



September 3, 2021

Ms. Rajinder Sahota, Deputy Director
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Re: Comments on 2022 Climate Change Scoping Plan Scenarios

Dear Ms. Sahota:

The Bioenergy Association of California (BAC) submits these comments on the Climate Change Scoping Plan Scenarios presented on August 17. BAC strongly supports the state's climate goals and rapid decarbonization of fuels, power, soil amendments, industrial processes, and agriculture. BAC is concerned about the technology biases throughout the scenarios and the many questions posed that are not linked to carbon reductions or other performance criteria. BAC urges the Air Resources Board to focus the scoping plan scenarios on climate performance criteria including lifecycle carbon intensity, ability to provide negative carbon emissions, ability to reduce climate super pollutants (SLCPs), carbon sequestration, and other issues related directly to climate change.

BAC represents more than 80 local governments, public agencies, private companies, and non-profits that are working to convert organic waste to energy. BAC's public sector members include environmental, air quality, waste and wastewater agencies, research institutions, publicly owned utilities, community and environmental groups. BAC's private sector members include energy and technology companies, developers, waste industry, agriculture and food processing, investor-owned utilities, investors, and others.

BAC's specific comments on the August 17 presentations are below.

1. The Scenarios Should Focus Much More on SLCP Reductions and Near-Term Opportunities to Benefit the Climate.

BAC urges CARB to focus more specifically on opportunities to bend the warming curve right away. The latest IPCC report makes clear that we have much less than a decade

to prevent catastrophic and irreversible climate change. It is critical, therefore, to increase the focus on actions that benefit the climate right away, or at least within a few months or years.

Governor Newsom has also called on the state to step up its climate actions and to do more to make a difference right away. As the Governor stated recently, “We are in a climate damn emergency. . . across the entire spectrum, our climate goals are inadequate. We have to step up our game. As we lead the nation in low carbon green growth, we’ll have to fast track our efforts.”¹

Climate experts around the state echoed this urgency in a recent paper that states that “decarbonization measures, while essential, will take two to three decades to have an impact on the steeply warming curve. The need for speed is great and it is a race against time.”² The climate experts call for “drastic” reductions in SLCP emissions, which can benefit the climate right away, including eliminating the use of diesel and reductions in methane and black carbon from organic waste.³ They also call explicitly for accelerating the timeline for meeting the requirements of SB 1383, which currently calls for a 40 percent reduction in methane and a 50 percent reduction in anthropogenic black carbon by 2030.⁴

Climate science is clear that the only measures that reduce warming right away and can do so at large scale are the measures to reduce SLCP emissions.⁵ Those measures also have enormous co-benefits for public health and safety by reducing methane, black carbon, smoke, wildfire, toxic air contaminants, water pollution, and other impacts of organic waste disposal and fires, both wild and controlled.⁶

BAC urges CARB, therefore, to prioritize SLCP reductions in the scenarios planning and all other parts of the 2022 Climate Change Scoping Plan. These should be the highest priority “Early Action” items and we need to maximize them as quickly as possible. As presented at the August 17 workshop, the scenarios related to methane and black carbon followed other, far less urgent measures (in terms of how quickly they will benefit the climate) and there was no prioritization among the different sector scenarios or options. This is illogical and counter-productive when goals like vehicle or building electrification (unless done using biofuels) does not reduce SLCP emissions and therefore will not benefit the climate for several decades. We simply do not have that much time left.

¹ <https://calmatters.org/environment/2020/09/california-governor-climate-emergency/>.

² Kammen, Ramanathan, Matlock, et al, “*Accelerating the Timeline for Climate Action in California*,” submitted to Environmental Research Letters, 2021. Available at: <https://arxiv.org/abs/2103.07801> [arxiv.org].

³ Id. at page 4.

⁴ Id. at page 4.

⁵ Presentation of Dr. V. Ramanathan, UC San Diego and Scripps Institute, Presentation June 24, 2021 at MoveLA Symposium on Short-Lived Climate Pollutant Reductions.

⁶ Lawrence Livermore National Lab, *Getting to Neutral – Options for Negative Carbon Emissions*, January 2020, at page 2.

To focus more on SLCP reductions – as the last lever we have left to avoid catastrophic climate change⁷ – CARB should make SLCP Reductions the first and highest focus of the Scenarios generally and within each sector scenario, as well as all other sections of the 2022 climate Change Scoping Plan.

2. Prioritize the Elimination of Diesel to Reduce SLCP Emissions and Toxic Air Pollution.

The Scenarios presentation does not prioritize or even mention SLCP reductions in key sectors like transportation or electricity. In fact, the slides on vehicle electrification and petroleum reduction make no distinction between diesel and other fuels, despite the fact that diesel is a significant source of black carbon emissions (as well as toxic air contaminants and smog-forming pollution). The single biggest opportunity to reduce SLCP emissions in the transportation sector is to replace diesel – right now – with carbon negative biomethane from organic waste. This not only reduces SLCP emissions from organic waste, but reduces black carbon from diesel combustion. Given the urgency of reducing SLCP emissions, this should be the highest focus in the transportation sector and yet is not mentioned at all. Eliminating diesel use should be a near-term goal in and of itself. Increasing use of biomethane to reduce SLCP emissions should be another explicit goal of the transportation sector scenario planning.

