



March 9, 2026

California Air Resources Board
P.O. Box 2815
Sacramento, CA 95812

Submitted electronically via: <https://carb.commentinput.com/?id=pNeRj64MA>

RE: Charm’s Comments on the Proposed Amendments to Cap-and-Invest

Dear California Air Resources Board,

Charm Industrial (Charm)¹ appreciates the opportunity to submit comments to the California Air Resources Board (CARB) on the Proposed Amendments (Proposed Amendments) to the Cap-and-Invest program released on January 20, 2026.²

Charm greatly appreciates CARB’s leadership and commitment to developing California’s Cap-and-Invest (previously Cap-and-Trade) program, which establishes a durable, economy-wide carbon price and a transparent, well-regulated compliance market that can enable long-term investment in high-quality carbon dioxide removal. Cap-and-Invest’s emphasis on rigorous accounting, verification, and environmental integrity provides a strong foundation for scaling permanent carbon removal solutions in alignment with the state’s climate goals. We are especially grateful for CARB’s continued leadership in creating a stable policy framework that supports innovation, unlocks private capital, and positions California as a global model for integrating carbon removal into a comprehensive decarbonization strategy.

We support the Proposed Amendments and believe they could be further strengthened to accelerate the progress needed to reach California’s climate goals. Accordingly, we recommend that CARB staff:

- Prioritize the development of additional compliance offset protocols that explicitly include carbon dioxide removal (CDR) technologies within Cap-and-Invest pursuant to Assembly Bill 1207 (2025);

¹ <https://charmindustrial.com/>

² See [Staff Report: Initial Statement of Reasons](#).

- Include CDR As An Eligible Pathway Under The New Manufacturing Decarbonization Incentive; and
- Coordinate Cap-And-Invest Implementation with the SB 905 Regulatory Framework.

I. About Our Technology

Charm is a California-based company working in support of the state's efforts to rapidly drive down greenhouse gases (GHGs) on the path to carbon neutrality. Charm has developed a proven carbon dioxide removal technology that has already removed thousands of tons of carbon from the atmosphere. Our innovative approach converts biomass residues into a carbon-rich liquid that is safely and permanently stored underground. Agricultural residuals and highly combustible forest residues that would otherwise burn or be left to rot, emitting GHGs into the atmosphere, are instead transformed into a carbon benefit. As part of California's Electric Program Investment Charge (EPIC), Charm conducted an on-site biomass processing and pyrolysis pilot in the Inyo National Forest as part of a larger wildfire fuel reduction project in summer of 2024. To date, Charm has permanently removed 11,754 tonnes of carbon dioxide emissions.³

In addition to the vital climate benefits that negative emissions technologies like bio-oil sequestration provide, Charm's approach can deliver critically needed air quality, wildfire resilience, and economic benefits in parts of California that most need them, like the Sierras and the Central Valley. At a scale of 4,000 pyrolyzers, Charm could process 38 million MT of woody biomass per year – the quantity of piled biomass from 2.8 million acres of wildfire thinning projects. Based on current biomass disposal costs of \$400-\$2000/acre, this could reduce costs by \$1.1-5.6 billion annually.⁴ In addition to reducing the cost of wildfire mitigation projects, this fleet could deliver \$53.6 billion in health benefits each year from reduced wildfire and pile-burn particulate exposure,⁵ based on CARB's 2022 estimate that every ton of PM2.5 released from wildfires has health impact costs of \$176,000.⁶

II. Charm's Comments

To achieve the state's climate and GHG reduction goals, California's 2022 Scoping Plan and Governor Newsom call for **20 million metric tons (MMT) of carbon removal in 2030 and 100 MMT in 2045**. Therefore, reaching California's climate goals will require the rapid and broadscale deployment of zero- and negative-carbon technologies. This will require a broad spectrum of CDR approaches including, but not limited to, direct air capture (DAC), enhanced weathering and mineralization, marine-based carbon removal (mCDR), bio-oil sequestration, and

³ [Charm Industrial Ledger](#)

⁴ Barker, et al. [Assessing costs and constraints of forest residue disposal by pile burning](#). 2025.

⁵ [US Forest Service. Piled Fuels Biomass and Emissions Calc, Satellite-Derived PM2.5 Emissions From Wildfires For Air Quality Forecast](#); Estimated 1 ton PM2.5 released from an average of 123 m.t. burned in wildfires and pile burns, 12.5 m.t. wildfire mitigation residuals removed per acre.

⁶ CARB. 2022 Scoping Plan Update, [Appendix I - Natural and Working Lands Technical Support Document](#).

biomass carbon removal and storage (BiCRS). **As Charm’s work has demonstrated, the use of CDR technology can help accelerate reduce GHGs, the pace at which wildfire mitigation is done in the state, while also providing key co-benefits, including improving air quality for local communities, creating new jobs, and reusing orphan and idle wells.**

For this reason, Charm sincerely appreciates the Proposed Amendments to Cap-and-Invest and is particularly encouraged by staff’s recognition of the role that CDR technologies can play in achieving the state’s ambitious climate goals. Charm wishes to reinforce staff’s observation that “ensuring cost-effective access to compliance options such as carbon dioxide removal . . . will be important as regulated companies develop strategies and investment plans to reduce their GHG emissions.”⁷

Given that there is a statutory target and clear legislative support for CDR through Senate Bill (SB) 905, Assembly Bill (AB) 1207, and SB 1279, it is important that Cap-and-Invest be amended in a way that provides a durable, timely, and scalable pathway for high-quality carbon dioxide removal to participate as a compliance offset, with sufficient market certainty to enable near-term investment and deployment.

