

Direct Air Capture Market to Reach USD 120,811M by 2034, Growing at 61.4% CAGR with forecast period from 2025 to 2034

Direct Air Capture Market size is expected to be worth around USD 1,20,811 Mn by 2034, USD 1,007 Mn in 2024, growing at a CAGR of 61.4% forecast 2025 to 2034

NEW YORK, NY, UNITED STATES, January 27, 2025 /EINPresswire.com/ -- Report Overview

Direct Air Capture (DAC) is a technology that involves capturing carbon dioxide (CO₂) directly from the ambient air.

The technology employs chemical solutions or solid sorbents to absorb CO₂, which is then released in a concentrated stream for utilization or permanent storage underground. DAC is considered a vital climate mitigation technology, aiming to reduce greenhouse gases in the atmosphere and combat global warming.

“

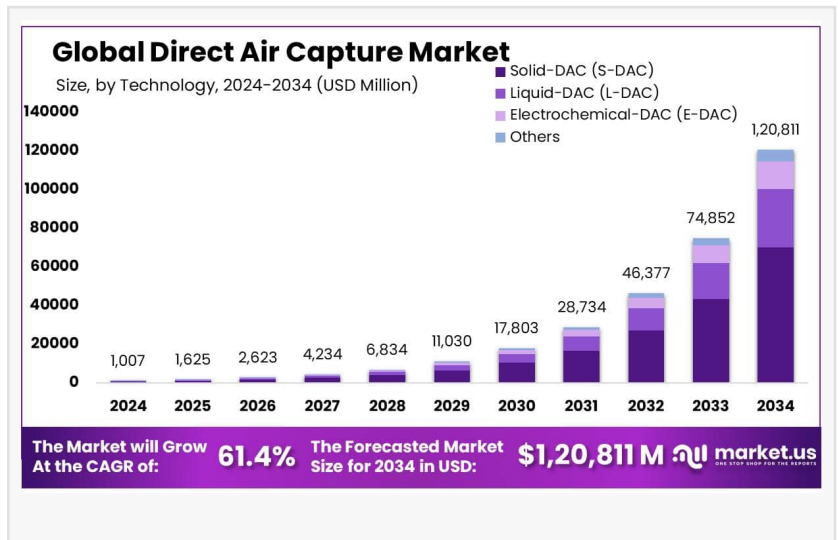
In 2024, North America dominated the Direct Air Capture (DAC) market, accounting for 48.30% of the global share, valued at approximately \$486.3 million.”

Tajammul Pangarkar

technologies.

The Direct Air Capture market refers to the industry surrounding the technologies and services associated with DAC systems' design, manufacturing, and operation. This market includes a range of stakeholders, including technology developers, engineering firms, end-users in the energy and manufacturing sectors, and government bodies. It is driven by the need for innovative solutions to reduce atmospheric CO₂ and supported by investments, regulatory frameworks, and advancements in related

The growth of the Direct Air Capture market is primarily fueled by the increasing global urgency to address climate change and meet net-zero emissions targets. Technological advancements that improve the efficiency and reduce the costs of CO₂ capture are also critical. Additionally, the



integration of DAC with renewable energy sources enhances its viability and scalability, contributing further to its growth.

Demand for Direct Air Capture technology is rising sharply as nations and corporations commit to ambitious climate goals. Industries with hard-to-abate emissions, such as cement, steel, and chemicals, are particularly interested in DAC as a method to reduce their carbon footprint. Furthermore, the potential to create marketable byproducts from captured CO₂, such as synthetic fuels and building materials, also stimulates demand.

The DAC market presents numerous opportunities, especially in regions with supportive regulatory environments and financial incentives for carbon capture and storage.

