



Item 11: Direct Air Capture Research, Demonstration and Community Engagement – GFO-24-303

April 10, 2025 Business Meeting

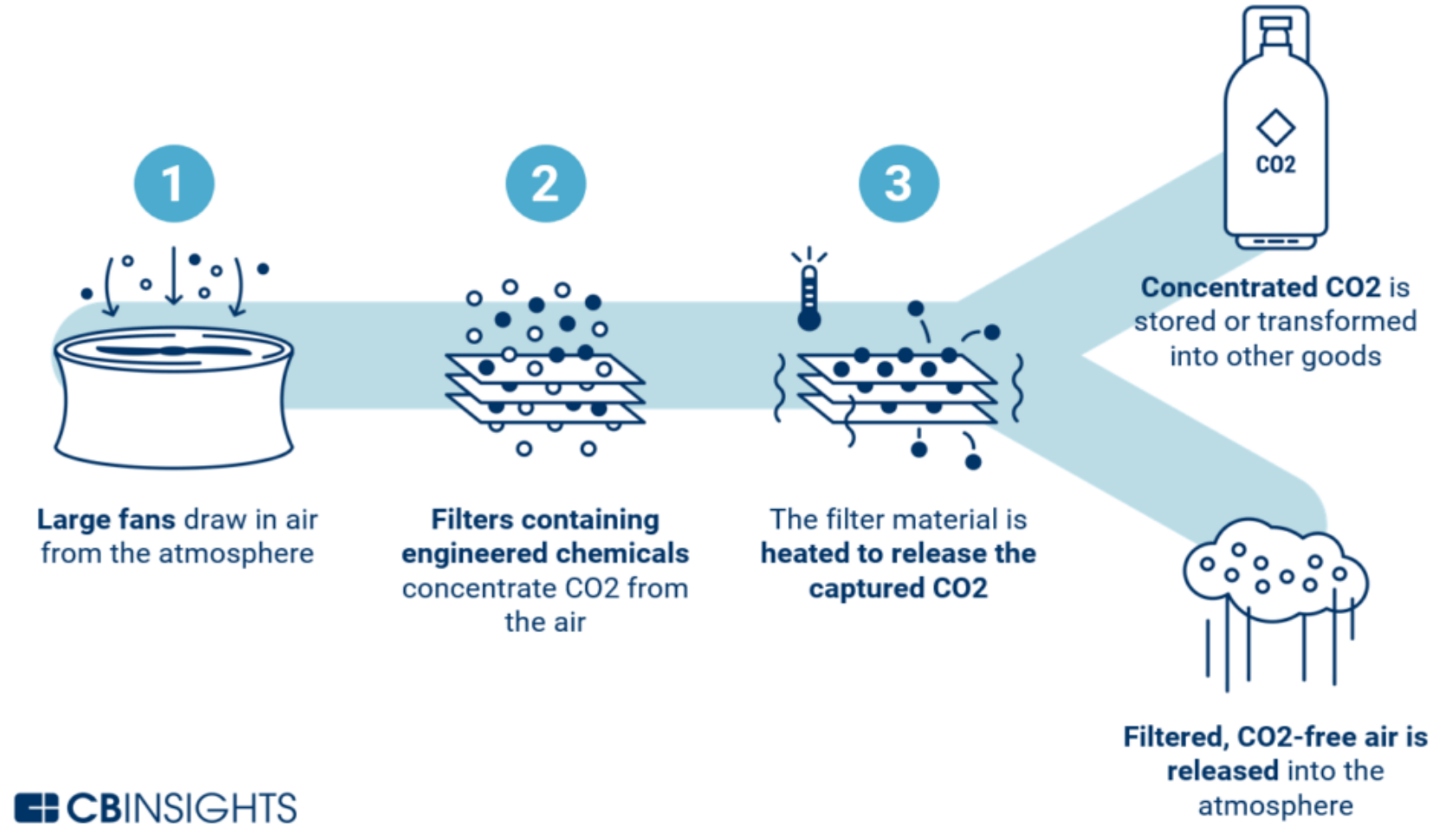
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Direct Air Capture (DAC)

How direct air capture works

Direct air capture (DAC) technology removes carbon dioxide (CO₂) from the atmosphere for permanent underground storage or conversion into valuable products.





Carbon Removal Innovation Support Program (CRISP) - Background

- Established by Assembly Bill 209 (2021) to develop direct air capture technologies using physical and/or chemical processes.
- Use Cap-and-Trade funds from California Climate Investments to:
 - Reduce greenhouse gas emissions
 - Strengthen the economy
 - Enhance public health and the environment in disadvantaged communities.



