

Finance and Incentives



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Carbon Capture, Utilization, and Storage: Handbook for Policymakers

About the Handbook

A ‘how-to’ action guide to empower legislators, ministries, regulators, and NOC officials for understanding the policies, rules, and best practices that countries can adopt and implement for CCUS.

Available here:

cldp.doc.gov/carbon-capture-utilization-and-storage-ccus-resources

**Carbon Capture,
Utilization, and Storage**
Handbook for Policymakers



Carbon Capture, Utilization, and Storage: Handbook for Policymakers

About the Handbook (Cont.)

- Sponsored by **U.S. Department of State, Bureau of Energy Resources.**
- Drafted over one week in an intense session with eight expert co-authors.
- Co-written by authors representing:
 - Government
 - NGOs
 - Multilaterals
 - Industry
 - Academia



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ASIAN DEVELOPMENT BANK



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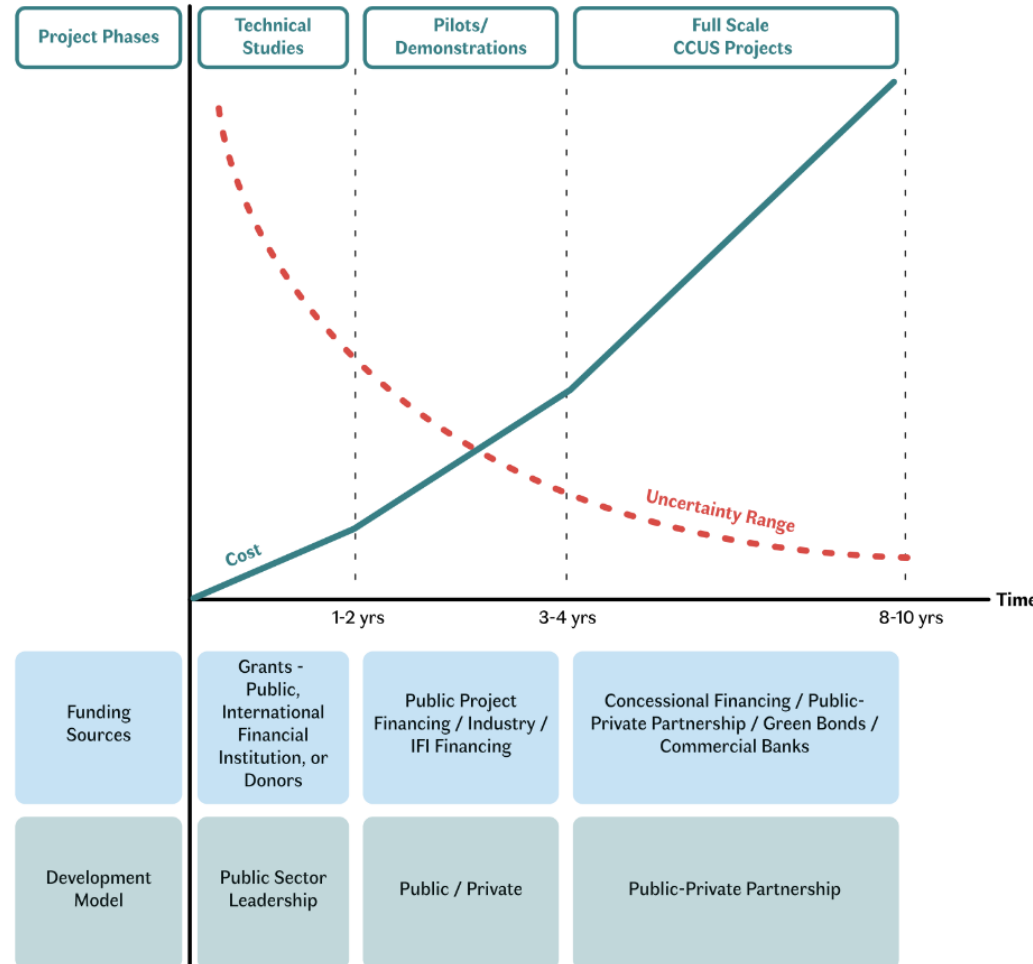
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Key Takeaways

- Most produced carbon must be disposed of permanently. CCUS project investors and operators will be incentivized to construct and operate CCUS projects when there is an economic reason to capture, transport, and store waste carbon. Captured carbon must have a value.
- For policymakers and regulators seeking to incentivize investment into CCUS projects, there are a number of ways to create value from capture/stored carbon. These include tax credits, carbon taxes on emissions, cap-and-trade schemes for emissions, and simply regulatory requirements that limit how much carbon can be emitted (and thus spur investment into CCUS to meet such a threshold). Voluntary carbon markets may also be a source of value for CCUS projects.
- However, policymakers should be aware of the unintended consequences of their policy choices and be prepared to adapt fiscal incentives once these consequences become clear.
- To reduce the cost of capital, CCUS project investors and operators may have access to loans and other financial instruments that are tied to climate objectives.