The electricity sector slides also fail to mention the rapid expansion of diesel backup generators and the need to eliminate diesel in the electricity sector.

Eliminating diesel from the transportation and electricity sectors should be an explicit goal of the Scenarios and the Scoping Plan since diesel is a major source of black carbon emissions, as well as toxic air contaminants and smog.

3. Drop questions about the highest and best use of organic waste in 2045 or 2050.

For climate change purposes, it is far more critical to begin reducing SLCP reductions right away than to waste more years worrying about what the highest and best use of organic waste or biomethane will be decades from now. The CEC reached that conclusion when it was required by SB 1383 to consider the highest and best use of biomethane.⁸ The CEC provided an extensive analysis of biomethane potential and end uses in the *2017 Integrated Energy Policy Report*, but ended up recommending biomethane use across a range of sectors.⁹ In other words, it was not possible to determine the highest and best use of organic waste decades from now since that depends on technology development across a range of applications (battery

⁷ Id. See, also, Kammen, Ramanathan, Matlock, et al, footnote 2 above.

⁸ Health and Safety Code section 39730.8(b).

⁹ California Energy Commission, *2017 Integrated Energy Policy Report*, at pages 284-285.

improvements, vehicle technology, changes to the electricity grid, etc.). In addition, the end use can always be changed later. As the CEC recommended, the state should:

“Focus on near-term opportunities . . . Attention should be focused on projects that can cost-effectively begin to capture and beneficially re-use methane in the next five years, when the need for short-term climate pollution reduction is at its peak.”

The CEC was correct to focus more on near-term opportunities and the urgency of SLCP reductions. The CEC was also correct to focus on cost-effectiveness of carbon reductions. CARB’s own report to the Legislature on the state’s climate investments makes clear that the most cost-effective of all the state’s climate investments have been the investments in organic waste to energy projects, which are reducing carbon emissions for the tiny cost of \$9 to \$10 per ton of carbon.¹⁰ Given the urgency of reducing SLCP emissions and how costs-effective those measures are, CARB should place much greater focus on SLCP reductions in the Scenarios and the Scoping Plan generally.

4. The Scenarios Should Identify Opportunities for Carbon Negative Emissions.

While the scenarios presentation mentions carbon neutrality in several places, it does not pose any questions in the sector specific presentations about opportunities to achieve carbon negative emissions. This is a significant omission, especially in the electricity, transportation, and industrial sector presentations, all of which can achieve negative emissions by combining bioenergy with carbon capture and storage or use (BECCS), and in some cases, with bioenergy alone.

According to Lawrence Livermore National Lab and other experts who’ve considered how to achieve carbon neutrality, achieving carbon neutrality will require a significant investment in negative carbon emissions.¹¹ LLNL also found that the biggest opportunity for negative carbon emissions in California is from BECCS, which can provide more than two-thirds of all the carbon negative emissions needed to reach carbon neutrality.¹²

Since the science and state policy call for carbon neutrality by mid-century or sooner, it is critical to consider where California can achieve carbon negative emissions to balance out the emissions that cannot be avoided.

BAC urges CARB, therefore, to assess opportunities for negative carbon emissions in each sector of the scenario planning.

¹⁰ CARB’s Annual Report to the Legislature: *California Climate Investments Using Cap-and-Trade Auction Proceeds*, issued April 2021, Table 2.

¹¹ Lawrence Livermore National Lab, *Getting to Neutral – Options for Negative Carbon Emissions*, January 2020, at page 2.

¹² Id.

5. The Electricity Sector Scenario Must Address Lifecycle Emissions of SB 100 Eligible Resources.

The electricity sector scenarios fail to focus on the lifecycle carbon intensity of different resources or opportunities for carbon negative emissions. To achieve a truly zero carbon electricity sector, it is critical to adopt a lifecycle carbon intensity focus, rather than focusing on specific technologies – ie, combustion – that are not related to carbon intensity.

In order to achieve a zero carbon electricity sector, it will be critical to have significant carbon negative emissions in the sector since most resources are not, in fact, truly carbon neutral. This includes solar and wind power, which have lifecycle carbon intensities between 4 and 40 grams of CO₂e per kilowatt hour.¹³ Batteries also have some carbon emissions on a lifecycle basis. These are due to sourcing the raw materials, manufacturing, installation, land use changes, and disposal or recycling of used batteries and other equipment (turbines, panels, etc.). This wide range of emissions is much more than de minimis and should be included in any plan to achieve zero carbon electricity overall.

Bioenergy, by contrast, can be carbon negative – in some cases, extremely carbon negative – because it reduces SLCP and GHG emissions from organic waste as well as displacing fossil fuels. When carbon capture and storage or use is added, then all forms of bioenergy can be carbon negative.

