

CCUS Absorption Market Forecasts to 2032 – Global Analysis By Absorption Mechanism (Chemical Absorption and Physical Absorption), CO₂ Source (Stationary Industrial Sources, Fossil Fuel Power Plants, Biomass Combustion and Mobile Emissions), Deployment Stage, Economic Tier, Environmental Impact, Technology Type, Application, End User and By Geography

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Abstracts

According to Statistics MRC, the Global CCUS Absorption Market is accounted for \$0.71 billion in 2025 and is expected to reach \$3.21 billion by 2032 growing at a CAGR of 24.1% during the forecast period. Carbon Capture, Utilization, and Storage (CCUS) Absorption is a crucial step in reducing emissions of industrial carbon dioxide (CO₂). In order to selectively extract CO₂ from flue gases or industrial exhaust streams, chemical or physical solvents are used. In chemical absorption, CO₂ and solvents like amines combine to form a compound that can be heated to release concentrated CO₂ for use or storage. Physical absorption depends on CO₂'s ability to dissolve in high-pressure liquids. Following capture, the CO₂ can be moved for geological formation storage or utilized for processes like chemical synthesis or enhanced oil recovery. Reducing the environmental impact of using fossil fuels and promoting global climate goals depend on efficient absorption.

According to the NITI Aayog's 2023 CCUS Policy Framework Report, India has a cumulative CO₂ storage potential of 400–500 gigatonnes, and CCUS technologies—particularly absorption-based systems—are critical for decarbonizing hard-to-abate sectors like steel, cement, and refining.

Market Dynamics:

Driver:

Increasing carbon emissions worldwide

Global carbon emissions have increased at an unprecedented rate due to rapid industrialization, urbanization, and reliance on fossil fuels. Concerns about climate change are heightened by the significant contributions of manufacturing, transportation, and power plants to the buildup of greenhouse gases. By directly absorbing CO₂ from flue gases or industrial exhaust streams, CCUS absorption technologies are essential in reducing these emissions. These systems enable industries to continue operating while supporting environmental sustainability goals by keeping significant amounts of carbon from entering the atmosphere. Additionally, global adoption of absorption-based CCUS solutions is accelerating due to growing awareness of the effects of climate change and social pressure for cleaner industrial practices.

Restraint:

High operating and capital expenses

The significant capital expenditure needed for infrastructure and installation is one of the main barriers to the adoption of CCUS absorption. Advanced machinery, chemical solvents, and auxiliary facilities are required for absorption-based systems, and these can be prohibitively expensive for small and medium-sized businesses. The financial burden is further increased by operational expenses, such as energy use for solvent regeneration and system upkeep. Cost-effectiveness is also impacted by changes in energy prices. Furthermore, adoption is slowed down by high initial and continuing costs, particularly in areas with little financial assistance or incentives. Cost and environmental benefits are frequently weighed by industries, and large-scale deployment may be postponed or limited in the absence of economic support.

Opportunity:

Increasing attention to carbon neutrality worldwide

There is a huge opportunity for CCUS absorption technologies as nations commit to net-zero targets and more stringent carbon reduction goals. There is a growing need for

effective carbon capture solutions as industries worldwide are being pressured to decarbonize their operations. To meet environmental goals, the chemical, steel, cement, and power generation industries are actively looking for scalable absorption-based systems. In addition to meeting regulations, businesses that invest in CCUS can improve their market standing, draw in eco-aware investors, and gain a competitive edge. The global push for climate commitments and sustainability offers absorption technologies a long-term growth path.

Threat:

Energy-intensive activities and issues with efficiency

Energy-intensive absorption-based CCUS systems need a lot of power to operate, regenerate solvents, and compress CO₂. If the energy is derived from fossil fuels, this increased energy demand may partially offset environmental benefits and increase operating costs and overall plant efficiency. This energy intensity is a significant obstacle in areas with expensive electricity or little access to renewable energy. Industries might put off adoption or favor different approaches to reducing carbon emissions. Moreover, this operational challenge continues to be a persistent threat to large-scale market expansion in the absence of advancements in energy-efficient absorption processes or integration with renewable energy.

Covid-19 Impact:

There were conflicting effects of the COVID-19 pandemic on the market for CCUS absorption. On the one hand, the demand for new carbon capture projects was slowed immediately by the temporary drop in CO₂ emissions caused by worldwide lockdowns and decreased industrial activity. Further impeding planned and ongoing CCUS installations were labor shortages, supply chain disruptions, and delays in construction and equipment delivery. However, the pandemic forced governments and businesses to prioritize low-carbon technologies and green recovery programs, which allowed absorption-based CCUS to grow over the long run. Overall, even though short-term market activity slowed, the pandemic reaffirmed how strategically important carbon capture is to reaching sustainability and climate goals.

The commercial operations segment is expected to be the largest during the forecast period

The commercial operations segment is expected to account for the largest market share

during the forecast period, driven by the installation of large-scale, fully functional carbon capture facilities in a variety of sectors, such as chemical manufacturing, cement, steel, and power generation. These projects show off tested technologies that can absorb large amounts of CO₂, which has advantages for the environment and the economy. Large-scale absorption projects are made financially feasible by the segment's advantages, which include government incentives, regulatory compliance requirements, and corporate sustainability commitments. Moreover, the expansion and domination of commercial operations in the CCUS absorption landscape are further enhanced by ongoing advancements in solvent technology, process efficiency, and integration with CO₂ utilization.

