Rhodium Group

The Landscape of Carbon Dioxide Removal

US Policies to Scale Solutions

Energy & Climate

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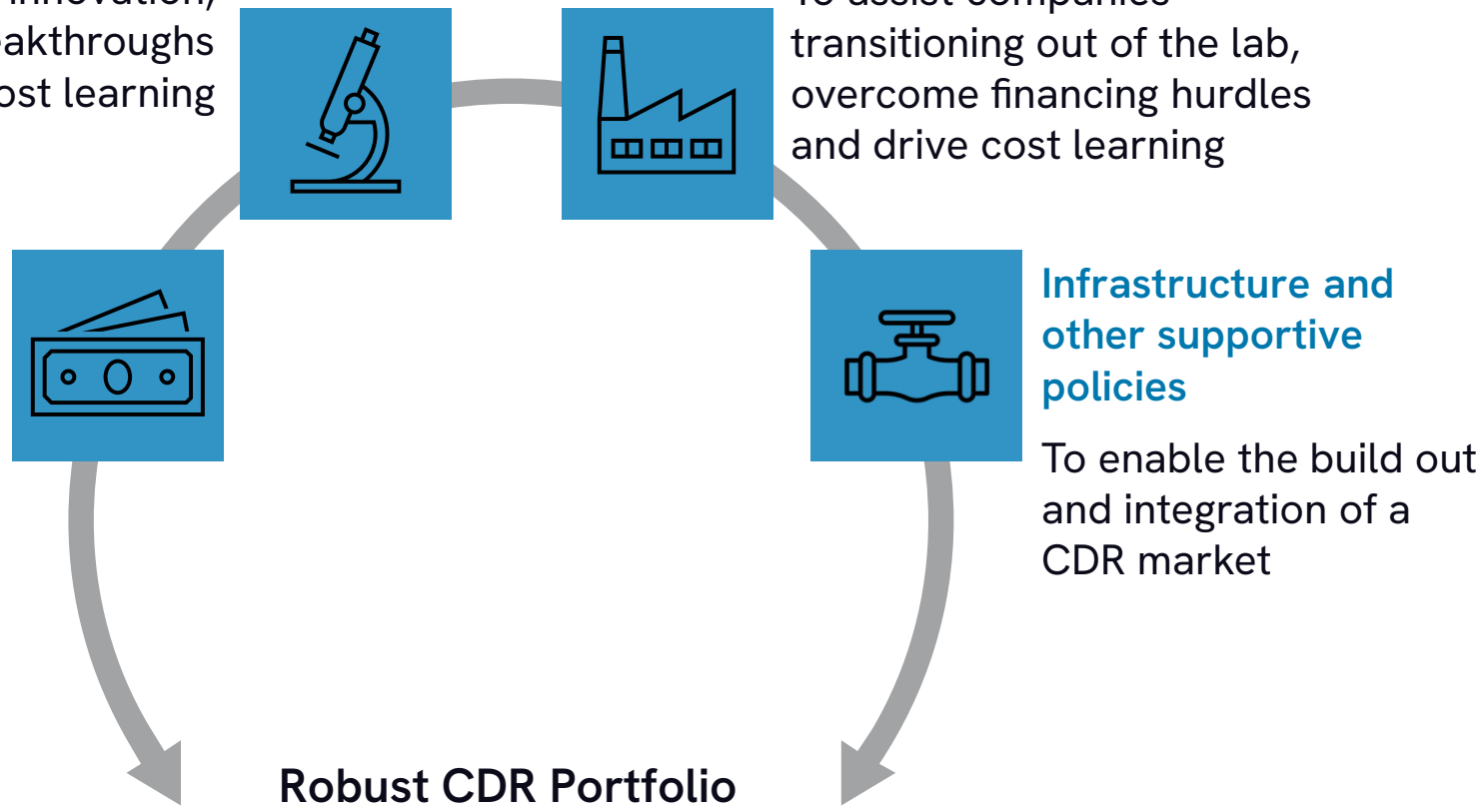
Types of policies needed to support CDR

