

Carbon Capture, Utilization, and Storage Market Assessment, By Stages [Capture, Transport, Utilization, Storage], By Technology [Post-combustion Carbon Capture, Pre-combustion Carbon Capture, Oxy-fuel Combustion Systems], By Capture Routes [Absorption, Membrane, Adsorption, Chemical Looping], By End-user [Power Generation, Oil and Gas, Iron and Steel, Chemicals, Cement, Others], By Region, Opportunities and Forecast, 2017-2031F

<https://marketpublishers.com/r/C513E0CB8B79EN.html>

Date: March 2025

Pages: 258

Price: US\$ 4,500.00 (Single User License)

ID: C513E0CB8B79EN

Abstracts

Global carbon capture, utilization, and storage market size was valued at USD 3,231.63 million in 2023, which is expected to reach USD 8,142.27 million in 2031, with a CAGR of 12.25% for the forecasted period between 2024 and 2031. Carbon capture, utilization, and storage (CCUS) captures carbon dioxide emissions from sources such as coal-fired power plants, chemical factories, refineries, and others. The declining prices associated with carbon capture, utilization, and storage, increasing inauguration of operational CCUS plants, favorable government aid for the adoption of technologies linked with CCUS, and others are some of the prominent aspects driving the market growth at the global level.

Carbon-dioxide is compressed and transported through pipelines, rail, ship, or truck to be deployed in a wide range of end-use industries or injected into deep geological formations, including depleted oil and gas reservoirs or saline aquifers. CCUS can be installed in existing power and industrial plants to ensure the continued operation of facilities. It can tackle emissions in hard-to-abate sectors, including heavy industries such as steel, cement, or chemicals.

Moreover, the surge in the production activities associated with heavy industries, such as iron and steel, oil and gas, power generation, and others, is a major concern for the environment, as CO₂ emission is increasing at a robust rate. Thus, the adoption of CCUS is increasing, thereby amplifying the market growth.

Carbon capture, utilization, and storage technologies help the oil and gas industry reduce its carbon footprint by capturing and storing CO₂ emissions, thereby supporting global decarbonization efforts. In addition, the CCUS technologies play a crucial role in enabling the oil and gas industry to transition towards a more sustainable, low-carbon, and efficient future, while ensuring a secure energy supply.

For instance, according to the recent data published by the Global CCS Institute, in 2023 about 17 carbon capture units were attached to the oil and gas manufacturing facilities were operational. Thus, increasing the operation of carbon capture plants linked with oil and gas refineries is a key trend boosting the revenue growth of the carbon capture, utilization, and storage market at the global level.

Strengthened Climate Commitments to Drive CCUS Market

Climate conditions are being monitored strictly to drive the CCUS business, since it is estimated that a significant deployment of carbon capture will cost 2 to 4 times as compared to the existing oil sector, with the potential for an even greater carbon removal industry. It is because total CO₂ emissions must be lowered to zero to stabilize the global climate. However, while reducing emissions is vital, fossil fuels are likely to remain a key energy source over the next decades. Meeting the targets adequately will most certainly involve the continued use of fossil fuels in conjunction with carbon capture.

For instance, the Net Zero Industry Act, which aims to create a framework of regulations to support Europe's net-zero technology product manufacturing ecosystem, was introduced by the European Commission in March 2023. The ultimate objective is to set Europe for success so that, by 2031, at least 40% of its clean energy technology needs will be produced domestically. According to the Act, increasing manufacturing capacity for eight strategic net-zero technologies is essential to achieving the EU's climate goals, including CCUS. It in turn, is anticipated to propel the market growth at present as well as over the years to come.

Rising Investments in Oil and Gas Sector to Strengthen CCUS Market Growth

Investments in oil and gas sector are driving the market, owing to the industry's financial strength, which boosts expectations for emissions reductions, increasing investments in low-carbon energy sources, and stronger shareholder returns. The financial stability encourages businesses to focus on emission reduction and economic success, which shapes their capital allocation choices. As per the International Energy Agency (IEA), the oil and gas industry has made significant investments in carbon capture, utilization, and storage (CCUS) facilities.

Furthermore, The EU Innovation Fund announced that it will assist CCUS initiatives to demonstrate breakthrough low-carbon technology in Europe. The fund is supported by income from the Emissions Trading System (ETS), which is worth EUR 10 billion at current CO₂ prices (European Commission, 2020). Norway is sponsoring the construction of the Longship full-chain carbon capture and utilization system, which includes CO₂ capture at a cement mill and a waste-to-energy facility. CO₂ is then stored in the Northern Lights, a large facility in the North Sea being created by a consortium of oil and gas corporations.