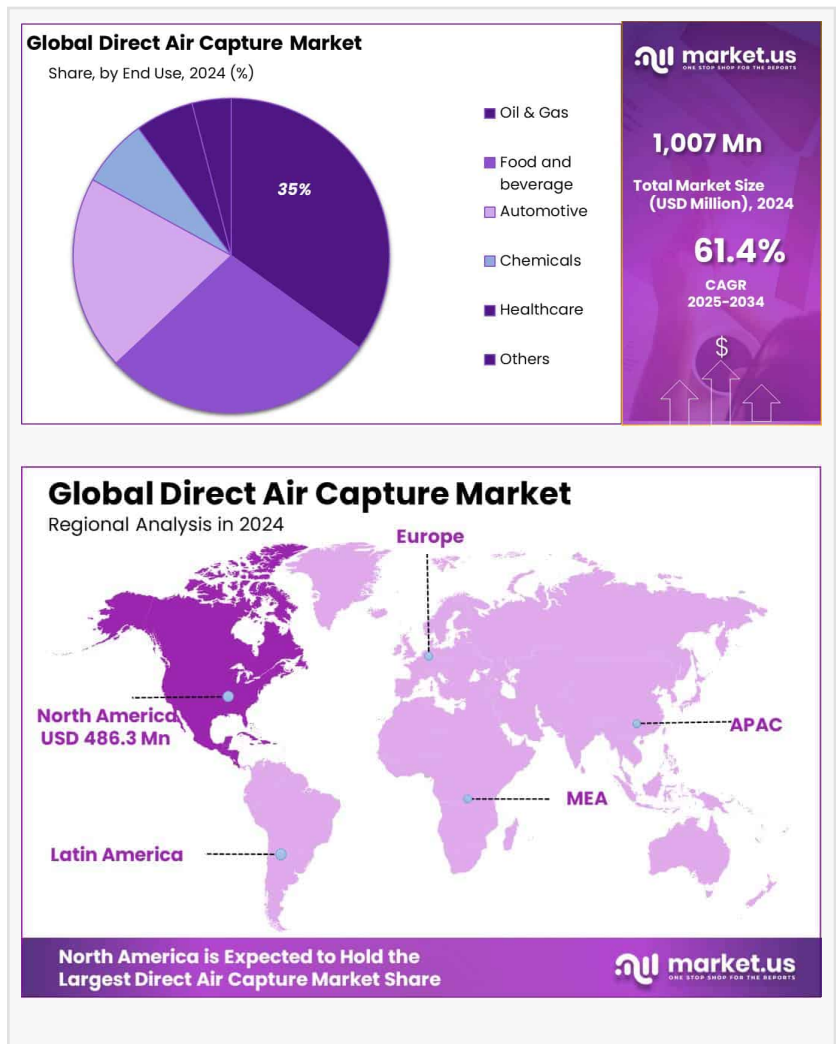
Innovations in DAC technology, such as improvements in energy efficiency and cost reductions, open up new applications in various sectors. The growing voluntary carbon markets and corporate sustainability commitments provide additional opportunities for market expansion.

Key driving factors for the Direct Air Capture market include governmental policies and financial incentives that encourage carbon capture initiatives. The development of carbon pricing mechanisms and subsidies directly influences the economic feasibility of DAC projects. Public and private investments in research and development are crucial for advancing DAC technologies, making them more accessible and effective at a larger scale.

Get a Sample PDF Report: <https://market.us/report/direct-air-capture-market/request-sample/>

Key Takeaway

- Direct Air Capture Market size is expected to be worth around USD 1,20,811 Million by 2034, from USD 1,007 Million in 2024, growing at a CAGR of 61.4%
- Solid-DAC (S-DAC) held a dominant market position, capturing more than a 58.30% share



- Electricity held a dominant market position in the Direct Air Capture (DAC) sector, capturing more than a 68.30% share.
- less than 10 collectors held a dominant market position in the Direct Air Capture (DAC) market, capturing more than a 46.40% share.
- Carbon Capture and Storage (CCS) held a dominant market position, capturing more than an 82.10% share.
- Oil & Gas sector held a dominant market position in the Direct Air Capture (DAC) market, capturing more than a 34.50% share.
- North America dominated the Direct Air Capture (DAC) market, accounting for 48.30% of the global share, valued at approximately \$486.3 million.
- In 2024, the U.S. government announced a \$3.5 billion investment in DAC projects through the Inflation Reduction Act.

Direct Air Capture Market Segment Analysis

By Technology Analysis

In 2024, Solid-DAC dominated the Direct Air Capture market with a 58.30% share, leveraging solid sorbents for efficient, low-energy CO₂ capture. Liquid-DAC, though smaller in market share, offers scalability and potential for integration with existing facilities. Electrochemical-DAC, still developing, stands out for its low energy use and compatibility with renewable energy, showing significant growth potential, particularly in regions with high renewable energy adoption. These technologies are driven by the increasing focus on reducing carbon footprints and supportive regulatory frameworks.