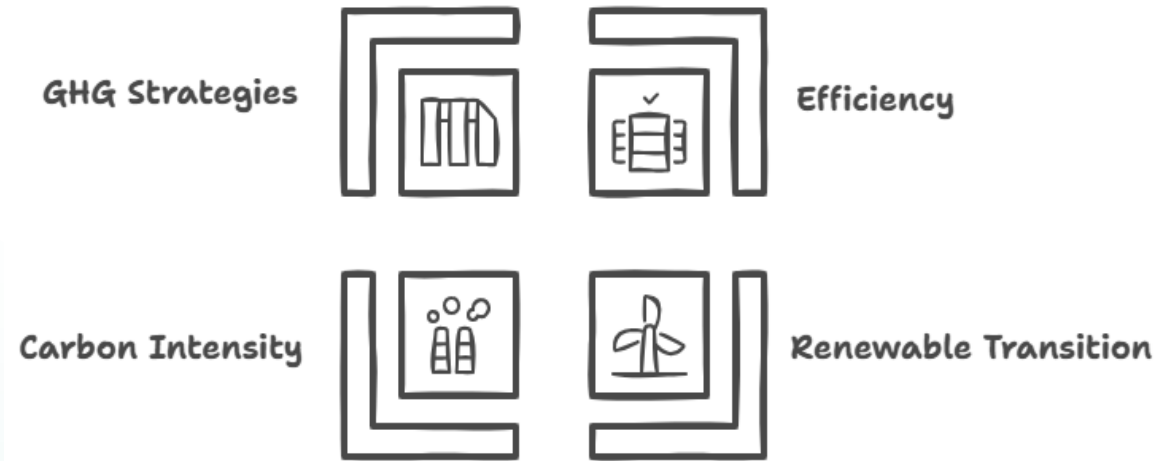


Benefit to Californians

Investing in direct air capture technology:

- Develops technology for legacy emissions and hard-to-abate carbon dioxide sources
- Lowers technology operating costs
- Fosters innovation in California
- Creates jobs in California

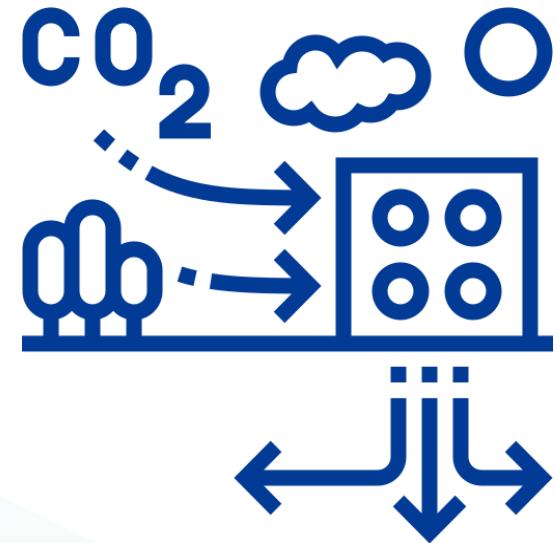
Advancing Direct Air Capture (DAC) for California's Carbon Neutral Future





Solicitation Overview

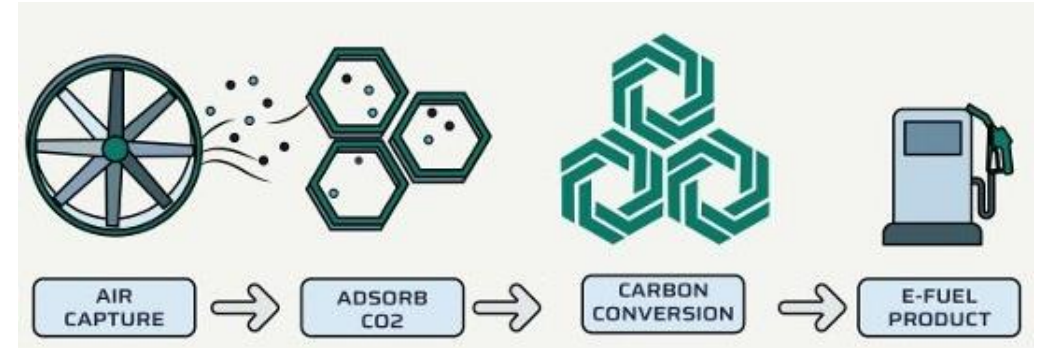
- Advance innovative direct air capture technologies that support California's carbon neutrality goals.
- Projects focused on:
 - Research and development
 - Field demonstration and community engagement
- **Solicitation Funding:**
 - 7 Projects
 - \$12.99 M with \$13.69 M in private match funding





Item 11a. Circularity Fuels, Inc

- **Location:** Redwood City
- **Project Focus:** Develop a self-heating monolith to regenerate the sorbent, eliminating the need for steam or water.



- **Objectives:**
 - Reduce CO₂ capture cost by at least 30% from \$250/MT CO₂
 - Reduce energy consumption/intensity by at least 30% from 2500 kWh/MT CO₂
 - Eliminate water use, improving from 1.6 MT H₂O/ MT CO₂ to Zero.

