DAC Dialogues

Bridging Policy and Innovation for Direct Air Capture Deployment

2024 April

Summary Report

Prepared in collaboration with the Regional Carbon Capture Deployment Initiative and Carbon Capture Coalition at the Great Plains Institute

Event Overview

The Carbon Capture Coalition and the Regional Carbon Capture Deployment Initiative, convened by the Great Plains Institute, held **DAC Dialogues: Bridging Policy and Innovation for Direct Air Capture Deployment** in Austin, Texas, in Spring 2024. The one-day event brought together 30 representatives from direct air capture (DAC) companies, nonprofits, research institutes, universities, and state and federal government agencies to discuss challenges and policy solutions for DAC deployment.

This event focused on exploring policy opportunities for DAC deployment by fostering synergies between state, federal, and industry implementation efforts. During the event, participants engaged in open and constructive dialogue to identify and address key barriers to DAC deployment, including regulatory, financial, and logistical challenges. The discussions highlighted opportunities for innovation and collaboration on DAC deployment across various jurisdictions, covering topics such as resource challenges for DAC deployment, state and federal DAC permitting and siting, market deployment for DAC, and federal support for DAC hubs.

This summary report provides a high-level overview of the key themes and discussions from the day. The event was designed to foster open dialogue rather than achieve a consensus. Discussions were held under the "Chatham House Rule," and the following statements are not attributed to individuals or organizations. Although the shared perspectives do not necessarily reflect the perspectives of all attendees or the Great Plains Institute; the insights gathered during this session will serve as a foundation for the Great Plains Institute's ongoing efforts on direct air capture.

Main Themes

Thematic Area 1: Energy

DAC projects require sources of low-carbon energy to ensure that their CO_2 removal process does not increase overall CO_2 emissions. Developers are experiencing delays in accessing renewable energy, such as challenges in securing power. The permitting process for renewable energy projects can take several years, which can delay the availability of renewable energy for DAC projects. Additionally, perceptions about the creditworthiness of DAC facilities may make it more difficult to secure clean energy sources. DAC facilities also face reliability issues due to the intermittency of low-carbon energy sources and the potential impact of rising energy prices on ratepayers. The section below provides some potential policy solutions to address the challenges of accessing these resources.

1. **Provide incentives that foster collaboration between energy providers and DAC project developers in integrating carbon removal into the energy providers' climate goals.** Incentives that motivate energy utility companies to supply low-carbon energy sources to DAC facilities can help DAC project developers access the energy grid. Additionally, policymakers could address challenges by advocating for streamlined processes for DAC companies to obtain power purchase agreements and encouraging utilities to adopt more flexible policies that support the reliable integration of innovative technologies like DAC into the grid.
2. **Incentivize the co-location of DAC facilities with low-carbon energy projects to help facilitate the grid integration of DAC projects.** Incentivizing the co-location of DAC facilities and clean energy projects will be critical to address the grid integration of DAC facilities. States can incentivize the co-location of DAC facilities with clean energy projects by offering grants, tax credits, and other financial incentives.

Thematic Area 2: Land and water use

DAC deployment, like any industrial activity, requires resources such as water and land, with specific needs varying between technologies. The availability of these resources differs by region and must be considered alongside alternative community usage such as agriculture, conservation, and renewable energy projects. By adopting innovative strategies and policy solutions, we can ensure that DAC deployment contributes to sustainable resource management while supporting local community priorities and mitigating climate change. The section below outlines policy solutions to promote sustainable resource management, ensuring that DAC deployment can be balanced with other community priorities and resource demands.

3. **Incentivize the co-location of DAC facilities with existing brownfield sites.** To resolve potential land use conflicts, incentives can promote the use of previously disturbed areas such as brownfield sites. These incentives can encourage sustainable land use practices and facilitate project approval. Collaborative land use planning processes with local communities and stakeholders can also help to identify suitable sites for DAC deployment that minimize conflicts with existing land uses.
4. **Provide grants and tax credits to promote water use efficiency.** States can help address water-use issues by providing incentives, such as grants and tax credits, to promote water recycling and efficiency. These incentives could encourage water recycling and reuse systems within DAC facilities to minimize water consumption and alleviate pressure on local water supplies. These incentives could also support engaging in collaborative water management agreements with local communities and stakeholders on sustainable water usage practices. Additionally, state grants could promote research and development to improve water-efficient DAC technologies and explore innovative water-sourcing solutions, such as desalination or rainwater harvesting. By providing incentives to promote water efficiency in DAC facilities, the state can help build community acceptance and trust.

Thematic Area 3: State Permitting and Siting

State-level regulation plays a crucial role in the effective oversight of DAC deployment, while promoting community benefits and ensuring public safety. The varying or lack of regulatory requirements between states present challenges for DAC deployment, underscoring the need for standardized permitting processes and transparent regulatory frameworks. While existing siting processes provide a starting point for regulating DAC, states should carefully consider if they would like to modify these regulations to ensure compatibility with DAC technologies and avoid unnecessary complications. The section below highlights proposed policy solutions to improve the siting and permitting of DAC facilities.