Similarly, a significant number of new investment plans have been sparked in the United States by the extension of 45Q tax credit, combined with complementary laws such as the California Low Carbon Fuel Standard (LCFS). The government of the United Kingdom reaffirmed in March 2020 that it would invest USD 995 million in CCUS infrastructure. It included installing CCUS in two industrial locations and outfitting a gas-fired power plant with additional CCUS. In July 2022, it declared that it would spend USD 178 million to reduce emissions from heavy industry, which included using CCUS.

North America Takes the Lead in CCUS Market

North America has emerged as a leader in global CCUS market due to several factors. The region's extensive industrial infrastructure, abundant natural resources, and commitment to reducing carbon emissions contribute to its prominence. Additionally, supportive government policies, research initiatives, and investments in CCUS technologies boost its market position. Moreover, the recognition of CCUS as a key solution for mitigating climate change and meeting emission reduction goals further propels North America's leadership in spearheading the development and implementation of these crucial technologies.

For instance, according to the International Energy Agency (IEA), approximately 80 carbon capture projects aim to be operational by 2031. IEA data indicates that the

United States may experience a fivefold increase in CO₂ capture capacity, reaching over 100 MT annually since 2023. Meanwhile, Canada is advancing at a rapid pace with around 15 carbon capture projects which are currently in different stages of development.

Moreover, according to Global CCS Institute, around 50 new carbon capture plants will begin operations in North American nations such as the United States and Canada by the end of 2024. Furthermore, in 2023, the Canadian government announced several incentives and support measures for CCUS projects, including the Alberta Carbon Capture Incentive Program (ACCIP), which provides grant funding of up to 12% of a project's eligible capital costs for carbon capture, utilization, and storage. Furthermore, the United States has pledged to reach net-zero emissions by 2050. The commitment calls for a 65% decrease in emissions by 2030. The net-zero aim applies to all greenhouse gas emissions and makes clear assumptions about CO₂ removal using land-based and technology-based solutions.

Future Market Scenario (2024 – 2031F)

By 2040, the CCUS market is expected to continue to develop rapidly, with dynamic growth prospects expected across various geographical locations. The market will play an important part in global decarbonization effort, providing prospects for development and innovation.

The market is likely to expand in the future for inculcating more applications in difficult-to-abate industries such as cement manufacturing, coal-fired power plants, iron and steel, fertilizers, and chemical production via retrofitting existing plants. Furthermore, emission technologies such as Bioenergy CCS (BECCS) & Direct Air CCS (DACCS) are anticipated to be used for long-term decarbonization efforts.

CCUS hubs are expected to play a key role in integrating industrial clusters into the ecosystem while lowering costs and operating hazards. Cost reduction, technological optimization, modularization, and new business models will be significant opportunistic areas of market development in the years to come.

Key Players Landscape and Outlook

The global CCUS market is experiencing swift progress as major corporations increase

their investments in the CCS projects. These companies are dedicating significant resources to enhance their market presence and boost profitability. Through active participation in collaborations, acquisitions, and partnerships, these enterprises are reshaping the industry's landscape and expediting the overall growth of the market.

In February 2024, Aker Solutions and Aker Carbon Capture secured a Front-End Engineering Design (FEED) contract from Celsio for carbon capture at the Klemetsrud waste-to-energy facility. Aker Solutions, with its expanding expertise in the entire Carbon Capture and Storage (CCS) value chain, is committed to supporting customers in their decarbonization efforts.

In October 2023, MHI Group initiated a demonstration testing of a CO₂ liquefaction system as a strategic move to enhance the proficiency of CCUS research. This testing endeavor comprises the collecting of CO₂ from gas engine generating sets at the MHIET's Sagamihara Plant in Japan, which is then liquefied using MHI-AC&R's specialist CO₂ liquefaction equipment. The major purpose of this initiative is to develop expertise in managing liquefied CO₂ and to provide a complete customer support structure that covers the full process ranging from CO₂ capture to liquefaction.

Shell PLC, The Big Market Giant

Shell, a global energy company, leads the way in sustainable practices, aiming to become a net-zero emissions energy business by 2050. Shell leverages digital technologies and artificial intelligence by embracing innovation to drive faster advancements in materials crucial for the energy transition, spanning from batteries to carbon capture and lower-carbon fuels. The company actively contributes to biomethane growth and explores opportunities in renewable natural gas production. Committed to empowering people, Shell values diversity, including those with disabilities. Shell invests in decarbonization strategies, depicted by its ongoing efforts in repurposing the German Energy and Chemicals Park Rheinland as part of its climate targets. Shell pioneers' solutions focus on progress and cleaner energy choices for a sustainable future.