Abbreviations

- MT = Metric Tonne
- CO₂ = Carbon dioxide
- kWh = kilowatt hours
- H₂O = water

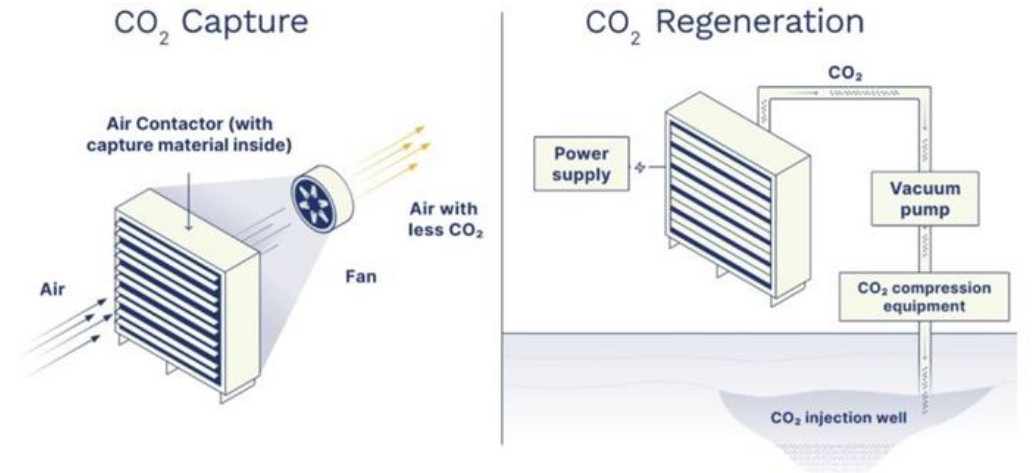


Item 11b. Noya PBC, dba Noya Inc.

- **Location:** Oakland
- **Project Focus:** Enhance sorbent materials and CO₂ regeneration by integrating amines with Noya's electric heating system to reduce costs and improve carbon removal performance.

- **Objectives:**

- Reduce CO₂ capture cost by at least 30% from \$108/MT CO₂
- Reduce energy consumption/intensity by at least 30% from 2500 kWh/MT CO₂
- Produce 1 MT H₂O/MT CO₂



In the Capture phase, CO₂ is separated from ambient air using the CO₂ capture material ("Sorbent") inside Noya's Air Contactor.

In the Regeneration phase, electricity is used to release captured CO₂ from Noya's Sorbent. This captured CO₂ is permanently removed by injecting it underground.



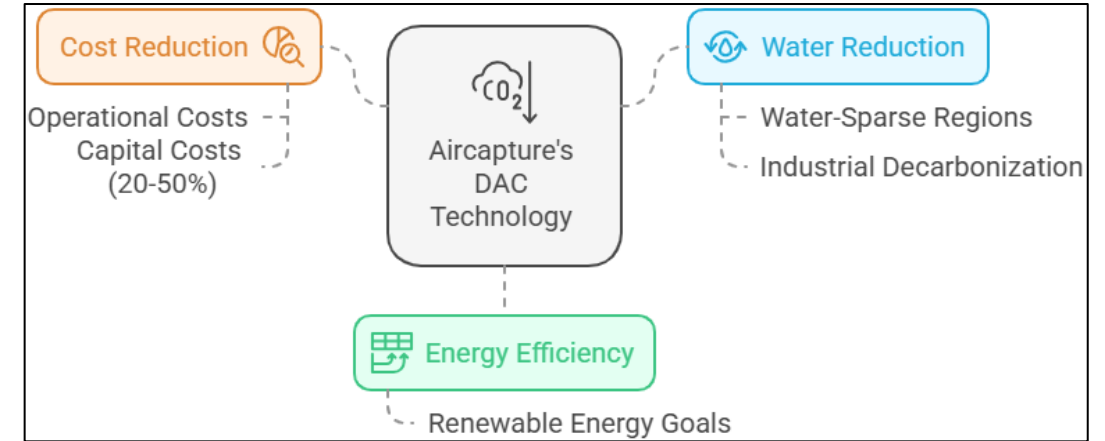
Abbreviations

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Item 11c. AirCapture LLC

- **Location:** Berkeley
- **Project Focus:** Design, develop, and test a DAC system that uses microwave energy for sorbent regeneration.



- **Objectives:**
 - Reduce CO₂ capture cost by at least 30% from \$230/MT CO₂
 - Reduce energy consumption/intensity by at least 30% from 350 kWh/MT CO₂
 - Increase the usable lifespan of sorbents by 50%

Abbreviations

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- H₂O = water



Staff Recommendation

- Approve the three grant agreements
- Adopt staff's recommendation that these actions are exempt from CEQA