How RD&D Supports Early Development in Public-Private Partnerships



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Economics of CCUS Projects

- CCUS projects can have significant initial capital and long-term yearly operating and maintenance (O&M) costs
- CCUS projects should be evaluated in a manner consistent with general economics and project finance principles
- The goal of project analysis is to ascertain both the future revenues and total capital and O&M costs over time
- Revenues for projects are in large part driven by governmental action



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Bankability and Financial De-risking CCUS

Government Actions for CCUS

- ❖ Mandates – carbon taxes, environmental mandates
- ❖ Incentives – direct government expenditure, tax credits, financial services

Carbon Tax

- ❖ Mechanism by which emissions are taxed based on their volume, impact, and/or source
- ❖ Important to include mitigation measures such as CCUS or net negative activities like CDR
- ❖ Tax levels can be set by the government and are transparent and predictable, and provide a stable price on emissions

Cap-and-Trade

- ❖ Sets a maximum amount of allowed emissions
- ❖ Allowances, or authorizations for emissions, would be sold under a competitive market to the highest bidder
- ❖ Benefit of allowing the carbon value to vary based on demand for emissions and the supply for mitigation

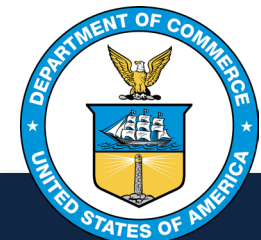
Case Study: EU's Emissions Trading Scheme (ETS) Cap-and-trade

The EU's ETS regime provides for a total cap of emissions, in which a tonne of allowed emission is expressed as an allowance.

Emitters must surrender allowances equivalent to their emissions, and if they fail to do so, they must pay a fine.

If the emitters emit less than the allowance, the ETS regime allows for the emitter to trade/sell the excess allowances to other emitters.

The ETS does not cover all types of emissions, and several countries are implementing carbon taxes to incentivize emission reductions outside the ETS.



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Bankability and Financial De-risking CCUS

Emission Regulations of Industrial Processes/Power Plants

- ❖ Direct regulatory restrictions on emissions can be used alone or in combination with other mechanisms, such as cap-and-trade
- ❖ Requires the emitter to implement emission control measures or reduce or eliminate the emission source
- ❖ Can be done on a mass balance basis, final product performance basis, or gross balance basis



RD&D Expenditures

- ❖ Potential pathway to incentivize the deployment of CCUS and advance local and global knowledge of CCUS technologies
- ❖ Should be preceded by a robust identification of needs and target opportunities

