August 16, 2021

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

RE: Sierra Club California Comments on Scoping Plan Workshop - Engineered Carbon Removal Technical Workshop on August 2, 2021

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 Technical Workshop on Engineered Carbon Removal.

We are concerned that CARB is moving forward on advancing carbon capture, utilization and storage (CCUS) technologies at a pace that fails to take into account input from environmental and environmental justice organizations. The Scoping Plan workshop that took place on August 2, 2021 gave the impression that CARB has already decided that engineered carbon removal technologies will be the solution to achieving our climate targets. CARB is required to take into consideration input from the Environmental Justice Advisory Council (EJAC).[1] Yet, the workshop made it clear that CARB is not effectively doing so as one EJAC member commented "[It] feels like someone has already decided that this is the right solution and now it's being announced."

During the workshop, members from the EJAC raised critical concerns regarding CCUS technologies. Sierra Club California shares these concerns and is concerned that CARB is catering to industry over the environment by leaning on these technologies when there are extreme risks associated with them as well as better, cleaner pathways. We urge CARB to consider the following:

I. Climate change strategies should prioritize the health and safety of environmental justice communities.

CARB must take into consideration that CCUS technologies will not reduce air pollutants aside from CO_2 and will not address the harms of fossil fuel pollution that are felt by environmental justice

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

communities. In fact, research has shown that these technologies can increase co-pollutants at the source.[2]

Any increase in air pollutants in environmental justice communities is unacceptable. California has some of the worst air quality in the world. Often low-income communities and communities of color suffer the brunt of the harms of local air pollution, which CCUS does not mitigate. Many of these communities are located nearby fossil fuel plants so they are disproportionately exposed to a greater amount of air pollution. As a result, they suffer from higher levels of pollution-associated illnesses. Because CCUS focus is on capturing carbon before it enters the atmosphere as opposed to reducing or removing other toxic air pollutants, it fails to address the air quality and public health problems faced by environmental justice communities.

As EJAC members stated during the workshop, these communities are already treated as "sacrifice zones". CCUS will be used to extend the life of fossil fuel operations, including its harmful impacts on environmental justice communities. In addition, the process of CCUS itself will rely on fossil fuels to power it, resulting in more negative impacts.

The state must prioritize protecting these communities and relieving them of the poor air quality and public health impacts they are experiencing. In order to prioritize the health and safety of environmental justice communities, CARB should focus its time and resources on strategies that promote the development of clean energy resources and phasing out fossil fuel production.

II. The risks associated with these technologies must be balanced against the cost

Many CCUS technologies have not been proven to be feasible or economic at scale and have only seen limited use or use that permits climate and public health harmful activities such as enhanced oil recovery (EOR).

One EJAC member noted during the workshop that, financially, the investment in this technology is risky - some facilities have failed or not resulted in significant carbon reductions while others were only profitable because the CO_2 was used for EOR.[3] In fact, CCUS technologies have been shown to only contain a fraction of source emissions since fossil fuels release pollutants at every stage of their lifecycle (extraction, refining, transport, use, and disposal).[4] Reports have shown that the 28 existing CCUS facilities currently operating have a capacity to capture 0.1 percent of fossil fuel emissions (and the vast majority of the captured carbon is being used to produce more oil).[5]

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[2] Jacobson, Mark Z., *The health and climate impacts of carbon capture and direct air capture*, Energy Environ. Sci. (2019), available at https://web.stanford.edu/group/efmh/jacobson/Articles/Others/19-CCS-DAC.pdf

[3] *Id.*

[4] Drugmand, D. & Muffett, C., *Confronting the Myth of Carbon-Free Fossil Fuels: Why Carbon Capture is Not a Climate Solution,* CIEL (2021), available at https://www.ciel.org/wp-content/uploads/2021/07/Confronting-the-Myth-of-Carbon-Free-Fossil-Fuels.pdf [hereinafter "CIEL, Why Carbon Capture is Not a Climate Solution"].

[5] *Id.*

Most of these technologies are very expensive with little payoff, costing hundreds of dollars to remove just one ton of carbon dioxide.[6] CARB's own presentation showed how expensive these technologies will be ($190/200 per ton) as compared to natural and working land strategies ($11 per ton). To put this in further context, in 2018 we released 37 billion tons of CO_2. That means removing a year's worth of carbon using these technologies at an average price of $200 per ton, would cost around $7.4 trillion dollars.[7]

Considering that the research is still unclear and undetermined as to what the risks associated with these technologies will be, is the cost worth it? Science reports have stated that these technologies will have to be monitored over the next 100 years. However, we have seen that our state has failed to monitor the current fossil fuel industry which has resulted in devastating leaks, spills, and gas explosions. The 2018 IPCC report cautioned against technologies such as CCUS given "concerns about storage safety and cost" and the "non-negligible risk of carbon dioxide leakage from geological storage and the carbon dioxide transport infrastructure."[8]

Bottom line, we don't know the wide-ranging effects these technologies may have. As we've seen with anthropogenic climate change, when humans alter the atmosphere at a global scale, unexpected consequences occur. Therefore, we recommend that CARB focus on cleaner, safer alternatives for reaching our climate goals.

