September 19, 2022

Low Carbon Fuel Standard Program
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Re: Comments on Potential Changes to LCFS (as Proposed at August 18 Staff Workshop)

Dear LCFS Program:

The Bioenergy Association of California (BAC) appreciates the opportunity to submit these comments in response to the staff workshop on August 18. BAC represents more than 100 public agencies, local governments, private companies, and others working to convert organic waste to energy to meet the state's climate change, air quality, low carbon fuel, renewable energy, waste reduction, and other goals. BAC strongly supports the LCFS program and many individual BAC members are producing low carbon and carbon negative fuels that participate in the program. BAC submits these comments to ensure that the lowest carbon fuels, which are fuels generated from organic waste, remain eligible under the LCFS and receive full credit for their carbon reductions. In particular, BAC recommends that:

- The LCFS should include a bonus for fuels that reduce SLCP emissions as the most urgent climate measure and the only one that benefits the climate for several decades;
- The LCFS should update its assessment of landfill emissions to reflect the best available science rather than outdated underestimates of those emissions;
- The LCFS should include a Tier 1 pathway for all forms of renewable hydrogen, including hydrogen from organic waste biomass; and
- The LCFS should include a full true-up for fuels that use a temporary pathway during start-up.

1. Need to Incentivize SLCP Reductions

BAC urges the Air Board to adopt additional incentives for fuels that reduce Short-Lived Climate Pollutants, which is the most urgent measure we can take to address climate

change and the only one that benefits the climate right away – or for the next several decades. As climate experts have noted, reducing SLCP emissions is "the last lever we have left to avoid catastrophic climate change."[1]

Adding incentives for fuels that reduce SLCP emissions makes sense for several reasons. First, SB 1383 requires significant reductions in SLCP emissions – a 40 percent reduction in methane and a 50 percent reduction in anthropogenic black carbon - by 2030.[2] Second, climate science is now very clear that reducing SLCP emissions is by far the most urgent step we can take to address climate change as it is one of very few measures that begins to cool the climate right away – or even in the next several decades. As the Air Board's *Short-Lived Climate Pollutant Reduction Strategy* states, "The science unequivocally underscores the need to immediately reduce emissions of short-lived climate pollutants (SLCPs)."[3] The *Draft 2022 Climate Change Scoping Plan* also notes the urgency of reducing SLCPs, stating that "[g]iven the urgency of climate change . . . efforts to reduce short-lived climate pollutants are especially important"[4] and that "efforts to reduce short-lived climate pollutants emissions can provide outsized climate and health benefits."[5]

SLCP reductions, unlike reductions in carbon dioxide emissions, also provide immediate and significant public health benefits.[6] Black carbon and methane are both air pollutants that impact air quality and public health significantly. As the *Draft Scoping Plan* notes, every million metric tons of methane reduced saves 1,430 premature deaths.[7] Black carbon, also known as particulate matter, is even worse for public health and also impacts agricultural productivity, forest health, and precipitation patterns. In other words, not only is SLCP reduction more critical for the climate than other carbon reductions, but it also provides more immediate benefits to public health and the economy than carbon dioxide reductions.

BAC urges the Air Board to incentivize low carbon fuels that reduce SLCP emissions to help meet the requirements of SB 1383 and to provide direct benefits to public health. This includes biofuels, hydrogen and electricity generated from organic waste in California, which reduces SLCP emissions from landfills, livestock, agricultural, and forest waste. The Air Board could adopt additional incentives for fuels that cut SLCP emissions to accelerate their production and use. Incentives for fuels that reduce SLCP emissions could include the adoption of a bonus credit or adder, a guaranteed credit price as suggested in SB 1383, or other incentives.

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[1] Dr. V. Ramanathan, UC San Diego Scripps Institute, https://bendingthecurve.ucsd.edu/.

[2] Health and Safety Code section 39730.5.

[3] *Short-Lived Climate Pollutant Reduction Strategy*, adopted by the California Air Resources Board, March 2017, at page 1.

[4] Id. at page 22.

[5] Id.

[6] Id.

[7] *Draft 2022 Climate Change Scoping Plan*, page 180.

2. Need to Accurately Account for Avoided Landfill Emissions

Recent methane monitoring by NASA's Jet Propulsion Lab shows that methane leaks from landfills are significantly greater than previously estimated.[8] In fact, the NASA data shows that methane leaks from landfills are more than double earlier estimates.[9] Instead of 75 percent methane capture, NASA data shows that the actual capture rate is closer to 34 percent.[10] This means that fuels produced from diverted organic waste are providing much greater carbon reductions than previously thought because the avoided methane emissions are much greater than previously estimated.

CARB should update the avoided landfill emissions factors that it uses to determine the carbon intensity of fuels generated from diverted organic waste, including biomethane, hydrogen and electricity generated from diverted organic waste. Using the most accurate data in place of outdated estimates is critical to maintain the scientific integrity of the LCFS program. It will also help to accelerate organic waste diversion from landfills, as required by SB 1383, by providing a more accurate and appropriate financial signal that represents the true value to the climate of diverting organic waste from landfills that are far leakier than previously thought.

BAC urges the Air Board to use actual monitoring data, which NASA's jet Propulsion Laboratory and others can provide, rather than outdated estimates of landfill methane emissions. The carbon intensity of LCFS fuels generated from diverted organic waste should include actual avoided emissions from landfills where that data exists and updated estimates where landfill-specific data is not available.

