CCUS AND HYDROGEN IN NORTH AMERICA

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GLOBAL CCS OVERVIEW





IN OPERATION AND ADVANCED DEVELOPMENT



Source: Global Status of CCS 2021 Report, GCCSI.



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NORTH AMERICA

United States

- CCS networks, large CCS projects, onshore and offshore hubs developing
- Houston and Gulf Coast, Northern Plains, Midwest, Appalachia, and California
- Blue hydrogen projects and DAC projects
- IIJA CCS project and infrastructure funding, US DOE FECM Strategy, and WH CEQ Guidance
- Inflation Reduction Act 45Q enhancements

Canada

- Multiple CCS networks and large CCS projects
- Alberta and Saskatchewan CCS support
- Carbon price, proposed Federal CCS ITC credit

Modified from Global Status of CCS 2021 Report, GCCSI



18 commercial projects operating or in construction

74+ commercial projects in development (not including announced projects)



CANADA

Notable Projects

Shell Quest CCS Project (Blue hydrogen production and bitumen upgrader)Alberta Carbon Trunk Line (CCUS Hub)SaskPower Boundary Dam (CO2 capture at coal-fired power plant)

Challenges

Economics Backlash against oil sands/EOR

Strengths

Strong government support Vast geologic prospects for CO2 storage





UNITED STATES – POLICY DEVELOPMENTS

- Infrastructure Investment and Jobs Act (Bipartisan Infrastructure Law)
- Inflation Reduction Act Enhancements to Section 45Q of the IRS Code
- SEC's Enhancement and Standardization of Climate-Related Disclosures
- White House Council on Environmental Quality Guidance
- US Department of Energy FECM Strategy
- Department of Interior's Bureau of Ocean and Energy Management Offshore Carbon Sequestration Regulations Development



INFRASTRUCTURE INVESTMENT AND JOBS ACT OF 2021

\$12 billion in new carbon management funding over five years

Carbon Capture Capture and Pipelines

Carbon Capture Technology Program – Carbon Dioxide Pipeline FEEDs: \$100 million CO2 Infrastructure Finance and Innovation Act (CIFIA): \$2.1 billion Carbon Capture and Storage Demonstration: \$2.5 billion Carbon Capture Pilots: \$1billion

Carbon Dioxide Utilization and Storage

Carbon Storage Validation and Testing: \$2.5 billion Carbon Utilization Program: \$310 million

Carbon Dioxide Removal through Direct Air Capture Regional Direct Air Capture Hubs: \$3.5 billion DAC Technology Prize Competition: \$115 million





INFLATION REDUCTION ACT – CCS PROVISIONS

- **Increased credit values** wage and apprenticeship requirements •
- **Lower volume thresholds** industrial facilities from 100,000 tpa to 12,500 tpa ullet
- **Direct pay option** first five years ullet
- Later start of construction deadline from 2026 to 2033 •
- **Expanded transferability** •

Carbon capture tax credit (\$/tonne)	Current 45Q	45Q under IRA	
		Point Source	Direct Air Capture
Geological Storage	\$50	\$85	\$180
Enhanced-oil-Recovery	\$35	\$60	\$130
Other Utilization	\$35	\$60	\$130





INFLATION REDUCTION ACT – IMPACT



ZERO LAB



EVOLVED ENERGY RESEARCH

Incentives for carbon capture, storage, and use in the Inflation Reduction Act would build on demonstration funding in the Bipartisan Infrastructure Law to make carbon capture a viable economic option for the most heavily emitting industries, such as steel, cement, and refineries, as well as power generation from coal and natural gas.

The total volume of CO₂ captured for transport and geologic storage across energy and industry could reach 200 million tons per year by 2030, if sufficient investment in transport networks and storage basins can be deployed.1

That includes roughly 110 million tons across industries and 90 million tons in power generation.² Modeled results include 6 gigawatts of carbon capture retrofits at existing coal-fired power plants and 18 gigawatts of gas power plants with carbon capture installed by 2030.

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WHAT'S NEEDED – GOVERNMENT SUPPORT

- Provide sustained support for R&D for new technologies
- Define the role of CCS in meeting national emissions reduction targets and communicate this to industry and the public
- Create a long-term, high value on the storage of CO_2
- Support the identification and appraisal of geological storage resources
- Ensure emissions abatement policies are inclusive of all options (including CCS)
- Develop specific CCS laws and regulations
- Identify opportunities for CCS networks and facilitate their establishment
- Provide capital grants, low-cost finance and/or guarantees to reduce the cost of capital for CCS investments





MOVING CCS FORWARD

- CCS has a critical role in achieving net zero emissions
- The scale of CCS needs to grow around 100x by 2050
- Lots of progress on many elements of CCS, from capture costs to access to CO₂ infrastructure
- Intensifying climate regulation helping the business case for many CCS opportunities
- Continued deployment of CCS projects and networks will reduce costs – along with intensifying CO₂ regulation – should improve economics



Source: CCS Image Library, Global CCS Institute



THANK YOU

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