III. The state must focus on reducing anthropogenic emissions including phasing out fossil fuel production and reaching 100% clean, renewable energy resources

It is essential that we prioritize climate change mitigation and transitioning to clean, renewable energy as soon as possible.[9] Any carbon removal technologies or practices should be implemented as a last resort and in addition to, rather than instead of, anthropogenic carbon emissions reductions.

Clean energy resources have additional benefits that these technologies do not have such as reducing non-CO_2 air pollutants caused by fossil combustion as well as eliminating the risks of oil spills, oil fires, gas leaks or gas explosions.[10] Transitioning to clean, renewable alternatives seems the most efficient pathway for achieving reductions especially considering CCUS does not remove carbon from the atmosphere but only prevents *some* emissions caused by the fossil fuel activities from reaching the atmosphere.[11] Reports state that "[CCUS] masks the harmful carbon emissions from the

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[6] Sabine Fuss et al., *Negative emissions - Part 2: Costs, potentials and side effects*, Environ. Res. Lett. 13 (2018), available at https://iopscience.iop.org/article/10.1088/1748-9326/aabf9f/pdf.
[7] Kelly Levin, *New Global CO2 Emissions Numbers Are In. They're Not Good*, WRI (Dec. 5, 2018), https://www.wri.org/insights/new-global-co2-emissions-numbers-are-theyre-not-good.
[8] IPCC, Summary for Policymakers in IPCC, Global Warming of 1.5°C: An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty (2018).
[9] *Id.*
[10] Jacobson, supra note 1.
[11] CIEL: Why Carbon Capture is Not a Climate Solution, supra note 2.

underlying source, enabling that source to continue operation rather than being replaced altogether, while creating additional risks, impacts, and costs associated with the [CCUS] infrastructure."[12]

We cannot allow the prospect of these technologies to delay fossil fuel elimination. It's healthier, cheaper, and safer to limit pollution at the source, transition to clean, renewable energy sources, and enhance nature based solutions.[13] Studies have shown that replacing fossil fuels with clean energy resources such as wind or solar will not only result in more CO_2 emission reductions than relying on CCUS equipment, but it will also result in reductions in air pollution emissions and doesn't have the added costs and risks associated with CCUS.[14]

Experts have stated that "Carbon capture is a polluting technology because it doesn't reduce air pollutants aside from CO_2, and all the [other pollutants] go up because of the fact that you need more energy to run carbon capture equipment. . .There is no reason for it, except to distract us and waste money."[15] These technologies are delaying the state from transitioning away from fossil fuels and will provide the fossil fuel industry with a license to continue polluting.[16] Technologies like CCUS that allow the fossil fuel industry to continue business as usual should not be permitted.

IV. Conclusion

The Intergovernmental Panel on Climate Change's The Sixth Assessment Report (August 2021) makes it clear that we must rapidly stop new CO_2 emissions from entering the atmosphere. It is imperative that we do not allow technologies like CCUS to become an excuse to continue creating new pollution.

Considering the risks, costs, and negative impacts on environmental justice communities, we urge CARB to slow down and direct its focus and resources on strategies that encourage the development of clean, renewable energy and phasing out fossil fuel production. Those pathways are guaranteed to result in reductions in climate emissions, air pollutants, and other harmful impacts from fossil fuel activities.

Sincerely,

Lauren Cullum
Policy Advocate

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[12] *Id.*
[13]CIEL: Why Carbon Capture is Not a Climate Solution, supra note 2.
[14] Jacobson, supra note 1.
[15]CIEL: Why Carbon Capture is Not a Climate Solution, supra note 2; Hutchins, M., The Weekend Read: Looking at the energy transition's bigger picture (July 10, 2021) (featuring Mark Jacobson), https://www.pv-magazine.com/2021/07/10/the-weekend-read-looking-at-the-energy-transitions-bigger-picture/ (stating "The correct idea of electrifying everything and supplying that electricity through wind, water, solar, and storage has really hit the mainstream now. But still a lot of effort and money is being spent on appeasing the fossil fuels industry with carbon capture and related technologies……").
[16] CIEL: Why Carbon Capture is Not a Climate Solution, supra note 2.