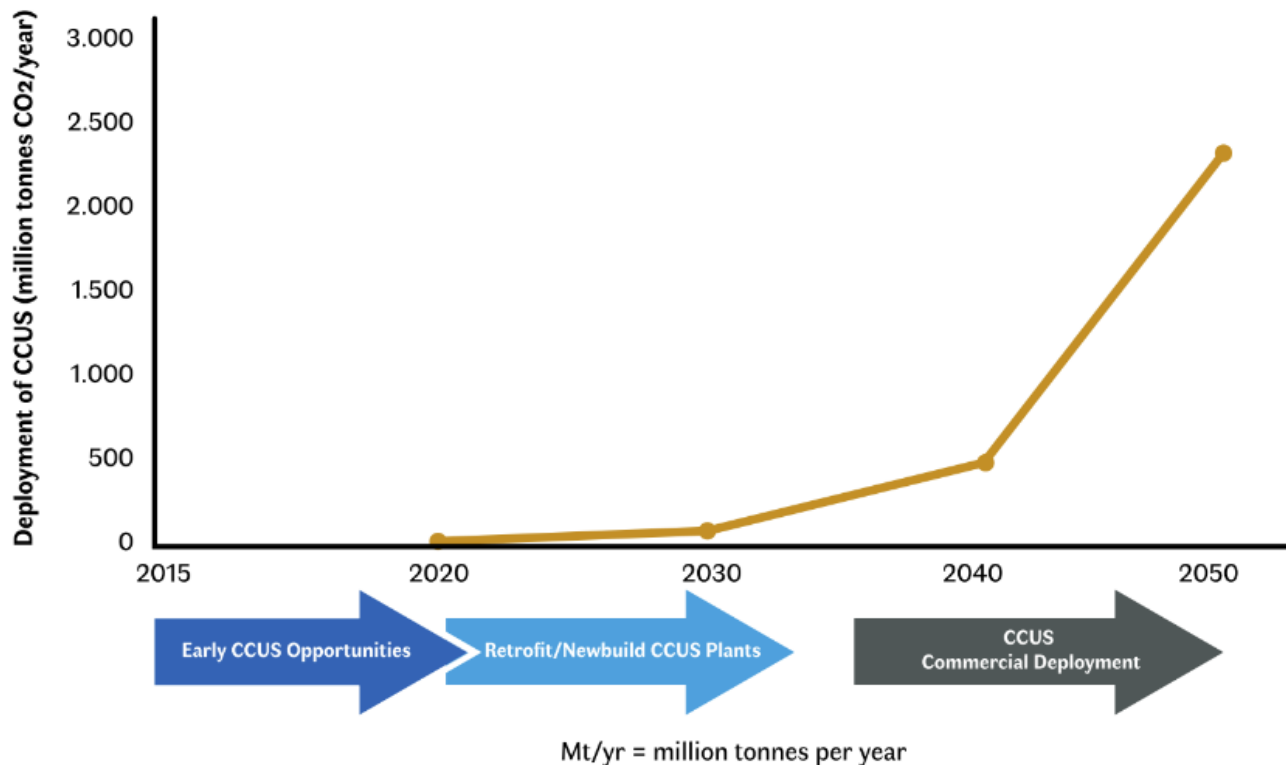


Multilateral Development Banks

- ❖ Provide various resources to developing countries hoping to facilitate the development of CCUS infrastructure
- ❖ Key best practice to mobilize support from banks: express clearly that a country wants a bank to engage in accelerating CCUS and request assistance throughout the project lifecycle



Case Study: CCUS Demonstration & Deployment in China



Roadmap for CCUS demonstration and deployment in PRC.
(Simplified from ADB 2015: Roadmap for Carbon Capture and Storage Demonstration and Deployment in the People's Republic of China)

Case Study: ADB's Support of the CCUS in the People's Republic of China (PRC)

Since 2009, the PRC has partnered with the Asian Development Bank (ADB) to raise awareness of CCUS. As a result, in 2012, post-combustion capture technology on a coal-fired power plant commenced operation in Tianjin.

PRC is a CCUS leader in the Asia-Pacific region with 21 projects, 11 of which are operational as of 2023.

Their key to successful deployment has been developing an initiation roadmap for CCUS Demonstration and Deployment and the Carbon Capture and Storage Research Center in Shanghai to promote CCUS innovation and industrial capacity.



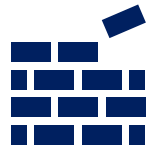
Bankability and Financial De-risking CCUS



Direct Investment and Production Incentives

❖ Investment Tax Credits (ITC)

- Distributed based on infrastructure and construction expenditures
- Generally available after the equipment is put into service, independent of equipment usage



❖ Production Tax Credits (PTC)

- Distributed based on the production of a material
- Credit is only disbursed after the product is produced and conditions for their delivery are met
- Do not take into consideration the cost incurred in producing the unit of output being incentivized
- Effective in ensuring meaningful utilization of the investment



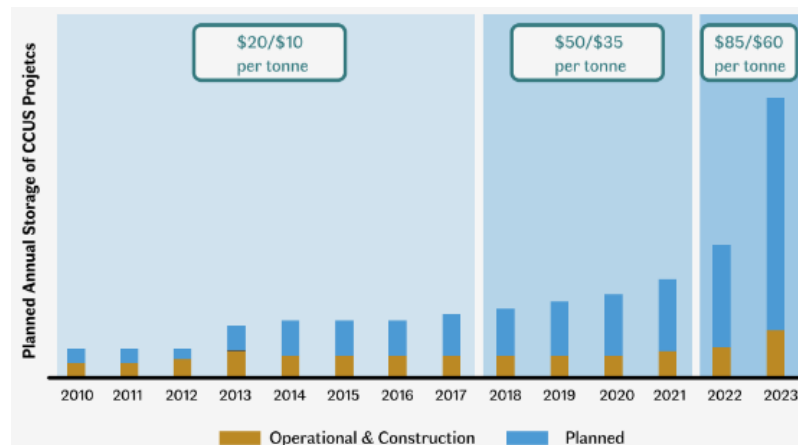
Direct Investment and Production Incentives: Case Studies

Case Study: PTC – Section 45Q of the US Inflation Reduction Act (IRA) of 2022

Taxes under 45Q have been available since 2008. However, the value, threshold limitations, and Commerce Construction Date limited widespread commercial deployment.

