

Who Pays for DAC? The Policy and Market Landscape for Advancing Direct Air Capture

Colin McCormick, Georgetown University

Direct Air Capture (DAC) is a key climate technology, with the potential to make major contributions to stabilizing atmospheric CO₂ levels. It is extremely location-flexible, uses relatively little land area, and produces a verifiable, high-purity stream of CO₂ that can be permanently sequestered or utilized for a variety of purposes. This has understandably led to a great deal of interest in the technology, and aspirations to deploy it at large scale as part of the response to the climate crisis.

However, as with all technologies, DAC cannot grow to large-scale deployments without a profitable business model in which the cost of installing and operating DAC facilities is offset by revenue from one or more sources. This is particularly challenging for DAC, because the current cost is relatively high compared to most other pathways for removing CO₂ from the atmosphere. Investments in R&D and learning-by-doing will bring this cost down over time, but it will likely always remain higher than short-duration, nature-based carbon removal pathways such as afforestation/reforestation.

Companies building and operating DAC facilities have three basic options for securing revenue. First, they may seek to sell removed CO₂ into a variety of markets, such as enhanced oil recovery (EOR), air-to-fuels, cement and concrete, commodity chemicals, and food and beverage. These options, known as “CO₂ utilization”, are already providing small amounts of early revenue for the DAC industry and are likely to continue doing so. However, CO₂ utilization has a limited total market size, and many forms of utilization substantially reduce or even eliminate the climate benefits of the CO₂ removal process by rapidly returning removed CO₂ to the atmosphere.

The second source of revenue is from government policy support, in the form of grants, direct subsidies, tax breaks, or other mechanisms. In the US, the federal 45Q tax credit and the California Low Carbon Fuel Standard (LCFS) are the primary policy support mechanisms available to DAC. In Europe, the Emissions Trading Scheme or the Renewable Energy Directive may provide an opening for DAC support in the future, although this is highly uncertain. Similarly, China’s emissions trading scheme may in theory provide an opportunity for DAC support at some point in the future. Alternative forms of policy support include government procurement of products made with DAC-sourced CO₂, or direct procurement of CO₂ removal services. A final policy option that can be considered is a mandate on a subset of companies to adopt or financially support DAC, without any government compensation in return.

The final source of revenue to support DAC is from voluntary markets, in which companies or even individuals buy carbon-removal services to offset their own emissions without any specific government requirements or incentives to do so. As a growing number of large corporations declare “net zero” emissions targets, the demand for carbon removal is growing as a necessary part of the net-zero arithmetic. While

some of this demand could be met by DAC, most corporate sustainability teams are unfamiliar with the technology and find the high relative costs to nature-based removal pathways to be a disincentive. Nevertheless, the nimbleness of the voluntary markets and the potential ability of a small number of net-zero corporate champions to support DAC as part of a net-zero commitment make this revenue source extremely important for near-term DAC deployment.

Ultimately, the technological promise of DAC will be largely irrelevant to the climate crisis if this core issue of “who pays?” cannot be resolved. Near-term support that blends the three broad categories of revenue will be a key part of the answer, with utilization and voluntary markets likely to play the biggest role over the next few years. However, given the vast scale of the need for carbon removal and DAC’s potential contribution, fundamental changes to the form of government policy support for DAC, and a major expansion of its overall size, will be necessary.