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BAC Comments on Climate Innovation Program

Additional submitted attachment is included below.

November 29, 2022

Mr. Anthony Ng, Manager
Energy Deployment and Market Facilitation Branch
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

Re: Comments on the Climate Innovation Program (Docket # 22-ERDD-02)

Dear Mr. Ng:

The Bioenergy Association of California (BAC) appreciates the opportunity to comment on the Commission's Climate Innovation Program and the November 15 workshop presentation. BAC represents more than 100 public agencies, local governments, private companies, non-profit organizations, and others working to convert organic waste to energy to meet California's clean energy, climate change, air quality, waste reduction and wildfire mitigation goals. BAC strongly supports the Commission's work to advance clean energy and meet the state's climate goals. To do so as quickly and cost-effectively as possible, BAC urges the Commission to focus the Climate Innovation Program on the following:

- Energy sources that reduce Short-Lived Climate Pollutants as the most urgent step needed to address climate change;
- Energy sources that provide carbon negative emissions needed to reach carbon neutrality;
- Firm renewable power to maintain energy reliability;
- Resources that provide the most cost-effective carbon reductions; and
- Resources that help to mitigate the state's wildfire crisis.

Each of these priorities is described more below.

1. Over-Arching Goals of the Climate Innovation Program

BAC supports the two over-arching goals for the Climate Innovation Program identified in the workshop presentation, but would suggest a third. The two goals identified on slide 4 of the workshop presentation are:

- To meet California's GHG reduction goals on an accelerated timeframe and at a lower cost; and
- To be more resilient against climate change impacts.

BAC would suggest a third over-arching priority for the Climate Innovation Program, which is:

- To maintain energy reliability as California transitions to 100 percent renewable resources and zero carbon resources.

As we've seen in the past few years, risks to reliability can lead to more fossil fuel use and dirtier technologies. Ensuring that our clean energy mix is fully reliable is critical not only because electricity is an essential service but because threats to reliability will lead to more diesel backup generators and use of fossil fuels generally, which undermine California's progress on climate change and air quality.

2. Need to Prioritize SLCP Reductions

BAC agrees that carbon reductions should be the biggest priority of a Climate Innovation Program, but not all carbon reductions are equally urgent or equally valuable in the near- to mid-term. Reducing Short-Lived Climate Pollutants (SLCPs) is far more urgent than reducing carbon dioxide emissions since only SLCP reductions benefit the climate right away or in the next few decades. Climate experts around the state underscored this in a recent study that found reducing carbon dioxide emissions "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."[1] That is why climate scientists consider SLCP reductions to be the last lever we have left to avoid catastrophic climate change.[2]

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]

As the Air Board notes in the *2022 Climate Change Scoping* Plan, SLCP reductions, unlike reductions in carbon dioxide emissions, also provide immediate and significant

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[1] Kammen, Ramanthan, 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].
[2] Id. See, also, Kammen, Ramanthan, Matlock, et al, footnote 2 above.
[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.

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.

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.[8] They also call explicitly for accelerating the timeline for meeting the requirements of SB 1383, which requires a 40 percent reduction in methane and a 50 percent reduction in anthropogenic black carbon by 2030.[9]

For all these reasons, BAC urges the CEC to prioritize SLCP reductions in the Climate Innovation Program. It can do so by investing in advanced technology projects that convert organic waste to energy since organic waste causes 87 percent of California's methane emissions and more than 90 percent of its black carbon emissions.[10]

3. Importance of Carbon Negative Resources

The Climate Innovation Program should also prioritize resources that can provide carbon negative emissions, which will be essential to achieve carbon neutrality. The California Air Resources Board (CARB) study on achieving carbon neutrality, the *2022 Climate Change Scoping Plan*, and a report by Lawrence Livermore National Lab on how to achieve carbon neutrality all point to the need for carbon negative emissions to offset emissions that cannot be eliminated by 2045. According to Lawrence Livermore National Lab, California will need 125 million metric tons of negative emissions to achieve carbon neutrality and bioenergy with carbon capture and storage (BECCS) can provide two-thirds of all the carbon negative emissions needed.[11]

Energy generated from organic waste is the only form of energy that can provide carbon negative emissions. Since those emissions are essential to reach the state's goal of carbon neutrality, the Climate Innovation Program should prioritize resources that provide carbon negative emissions.

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[6] Id.
[7] *Draft 2022 Climate Change Scoping Plan*, page 180.
[8] Id. at page 4.
[9] Id. at page 4.
[10] *2022 Climate Change Scoping Plan for Achieving Carbon Neutrality*, issued by the California Air Resources Board on November 15, 2022.
[11] Id.