Shell is actively addressing the challenges of carbon capture, utilization, and storage market, while strategically focusing on cleaner energy solutions. The company has set forth ambitious goals, striving to transform into a net-zero emissions energy business by 2050. Shell's key market focus in the CCUS domain includes advancements in digital transformation, natural gas utilization, and deep-water technologies. Shell actively contributes to decarbonizing industries and meeting the growing energy demands

sustainably by leveraging leading science, engineering, and digital expertise. The company plays a pivotal role in developing and implementing technologies for carbon capture and storage, thus reducing emissions, and fostering innovation across the entire energy landscape. The company has undertaken notable ventures such as offshore wind farms in the Netherlands, renewable energy projects in Australia, and hydrogen electrolyzer operations in China.

Contents

1. RESEARCH METHODOLOGY

2. PROJECT SCOPE & DEFINITIONS

3. IMPACT OF COVID-19 ON GLOBAL CARBON CAPTURE, UTILIZATION, AND STORAGE MARKET

4. EXECUTIVE SUMMARY

5. VOICE OF CUSTOMER

5.1. Product and Market Intelligence

5.2. Factors Considered in Purchase Decisions

5.2.1. Characteristics of Solutions

5.2.2. Carbon Capture Facility

5.2.3. Technology

5.2.4. Process

5.3. Consideration of Safety Regulations

6. GLOBAL CARBON CAPTURE, UTILIZATION, AND STORAGE MARKET OUTLOOK, 2017-2031F

6.1. Market Size & Forecast

6.1.1. By Value

6.1.2. By Volume

6.2. By Stages

6.2.1. Capture

6.2.2. Transport

6.2.3. Utilization

6.2.4. Storage

6.3. By Technology

6.3.1. Pre-combustion carbon capture

6.3.2. Post-combustion carbon capture

6.3.3. Oxy-fuel combustion systems

6.4. By Capture Routes

6.4.1. Absorption

6.4.2. Membrane

- 6.4.3. Adsorption
- 6.4.4. Chemical Looping
- 6.5. By End-User
 - 6.5.1. Power Generation
 - 6.5.2. Oil and Gas
 - 6.5.3. Iron and Steel
 - 6.5.4. Chemicals
 - 6.5.5. Cement
 - 6.5.6. Others
- 6.6. By Region
 - 6.6.1. North America
 - 6.6.2. Asia-Pacific
 - 6.6.3. Europe
 - 6.6.4. South America
 - 6.6.5. Middle East and Africa
- 6.7. By Company Market Share, 2023

7. GLOBAL CARBON CAPTURE, UTILIZATION, AND STORAGE MARKET OUTLOOK, BY REGION, 2017-2031F

- 7.1. North America*
 - 7.1.1. Market Size & Forecast
 - 7.1.1.1. By Value
 - 7.1.1.2. By Volume
 - 7.1.2. By Stages
 - 7.1.2.1. Capture
 - 7.1.2.2. Transport
 - 7.1.2.3. Utilization
 - 7.1.2.4. Storage
 - 7.1.3. By Technology
 - 7.1.3.1. Pre-combustion carbon capture
 - 7.1.3.2. Post-combustion carbon capture
 - 7.1.3.3. Oxy-fuel combustion systems
 - 7.1.4. By Capture Routes
 - 7.1.4.1. Absorption
 - 7.1.4.2. Membrane
 - 7.1.4.3. Adsorption
 - 7.1.4.4. Chemical Looping
 - 7.1.5. By End-User

