible without interim, polluting technologies.

Over the past 5 years, the electrification of heavy-duty vehicles has surged in the commercial sector, with both manufacturers and fleets making significant commitments. Cummins, Ford, Freightliner, Mack, Navistar, Nikola, Mitsubishi Fuso, Peterbilt, Tesla, and Volvo all have announced plans for commercial products, with Volvo (the second largest truck maker in North America) and Peterbilt (as part of PACCAR, the third largest truck maker in North America) beginning mass production of zero-emission trucks this year.[2]

Further, a wide range of zero-emission trucks are already commercially available. BYD has been delivering electric trucks for more than a year and has more than 12,000 on the roads globally.[3] As of 2021, there are 48 medium-duty, 29 heavy-duty, and 40 bus models that are electrified.[4] Dozens of new models are anticipated in the next two years alone.[5]
That rapid development of zero-emission truck technologies continues today. In the last year alone, attention and investment from OEMs has intensified. A report by the International Council of Clean Transportation that summarized the availability or planned production of 125 zero-emission

[1] Cenex, Dedicated to Gas:Assessing the Viability of Gas Vehicles (Oct. 2019), https://www.cenex.co.uk/app/uploads/2019/11/324-003-004-Dedicated-to-Gas-Assessing-the-Viability-of-Gas-Vehicles.pdf.
[2] CARB, Slide Presentation: Advanced Clean Fleets Workshop (Sept. 18, 2020), https://ww2.arb.ca.gov/sites/default/files/2020-09/200918presentation_ADA.pdf
[3] BYD Delivers 100th Battery-Electric Truck in the United States, press release (Jan. 8, 2020), https://en.byd.com/news-posts/byd-delivers-100th-battery-electric-truck-in-the-united-states/
[4] Lowell, D. & Huntington, A., Electric Vehicle Market Status -Update , Environmental Defense Fund (Apr. 2021), http://blogs.edf.org/climate411/files/2021/04/EDF_EV_Market_Report_April_2021_Update.pdf
[5] Union of Concerned Scientists, Ready for Work: Now is the Time for Heavy-Duty Electric Vehicles (Dec. 2019), https://www.ucsusa.org/sites/default/files/2019-12/ReadyforWorkFullReport.pdf

commercial vehicles as of July 2020 already requires updating (the author's suspected it would, given "new zero-emission products being announced on nearly a weekly basis").[6]

The scoping plan must send a clear message that California is looking to achieve a zero emission future without the help of bridge technologies.

California Must Continue Momentum on Zero Emission Vehicles While Reducing Vehicle Miles Traveled

The most recent Revised Draft of the Mobile Source Strategy[7], a recent executive order[8], and the most recent workshops on the Advanced Clean Cars II rulemaking[9] all affirm a commitment to achieve 100% zero-emission light-duty vehicle sales by 2035. The Scoping Plan must unequivocally uphold this commitment.

In addition to replacing polluting vehicles with zero emissions ones, California must decrease Vehicle Miles Traveled (VMT). Every scenario in CARB's *Achieving Carbon Neutrality in California* report relies on the assumption that average fuel efficiency will increase from 45 MPG to 70 MPG in 2045 (driven largely by mass adoption of zero-emission cars) AND the assumption that VMT per capita will decrease by 17% by 2045.[10]

California is well on its way to achieving the former assumption, but is woefully lacking in its efforts to drive down VMTs. Between 2013 and 2017, the transportation sector was California's largest source of emissions and VMTs *increased* each year during this period.

The state will need to invest in public transit, facilitate telecommuting, and encourage cities to plan housing, amenities, and active transportation systems that allow Californians to, at the very least, drive 17% fewer miles.

Not All Hydrogen is Equal

As the state works towards a zero-emission future, hydrogen will be an important fuel in difficult to decarbonize sectors such as certain industrial uses and potentially long-haul trucking (though battery electric vehicles are making promising developments in this space).