3. Need to Include All Renewable Feedstocks in Tier 1 Hydrogen Pathway

BAC supports staff's proposal to create a Tier 1 pathway for renewable hydrogen to enable "integration of low CI sources of hydrogen expeditiously."[11] That pathway should include all forms of renewable hydrogen, though, including waste biomass as defined in Public Resources Code section 40106, to be consistent with other state laws and policies. Staff's August 18 presentation only proposed a Tier 1 pathway for electrolytic hydrogen and hydrogen from steam methane reformation of renewable natural gas. This excludes hydrogen from waste biomass such as forest waste, agricultural waste, or urban wood waste that will otherwise go to landfills. Excluding hydrogen from waste biomass contradicts the goals of SB 1383 to reduce anthropogenic black carbon and methane emissions and it also contradicts a number of recent policies to promote hydrogen production from waste biomass, including the state's 2021 allocation of $50

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[8] See, http://methane.jpl.nasa.gov/. See also: https://www.jpl.nasa.gov/news/a-third-of-california-methane-traced-to-a-few-super-emitters.

[9] Id. and presentation by Dr. Eugene Tseng to the California Resource Recovery Association on September 8, 2022.

[10] Id. and "Updated California Landfill Capture Rate Determination," January 2022 analysis by Anaergia.

[11] LCFS Program Staff Presentation, August 18, 2022, slide 21.

million to the Department of Conservation for forest waste to advanced biofuels projects including forest waste to hydrogen.[12]

Excluding hydrogen from waste biomass makes no sense when biomass (cellulosic waste) makes up 80 percent of California's organic waste stream.[13] In addition, many recent studies and analyses have found that hydrogen from waste biomass can be very low carbon or carbon negative. As Lawrence Livermore National Lab's 2020 report on carbon neutrality found, converting forest, agricultural, and urban wood waste to hydrogen with carbon capture and storage can provide significant carbon negative emissions.[14]

In addition, the conversion process for biomass to hydrogen uses a lower emission process – water gas shift – than the steam methane reformation process. That is why the CPUC has included hydrogen from waste biomass in its Self-Generation Incentive Program, but does not allow hydrogen from RNG (biomethane).[15] The CPUC's SGIP Decision defines SGIP-eligible renewable hydrogen fuel as hydrogen produced from either a) non-combustion thermal conversion of biomass, or b) electrolysis using 100 percent renewable electricity.[16]

Excluding waste biomass from the Tier 1 pathway would also contradict recent legislation that defines renewable and clean hydrogen to include hydrogen from any RPS eligible resource, which would include biomass as well as biogas (RNG).[17]

- AB 157 (Budget 2022) section 12100.161 defines "clean hydrogen" for purposes of the federal clean hydrogen hub funding as:

  > "Clean hydrogen" means hydrogen produced from **eligible renewable energy resources**, as defined in Section 399.12 of the Public Utilities Code, and otherwise consistent with the standard set forth in Section 16166(b)(1)(B) of Title 42 of the United States Code"

- AB 209 (Budget 2022), Article 4, creating Public Resources Code section 25664, which establishes a hydrogen program at the CEC:

  > For purposes of this article, hydrogen projects that produce, process, deliver, store, or use hydrogen derived from water using eligible **renewable energy resources, as defined in Section 399.12 of the Public Utilities Code, or produced from these eligible renewable energy resources**, shall be eligible for financial incentives pursuant to this article.

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[12] See, https://www.conservation.ca.gov/cgs/fbp.

[13] See the CEC's *2017 Integrated Energy Policy Report*, Table 19, page 263. See, also, Lawrence Livermore National Laboratory, *Getting to Neutral – Options for Negative Carbon Emissions in California*," January 2020.

[14] Lawrence Livermore National Laboratory, footnote above.

[15] CPUC Decision 21-06-005 at page 34.

[16] Id.

[17] See the definitions of "clean" and "renewable" hydrogen adopted in AB and AB

For all these reasons, BAC supports the proposed Tier 1 pathway for renewable hydrogen and urges the Air Board to include hydrogen from all RPS eligible resources including waste biomass. If the Air Board wants to ensure that only low CI hydrogen is included, then it should adopt a CI based performance standard. The Air Board should not categorically exclude renewable feedstocks such as waste biomass that can provide low carbon and carbon negative hydrogen while helping to reduce black carbon and methane emissions from the open burning or landfilling of waste biomass.

4. **Need Full True-Up for Temporary Pathway Fuels**

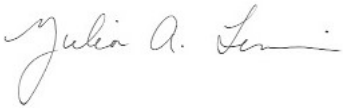
BAC strongly supports the staff proposal for a full true-up upon certification of fuels that used a temporary pathway. As the staff presentation notes, temporary pathways use very conservative estimates of carbon intensity that, in the case of biomethane from organic waste, can be many times higher than the final certified pathway. For example, the temporary CI for diverted organic waste to biomethane is +45 grams of CO2e/MJ while the actual CI for certified pathways is a small fraction of that amount, in some cases lower than negative 100. At a minimum, the temporary CI should be no higher than the highest actual CI for fuels of the same type.

Without a full true-up, fuel producers may lose significant amounts of revenue that risk project viability and will slow market development. Some producers may also try to store biomethane until the true-up is complete to avoid losing revenue, but this add project costs, operational challenges, and its own uncertainty to project financing. Providing a full true-up upon certification is the only fair way to address this and will also accelerate the development of very low carbon and carbon negative fuels generated from organic waste feedstocks.

BAC supports a full true-up for fuels that choose a temporary pathway. That true-up should include any difference between the temporary CI value and the actual CI value and should also include any adjustments based on operational factors such as landfill- or location-specific avoided methane leakage, process inputs, etc. Providing a full true-up, based on actual operations and avoided emissions is the only way to accurately assess, account for, and incentivize actual carbon emissions.

Thank you for your consideration of these comments.

Sincerely,



Julia A. Levin
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