

Carbon Capture And Storage - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts (2024 - 2029)

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Abstracts

The Carbon Capture And Storage Market size is estimated at USD 2.42 billion in 2024, and is expected to reach USD 4.69 billion by 2029, growing at a CAGR of 14.21% during the forecast period (2024-2029).

Key Highlights

The major factors driving the carbon capture and storage market are the emerging demand for CO₂ injection techniques for enhanced oil recovery (EOR) and strict government norms toward GHG emissions.

On the flip side, huge CCS technology implementation costs and increases in shale investments are expected to hinder the market's growth.

Augmenting prominence for bioenergy carbon capture and storage (BECCS) is likely to be an opportunity in the future.

North America is likely to dominate the market, and it is expected to remain in a dominant position over the forecast period, owing to the increasing implementation of technology, mainly in the United States and Canada.

Carbon Capture And Storage Market Trends

Oil and Gas Segment to Dominate the Market

Carbon dioxide stored in deep, onshore, or offshore geological formations uses CCS

technologies for enhanced oil recovery that have been developed in the oil and gas industry.

Carbon dioxide is extensively used in the oil industry for enhanced oil recovery (EOR) from mature oilfields. When carbon dioxide is inserted into an oilfield, it can mix with the crude oil, triggering it to swell and drop its viscosity, helping to maintain or raise the pressure in the reservoir. The combination of these processes permits more crude oil to flow to the production wells.

In other circumstances, the carbon dioxide is not soluble in the oil. Here, the injection of carbon dioxide raises the pressure in the reservoir, helping to sweep the oil toward the production well.

For more than three decades in Texas (United States), carbon dioxide has been used in enhanced oil recovery projects. EOR constitutes over 20% of total oil production, and some fields achieve recoveries of nearly 70%.

Moreover, as part of sustainable development, the oil and gas industry is moving toward carbon capturing and storage technologies.

According to the International Energy Agency (IEA), global energy-related CO₂ emissions from oil and gas grew by 2.5% or 268 million tons (Mt) in 2022, reaching over 11.2 gigatons (Gt).

Methane from energy combustion, leaks, and venting represented another 10%, mostly from onshore oil and gas operations and steam coal production. Methane emissions rose to nearly 135 Mt CH₄ or around 4 Gt CO₂-eq in 2022 despite high natural gas prices that increased the cost-effectiveness of methane abatement technologies.

Therefore, public sector oil and gas companies in India are actively embracing emission-reduction strategies such as Carbon Capture, Utilization, and Storage (CCUS) as India targets net zero by 2070.

North America is Likely to Dominate the Market

North America dominates the global carbon capture and storage market. The growing demand for clean technology, accompanied by the growing use of CO₂ in EOR

practices, is likely to drive the CCS market in countries like the United States and Canada.

Chemical production, hydrogen production, fertilizer production, natural gas processing, and power generation are among the industries in the United States where CO₂ is captured and injected. These facilities capture and inject CO₂ to store it underground in geologic formations or to use it to boost oil production from aging oil fields, a process known as enhanced oil recovery (EOR).

According to the Congressional Budget Office of the federal government of the United States, as of 2023, the country has about 15 operating CCS facilities, with the majority of these located at plants that process natural gas or produce ethanol for fuel or ammonia for fertilizer.

These 15 facilities can capture about 22 million metric tons of CO₂ per year, which is about 0.4% of the total annual CO₂ emissions in the United States. Furthermore, the country has about 121 under-construction or being-developed CCS facilities with a combined capacity of 134 million tons of CO₂ per year.

According to IEA, in 2023, out of the operational 22 million metric tons of CO₂ per year capacity of CCS, natural gas processing/LNG accounted for the largest share of about 60% of the total capacity and was valued at 13.1 million metric tons of CO₂ per year, followed by fuel transformation with a share of about 18% and capacity of 3.9 million metric tons of CO₂ per year.

Under the Infrastructure Investments and Jobs Act (IIJA), the US government allocated USD 12.1 billion for carbon management technologies, of which USD 2.54 billion is appropriated for carbon capture and storage (CCS) demonstration projects from 2022 to 2025.

As Canada has a rich supply of coal, oil reserves, and natural gas, CanmetENERGY, Canada's leading research and technology organization in the field of clean energy, is finding ways to minimize the environmental impact of fossil fuel combustion technologies, which currently comprise a substantial portion of the Canadian energy supply. One of the options is carbon capture and storage (CCS).

Canada has agreed to reduce emissions by 30% below 2005 levels by 2030, or approximately 200 million tonnes of carbon dioxide per year, under the UN Framework Convention on Climate Change. The combined capacity of the four major CCS projects

in Canada (two operational and two in development) will be up to 6.4 Mtpa, representing 3% of the reduction needed to meet the 2030 target.

Carbon Capture And Storage Industry Overview

The carbon capture and storage market is consolidated in nature. The major players in the market (not in a particular order) include Occidental Petroleum Corporation, Exxon Mobil Corporation, Dakota Gasification Company, Shell PLC, and Air Liquide, among others.

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