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[6] ICCT, Race to Zero, (Oct 2020) https://theicct.org/sites/default/files/publications/Canada-race-to-zero-EN-oct2020.pdf at 2.
[7] CARB, Revised Draft 2020 Mobile Source Strategy (Apr. 23, 2021), https://ww2.arb.ca.gov/sites/default/files/2021-04/Revised_Draft_2020_Mobile_Source_Strategy.pdf
[8] Executive Order N-79-20, https://www.gov.ca.gov/wp-content/uploads/2020/09/9.23.20-EO-N-79-20- Climate.pdf
[9] CARB, Slide presentation: Advanced Clean Cars (ACC) II Workshop (May 6, 2021), https://ww2.arb.ca.gov/sites/default/files/2021-05/acc2_workshop_slides_may062021_ac.pdf
[10] 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 [hereinafter "E3, Achieving Carbon Neutrality"].

However, the state must be extremely careful in the onset to ensure that California only uses truly clean hydrogen. When hydrogen is produced through electrolysis using water and zero-emission renewables, it is zero-emission. Hydrogen can also be produced through a process called steam reformation, which creates hydrogen using methane. This process is not zero emission and is incredibly carbon intensive.

The state should also be cautious with electrolytic hydrogen as it can be formed using any type of energy. CARB has determined that electrolytic hydrogen produced using average grid electricity is almost 65% more carbon intensive than diesel fuel.[11]

Planning documents released in the coming few years will define the future of hydrogen in our state. The Scoping Plan, being the most prominent of these documents, will play a huge role in forming this future. If CARB is not extremely careful, it is very likely that many sectors in California will be powered by hydrogen that is worse than the fossil fuels that power them today.

Decarbonizing the Grid

The most affordable and feasible path to achieving CARB's carbon neutrality goals by 2045 is to rapidly decarbonize the grid to electrify other sectors.[12] California's clean energy industry is well-positioned to scale development because of multiple readily available clean energy technologies. But this clean energy transition will only happen if the state agencies support planning that aligns with long-term resource needs (including a narrowing of the GHG planning target range for the electric sector to 30-38 MMT) and reject approaches that further invest in existing or new fossil fuel infrastructure.

As electric loads increase, the pace at which California reduces the carbon intensity of its power mix will in turn determine the pace of reductions across the economy. California needs to procure significant new clean energy resources to meet the zero-carbon electricity target in SB 100. In 2018, CARB set a GHG planning target range for the electric sector between 30 and 53 MMTCO_2e. This range should be lowered to a maximum of 38 MMT in order to ensure alignment with SB 100 resource planning and to deliver air quality benefits to communities facing unhealthy air pollution.

The current target range for the electric sector has proven problematic. The CPUC has adopted a GHG planning target of 46 MMT for CPUC-jurisdictional entities in the Integrated Resource Plan (IRP) proceeding, but its modeling raised doubts about how well the CPUC is reflecting actual GHG emissions.[13] The California Independent System Operator (CAISO) has found that the CPUC's

[11] Table 7-1. Lookup Table for Gasoline and Diesel and Fuels that Substitute for Gasoline and Diese1, https://ww2.arb.ca.gov/sites/default/files/classic//fuels/lcfs/ca-greet/lut.pdf?_ga=2.203004886.653322344.1614708040-1879896213.1525667140.

