Around the Delta: Examining Direct Air Capture's (DAC) Impact

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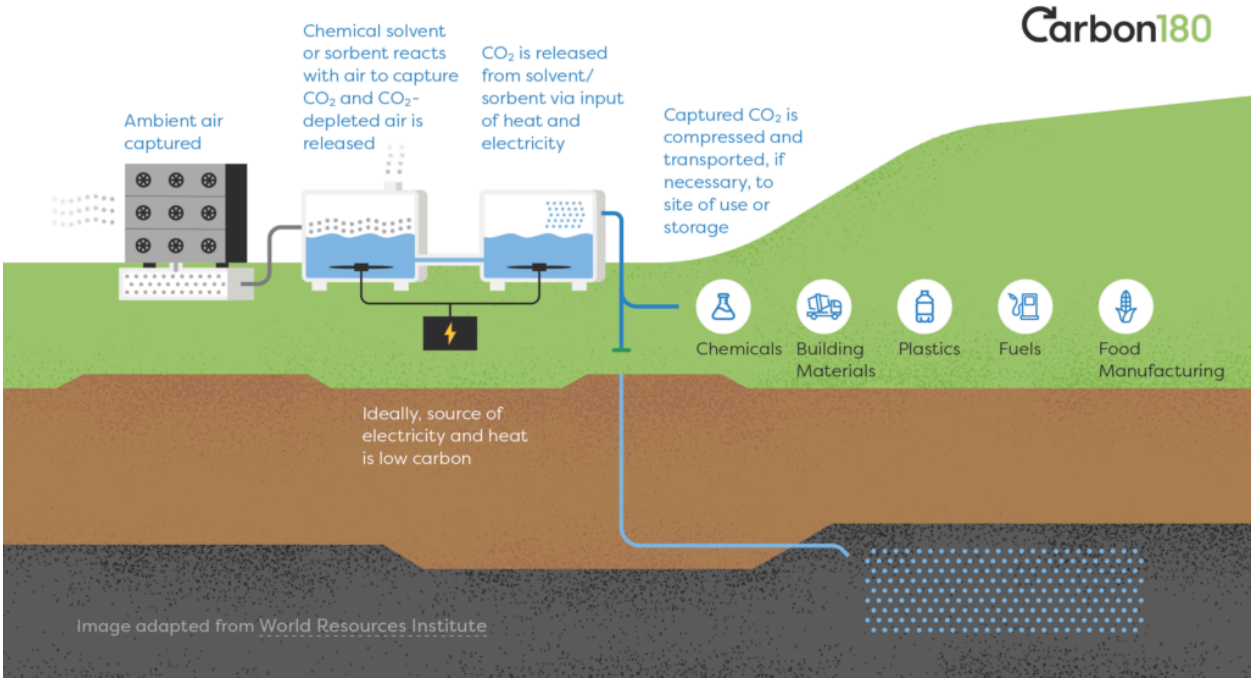
Introduction to DAC in the Delta

Direct Air Capture (DAC) has received a lot of attention as a potential climate solution, and the Sacramento-San Joaquin Delta is increasingly being prioritized for its deployment. Heirloom Carbon's pilot scale DAC facility in Tracy, California is the first of its kind in the country!

Cool, but what's Direct Air Capture? DAC refers to a suite of technologies that remove CO2 directly from ambient air through chemical or physical processes. It's one of several carbon dioxide removal approaches the IPCC is calling for to address climate change. The captured CO2 can be stored underground in suitable geological formations or utilized in various applications, such as cement manufacturing processes. For more information on how DAC works, check out this video by World Resources Institute.



Key Concerns

For Direct Air Capture to be successful in the Delta – home to sensitive ecosystems and economically disinvested communities – project developers must address significant equity, sustainability, and environmental justice concerns.

1. **Health and Environmental Impacts**

Air Quality and Pollution

The San Joaquin Delta region already has high levels of air pollution from agricultural, industrial, and transportation activity. DAC plants, although removing CO2, could contribute to localized air quality concerns through construction, transportation, and energy use.

Water Resource Management

Some DAC technologies demand a substantial amount of water for cooling and CO2 processing, depending on the humidity and temperature of the plant's location. In water-scarce areas like the Central Valley, this raises worries about competing with agricultural and residential water needs.

Energy Use and Sustainability

DAC operations have extremely high energy demands, and their dependence on renewable energy sources means there is less clean electricity available for more urgent uses.

2. **Community Well-being and Justice**

Vulnerable Populations

Without policy interventions, DAC plants, like other industrial facilities, could contribute to historical patterns of siting infrastructure in low-income, pollution-burdened communities. Residents may face worsening health inequalities as a result of higher emissions throughout the development and operating periods.

Cultural and Historical Context

The San Joaquin Delta is home to Indigenous groups with deep historical and cultural ties to the region. Their viewpoints must be addressed before the development of a DAC facility.

3. **Economic Development Opportunities**

Economic Growth and Job Creation

DAC projects can provide highly skilled engineering, construction, and facilities management jobs. To promote fair economic access, workforce development initiatives should prioritize local and historically excluded communities to ensure equitable representation and economic benefits in the emerging DAC industry.

4. **General Policy Recommendations**

Transparency

DAC companies can be transparent to communities about storage plans for captured CO2 and ensure best practices for community health and safety are in place. For example, DAC companies should demand that geologic storage companies make all US EPA Class VI permit information publicly accessible to allow scrutiny of groundwater protection plans.

Life Cycle Assessments (LCAs)

DAC companies can conduct comprehensive LCAs to assess the environmental, social, and economic implications of DAC facilities from construction to decommissioning, and allow for third-party reviews to verify that evaluations are neutral and complete.

Community Engagement

Mandatory public consultations and stakeholder meetings (e.g. CEQA, AB 52 tribal consultation, etc.) should incorporate Indigenous and local viewpoints. Establish community benefit agreements (CBAs) to ensure that economic and social advantages are distributed directly to local communities.

Conclusion: A Path Toward Equity and Sustainability.

Direct Air Capture is a potential method for combating climate change, but its effectiveness depends on fair and sustainable adoption. Because DAC technologies vary considerably, environmental and social impacts will have to be assessed on a project-by-project basis. At a minimum, DAC projects in the San Joaquin Delta should address environmental justice concerns, guarantee sustained community engagement throughout project development and lifetime operations, and adhere to strong regulatory frameworks for environmental protections and labor standards.