CARBON CAPTURE CALIFORNIA

June 23, 2022

Clerk of the Board
California Air Resources Board
1001 I Street
Sacramento, California 95814

## RE: Comments 2022 Draft Scoping Plan Update

The California Carbon Capture Coalition appreciates the opportunity to provide comments on the Draft 2022 Climate Change Scoping Plan Update.

The California Carbon Capture Coalition includes a number of leading industries and hundreds of thousands of workers in the state that are critical to successful climate action in California. We are committed to supporting California's efforts to reduce greenhouse gas (GHG) emissions in line with the Paris Agreement in cost-effective ways that drive technology and create and maintain high quality jobs and robust economic growth in the state.

The 2022 Climate Change Scoping Plan Update will play a pivotal role in charting California's path to achieving the state's 2045 carbon net-neutrality goal. The Scoping Plan should be designed to optimize the range of benefits that achieving climate goals in California can provide.

California is uniquely positioned to benefit from Carbon Capture Utilization and Sequestration (CCUS) across a range of industries in ways that provide significant and lasting greenhouse gas emissions reductions and support new and existing high-quality jobs. CCUS can also deliver air quality and local economic benefits to California communities in many parts of the state.[1] As the Draft Plan recognizes, CCUS will be a necessary tool to support achievement of California's climate goals. CCUS technologies have been successfully demonstrated for decades as safe and reliable approaches to reducing greenhouse gas emissions.[2] These technologies are being safely deployed at multiple locations across the world today to reduce emissions in increasingly cost-effective and innovative ways.

[1] See "The role of carbon capture and storage in the race to carbon neutrality," Peridas and Schmidt, 2021.
[2] See Draft 2022 Scoping Plan Update, pg. 177.

AERA · California Business Roundtable · CALPINE · Chevron · Clean Energy Systems · CMTA · IEPA · SoCalGas · Western States Petroleum Association

## California will not achieve its climate goals without CCUS

Achieving California's climate goals will require significant and rapid deployment of CCUS technology. As CARB has recognized throughout this Scoping Plan Update process, the scale and pace of emissions reductions required to achieve California's 2030 GHG target and subsequent 2045 net-neutrality goal must increase substantially from current progress to date.[3] Numerous recent expert analyses have identified CCUS as a critical component of successful climate action strategies globally, nationally, and in California, including those from the Intergovernmental Panel on Climate Change, the International Energy Agency, the Energy Futures Initiative, Stanford University, and Lawrence Livermore National Laboratory.

California's 2008 Climate Change Scoping Plan, and subsequent 2013 and 2017 plan updates, all recognized the important role that CCUS will need to play the state's comprehensive climate strategy moving forward. Governor Newsom's recent California's Electricity System of the Future report also highlighted the key role that CCUS can play in state climate action. The 2022 Draft Scoping Plan Update makes it clear that any reasonable approach to achieving California's 2045 net-carbon neutrality goal in ways that are both economically and technologically feasible will require deployment of CCUS.

The Biden Administration has identified CCUS as a key strategy to support national decarbonization efforts. The White House Council on Environmental Quality Report to Congress on Carbon Capture, Utilization and Sequestration notes specifically that large scale deployment of CCUS can deliver multiple benefits in addition to reducing greenhouse gases, including reducing emissions of other pollutants and providing support for well-paying union jobs.

As the Draft Scoping Plan acknowledges, collaboration with the federal government will be necessary for California to successfully achieve climate goals.[4] Currently, billions of dollars in federal funding and incentives are being provided for a host of innovative carbon capture, utilization and sequestration technologies and projects. In order to successfully take advantage of these key incentives, California needs a clear and comprehensive plan to maximize the role of CCUS as part of the state's climate strategy that will benefit industries and technology developers across the state, delivering economic benefits for all Californians and supporting jobs for hard working women and men throughout the state. Rapid action to deploy CCUS in California is necessary to take advantage of these incentives.

---

[3] See Slide 9, "2022 Scoping Plan Workshop Update," Kickoff Workshop, June 8, 2021; and Slide 4, "2022 Scoping Plan Workshop Update," Engineered Carbon Removal Technical Workshop," August 2, 2021.

[4] See Draft 2022 Scoping Plan Update pg. ES iii.

## California is uniquely positioned to safely take advantage of CCUS

California's history as a national climate leader ideally positions the state play an instrumental role as part of efforts to scale CCUS technologies across the country, and reap the benefits these actions can deliver in California. The state has an unparalleled set of resources to be a global leader in demonstrating the critical role that safe and effective CCUS technologies can play in climate action. Analyses presented by leading experts from Stanford University and Lawrence Livermore National Laboratories at the August 2, 2021 Engineered Carbon Removal Scoping Plan workshop highlighted the abundance of safe, high quality geologic sequestration capacity in the state – much of it strategically located near existing facilities currently suited for safely capturing and transporting CO2. Analysis from the U.S. Department of Energy concludes that California has more than enough sequestration capacity to safely and permanently store hundreds of years' worth of the state's total CO2 emissions.

CCUS technologies have been safely and successfully practiced for decades across the spectrum of capture, transport and storage activities.[5] There are dozens of carbon capture projects currently operating across the world, with decades worth of project experience.[6] CO2 has long been in use in the United States, with over 5,000 miles of CO2 pipelines safely in operation today.[7] Experience has shown that the risk of CO2 leakage is extremely low. The IPCC reports that an estimated 99% of stored CO2 will remain sequestered for over 1000 years.[8]

These technologies and practices can be applied, refined, and enhanced to enable CCUS to play a meaningful role in California's decarbonization efforts and further California's actions to paving a path forward on a science-based carbon management infrastructure policy that can serve as an example for other jurisdictions.

