

CO2 Separation Membrane Market Size, Share & Trends Analysis Report By Material (Polyimide & Cellulose Acetate, Polysulfone), By Membrane (Polymeric Membranes, Inorganic Membranes), By End-use, By Region, And Segment Forecasts, 2026 - 2033

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Abstracts

The global CO2 separation membrane market size was estimated at USD 560.7 million in 2025 and is projected to reach USD 949.1 million by 2033, growing at a CAGR of 6.8% from 2026 to 2033. The demand for CO2 separation membranes is rising significantly as the global push to reduce greenhouse gas emissions and achieve carbon neutrality targets.

Industries such as power generation, oil & gas, and chemicals are increasingly adopting carbon capture solutions to comply with environmental mandates. Membrane-based separation is gaining preference over conventional methods due to its lower energy consumption and operational efficiency. The growing adoption of carbon capture, utilization, and storage (CCUS) technologies is further boosting demand across industrial sectors. Additionally, increasing investments in clean energy infrastructure and sustainable industrial processes are accelerating market expansion. The need to purify natural gas and remove CO2 impurities is also a key contributor to demand.

Key drivers include stringent environmental regulations, rising carbon pricing mechanisms, and industrial decarbonization goals. The oil & gas sector remains a major demand generator due to its reliance on CO2 removal for natural gas processing and enhanced oil recovery. Rapid growth in hydrogen production and biogas upgrading is also driving the adoption of membrane technologies. Technological advancements in

polymeric and inorganic membranes are improving efficiency, selectivity, and durability, making them more commercially viable. Additionally, increasing demand for renewable natural gas (RNG) and cleaner fuels is supporting membrane integration in energy systems. Industrial applications such as petrochemicals, cement, and power plants are expanding use cases.

The market is witnessing rapid innovation in membrane materials, including mixed-matrix membranes, nano-engineered membranes, and advanced polymeric structures. These innovations enhance permeability, selectivity, and resistance to harsh operating conditions. The integration of nanotechnology is improving gas separation efficiency and reducing fouling issues. There is also a trend toward developing cost-effective manufacturing processes to enable large-scale deployment. Hybrid membranes combining polymeric and inorganic materials are gaining traction for improved performance. Additionally, the increasing use of membranes in emerging applications such as biogas upgrading and hydrogen purification is expanding the market scope.

Global CO2 Separation Membrane Market Report Segmentation

This report forecasts revenue growth at regional & country levels and provides an analysis on the industry trends in each of the sub-segments from 2021 to 2033. For the purpose of this study, Grand View Research has segmented the global CO2 separation membrane market report on the basis of material, membrane, end use, and region:

Material Outlook (Revenue, USD Million, 2021 - 2033)

Polyimide & Cellulose Acetate

Polysulfone

Others

Membrane Outlook (Revenue, USD Million, 2021 - 2033)

Polymeric Membranes

Inorganic Membranes

Hybrid / Mixed-Matrix Membranes

End Use Outlook (Revenue, USD Million, 2021 - 2033)

Oil & Gas

Power Generation

Industrial

Others

Regional Outlook (Revenue, USD Million, 2021 - 2033)

North America

U.S.

Canada

Mexico

Europe

UK

Germany

France

Italy

Asia Pacific

China

Japan

India

Central & South America

Middle East & Africa

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