

North America Oxy-fuel Combustion Technology Market Size and Forecast (2021 - 2031)

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Abstracts

The North America oxy-fuel combustion technology market is projected to grow significantly, with an expected market size of approximately US\$ 395.6 million by 2031, up from US\$ 216.3 million in 2024. This growth reflects a compound annual growth rate (CAGR) of 9.3% from 2025 to 2031.

Executive Summary and Market Analysis

The oxy-fuel combustion technology market in North America is primarily segmented into three countries: the United States, Canada, and Mexico. A major concern in both the US and Canada is the high level of greenhouse gas emissions, largely attributed to their reliance on fossil fuels to meet energy demands. The United States is particularly notable for its substantial greenhouse gas emissions, which stem from various human activities, including the combustion of fossil fuels for electricity, heating, and transportation. According to the United States Environmental Protection Agency (EPA), total greenhouse gas emissions in the US rose from 5,981 million metric tons in 2020 to 6,343.2 million metric tons of CO₂ equivalent in 2021. The primary sectors contributing to these emissions include transportation (28%), electricity production (25%), industry (23%), commercial and residential sectors (13%), and agriculture (10%).

Strategic Insights

Market Segmentation Analysis

The North America oxy-fuel combustion technology market can be categorized based on offerings and industry applications. In terms of offerings, the market is divided into solutions and services, with the solutions segment leading the market in 2024. When

analyzed by industry, the market is segmented into oil and gas, power generation, manufacturing, metals and mining, and others, with the power generation sector also dominating in 2024.

Market Outlook

Despite the ongoing transition towards renewable energy sources, fossil fuels continue to play a significant role in the energy mix of many North American countries, which directly correlates with elevated greenhouse gas emissions. The increasing concentration of carbon dioxide (CO₂) in the atmosphere poses significant challenges to global sustainability goals. Projections indicate that CO₂ levels could reach approximately 550 ppm by 2050 if no corrective measures are implemented. The International Energy Agency has emphasized the need for capturing 1 gigaton of CO₂ per year by 2030, escalating to 5 gigatons per year by 2045. Consequently, power plants and other high-emission sectors are expected to adopt oxy-fuel combustion technology in conjunction with carbon capture and storage (CCS) strategies to mitigate carbon emissions. CCS is recognized as a vital approach for achieving decarbonization objectives worldwide, focusing on capturing CO₂ emissions from industrial processes and securely storing them underground to prevent atmospheric release. Oxy-fuel combustion technology is integral to CCS, as it enables cleaner combustion of fossil fuels in an oxygen-rich environment, resulting in the production of CO₂ and water, which simplifies the separation and capture of CO₂.

A notable example of the successful integration of oxy-fuel combustion and CCS technologies is the Boundary Dam Power Station in Canada, which showcases how existing coal-fired power plants can adopt these advanced technologies. The US Department of Energy (DOE) has initiated several programs to promote CCS technologies, including the Carbon Negative Shot initiative, which encourages innovation in carbon dioxide removal pathways, as well as funding for research and development and the establishment of CCS hubs. The increasing focus on climate change mitigation and the reduction of greenhouse gas emissions is driving advancements in oxy-fuel combustion technology, leading to a surge in the adoption of CCS across various sectors, thereby propelling the growth of the oxy-fuel combustion technology market globally.

Country Insights

The North America oxy-fuel combustion technology market is further analyzed by country, with the US holding the largest market share in 2024. The US is at the forefront

of promoting carbon capture and storage (CCS) as a clean energy technology that captures CO₂ emissions from industrial and power plants, transports it underground, and stores it permanently. The US government has implemented various policies to encourage private sector engagement, innovative business models, and the deployment of new clean energy technologies. Over the past decade, the US has been a leader in energy supply investments, ranking as the second-largest destination for energy investment after China. Programs such as the EPA's State and Local Climate and Energy Program aim to assist in reducing greenhouse gas emissions, improving air quality, and achieving economic development goals. Additionally, the EPA's ENERGY STAR Program provides resources and best practices for energy efficiency to organizations and consumers. The growing urgency to address greenhouse gas emissions is significantly contributing to the expansion of the oxy-fuel combustion technology market in the US, as this technology is pivotal for effective carbon capture and storage.

Company Profiles

Key players in the North America oxy-fuel combustion technology market include Air Liquide, Encon Thermal Engineers Pvt Ltd, Falorni Gianfranco SRL, Jupiter Oxygen Corp, Linde Plc, Heidelberg Materials AG, ESA SpA, Messer SE & Co KGaA, Babcock & Wilcox Enterprises Inc, and Air Products and Chemicals Inc. These companies are employing various strategies, including market expansion, product innovation, and mergers and acquisitions, to enhance their offerings and increase their market presence.

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