

Air Quality Control Systems Market Assessment, By Technology [Flue Gas Desulfurization, Electrostatic Precipitators, NOx Control Systems, Scrubber, Mercury Control Systems], By Pollutant Type [Gas, Dust, Multi-Pollutant], By Product [Indoor, Ambient], By End-use Industry [Power Generation, Construction Material, Metal Processing, Oil and Gas, Food and Beverage, Textile, Pharmaceutical, Others], By Region, Opportunities and Forecast, 2017-2031F

Market Report | 2024-11-27 | 222 pages | Market Xcel - Markets and Data

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Report description:

Global air quality control systems market is projected to witness a CAGR of 6.23% during the forecast period 2024-2031, growing from USD 155.54 billion in 2023 to USD 252.24 billion in 2031. The market is expected to grow due to worsening air quality, rising dust, and air pollution from industries and growing urbanization. Scrubbers, low-emission technology, catalytic conversion, and multi-pollutant monitoring are some of the latest technologies shaping market dynamics. Al and IoT-based systems along with proactive solutions, ensure real-time monitoring and dust collection through these systems.

Smart technologies that incorporate air quality control systems (AQCS) into urban planning are being used by numerous sectors globally. This involves placing sensors around cities to continuously check the air quality and make data-driven choices for public health and urban development projects. The development of wearable and portable air quality monitoring equipment is becoming widely popular. These technologies allow individuals to monitor their personal exposure to pollutants, enhancing public awareness and encouraging healthier lifestyle choices. Key players focus on developing new air quality control and monitoring technology that delivers different technologies while combining them for accurate control.

For instance, in November 2023, Daikin Industries, Ltd. introduced powerful automated indoor air quality technology. The company released a fully integrated system that combines the advantages of the Air Handling Unit (AHU) Modular T Series and

the Daikin Indoor Environmental Quality (IEQ) Sensor. The technology improves indoor air quality, automatically reducing concentrations of pollutants and small particles, such as VOC, PM 10, and PM 2.5, while optimizing oxygen, humidity, and temperature levels.

Integration of Artificial Intelligence and IoT to Fuel Market Growth

The air quality control systems market is undergoing huge technological advancement to upgrade air quality monitoring and management. The Internet of Things (IoT) and artificial intelligence (AI) have transformed air quality control system technology as it is now possible to monitor air quality in real-time, collect data, and analyze it to take pre-emptive action on the matter of poor air quality. Smart technologies are being implemented across cities, thereby implementing AQCS into urban planning. It entails installing sensors in cities for constant air quality monitoring, from which decisions are made in developing cities and initiatives towards public health. Governments across the globe focus on delivering AI and IoT-based monitoring and control systems. For instance, Local Scientists at the Institute for Collider Particle Physics launched a first-of-its-kind air quality monitoring system, Ai_r, to monitor air pollution hotspots in real time. Based on how the light reflects, it measures the concentration of particles and feeds data every five minutes through an antenna back to a cloud-based system where the data is then stored.

The trend is shifting towards portable and wearable air quality monitoring devices. Technologies that allow people to monitor their exposure to pollutants can be used to enhance public awareness and promote healthier lifestyle choices. Innovations in AQCS have been developed to pursue sustainability, including energy efficiency and renewable resources. Systems are designed based on minimal environmental impact and effective control of emissions.

Rising Pollution Awareness Around Health and Industrial Expansion to Fuel the Market Dynamics

Rising public awareness regarding the health effects of poor air quality, including respiratory diseases, cardiovascular issues, and other serious health conditions, will likely fuel market growth. This growing concern encourages consumers and businesses to invest in air quality management solutions to mitigate health risks. The demand for cleaner air is leading to increased development of AQCS across various sectors, particularly in urban areas with higher pollution levels.

Growing emissions from factories and automobiles are largely caused by rapid industrialization and urbanization, particularly in developing nations such as China and India. The need for energy and industrial production rises as these regions' economies continue to expand, making efficient air quality management systems more crucial to controlling emissions from these activities. High Collection Efficiency and Durability to Fuel Electrostatic Precipitators (ESP) Segment

Based on technology, the electrostatic precipitators (ESP) segment leads the market in terms of revenue. The electrostatic precipitators have indeed provided a very high collection efficiency of over 99% to the various sizes of particles, such as fine PM2.5. This efficiency is crucial to all industries facing progressively hard regulatory requirements from the emission aspect. The efficient performance of ESPs has thus enabled them to be preferred for air quality control as they have delivered overall control over the air quality in industrial and commercial spaces.

ESPs operate using electrical forces to charge and collect particles, resulting in a more durable filtration performance than traditional filters that may lose efficacy over time. The reliance on external electricity allows ESPs to maintain their performance without significant degradation, making them a long-term solution for air pollution control. One of the significant advantages of ESPs is their low-pressure drop across the system, converting them to lower energy consumption and operational costs. This characteristic is particularly beneficial in power generation and heavy industries where maintaining airflow efficiency is crucial for overall system performance.

For instance, in November 2022, Mitsubishi Heavy Industries Power Environmental Solutions Ltd., part of Mitsubishi Heavy Industries (MHI) Ltd, developed a revolutionary new type of electrostatic precipitator (ESP), the Ionic Wind Type Electrode ESP delivers an entirely new dust collection principle and electrode. This new model is expected to offer significantly better performance and enable cost savings, space savings, and quicker building times.

Europe to Hold the Major Air Quality Control Systems Market Share

Based on the region, Europe leads the market in terms of revenue. European governments actively support initiatives aimed at improving air quality through various funding programs and incentives. For instance, the United Kingdom has implemented feed-in tariffs to encourage investments in cleaner technologies. Such government backing not only facilitates the adoption of AQCS but also promotes research and development in innovative air quality technologies.

The rising focus on health and public awareness is likely to impact the regional market growth. Both individuals and businesses

are looking for AQCS to enhance the quality of the air in residential, commercial, and industrial settings due to growing public awareness of the dangers posed by air pollution.

For instance, in April 2024, to protect public health and enhance air quality throughout Georgia, the European Union gathered both domestic and foreign partners. The four-year project, which has received EUR 4 million in EU financing, expands on collaboration with the Environment Agency Austria (UBA), UNDP, WHO, UNECE, and Georgia's Ministry of Environmental Protection and Agriculture.

Future Market Scenario (2024 - 2031F)

-[]Advanced sensor technologies, including enhanced sensors, are likely to enable real-time accurate monitoring of multiple pollutants, improving data collection and public awareness.

- loT is anticipated to facilitate remote monitoring and predictive maintenance, allowing for more efficient air quality management.

- Al is expected to enable predictive modeling and automated decision-making, optimizing emissions control strategies based on real-time data.

—]Future AQCS is projected to focus on simultaneous monitoring of multiple pollutants for comprehensive air quality assessments. Key Players Landscape and Outlook

In the air quality control systems (AQCS) market, key player strategies focus on innovation, collaboration, and compliance to capture a larger market share. Companies are increasingly investing in research and development to enhance their product offerings with advanced technologies such as IoT and AI, enabling real-time monitoring and predictive analytics. Strategic partnerships and collaborations are being formed with governmental bodies and other industries to align with regulatory standards and improve environmental outcomes. Additionally, players are pursuing expansion strategies through mergers and acquisitions to strengthen their market presence and diversify their portfolios.

For instance, in August 2024, Apzem India Engineering announced its supply of Horizontal wet scrubbers. This cutting-edge equipment has been designed to address the specific requirements of the aerospace sector, where the removal of acid and alkali pollutants from exhaust streams is critical for environmental compliance and workplace safety.

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

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