A. Develop Additional Compliance Offset Protocols That Explicitly Include CDR Technologies, Including Bio-Oil Sequestration, Within Cap-And-Invest Pursuant To Assembly Bill 1207 (2025).

Charm sincerely appreciates the efforts of Governor Newsom and the California Legislature to extend California’s Cap-and-Invest program through 2045.⁸ AB 1207, signed by the Governor in September, not only reauthorizes and extends the program but also requires that CARB “consider developing additional compliance offset protocols to address sectors that are not covered by the market-based compliance mechanism but are identified in the scoping plan . . . including carbon dioxide removal.”⁹ While staff notes that no new protocols are included in the Proposed Amendments, we appreciate the recognition that carbon dioxide removal plays an important role in achieving the state’s climate targets and remain encouraged that the Proposed Amendments will help facilitate future incorporation of carbon dioxide removal.

To build on Cap-and-Invest’s success and help accelerate progress toward California’s climate targets, we encourage CARB to include compliance offset protocols that expressly enable carbon dioxide removal pathways to participate in Cap-and-Invest. While the amounts and limits would still need to be determined, CDR technology could be purchased as an offset by regulated entities to meet a portion of their GHG compliance obligations. Given that offsets are an existing

⁷ See [Staff Report: Initial Statement of Reasons](#).

⁸ Office of Governor of California, “[Governor Newsom, Legislature double down on state’s critical cap-and-trade program in face of federal threats](#).”

⁹ [AB 1207](#)

mechanism within the Cap-and-Invest framework, expanding it to CDR technologies would not only be feasible but also provide flexibility to regulated entities such that they have an additional pathway for compliance that is verifiable, credible, and in support of the state's goals. Additionally, making CDR technologies eligible as offsets would provide the long-term, comprehensive support needed to achieve the **100 MMT carbon removal and capture target in 2045** identified in CARB's 2022 Scoping Plan as necessary to meet California's climate requirements.¹⁰

B. Include CDR As An Eligible Pathway Under The New Manufacturing Decarbonization Incentive

Charm supports the inclusion of a new manufacturing decarbonization incentive that allocates additional allowances to qualifying facilities that deploy technologies to lower their covered emissions in the Proposed Amendments. Given that the industrial sector accounts for roughly 18.6% of total statewide GHG emissions, addressing the process emissions of these facilities will prove integral.¹¹

To ensure this incentive achieves its stated purpose, it is critical that CDR be included as an eligible pathway to generate the progress needed to meet the state's climate requirements. However, as currently written, Section 95891(g)(2) limits eligible pathways to those that address emissions reductions from energy use and fuel switching.¹² While these are essential pathways, California needs a portfolio approach to achieve our decarbonization goals. There are hard-to-abate industrial facilities where emissions reductions from energy use and fuel switching will not be feasible. Without recognizing CDR as an eligible pathway, the program risks constraining compliance options and increasing overall decarbonization costs for sectors that lack feasible abatement alternatives. Charm therefore recommends that CARB explicitly include CDR technologies consistent with SB 905 as an additional pathway for industrial carbonization.

C. Coordinate Cap-and-Invest Implementation with the SB 905 Regulatory Framework.

As discussed in the Proposed Amendments, CARB, in addition to Cap-and-Invest, is currently working to develop a Carbon Capture, Removal, Utilization, and Storage Program through SB 905. We commend CARB's commitment across both programs to advancing carbon capture, removal, utilization, and storage technologies, all of which are essential to combating climate change.

¹⁰ CARB. [2022 Scoping Plan for Achieving Carbon Neutrality](#).

¹¹ CARB. [California Greenhouse Gas Emissions from 2000 to 2023: Trends of Emissions and Other Indicators](#).

¹² See [Appendix A-1: Proposed Regulation Order](#)

Charm has been engaged in the SB 905 implementation process at CARB since its inception in 2023. Most recently, Charm submitted comments in response to the August 2025 Information Solicitation to Inform Implementation of SB 905¹³ and presented at CARB's SB 905 workshop in February 2025 on the status of deploying and scaling CDR technology to achieve carbon neutrality.¹⁴ Throughout our participation we have expressed our support for establishing an engagement and implementation timeline for SB 905 and providing CARB with the needed funding and resources to implement this important program.

Given California's need for progress, it is critical that there is alignment and consistency across Cap-and-Invest and SB 905 implementation so that there are clear pathways for market participation. For this reason, we believe these two programs should be designed in a coordinated manner, using a common set of core requirements and processes, so that projects can move efficiently between them without duplicative reviews or conflicting standards. In doing so, CARB can more efficiently incentivize the scaling of the CCUS and CDR technologies in line with the state's broader decarbonization goals.

Conclusion

Charm is fully committed to supporting California in achieving its climate goals. Since carbon removal is a critical component of reaching carbon neutrality, it is essential that Cap-and-Invest includes strong incentives for carbon removal and aligns closely with existing efforts to drive meaningful progress in the near-term. We appreciate CARB's work on this important issue and look forward to continued collaboration.

Sincerely,



Nora Cohen Brown
Head of Market Development and Policy

¹³ [Charm Industrial's Comments on the Information Solicitation to Inform Implementation of SB 905.](#)

¹⁴ [Charm Industrial. "Putting Oil Back Underground." \(slides 10 - 18\)](#)