5. **Establish a clear permitting process and guidelines.** States should develop clear guidelines and criteria for DAC siting to help streamline the permitting process, provide certainty for developers, provide clarity for communities, and facilitate timely project approvals. These guidelines should integrate existing siting frameworks while filling gaps identified through state-by-state assessments. To avoid creating unintended preferences for DAC over other clean energy technologies, guidelines should be designed to be inclusive and flexible. Emphasizing flexibility within regulatory structures can prevent over-regulation.
6. **Develop permitting guidance to help harmonize regulations across state lines**. To help streamline DAC deployment processes across states and provide a resource for policymakers looking to regulate DAC in their state, stakeholders could collaborate to develop permitting guidance tailored to DAC projects' specific needs. This guidance would include a standardized set of regulations and requirements that are flexible enough to be adopted across different states to ensure consistency and efficiency in the permitting process, where possible. The development and socialization of this regime could help facilitate the establishment of larger DAC hubs across state lines, promoting efficiency and scalability.

7. **Provide policymakers with easily understandable resources.** Developing easily understandable educational resources on DAC that cover various policy issues can help address the knowledge gap among state policymakers. These resources should provide policymakers with clear explanations of DAC technologies, potential benefits and challenges, and implications for policy development. By equipping policymakers with the knowledge and resources they need to make informed decisions about DAC, we can facilitate the development of supportive policy frameworks that accelerate DAC deployment.

Thematic Area 4: Federal Permitting and Siting

To meet its climate goals the US may need to consider using federal lands with the potential for siting DAC surface infrastructure and supportive infrastructure, such as CO_2 pipelines and Class VI wells for CO_2 storage. However, siting DAC on federal land presents challenges. Considering the land use implications of these projects is crucial and it is essential to balance the potential environmental impact with the climate benefits they offer. The authorization process for siting carbon management projects, including DAC facilities, should be formalized and clearly articulated by federal agencies, and ideally, they would be consistent across all agencies that own or administer the land. The section below highlights proposed policy solutions to improve DAC siting on federal land.

8. **Establish clear regulatory frameworks for DAC by drawing from existing regulatory processes.** Clear regulatory frameworks are needed to provide certainty and guidance to DAC developers on federal lands. By defining specific requirements and timelines, these frameworks could streamline environmental assessments and approval processes, reducing uncertainty and delays. Establishing clear regulatory frameworks ensures consistency and clarity for DAC project developers, minimizing confusion and duplication of efforts across federal agencies. Leveraging existing regulatory processes could provide valuable insights into frameworks that can be adapted for DAC infrastructure authorizations.
9. **Enhance agency capacity on DAC**. By enhancing agency capacity through education and training on DAC, federal agencies may more efficiently process DAC authorizations. Additional understanding of the technologies and how they may affect other resources can reduce the amount of time needed to review and authorize projects.
10. **Develop geospatial decision support systems for DAC siting**: Developing geospatial decision support systems could support informed decision-making for DAC infrastructure siting on federal lands. These systems could integrate data on CO_2 storage capacity, energy resources, and environmental factors, facilitating the identification of optimal project locations that meet multiple criteria efficiently. Recognizing that federal lands serve a variety of public benefits—including cultural sites, recreation, biodiversity, cultural resources for Native Nations, renewable resources, and agriculture—it's crucial to ensure that DAC siting considers and integrates these diverse uses and values.

Thematic Area 5: Market Development

DAC technology needs a robust market to transition from research and early adoption to widespread commercial use. While government grants and incentives are crucial to creating the supply of carbon removal from the DAC technology by promoting research, innovation, and early adoption, market development is imperative to provide a demand signal for carbon removal to the scale needed to solve the climate crisis. Building this market is essential for driving investment, reducing costs, and supporting the broader adoption of DAC technology. The development of low carbon energy technologies such as wind and solar demonstrates the importance of demand-side policies in supporting technologies from research to commercial scale. The section below highlights possible policy solutions to promote the market development of DAC.

11. **Support pathways to leverage government procurement of carbon removal and products manufactured from CO_2 captured from DAC facilities.** There is no existing market for carbon removal from DAC beyond the existing voluntary carbon market. While there has been early-stage support from the federal government on procuring carbon removals attributed to DAC technology through the CDR Purchase Pilot Prize and Carbon Utilization Procurement Grant, there is a need for a wider range of both federal, state, and local government support in committing to purchase carbon removal credits attributed to DAC. Agencies within the federal and state governments may procure carbon removal credits to overcome their hard-to-abate emissions as part of their support for the government's net zero goals. Commitment to purchasing the goods and carbon removals attributed to DAC is key to supporting investment certainty in driving down the cost curve of DAC technology.
12. **Create a compliance market at the federal, state, and local levels to incentivize DAC deployment.** Beyond the recognition of carbon removal attributed to DAC in California's Low Carbon Fuel Standard (LCFS), there is no compliance market in the US to support DAC deployment. Federal and State agencies could mimic the compliance markets like the European Union Emission Trading System and California's LCFS to incentivize entities to address their hard-to-abate or process emissions by purchasing carbon removal credits from DAC facilities. In addition, the lack of support mechanism for DAC credits to access the international compliance market (e.g., on CORSIA) is a lost opportunity to secure support from actors outside the US. Regulatory support in facilitating the supply of DAC credits to the international compliance market, including the adoption of a Carbon Border Adjustment Mechanism, would incentivize DAC developers and promote future deployment of DAC in the US.
13. **Define MRV standards to ensure high-quality DAC removal credits.** While government procurement and compliance markets are essential for providing necessary demand pull for DAC deployment, it is important to ensure these DAC credits have high integrity, transparency, and durability. The federal government should identify the attributes and features in defining the language of 'high-quality' DAC credits. In addition, the government, in collaboration with international stakeholders, should support the creation of global standards of high-quality DAC removal to promote the international trade of the DAC credits.