4. Need Clean Firm Power for Reliability and Cost Containment

The Commission's modeling for SB 100 found that California will need up to 15,000 megawatts of clean firm power to maintain reliability while achieving 100 percent renewable and zero carbon power.[12] As the *2021 Integrated Energy Policy Report* noted, "the intermittency of solar and wind resources necessitates flexible or dispatchable resources that can quickly come on-line when the sun sets or winds stop blowing."[13]

More recent reports have found that California will need closer to 30,000 megawatts of clean firm power to maintain reliability,[14] especially if California needs to triple electricity generation, as projected in the *2022 Climate Change Scoping Plan* to enable building and transportation electrification.

Increasing clean firm power will also lower power costs overall, which meets one of the Commission's goals for the Climate Innovation Program, to reduce greenhouse gas emissions at a lower cost. A recent study in *Energy and Climate Change* found that including a diverse portfolio of firm, renewable resources would reduce overall system costs substantially - even if the individual resource costs are higher per MWh.[15] As Environmental Defense Fund explained:

> "California needs a significant amount of clean firm power to meet its decarbonization targets while keeping rates affordable. Failing to procure clean firm power will require a massive overbuild of solar and wind that will increase rates by about 65 percent in 2045; by contrast, using clean firm power California could keep rates similar to those found today."[16]

To maintain reliability and costs, the Commission should prioritize firm, renewable resources in the Climate Innovation Program.

5. Focus on Most Cost-Effective Carbon Reductions

One of the goals of the Climate Innovation Program is to reduce GHG emissions at a lower cost.[17] To assess how cost-effective different technologies and fuels are at reducing carbon emissions, the Commission should consider the cost per ton of carbon reduced. In other words, looking solely at the cost of energy (on a megawatt, therm,

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[12] California Energy Commission, *2021 Integrated Energy Policy Report*, Volume III, at page 72.

[13] California Energy Commission, *2021 Integrated Energy Policy Report*, Volume III, at page 24.

[14] Jane C.S. Long, et al, "Clean Firm Power is the Key to California's Carbon-Free Energy Future," published March 24, 2021 in *Issues in Science and Technology.*

[15] E. Baik, et al, "What is different about different net-zero carbon electricity systems?" published in *Energy and Climate Change* 2 (2021) 100046, July 2021.

[16] Comments of Environmental Defense Fund on the 2021 Preferred System Plan Ruling, filed in R.20-05-003 on September 27, 2021, at page 2.

[17] CEC's November 15 workshop presentation, slide 4.

Btu, or other energy basis) will not provide an accurate assessment of the cost of carbon reductions.

The California Air Resources Board, in its annual reports to the Legislature on the state's climate investments, regularly analyzes the cost per ton of carbon reduction for different climate investments. Investments in organic waste to energy consistently rank as the most cost-effective of all of the state's climate investments. For example, investments in bioenergy production from dairy digesters and diverted organic waste (diverted from landfills) reduce carbon at the tiny costs of $9 and $10 per ton of carbon, respectively.[18] Analysis by the Legislative Analyst's Office reached a similar conclusion: the most cost-effective climate investments the state has made have been investments in dairy digesters, diverted organic waste projects, and projects to promote forest health.[19] According to the LAO report, investment in waste to energy projects cost about one-fifth the average cost of California's climate investments.[20]

Investments in bioenergy are the most cost-effective climate investments because they reduce the most damaging climate pollutants – methane and black carbon – that are tens to thousands of times more damaging to the climate than the carbon dioxide emitted by fossil fuels.[21] They are also the only investments in the energy sector that provide carbon negative emissions. So, while bioenergy may be more expensive per megawatt hour, the carbon reductions provided by bioenergy are by far the most cost-effective of all climate investments in the energy sector and beyond.

6. Need to Prioritize Resources that Reduce Wildfire Risks

The November 15 presentation listed "benefits to frontline communities" as a priority for the Climate Innovation Fund. BAC agrees with this priority and urges the Commission to include communities that are most vulnerable to wildfire in the category of "frontline communities." Wildfire presents an unprecedented threat to electricity reliability and costs, as well as public health and safety. Wildfires have caused ratepayers tens of billions of dollars in recent years due to direct damages caused by wildfires sparked by electricity infrastructure and operations. The costs to harden electricity will also be enormous and will never fully mitigate wildfire risks. In addition, wildfires emit huge amounts of climate and air pollution. A recent study by UCLA found that the 2030 fire season alone emitted as much carbon as California has reduced across all sectors of

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[18] California Air Resources Board, *California Climate Investments 2022 Mid-Year Data Update,* September 2022, showing that investments in dairy digesters and diverted organic waste cut carbon emissions for $9 and $10 per ton, respectively. ARB's 2021 Annual Report to the Legislature on California's Climate Investments also showed that investments in organic waste to energy were the most cost-effective of all the state's climate investments. See Table 2, pages 17-18.

