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Ms. Liane Randolph, Chair
California Air Resources Board
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Subject: Comments to the August 2, 2021 Public Workshop: 2022 Scoping Plan Update – Engineered Carbon Removal Technical Workshop

Dear Chair Randolph:

Oxy Low Carbon Ventures ("OLCV") appreciates this opportunity to provide comments to the California Air Resources Board's ("CARB") Public Workshop: 2022 Scoping Plan Update – Engineered Carbon Removal Technical Workshop held August 2, 2021.

OLCV and its affiliates are leading efforts to deploy carbon capture and sequestration and direct air capture projects. The OLCV "CARB-1" project to store biogenic CO_2 in accordance with the Carbon Capture and Sequestration Protocol ("CCS Protocol") under the Low Carbon Fuel Standard ("LCFS") is currently undergoing CARB staff review. In a separate but related effort, OLCV is working on a first of its kind commercial scale direct air capture project that will remove and sequester carbon dioxide from the atmosphere – directly addressing the 409.8 parts per million of carbon dioxide in the atmosphere.

California has long been synonymous with effective climate action and is at the leading edge of government incentives and policies to address global warming. Beginning in 2001, California has proposed and adopted progressively more ambitious goals to address economywide emissions. This includes the California Global Warming Solutions Act of 2006 [Assembly Bill 32 (AB 32)], which created a comprehensive, multi-year program to reduce greenhouse gas (GHG) emissions in California and requires CARB to develop a Scoping Plan that describes the approach California will take to reduce GHGs. The resultant Scoping Plans have included a suite of policies to help the State achieve its GHG targets. OLCV's view is that Engineered Carbon Removal Technologies are a critical component to California continuing to make progress towards its GHG reduction goals.

<u>Engineered Carbon Removal Technologies are Essential to Reducing CO_2 in the Atmosphere</u>

Engineered Carbon Removal Technologies include a wide range of processes. These processes include Direct Air Capture ("DAC") and other technologies that can capture CO_2 emitted at a source. These processes require sequestration sites that are able to safely, securely and permanently sequester captured CO_2 deep within the earth. The technologies for capturing, transporting and sequestering CO_2 are proven, scalable, and deployable across the United States and globally.

DAC technology removes carbon dioxide directly from the atmosphere. CARB has taken a leadership position in recognizing DAC's potential. In 2018, the Board adopted amendments to the LCFS that included provisions enabling entities that employ direct air capture to remove from the atmosphere and sequester CO_2 to submit applications and, if approved, receive credits. (17 CCR § 95490(a)(1)).

Illustrative of the influence of California's programs, when the Board adopted the 2018 amendments, there were demonstration projects for DAC still being evaluated for their potential, but no developers had concrete plans to construct and operate large scale (500,000 Metric Tons ("MT") CO_2/year or greater) DAC and related sequestration projects. Since then, OLCV has announced its plans to develop and operate a large-scale DAC project consisting of the first of two process lines, or "trains." Each train will be capable of capturing 500,000 MT CO_2/year.

Large-scale DAC projects that can capture significant quantities of CO_2 from the atmosphere are complex projects that include capture equipment, a sequestration site and sources of reliable zero carbon energy. The first DAC project will require investments in excess of $1 billion dollars to build the capture facility and the transportation system necessary to deliver CO_2 to a sequestration site. In addition, DAC projects must necessarily use renewable or zero-carbon resources to provide the energy necessary to power the DAC equipment. Consequently, DAC will not only remove CO_2 from the atmosphere but will also speed deployment of renewable and zero carbon energy resources.

Deployment of DAC is at a critical juncture. CARB must continue to support engineered carbon removal technologies such as DAC to facilitate deployment of the technologies at scale. In addition to supporting DAC technology deployment, this support must also include the diligent review and approval of sequestration sites that meet the requirements of the Carbon Capture and Sequestration Protocol under the Low Carbon Fuel Standard.

CARB should be making every effort to work with developers to speed the deployment of engineered carbon removal technologies. The more rapidly the processes can be deployed, while ensuring environmental safeguards, the more rapidly CO_2 in the atmosphere and emitted at sources can be reduced. If the first DAC project can be on-line in 2025, at least 500,000 MT of CO_2 can start being removed from the atmosphere. Bringing additional DACs on-line over the ensuing ten years means that up to 10,000,000 MT/year of CO_2 can be removed from the atmosphere by 2035.

Conversely, a slower development cycle, even one where one large-scale DAC every two years is brought on-line, will mean millions of tons of CO_2 will remain in the atmosphere. There is broad recognition in the scientific community that carbon dioxide removal technologies will play a significant role in reducing emissions, particularly emissions from past industrial activities, and achieving net-zero emissions.