[12] E3, Achieving Carbon Neutrality, https://ww2.arb.ca.gov/sites/default/files/2020-08/e3_cn_draft_report_aug2020.pdf

[13] *See* R.20-05-030, CEJA and Sierra Club, Opening Comments on Load Serving Entities' Integrated Resource Plans (Oct. 23, 2020), pp. 2-5. See also, R.16-02-007, Sierra Club and CEJA Opening Comments on Proposed Reference

modeling likely underestimates GHG emissions by several MMTs.[14] Additionally, CPUC air quality modeling showed that the system portfolio meeting the 46 MMT target was likely to *increase* criteria pollutant emissions from gas plants between now and 2030.[15]

A planning target range between 30 and 38 MMTCO_2e would resolve these issues by ensuring that criteria pollutant emissions decrease, providing a buffer for potential underestimating of GHG emissions, and ensuring alignment with CEC SB 100 modeling. A far lower planning target would require new clean resources at nearly the same levels projected in SB 100 modeling.[16] Furthermore, several CPUC-jurisdictional load serving entities (LSEs) are already planning to procure to a target lower than required by the CPUC, meaning that a lower planning range would better reflect reality. CARB can support the commitments made by these LSEs and create uniformity by including in the Scoping Plan a GHG planning target range of 30-38MMT for California's electricity providers. This will help ensure the state is reducing emissions on a trajectory aligned with our long-term goals.

In addition, the Scoping Plan should include planning recommendations that decrease fossil fuel generation. These resources create significant carbon emissions and poor air quality in disadvantaged communities, particularly in transmission-constrained air basins like LA and the San Joaquin Valley that host a disproportionate number of gas plants[17] and already face unhealthy levels of air pollution.[18] Planning should focus on reducing gas capacity and replacing it with clean energy alternatives. This will provide relief to low-income and communities of color that disproportionately bear the brunt of harmful co-pollutants from gas-fired power plants.

System Portfolio and Related Policy Actions (Dec. 17, 2019), pp. 13-15 (detailing that SERVM and RESOLVE systematically underestimate actual grid GHG emissions). *See also* CEJA and Sierra Club, Reply Comments on the Proposed Reference System Portfolio and Related Policy Actions in R.16-02-007 (Jan. 6, 2020), p. 6 (citing growing agreement with the concern that SERVM and RESOLVE systematically underestimate GHG emissions).

[14] California Independent System Operator, Comments of the California Independent System Operator Corporation, (October 2020), at 5.

[15] *See* R.20-05-030 CEJA and Sierra Club Opening Comments on Load Serving Entities' Integrated Resource Plans (Oct. 23, 2020), p.12 (citing that multiple LSEs produced plans showing projected increases in emissions). *See* R.16-07-002, Sierra Club and CEJA Opening Comments on Proposed Decision on 2019-2020 Electric Resource Portfolios To Inform Integrated Resource Plans And Transmission Planning (Mar. 12, 2020), pp. 4-5 (citing Commission criteria pollutant analysis showing intensive criteria pollutant emissions in 2030 for San Joaquin and LA Air Basins).

[16] See R.20-05-030 Comments of CEJA and Sierra Club on Mid-Term Reliability Analysis and Proposed Procurement Requirements (Mar. 26, 2021) at 5-7 (noting alignment in the scale of projected resource builds modeled in SB 100 scenarios and in the CPUC's 30 MMT and 38 MMT scenarios).

[17] Brightline Defense, California Offshore Wind, https://www.offshorewindnow.com/brightline-defense-report, p. 2 ("78% of gas-powered plants [in California] are located in frontline environmental justice communities.").

[18] U.S. EPA, Green Book: Current Nonattainment Counties for All Criteria Pollutants (data current as of Dec. 31, 2020), https://www3.epa.gov/airquality/greenbook/ancl.html (noting many of California's air basins are in serious, extreme, and/or severe non-attainment for one or more criteria pollutants).

Building Decarbonization

We urge CARB to incorporate equitable building decarbonization recommendations into the Scoping Plan Update. The research and data have shown that strong building electrification policies will help the state meet its climate, health, and air quality goals.[19]

CARB has recognized the importance of all-electric homes and buildings to achieving California's climate, air quality and public health objectives by passing a resolution last year supporting electrification of appliances "in order to protect public health, improve indoor and outdoor air quality, reduce GHG emissions, and set California on track to achieve carbon neutrality."