[19] California Legislative Analyst's Office, *Estimated Average GHG Reduction Cost Is High With Wide Variation Across Programs,* report to the Legislature, April 2016, at page 2.

[20] Id.

[21] *Short-Lived Climate Pollutant Reduction Strategy*, adopted by the California Air Resources Board, March 2017, at page 40, Table 5.

the economy over the past 20 years. In other words, wildfire emissions wiped out 20 years of progress in reducing carbon emissions.[22]

Wildfires also pose huge risks to reliability. To reduce the risk of causing wildfires, the utilities have implemented Public Safety Power Shutoffs on numerous occasions. Wildfires in the Sierras or in neighboring states also threaten transmission of out of state power, putting more strain on California's instate supplies and power grid. And wildfires jeopardize hydropower supplies by impacting forests, erosion and sedimentation in reservoirs, precipitation patterns, and more. Finally, the communities that are most at risk of wildfires and PSPS events are the rural, forested communities that also tend to have the oldest, most vulnerable infrastructure.

According to the *California Forest Carbon Plan*, adopted by CalEPA and the California Natural Resources Agency, California cannot meet its climate goals without reducing wildfire emissions.[23] California also cannot maintain reliable electricity supplies without reducing the risk and severity of wildfires. As a result, the *2022 Climate Change Scoping Plan* calls for forest thinning on 2.3 million acres annually, which will generate 8 to 15 million tons of forest waste.[24] Converting that forest waste to energy would reduce the need for open burning, helping to reduce climate and air pollution. According to the *California Forest Carbon Plan,* converting that forest waste to energy cuts methane and black carbon emissions by 98 percent compared to pile and burn or controlled burns of forest waste.[25] Converting that waste to energy will also provide a source of firm power in the communities that are most vulnerable to grid disruptions. And, if combined with carbon capture and storage, it would provide carbon negative emissions.

Prioritizing resources that mitigate wildfire risks will also help to align the Climate Innovation Program with other state policies, including the state's wildfire reduction plans, the Governor's Emergency Order on Tree Mortality, the *California Forest Carbon Plan*, the *Forest Biomass Utilization Plan* adopted by the Board of Forestry, the *Short-Lived Climate Pollutant Reduction Strategy*, and numerous other plans and policies.

The CEC should make wildfire mitigation a priority of the Climate Innovation Program given that wildfire emissions now dwarf the state's carbon reduction efforts and threaten energy reliability. Supporting bioenergy generated from forest biomass waste will help mitigate the wildfire crisis while providing firm renewable power in the communities that are most vulnerable to fires and to PSPS events.

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[22] Michael Jerret, et al, "Up in Smoke: California's Greenhouse Gas Reductions Could be Wiped Out by 2020 Wildfires," published in *Environmental Pollution* 310 (2022) 119888. Available at: https://www.sciencedirect.com/science/article/pii/S0269749122011022#:~:text=In%20this%20short%20communication%2C%20we,GHG)%20emission%20reductions%20since%202003.

[23] *California Forest Carbon Plan*, adopted by CalEPA, CNRA, and CalFire in May, 2018, at page 2.

[24] *2022 Climate Change Scoping Plan for Achieving Carbon Neutrality*, issued by the California Air Resources Board on November 15, 2022, at page 99.

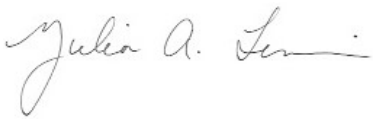
[25] *California Forest Carbon Plan* at pages 130, 135.

7. Top Priority Technology

The November 15 workshop asked what should be the top priority technology topic that would have the most significant impact.[26] That's actually quite an easy question to answer since this is a Climate Innovation Program. As noted above, by far the most urgent and beneficial measure to address climate change is the reduction of SLCP emissions. On the energy side, the most urgent need is for more clean, firm power to maintain reliability without sacrificing our climate and air quality goals. The highest priority for the Climate Innovation Program, therefore, should be to invest in technologies that reduce SLCP emissions while providing firm, renewable power. The Commission can achieve these goals by investing in projects that use noncombustion conversion technologies to generate biogas, biomethane and hydrogen from organic waste. There is nothing more urgent the Commission can do for the climate or for energy reliability.

Thank you for your consideration of these comments.

Sincerely,



Julia A. Levin
Executive Director

[26] November 15 workshop presentation slide 9.