In 2022, changes provided the needed level of incentives and an actionable time frame for deployment.

Modifications: increase in tax credit value for 1) geologic storage, 2) CO₂ – EOR, 3) direct air capture (DAC); decrease in emissions eligibility thresholds of qualifying projects; and allowing for direct pay while retaining tax credit transferability for liquidity options.



Project Development Based on the Evolution of the Section 45Q Tax Credit
(Adapted from IEA CCUS Projects Tracker 2023)

Case Study: ITC Example - Canada

In November 2023, the Government of Canada and the Province of Alberta announced a CCUS investment tax credit (ITC) program, aimed at incentivizing CCUS project development.

The ITC will be set at 50% for equipment used to capture carbon and 37.5% for equipment used in transporting and storing carbon.

The draft legislation expanded the CCUS ITC to make a portion of enhanced oil recovery projects eligible for CCUS ITCs.

The CCUS ITCs are available from January 1, 2022.



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Loans and Financial Assurances

- Low-interest financial programs offered by governments can also help initiate projects
- Mostly seen in the US rather than in emerging economies
→ **Ex. *The Carbon Dioxide Transportation Infrastructure Finance and Innovation Act (CIFIA)*** within the DOE's Loan Programs Office provides financial support for high-capacity, common-carrier CO₂ transport projects, such as pipelines, rail, shipping, and other transportation methods
- In Asia, there are climate change-relevant funds that support capital investment
→ **Ex. *The ADB's Climate Action Catalyst Fund*** and the Japanese government's ***Japan Fund for the Joint Crediting Mechanism***



Markets for Low-Carbon Products



- Creating a market for lower-carbon products, sold as premium materials, can also accelerate CCUS adoption
- These products such as low-carbon cement, steel, and chemicals could be acquired by both the public and private sector in sizeable quantities



Unintended Consequences

Unintended consequences can create a barrier to project development or result in project cancellations



- Capping credits that discourage or hinder additional CCUS deployment



- Selling carbon credits to an emitter for capture, which may discourage the emitter from making other investments in technologies that would limit its total emissions



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External Drivers

Carbon Taxes Overseas

- ❖ In 2023, the EU adopted the ***Carbon Border Adjustment Mechanism (CBAM)***
- ❖ The primary objective is to reduce the likelihood of carbon emissions by imposing a tax based on the carbon intensity to certain imports onto products imported to the EU from jurisdictions without a carbon tax

Carbon Accounting/Disclosure/Reporting

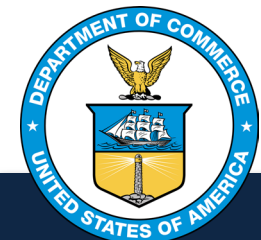
- ❖ Increasing pressure for corporations to be transparent in their disclosure and reporting of GHG emissions
- ❖ The ***International Sustainability Standards Board*** is developing sustainability-related disclosure standards
- ❖ This trend is increasing in Western economies, but international companies operating in emerging economies are asked to make a clear accounting of the emissions intensity of all products they plan to import

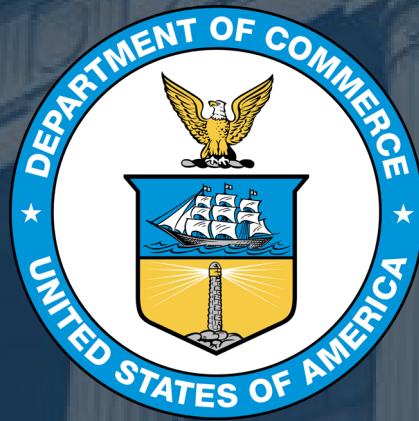
Carbon Markets

- ❖ To support the integrity of a carbon market, it is critical to 1) set a conservative baseline, 2) measure the reduction to that baseline, 3) make permanent, and 4) not double-count the activity

Incentives and Revenues for States

- ❖ Countries can potentially offset costs by embedding cost recovery mechanisms into CCUS frameworks, such as implementing a licensing fee, compliance fees, and injection tariffs





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