Given the wide range of carbon intensities for RPS eligible resources, it is critical to include lifecycle carbon intensities of different RPS resources to plan accurately for a zero carbon electricity grid. The scenarios planning, therefore, should consider where there are opportunities for carbon negative emissions, how to drive down emissions from RPS resources that are not carbon neutral or carbon negative, and how to achieve a truly zero carbon electricity grid. Ignoring the lifecycle emissions of different resources will not lead to an accurate assessment of electricity sector emissions.

6. Too soon to ban combustion, but should accelerate transition to non-combustion conversion of organic waste.

The electricity scenario slides pose the question whether or not to ban combustion, but that is not the correct question for a climate change plan. Rather than pick technology winners or losers, the plan should focus instead on maximizing SLCP reductions and carbon reductions generally, including opportunities for negative carbon emissions. Focusing on specific technologies that are unrelated to lifecycle carbon emissions should be outside the scope of a climate change scoping plan.

To give an example, a facility that combusts biomethane from dairy waste or diverted organic waste can provide significant negative carbon emissions whether not the power

¹³ See, <https://www.nrel.gov/analysis/life-cycle-assessment.html>.

is from biomethane combustion. Combustion of hydrogen derived from organic waste can also be carbon negative. In fact, combustion of biomethane can provide many times greater carbon reductions than solar or wind power.

Combustion may also be needed to provide thermal energy, power backup generators, and power industrial processes. It is not appropriate to focus on whether or not combustion as a process should be banned in the scoping plan when combustion may provide increased efficiency and other benefits. For example, biomass Combined Heat & Power (CHP) systems that utilize forest waste and other woody materials can provide significant energy efficiency gains by utilizing heat in a productive manner in addition to generating clean electricity. As the first resource in the loading order, energy efficiency benefits should not be discounted in the CARB scoping plan.

Biomass CHP can address a multitude of energy goals, including improving reliability during the net peak period when solar and other intermittent renewables are not available. Biomass CHP is one of the only fully dispatchable renewable resources that is commercially available today. It has the ability to ramp and up down quickly and provide firm capacity to the electric grid. Given the Governor's recent Emergency Proclamation on electric reliability, CARB should not be taking any renewable energy solutions off the table that have the potential to address the state's looming capacity shortfall.

A more appropriate focus would be on how to accelerate the non-combustion conversion of organic waste to energy. Technologies such as anaerobic digestion, gasification, and pyrolysis can be used in place of combustion to convert organic waste to energy. Any questions about combustion should, therefore, focus on the conversion of waste to energy rather than the use of biogas, RNG or hydrogen. BAC supports a transition away from direct combustion of organic waste resources to non-combustion conversion technologies. It is too soon, however, to ban combustion of biogas and hydrogen, although the state should prioritize the demonstration of non-combustion technologies with biogas and hydrogen, including expanded use of fuel cells, linear generators and other non-combustion technologies.

7. Bioenergy should be more prominently emphasized in the Scenarios.

Bioenergy can reduce the most damaging climate pollutants – SLCPs – and provide more than two-thirds of all the carbon negative emissions needed to reach carbon neutrality.¹⁴ Bioenergy also provides a clean energy option to rural forested communities that are not well suited for typical solar installations. Forest biomass projects, however, are perfectly suited for these locations. Bioenergy projects sited in rural communities will ensure those communities that are disproportionately impacted by outages and other extreme weather events are able to access reliable power, while stimulating local economies and contributing to the state's clean energy goals. Rural areas do not have the same access to public services and critical resources as urban

¹⁴ Lawrence Livermore National Lab report, footnote 11 above.

areas. They are more severely impacted in emergencies due to resource constraints and geography. These communities are often low-income, or just above California's designated low-income threshold, and at high risk of wildfire and power outages (planned and unplanned), making them particularly vulnerable.

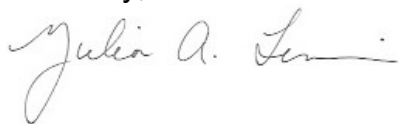
Bioenergy projects provide many other benefits to the state beyond clean energy and resiliency. Local governments can sustainably manage and meet new organic waste management goals as part of SB 1383 (Lara, 2016). California can drastically improve its forest health, fuel reduction and other wildfire mitigation efforts by incentivizing the build out of facilities that can handle processing forest waste and put it to beneficial use locally. Efforts to reduce wildfire risk that are holistic and regenerative, such as forest waste being used to produce clean energy, are high value investments for the state, and the public health and safety of Californians.

The Scoping Plan scenarios should focus much more on bioenergy. It should be a prominent focus of the final scoping plan, with proper weight given to the multitude of climate change and other benefits it provides the state of California.

For all the reasons outlined above, we strongly encourage CARB to adopt a more inclusive scoping plan focused on performance and maximizing climate benefits. When examined more holistically, it is clear that bioenergy must play a prominent role in the clean energy transition to reduce SLCP emissions and achieve carbon neutrality while maintaining reliability and affordability.

Thank you for your consideration of these comments.

Sincerely,

A handwritten signature in cursive script, reading "Julia A. Levin".

Julia A. Levin
Executive Director