The cement & construction segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the cement & construction segment is predicted to witness the highest growth rate. The energy-intensive production of clinker, an essential ingredient in the making of cement, is the cause of this industry's high carbon emissions. The need for sustainable solutions has grown urgently due to rising demand, especially in the Global South. Emerging innovations include alternative fuels, AI-driven production optimization, and low-carbon concrete. With the help of private initiatives and regulatory frameworks, CCUS technologies are gaining traction despite their high costs. The industry's dedication to decarbonization is demonstrated by initiatives such as Heidelberg's CCS facility in Norway.

Region with largest share:

During the forecast period, the North America region is expected to hold the largest market share. The region's strong industrial base, especially in the manufacturing, power generation, and oil and gas industries—all of which are major CO₂ emitters—is what propels this dominance. With more than 35 years of experience with CCUS technologies, the US has been at the forefront in particular. Adoption of CCUS solutions has been further encouraged by government programs like the 45Q tax credits. Moreover, major corporations like Honeywell, Fluor, and ExxonMobil are also actively working to advance CCUS technologies in the area.

Region with highest CAGR:

Over the forecast period, the Asia Pacific region is anticipated to exhibit the highest CAGR. Rapid industrialization in nations like China and India, which rank among the top

emitters of CO₂ worldwide, is the main driver of this growth. China, in particular, has pledged to become carbon neutral by 2060, which calls for large-scale emission reductions using CCUS technologies. Additionally, APAC is positioned as a major player in the global CCUS absorption market due to the region's growing need for sustainable energy solutions, as well as investments in CCUS infrastructure and encouraging government policies.

Key players in the market

Some of the key players in CCUS Absorption Market include Aker Solutions, Fluor Corporation, Mitsubishi Heavy Industries, Shell, Linde plc, Honeywell UOP, ExxonMobil Corporation, Chevron, Schlumberger (SLB), BASF SE, Equinor ASA, TotalEnergies SE, JGC Holdings Corporation, Siemens AG, Hitachi Ltd. and TechnipFMC.

Key Developments:

In August 2025, Fluor and JGC win FEED contract for LNG Canada expansion. A joint venture between US-based Fluor Corporation and Japan's JGC Holdings Corporation has been awarded the Front-End Engineering and Design (FEED) contract for the proposed Phase 2 expansion of the LNG Canada facility, in Kitimat, British Columbia (Canada). The duo, which secured the EPC contract for Phase 1 in 2018, will now update the FEED to support further development.

In June 2025, Cognizant and Aker Solutions have extended their long-lasting partnership, which began in 2016, with a new multi-year agreement. Using the Cognizant Neuro® platform, designed to boost generative AI adoption with flexibility, security, scalability, and responsibility, this agreement aims to transform Aker Solutions' IT service delivery, making it more agile and efficient for the evolving energy sector.

In February 2025, Mitsubishi Heavy Industries, Ltd. (MHI) has concluded a Positive Impact Finance agreement with Meiji Yasuda Life Insurance Company. MHI Group, in response to the growing need to address the global challenge of climate change, in 2020, identified five material issues, including Provide energy solutions to enable a carbon neutral world and Transform society through AI and digitalization, as priority measures to contribute to solving societal issues and ensuring continued growth over the medium to long term.

Absorption Mechanisms Covered:

Chemical Absorption

Physical Absorption

CO₂ Sources Covered:

Stationary Industrial Sources

Fossil Fuel Power Plants

Biomass Combustion

Mobile Emissions

Deployment Stages Covered:

Commercial Operations

Pilot & Demonstration Projects

Research & Development

Retrofitting Projects

Economic Tiers Covered:

High-Capex Projects

Low-Capex Modular Systems

Government-Funded Initiatives

Private Sector Ventures

Environmental Impacts Covered:

Net-Negative Emissions Systems

Carbon-Neutral Systems

Emission Reduction-Only Systems

Technology Types Covered:

Solvent-Based Systems

Solid Sorbents

Membrane Separation

Hybrid Systems

Applications Covered:

Carbon Sequestration

Enhanced Oil Recovery (EOR)

Carbon Capture & Utilization (CCU)

Synthetic Fuels

Building Materials

Chemical Feedstocks

End Users Covered:

Oil & Gas

Power Generation

Cement & Construction

Iron & Steel

Chemical & Petrochemical

Waste Management

Food & Beverages

Regions Covered:

North America

US

Canada

Mexico

Europe

Germany

UK

Italy

France

Spain

Rest of Europe

Asia Pacific

Japan

China

India

Australia

New Zealand

South Korea

Rest of Asia Pacific

South America

Argentina

Brazil

Chile

Rest of South America

Middle East & Africa

Saudi Arabia

UAE

Qatar

South Africa

Rest of Middle East & Africa

What our report offers:

- Market share assessments for the regional and country-level segments
- Strategic recommendations for the new entrants
- Covers Market data for the years 2024, 2025, 2026, 2028, and 2032

- Market Trends (Drivers, Constraints, Opportunities, Threats, Challenges, Investment Opportunities, and recommendations)
- Strategic recommendations in key business segments based on the market estimations
- Competitive landscaping mapping the key common trends
- Company profiling with detailed strategies, financials, and recent developments
- Supply chain trends mapping the latest technological advancements

Free Customization Offerings:

All the customers of this report will be entitled to receive one of the following free customization options:

Company Profiling

Comprehensive profiling of additional market players (up to 3)

SWOT Analysis of key players (up to 3)

Regional Segmentation

Market estimations, Forecasts and CAGR of any prominent country as per the client's interest (Note: Depends on feasibility check)

Competitive Benchmarking

Benchmarking of key players based on product portfolio, geographical presence, and strategic alliances

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Note: Tables for North America, Europe, APAC, South America, and Middle East & Africa Regions are also represented in the same manner as above.

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