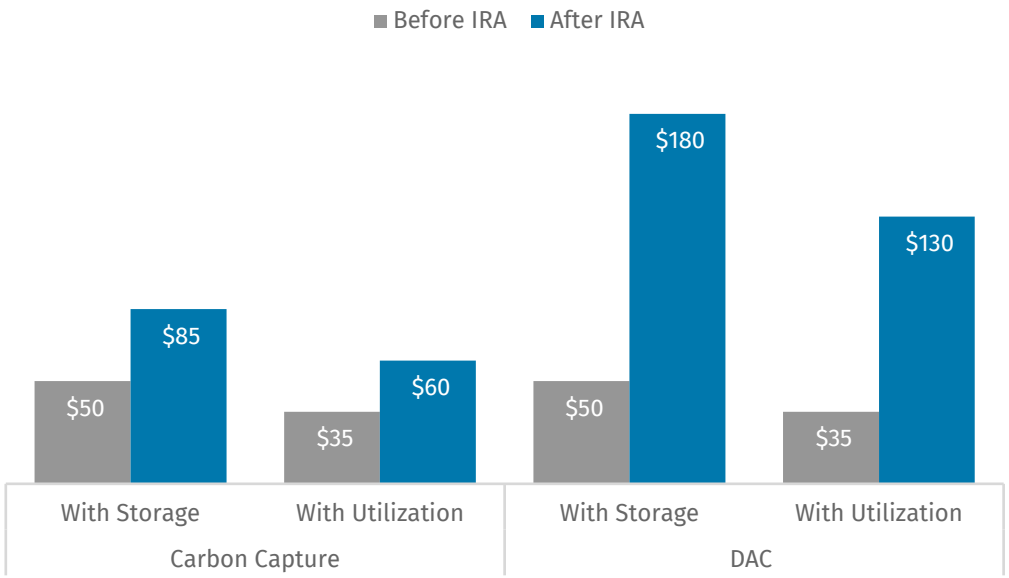


Current US CDR Policy

Current demand-side policy

Non-exhaustive list

45Q enhancements



USDA programs funded by the IRA

Through the US Department of Agriculture (USDA), the IRA has funded several conservation programs that promote natural CDR methods.

Low-carbon fuel standards

Designed to decrease greenhouse gas emissions associated with the transportation sector. Some CDR solutions are supported by an LCFS through eligibility for the generation of compliance credits.

State procurement targets

Some states have begun establishing CDR procurement targets, committing to purchasing certain levels of carbon removal over a determined amount of time.

Current research, development, and demonstration policies for CDR

Non-exhaustive list

Regional Direct Air Capture Hubs

- The Infrastructure Investment and Jobs Act (IIJA) includes $3.5 billion in funding to develop four DAC hubs that will capture at least 1 million metric tons of CO_2 per year at each hub.
- The DAC Hubs program also includes support for projects at earlier stages of development, including funding for feasibility assessments and front-end engineering and design (FEED) studies.

Infrastructure and other supportive policies

IIJA funding

State Primacy for Class VI Wells

The IIJA includes over $48 million in funding for additional states to apply for and implement Class VI primacy programs

CO_2 Locate Database

Designed to keep track of active and abandoned wells to inform decision-makers for Class VI wells and to minimize risk

CarbonSAFE

Carbon Storage Assurance Facility Enterprise (CarbonSAFE) designed to explore carbon storage feasibility at potential geologic storage locations

Carbon storage validation and testing

Gives funding to eligible participants for permitting, site characterization, and construction of carbon storage sites