The buildings sector is a major contributor to climate emissions (responsible for 25 percent of GHG emissions in California) and poor air quality.[20] Research has shown the negative impacts caused by gas from our homes and buildings. For instance, children living in homes with gas stoves have a 42% increased risk of experiencing asthma symptoms.[21]

Accordingly, studies have also shown that air quality is healthier and safer inside an all-electric home. Replacing residential gas appliances with zero-emission electric alternatives in California would result annually in at least 350 fewer deaths and produce at least $3.5 billion in health benefits.[22]

In addition, the environmental justice communities must be prioritized in the transition to clean, all-electric buildings. And early input from the environmental justice community is necessary as building electrification strategies progress in the state, especially for the existing building sector. Health risks from the indoor air pollution caused by gas appliances have a disproportionate impact on lower-income families, often renters. Many of these communities are located near fossil fuel power plants and therefore already suffering from air pollution burdens. Poor indoor air quality from gas appliances exacerbates the pre-existing, complex and adverse environmental and health burdens in

[19] As stated in E3's recent report, "Achieving Carbon Neutrality in California", aggressive building electrification is considered a "least regret" strategy to achieve our climate targets in a cost-effective manner. E3, Achieving Carbon Neutrality, https://ww2.arb.ca.gov/sites/default/files/2020-08/e3_cn_draft_report_aug2020.pdf; UCLA Fielding School of Public Health, "Effects of Residential Gas Appliances on Indoor and Outdoor Air Quality and Public Health in California | COEH - Center for Occupational & Environmental Health," coeh.ph.ucla.edu, April 2020, https://coeh.ph.ucla.edu/effects-residential-gas-appliances-indoor-and-outdoor-air-quality-and-public-health-california; Grab, et al., *California Can't Wait on All-Electric New Building Code*, RMI (July 28, 2020), https://rmi.org/california-cant-wait-on-all-electric-new-building-code/.

[20] Cal. Energy Comm'n, *Draft Staff Report: California Building Decarbonization Assessment* 11, 51, 211, 234 (May 2021), https://www.energy.ca.gov/data-reports/reports/building-decarbonization-assessment.

[21] Weiwei Lin et al., Meta-Analysis of the Effects of Indoor Nitrogen Dioxide and Gas Cooking on Asthma and Wheeze in Children, 42 Int'l J. Epidemiology 1724 (Dec. 2013).

[22] Yifang Zhu et al., Effects of Residential Gas Appliances on Indoor and Outdoor Air Quality and Public Health in California 39, UCLA Fielding School of Public Health (Apr. 2020), https://ucla.app.box.com/s/xyzt8jc1ixnetiv0269qe704wu0ihif7.

these communities.[23] Therefore, it is critical to prioritize environmental justice communities in the transition to all-electric buildings to ensure these communities are protected against any further harm.

Fossil Fuel Production Phase Out

During the kickoff workshops, we were surprised by the limited discussion on the phase out plan for fossil fuel production. Earlier this year, Governor Newsom requested that CARB analyze pathways to phase out oil extraction across the state by no later than 2045 stating that he "believe[s] that California needs to move beyond oil."

The phase out of fossil fuel production in the state will have a significant impact on all sectors. Therefore, it is imperative that the strategies and recommendations for this phase out be uplifted in the Scoping Plan Update throughout all sector discussions.

We also urge CARB to focus on reducing GHG emissions by phasing out fossil fuel production as well as prioritizing nature based GHG reduction strategies as opposed to relying on technologically based strategies, such as carbon capture and storage (CCS). There are still a significant number of risks and uncertainties around the use of technology based strategies. CCS and other technologies are energy intensive and could lead to an increase in direct emissions from facilities using these technologies. In addition, focusing on these technologies does not address the harmful toxins and pollutants from current facilities that have overburdened environmental justice communities.