By Source Analysis

In 2024, electricity led the Direct Air Capture (DAC) sector with a 68.30% market share, benefiting from the widespread availability and affordability of renewable energy, which supports the practicality and sustainability of electric DAC systems. These systems use electricity to power CO₂ capture and release processes, aligning with the global shift towards renewable energy, which reduces costs and increases environmental appeal. Although heat has a smaller market share in 2025, it remains crucial for DAC technologies that require thermal reactions for sorbent regeneration, utilizing waste heat or integration with industrial processes to enhance energy efficiency and reduce carbon footprints.

By Number of Collectors Analysis

In 2024, DAC systems with fewer than 10 collectors dominated the market, holding a 46.40% share. These smaller-scale systems are favored for their modular expandability, suitability for pilot projects, and lower initial investments, making them popular in sectors seeking to reduce carbon footprints with minimal infrastructural changes. In contrast, systems with more than 10 collectors, while less prevalent in market share, are critical for large-scale carbon capture, often integrated with industrial sites or major renewable projects. The interest and investment in these larger systems are growing in 2025, driven by technological advancements and enhanced financial and regulatory support for extensive carbon management.

By Application Analysis

In 2024, Carbon Capture and Storage (CCS) captured a commanding 82.10% market share, underlining its crucial role in trapping CO₂ emissions and sequestering them in underground geological formations. Its prominence is due to its significant potential to curb the adverse effects of industrial emissions on climate change. The widespread adoption of CCS is fueled by global recognition of the need for large-scale carbon removal strategies to meet climate targets, supported by government policies and incentives that encourage industries to comply with environmental regulations.

By End-Use Industry Analysis

In 2024, the Oil & Gas sector led the DAC market with a 34.50% share, utilizing the technology mainly for CO₂ capture in enhanced oil recovery and underground storage, driven by environmental compliance needs. The Food and Beverage industry employed DAC for carbonation and product preservation, showing increased interest in sustainable practices. The Automotive sector is investing in DAC for carbon neutrality, while the Chemicals industry uses it in sustainable chemical synthesis. The Healthcare sector, though smaller, is exploring DAC for pharmaceutical manufacturing and research, driven by stringent environmental standards.

Buy Now: https://market.us/purchase-report/?report_id=117179

Key Market Segments

By Technology

- Solid-DAC (S-DAC)
- Liquid-DAC (L-DAC)
- Electrochemical-DAC (E-DAC)

By Source

- Electricity
- Heat

By Number of Collectors

- Less than 10 collectors
- More than 10 collectors

By Application

- Carbon Capture, and Storage (CCS)
- Carbon Capture Utilization and Storage (CCUS)

By End-Use Industry

- Oil & Gas
- Food and beverage
- Automotive
- Chemicals
- Healthcare
- Others

Top Emerging Trends

1• Expansion of Modular DAC Systems: Modular Direct Air Capture (DAC) systems are rapidly gaining traction due to their scalability and flexibility. These compact units can be easily integrated into existing infrastructures, allowing businesses to incrementally increase their carbon capture capacity. This trend is especially appealing to industries and regions that are just beginning to implement carbon management strategies, providing a practical solution without the need for extensive initial investment.

2• Integration with Renewable Energy: The integration of DAC technology with renewable energy sources is a key trend, as it enhances the sustainability of the carbon capture process. By powering DAC systems with solar, wind, or hydroelectric power, the overall carbon footprint of the capture and storage process is significantly reduced. This synergy is crucial for making DAC a truly green technology, aligning with global goals for reducing greenhouse gas emissions.

3• Advancements in Capture Materials: Emerging innovations in sorbent and solvent materials are set to revolutionize the DAC market. Researchers are developing more efficient materials that can capture CO₂ at lower energy costs and higher capture rates. These advancements could significantly decrease operational costs and increase the feasibility of large-scale deployment of DAC technologies across various industries.

4• Regulatory and Financial Incentives: There is an increasing trend of governmental bodies implementing regulatory and financial incentives to promote DAC technologies. These incentives

include tax breaks, subsidies, and grants that make investments in DAC more attractive. As governments around the world commit to stringent climate targets, these incentives are crucial for accelerating the adoption and development of effective carbon capture solutions.