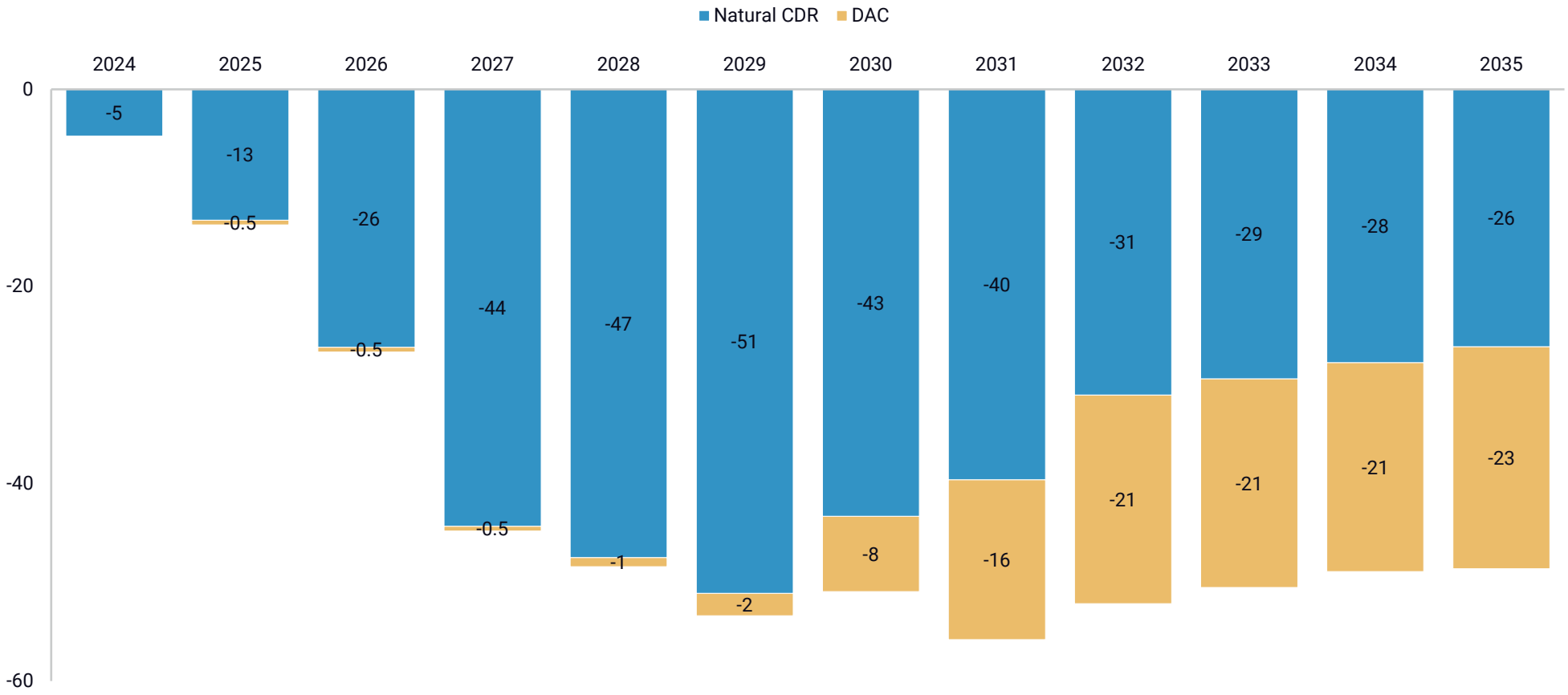
CIFIA

The Carbon Dioxide Transportation Infrastructure Finance and Innovation Act (CIFIA) to support a network of CO_2 transport

Current policy is not sufficient to get the US to a gigaton of CDR

CDR in the US, excluding baseline natural CDR

Net million metric tons (MMT) of CO_2e removal



Source: Rhodium Group's Taking Stock 2023, under our mid-emissions scenario.

Policies to Scale CDR

Demand-side policies for CDR

To establish a long-term revenue market

Tax credits

- Make 45Q more inclusive to advance CDR approaches beyond BECCS and DAC.
- Establish a separate, more inclusive tax credit where the sole focus is CDR and therefore encompasses a wider range of CDR technologies.

Federal procurement

The federal government pays for CDR services in increasing amounts over time.

A procurement program can be structured to pay by the ton for CDR or pay for practices that provide CDR.

Regulatory policies

Economy-wide or sectoral-level emissions standards can create compliance markets that can permit CDR credits as a means of compliance.

Research and development policies

US policies to expand the CDR portfolio

R&D and pilot programs for CDR

- R&D programs are particularly beneficial to CDR projects that are still in the lab stage of development.
- Pilot programs help fuel innovation and spur competition. These programs can fund feasibility studies, basic engineering, and pilot-scale demonstrations for CDR approaches.

Monitoring Reporting and Verification (MRV) R&D

- While start-ups and organizations are starting to pop up to fill this need, government support will serve as a catalyst for this research.
- This will require continued investments in the research and development of methods to ensure high levels of scientific certainty on CO_2 removal and reemission expectations.
- It's important for the government to invest in MRV now so that there are strong protocols once more CDR technologies scale.

Demonstration and deployment policies

US policies to scale CDR solutions

Demonstration programs

These policies support approaches in the demonstration and early-commercialization stage of development by providing or securing a large part of the capital investment required to build CDR facilities.

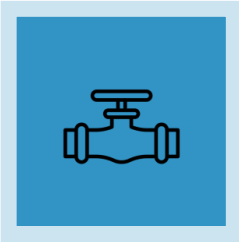
Policy support for each stage ensures the approach will successfully achieve full-scale deployment assuming long-term revenue support is available. Demonstration programs for a CDR approaches beyond DAC would be beneficial.

Loan guarantees

The federal government can provide loan guarantees at a favorable rate compared to the open market and assume a large part of the financial risk. This funding can come from DOE's Loan Programs Office or the Office of Clean Energy Demonstrations.

Infrastructure and other supportive policies

To set the stage for a gigaton CDR market



CO_2 transport and storage

Building upon funding under the IIJA to develop a CO_2 transport and storage system.

Opportunities for states

Many of the federal policy options can be adopted and tailored to the state level. Any action taken by states will complement federal efforts and further support the deployment of CDR in the US.

Workforce development

Scaling CDR methods will require a skilled workforce. Occupational training programs will be imperative.

Public Education

To garner more support and awareness of the variety of CDR approaches.

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The Landscape of Carbon Dioxide Removal and US Polices to Scale Solutions

https://rhg.com/research/carbon-dioxide-removal-us-policy/

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