Technologies that capture CO_2 at anthropogenic sources are urgently needed. For example, while California's efforts are accelerating a transition away from fossil fuels as an energy source, projections forecast that California will continue to require some proportion of its energy to be

supplied from natural gas combined cycle power plants. These plants are reliable sources of firm dispatchable energy on demand to consumers, regardless of whether the sun is shining or the wind is blowing, and will act as a compliment to further renewable energy deployment Capturing CO_2 from these sources will reduce GHG emissions to the atmosphere and enable California to manage its transition to renewable and zero-carbon energy.

Through refinements to its existing policies and regulations, California can further broader deployment of engineered carbon removal and carbon capture technologies. These refinements include OLCV's DAC Advance Credits proposal provided at the October 14-15, 2020 CARB Workshop titled "Low Carbon Fuel Standard Public Workshop to Discuss Potential Regulation Revisions." Another is a list of suggested revisions to the CCS Protocol the Environmental Defense Fund ("EDF") and OLCV provided to CARB in an October 30, 2020 comment letter. These refinements will speed deployment of critical technologies while continuing to uphold the highest environmental standards. We welcome further engagement on these issues.

Environmental Justice Considerations

Stakeholders in the scoping plan process include representatives of the environmental justice communities. OLCV recognizes these are important voices that must be heard, listened to, and addressed in developing the scoping plan and project development in and outside California. Among the environmental justice voices, we have heard a concern that engineered carbon removal technologies will prolong the California's transition from fossil fuel energy. This is an important consideration, in addition to ensuring carbon removal technologies and CCUS projects improve – not worsen – air quality in impacted communities, which is a current topic of academic and NGO research.

We believe engineered carbon removal technologies will both speed California's transition from fossil fuel energy sources while lessening any economic impacts that may occur.

First, California has already been extremely successful in creating one of the most comprehensive and responsive climate policy landscapes in the world. This wide-ranging strategy has resulted in policy innovations that run the gamut from direct regulations to inclusive interagency climate actions to a multijurisdictional carbon market.[1] For example, these policy innovations have enabled California to meet or exceed its 2020 emission reduction goals in 2018.[2] California's success has proven that effective state policies can meet challenging targets. Given its successful track record, continuing to recognize and provide engineered carbon removal technologies

[1] Aimee Barnes and others, Learning From California's Ambitious Climate Policy (Center for American Progress, April 16, 2021), available at https://www.americanprogress.org/issues/green/reports/2021/04/16/498242/learning-californias-ambitious-climate-policy/.

[2] State of California Air Resources Board, "Climate pollutants fall below 1990 levels for the first time," Press release, July 11, 2018, available at https://ww2.arb.ca.gov/news/climate-pollutants-fall-below-1990-levels-first-time.

pathways to generating LCFS credits will result in additional projects that will speed California's transition from fossil fuel energy sources and be a model for the globe.

In addition, engineered carbon removal technologies can take advantage of infrastructure already available in the state. Transportation infrastructure and geologic formations currently used for oil production can be repurposed for carbon removal and sequestration. Repurposing the infrastructure and sequestration site management needs will create continuing employment opportunities and generate economic benefits for those communities.

Concerns have been voiced that CO_2 captured from the atmosphere or anthropogenic sources could be used to prolong the life of oil fields. While it is true that in some reservoirs CO_2 can be used in enhanced oil recovery, such use requires a significant capital investment in equipment to manage CO_2 that returns to the surface with any oil or water produced. Equipment includes gas handling and recompression facilities that require the investment in the range of $15 million to $100 million. California oil producers are unlikely to make such investments in CO_2 if carbon capture can generate sufficient revenue. Also, current oil production utilizing CO_2 accounts for approximately 0.5% of world oil production yet ensures some of the most secure and safe geologic storage known.[3]

Engineered carbon removal projects use proven scalable technologies. CARB has existing regulations and protocols in place to ensure projects can safely, securely and permanently sequester CO_2. However, engineered carbon removal project developers should be encouraged to site projects appropriately and engage local communities early on in the planning and permitting process to achieve transparent and proven GHG emission reductions while improving local air quality.

Thank you for your consideration of our comments and we do look forward to actively participating with CARB throughout the 2022 Scoping Plan process.

Best regards,

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cc: Clerk of the Board
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[3] IEA (2018) Whatever happened to enhanced oil recovery? https://www.iea.org/commentaries/whatever-happened-to-enhanced-oil-recovery