California industries possess a depth of technological capability and technical expertise to quickly and safely deploy CCUS. The state has one of most skilled workforces in the world standing at the ready to design, build and operate CCUS projects and infrastructure. As detailed in the February 2021 report Permitting Carbon Capture and Storage Projects in California, California has the expertise to develop existing regulatory frameworks to ensure that CCUS projects protect public health, safety and the environment.

---

[5] See "The role of carbon capture and storage in the race to carbon neutrality," Peridas and Schmidt, 2021.
[6] See Global CCS Institute, The Global Status of CCS 2021.
[7] See Clean Air Task Force, US CO2 Transport and Storage Infrastructure, 2021.
[8] See IPCC Special Report on Carbon Capture and Storage, 2005.

## The 2022 Scoping Plan Update should maximize and account for the role that CCUS technology can play across ALL appropriate sectors and applications to support achievement of California climate goals

Modeling upon which the Draft Plan is based clearly shows that carbon capture and sequestration will be an "essential tool" to achieve carbon neutrality.[9] An unprecedented level of investment in a range of low carbon technologies and infrastructure across virtually every economic sector in the state is going to be required to reach California's climate goals.

CCUS is a technology that can provide near-term greenhouse gas reductions while providing significant economic and employment benefits. Though the modeling does not include widespread application of CCUS across all applicable sectors, the Draft Plan clearly acknowledges that there are a suite of applications for CCUS across a number of sectors and industries including refining, electricity, manufacturing, hydrogen production, cement and bioenergy.[10] California has at least 76 industrial and power generating facilities that with application of CCUS technologies can deliver as much as 60MMT/year in GHG reductions – nearly twice as much as the entire buildings sector in California.[11] Given the scope and scale of the challenge facing California, the state cannot afford to limit the role that CCUS technology can play as part of the effort.

As CARB works to finalize the 2022 Scoping Plan, it will be critical to ensure that it fully accounts for the greenhouse gas benefits that CCUS can deliver when deployed across ALL appropriate sectors and applications in the state on a timeline that is realistic given the acknowledged statutory and permitting hurdles such projects currently face.

## The 2022 Scoping Plan Update should fully account for the significant job and economic benefits that CCUS across a range of sectors will deliver in California

Deployment of carbon capture, utilization and sequestration technology affords California a significant opportunity to create and preserve hundreds of thousands of high quality, high wage jobs across the state in both new and existing industries.[12] Bringing CCUS projects and infrastructure on-line in California will support a range of employment opportunities across multiple economic sectors including construction and pre-construction, engineering, sciences, project development and ongoing project management.

---

[9] See Draft 2022 Scoping Plan Update pg. 66.
[10] See Draft 2022 Scoping Plan Update pg. 175.
[11] See Stanford University/Energy Futures Initiative (https://sccs.stanford.edu/california-projects/opportunities-and-challenges-for-CCS-in-California).
[12] See Global CCS Institute, The Global Status of CCS 2021; and California Carbon Capture Coalition, "Capturing the Opportunity for CCUS in California."

Deployment of CCUS technology and infrastructure in California can drive up to $30 billion of capital investment in the state.[13] Recent analyses show that buildout of CCUS to support California's climate goals can deliver between 60,000 to 150,000 new in-state jobs and preserve an estimated 230,000 additional jobs for Californians working across a range of industries and economic sectors in the state.[14] Further, investment in CCUS infrastructure will unlock the potential for a host of other innovative engineered carbon removal strategies to take root delivering even greater economic and job benefits for California.

CCUS technologies will also play a key role in helping to manage the costs associated with California's efforts to decarbonize, especially for the most vulnerable Californians.[15] For example, as detailed in "An Action Plan for Carbon Capture and Storage in California," deployment of CCUS technology in the electric sector would reduce power costs by $750 million annually by 2030 and deliver billions of dollars in energy cost savings annually to 2045 and beyond.[16]

As the 2022 Scoping Plan Update is finalized it is critical that CARB fully account for the vast economic and job benefits that CCUS applied across multiple economic sectors can deliver for California.

## The 2022 Scoping Plan Update should describe a clear and actionable path for CCUS in California

California needs a clear and comprehensive plan to maximize the role of CCUS as part of the state's climate strategy that will benefit industries and technology developers across the state, delivering economic benefits for all Californians and supporting jobs for hard working women and men throughout the state.

As detailed in the Draft Plan, there are a number of key strategies that the state must pursue to take advantage of California's unique position to benefit from CCUS, including permitting approaches that allow for rapid scaling of capture, transport and sequestration technologies and infrastructure, clarification of pore space ownership and unitization rules, and incorporation of CCUS into a broader range of sectors and programs.[17] As CARB works to finalize the 2022 Scoping Plan, it will be critical to explicitly identify actionable steps and outcomes to ensure that these key strategies can be successfully implemented.

---

[13] See California Carbon Capture Coalition, "Capturing the Opportunity for CCUS in California."

[14] See California Carbon Capture Coalition, "Capturing the Opportunity for CCUS in California;" and California Energy and Infrastructure Labor-Management Cooperation Trust, "Job Impacts of Carbon Capture and Storage in California."

[15] See "California needs clean firm power, and so does the rest of the world," Long, et. al., 2021.

[16] See California Carbon Capture Coalition, "Capturing the Opportunity for CCUS in California."

[17] See Draft 2022 Scoping Plan Update pg. 177.

The California Carbon Capture Coalition appreciates the opportunity to comment on the Draft 2022 Scoping Plan Update. The Coalition looks forward to ongoing engagement with CARB and all stakeholders throughout the 2022 Scoping Plan Update process.

Sincerely,

Virgil Welch
Director