Lastly, we recommend CARB to rely on additional information and input beyond the UCSB carbon neutrality (supply side) report when considering the phase out of fossil fuel production. CARB should not use this report to evaluate the health benefits or the economic costs related to reducing extraction and refining of fossil fuels in the Scoping Plan because the report does not use the most relevant and recent data and studies.

First, the data used biases upward the compensation and employment for blue-collar jobs in the oil and gas sector. The UCSB report uses average total compensation for all workers, which averages professional and blue-collar earnings plus payroll taxes, health care, and retirement expenses (making the UCSB total compensation data two to three times higher than actual blue-collar earnings).[24]

Second, the data and studies used underestimate the local pollution from fossil fuel extraction and refining, and therefore, the local health effects. Recent studies demonstrate not just PM2.5, but also Ozone, NO_2, and volatile organic compounds (VOC) have substantial health impact on mortality, hospitalizations, respiratory, and cardiovascular disease and other morbidities.[25]

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[23] *Id.*

[24] Actual California wage data for specific blue-collar jobs in extraction and refining is available at California OES Data May 2020, https://www.bls.gov/oes/current/oes_ca.htm.

[25] Wei Y , et al, Causal Effects of Air Pollution on Mortality Rate in Massachusetts, Am J Epi 2020 Nov 2:189 (11) 1316-1323. doi:10.1093/aje/kwaa098; Wang T, et al., Mortality burdens in California due to air pollution attributable to local and nonlocal emissions. Environ Int. 2019 Dec;133(Pt B):105232. doi: 10.1016/j.envint.2019.105232. Epub

Third, the data and studies used under-predict the health benefits to the impacted population from phasing out fossil fuel operations in California. The report underestimates health impact by omitting recent health studies that demonstrate negative health consequences. Racial and ethnic residents, who are especially vulnerable, live in close proximity to oil and gas development and refineries. Using whole population studies underestimates the health impact for these vulnerable communities.

Forests are Sinks and Ecosystems

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 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

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2019 Oct 26. PMID: 31665681; PMCID: PMC7145419; Villeneuve PJ, et al, A cohort study of intra-urban variations in volatile organic compounds and mortality, Toronto, Canada. Environ Pollut. 2013 Dec;183:30-9. doi: 10.1016/j.envpol.2012.12.022. Epub 2013 Jan 29. PMID: 23369806.

facilitate the state's forest management objectives[26]. 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[27]

Additional Inventory Considerations

Forest Carbon

To achieve measurable GHG reductions, CARB must accurately account California's current GHG emissions. In addition to methane leakage, there are a number of places where CARB's inventory could be improved.

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.

Aviation and Maritime Accounting

AB32 directs the Air Resources Board to "take into account the relative contribution of each source or source category to statewide greenhouse gas emissions" [section 38561(e)]. However, prior AB32 inventories have failed to include emissions from the in-state sale of maritime and aviation fuels.

These emissions are missing from the inventory that defines the Statewide GHG Emissions Limit. As a result, these data are not easy to locate by state and local policy makers, and members of the public,

[26] MB&G, High Hazard Fuels Availability Study (2019), at 92 https://fmtf.fire.ca.gov/media/2312/hhzfuelstudy_final_20190613.pdf

[27] 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.

seeking to understand the true and full scope of California's most significant sources of GHG emissions.

We understand the difficulty in regulating interstate emissions, but CARB should at least account for these emissions so that the inventory can inform future policies at the appropriate venues.

Equity Considerations or Metrics

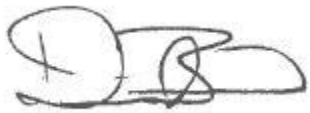
CARB should also include equity considerations either as a part of its inventory or as a tool to be used in conjunction with the inventory when making policy decisions. These considerations should be developed in close consultation with EJAC and other frontline communities. These may include air quality, water quality, employment, and any other factors that could affect the quality of life in communities that are overburdened by pollution.

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

Sincerely,

Brandon Dawson
Director

Lauren Cullum
Policy Advocate



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