7.1.5.1. Power Generation

7.1.5.2. Oil and Gas

7.1.5.3. Iron and Steel

7.1.5.4. Chemicals

7.1.5.5. Cement

7.1.5.6. Others

7.1.6. United States*

7.1.6.1. Market Size & Forecast

7.1.6.1.1. By Value

7.1.6.1.2. By Volume

7.1.6.2. By Stages

7.1.6.2.1. Capture

7.1.6.2.2. Transport

7.1.6.2.3. Utilization

7.1.6.2.4. Storage

7.1.6.3. By Technology

7.1.6.3.1. Pre-combustion carbon capture

7.1.6.3.2. Post-combustion carbon capture

7.1.6.3.3. Oxy-fuel combustion systems

7.1.6.4. By Capture Routes

7.1.6.4.1. Absorption

7.1.6.4.2. Membrane

7.1.6.4.3. Adsorption

7.1.6.4.4. Chemical Looping

7.1.6.5. By End-user

7.1.6.5.1. Power Generation

7.1.6.5.2. Oil and Gas

7.1.6.5.3. Iron and Steel

7.1.6.5.4. Chemicals

7.1.6.5.5. Cement

7.1.6.5.6. Others

7.1.7. Canada

*All segments will be provided for all regions and countries covered

7.2. Europe

7.2.1. Germany

7.2.2. France

7.2.3. United Kingdom

7.2.4. Italy

7.2.5. Russia

- 7.2.6. Netherlands
- 7.2.7. Denmark
- 7.2.8. Norway
- 7.2.9. Belgium
- 7.3. South America
 - 7.3.1. Brazil
- 7.4. Asia-Pacific
 - 7.4.1. Indonesia
 - 7.4.2. China
 - 7.4.3. Japan
 - 7.4.4. Australia
 - 7.4.5. South Korea
- 7.5. Middle East and Africa
 - 7.5.1. Saudi Arabia
 - 7.5.2. United Arab Emirates (UAE)
 - 7.5.3. Qatar

8. MARKET MAPPING, 2023

- 8.1. By Stages
- 8.2. By Technology
- 8.3. By Capture Routes
- 8.4. By End User Industry
- 8.5. By Region

9. MACRO ENVIRONMENT AND INDUSTRY STRUCTURE

- 9.1. Supply Demand Analysis
- 9.2. Import Export Analysis
- 9.3. Value Chain Analysis
- 9.4. PESTEL Analysis
 - 9.4.1. Political Factors
 - 9.4.2. Economic System
 - 9.4.3. Social Implications
 - 9.4.4. Technological Advancements
 - 9.4.5. Environmental Impacts
 - 9.4.6. Legal Compliances and Regulatory Policies (Statutory Bodies Included)
- 9.5. Porter's Five Forces Analysis
 - 9.5.1. Supplier Power

- 9.5.2. Buyer Power
- 9.5.3. Substitution Threat
- 9.5.4. Threat from New Entrant
- 9.5.5. Competitive Rivalry

10. MARKET DYNAMICS

- 10.1. Growth Drivers
- 10.2. Growth Inhibitors (Challenges and Restraints)

11. KEY PLAYERS LANDSCAPE

- 11.1. Competition Matrix of Top Five Market Leaders
- 11.2. Market Revenue Analysis of Top Five Market Leaders (in %, 2023)
- 11.3. Mergers and Acquisitions/Joint Ventures
- 11.4. SWOT Analysis (For Five Market Players)

12. PRICING ANALYSIS

13. CASE STUDIES

14. KEY PLAYERS OUTLOOK

- 14.1. Mitsubishi Heavy Industries Ltd
 - 14.1.1. Company Details
 - 14.1.2. Key Management Personnel
 - 14.1.3. Products & Services
 - 14.1.4. Financials (As reported)
 - 14.1.5. Key Market Focus & Geographical Presence
 - 14.1.6. Recent Developments
- 14.2. Exxon Mobil Corporation
- 14.3. Honeywell International Inc.
- 14.4. Aker Solutions
- 14.5. JGC Holdings Corporation
- 14.6. Shell PLC
- 14.7. Halliburton Energy Services, Inc.
- 14.8. Linde PLC
- 14.9. Fluor Corporation
- 14.10. Schlumberger Limited

*Companies mentioned above DO NOT hold any order as per market share and can be changed as per information available during research work.

15. STRATEGIC RECOMMENDATIONS

16. ABOUT US & DISCLAIMER

I would like to order

Product name: Carbon Capture, Utilization, and Storage Market Assessment, By Stages [Capture, Transport, Utilization, Storage], By Technology [Post-combustion Carbon Capture, Pre-combustion Carbon Capture, Oxy-fuel Combustion Systems], By Capture Routes [Absorption, Membrane, Adsorption, Chemical Looping], By End-user [Power Generation, Oil and Gas, Iron and Steel, Chemicals, Cement, Others], By Region, Opportunities and Forecast, 2017-2031F

Product link: <https://marketpublishers.com/r/C513E0CB8B79EN.html>

Price: US\$ 4,500.00 (Single User License / Electronic Delivery)

If you want to order Corporate License or Hard Copy, please, contact our Customer Service:

info@marketpublishers.com

Payment

To pay by Credit Card (Visa, MasterCard, American Express, PayPal), please, click button on product page <https://marketpublishers.com/r/C513E0CB8B79EN.html>