5• Growth in CCUS Applications: Carbon Capture, Utilization, and Storage (CCUS) is expanding as more industries explore the potential of reusing captured CO₂. Applications such as converting CO₂ into synthetic fuels, chemicals, and even building materials are being developed. This not only helps in reducing the atmospheric concentration of CO₂ but also creates value-added products, encouraging a circular economy and further driving the growth of the DAC market.

Regulations on the Direct Air Capture Market

Direct Air Capture (DAC) technologies, which extract CO₂ directly from the atmosphere, are gaining attention as tools for mitigating climate change. As of 2024, 53 DAC plants are expected to be operational globally, with projections indicating 93 plants by 2030, collectively capturing between 6.4 to 11.4 million tonnes of CO₂ annually.

In the United States, the Inflation Reduction Act has enhanced the 45Q tax credit to \$180 per tonne of CO₂ captured and stored via DAC, with a capture threshold as low as 1,000 tonnes of CO₂ per year. This financial incentive aims to accelerate DAC deployment.

Despite these advancements, the DAC industry is advocating for comprehensive federal regulations to establish standards for monitoring, reporting, and verification of carbon removal efforts. Such regulations are anticipated to enhance transparency and build confidence in the sector.

Globally, countries like China are investing in DAC technologies to meet their carbon neutrality goals. China's "CarbonBox" technology, for instance, is designed to capture over 100 tonnes of CO₂ annually per module, contributing to the nation's climate objectives.

Regional Analysis

North America (48.30% Market Share, \$486.3M): The region leads due to strong sustainability initiatives, decarbonization policies, and government incentives like the U.S. Inflation Reduction Act, which supports DAC adoption through tax credits.

Europe: Driven by ambitious climate targets, regulatory frameworks, and funding programs like the European Green Deal. Countries such as Norway and the UK lead DAC investments, supporting the EU's 2050 carbon neutrality goal.

Asia Pacific: A growing market with key players like Japan and China, addressing industrial emissions. However, infrastructure and financial constraints slow widespread adoption.

Latin America: Limited DAC adoption due to economic and technological barriers, though Brazil and Mexico are exploring carbon capture as part of their sustainability efforts.

Middle East & Africa: A small but growing market, as oil-rich nations (UAE, Saudi Arabia) invest in DAC to diversify economies and reduce energy-sector emissions.

Key Players Analysis

- Avnos, Inc.
- Capture6
- Carbon Capture Inc.
- Carbon Collect Limited
- Carbon Engineering ULC.
- Carbyon
- Global thermostat
- Heirloom Carbon Technologies
- Immaterial
- Infinitree LLC
- MISSION ZERO TECHNOLOGIES
- Mosaic Materials Inc.
- Noya PBC
- Octavia carbon
- RepAir Carbon
- Skytree
- Soletair Power
- Southern Green Gas Limited
- Spiritus
- Sustaera Inc.
- Climeworks AG
- Other Key Players

Recent Developments Direct Air Capture Market

— In November 2023, Avnos secured over \$80 million through strategic and investment partnerships.

— In August 2023, Occidental Petroleum acquired Carbon Engineering for \$1.1 billion, with plans to build 100 direct air capture plants.

Strategic Initiatives

— Product Portfolio Expansion: Companies are investing in R&D to develop advanced formulations that meet regulatory and consumer demands.

— Geographic Expansion: Focus on high-growth regions like Asia-Pacific and the Middle East to capitalize on industrialization trends.

— Sustainability Initiatives: Efforts to align with global sustainability goals and minimize environmental

Lawrence John

Prudour

+91 91308 55334

Lawrence@prudour.com

Visit us on social media:

[Facebook](#)

[LinkedIn](#)

This press release can be viewed online at: <https://www.einpresswire.com/article/780588779>

EIN Presswire's priority is source transparency. We do not allow opaque clients, and our editors try to be careful about weeding out false and misleading content. As a user, if you see something we have missed, please do bring it to our attention. Your help is welcome. EIN Presswire, Everyone's Internet News Presswire™, tries to define some of the boundaries that are reasonable in today's world. Please see our Editorial Guidelines for more information.

© 1995-2025 Newsmatics Inc. All Right Reserved.