

United States Gas Sensors - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts (2025 - 2030)

Market Report | 2025-04-28 | 120 pages | Mordor Intelligence

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Report description:

The United States Gas Sensors Market is expected to register a CAGR of 4.94% during the forecast period.

Key Highlights

- The major trend driving the gas sensors market is the development of wireless capabilities and miniaturization, coupled with improved communication capabilities that enable their integration into various devices and machines without compromising the detection of toxic or flammable gases at safe distances.
- Gas sensors are used in smart cities for various environmental monitoring applications like monitoring air quality across weather stations, public places, small cities, and building automation. Such widespread use is anticipated to boost the market's growth over the forecast period. Heating, ventilation, and air conditioning (HVAC) systems are utilized in buildings for various functions, such as environmental monitoring and regulating the concentration of a gaseous component, which has generated a significant amount of demand and is anticipated to propel the market's growth.
- Regarding energy usage, IoT-ready sensors based on batteries can run for extended periods, primarily in outdoor conditions. It would be preferable for gas sensors to continue operating until the transducer's lifetime expires. Mixing energy sources, including solar panels, would be feasible to replenish the batteries. Some gas sensing technologies use less energy since the transducers do not require temperature correction and can be turned off between measurement intervals, such as acoustic and optical approaches. Other technologies, including electrochemical, MOS, and catalytic, have a pre-heating time. Therefore, turning off these transducers would severely impact their performance and ability to produce accurate measurement readings.
- Another critical factor in sensing technologies is connectivity. More users emphasize their ability to successfully read and gather data through standard analog or digital outputs, cloud connectivity, or wireless monitoring. Customers can obtain critical readings and updates from a compatible smartphone or PC remotely monitoring gas concentrations in real time. Users interested in cloud-based tracking and data logging often select the Aranet4 PRO Indoor Air Quality Monitor - a sleek, modern, wireless-enabled

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gadget capable of precisely detecting CO₂, relative humidity, temperature, and barometric pressure via the Aranet4 iOS or Android app.

- Wireless gas sensors offer several advantages, such as accuracy and reliability, with the help of various innovative technologies, such as RFID and Bluetooth, and the potential to make electronic devices easy to integrate. As a result, they gained significant traction in the past few years. Wireless technology is primarily deployed for IoT applications, allowing direct connection over Wi-Fi, 3G or 4G mobile data networks, or local wireless networks. Many wireless devices consist of built-in intelligence that automatically identifies and links to the wireless building network by pushing a button that adds the device to the network.
- The US government is at the forefront of the fight against climate change. The country has a strong record of advancing technologies and techniques to reduce greenhouse gas emissions as part of this fight. According to the United States Environmental Protection Agency (EPA), in the United States, the oil and gas industry is the largest industrial source of methane emissions, which emits more methane than the total emissions of all greenhouse gases from 164 countries combined. Oil and natural operations also emit toxic air pollutants such as benzene and smog-forming volatile organic compounds (VOCs).
- In November 2021, the US government launched an initiative to reduce emissions from the oil and gas industry significantly. Through actions, the United States is catalyzing similar efforts worldwide, working in partnership with the European Union to lead a Global Methane Pledge to reduce overall methane emissions by 30% below 2020 levels by 2030.
- Researchers are implementing advanced technologies for designing to manufacture gas sensors in response to many new and emerging requirements and applications. Some of the research sectors include wearable gas sensors, energy-harvesting gas sensors, and gas sensors in mobile phones.
- During the pandemic, gas sensor firms have developed new products to maintain the cash flow. For instance, AerNos, Inc. intends to highlight its nano gas sensor technologies and capabilities targeted at the Smart Home market. For applications involving the monitoring of dangerous gases and indoor air quality, AerNos is introducing embeddable solutions with ground-breaking gas-sensing capabilities. Applications for the Smart Home gas sensor module from AerNos include automated air purification in HVAC, ventilation, and intelligent air purification systems and providing consumer air quality warnings from Smart Home products.

US Gas Sensors Market Trends

Increasing Health and Safety Regulations in Various Industries

- The American Conference of Governmental Industrial Hygienists (ACGIH) provided a threshold limit of 25 ppm for an 8-hour long workday, whereas the National Institute for Occupational Safety and Health (NIOSH) estimated a recommended exposure limit of 35 ppm.
- The US Environmental Protection Agency (EPA) determined that leaking equipment, such as pumps, valves, and connectors, are the prime source of emissions of volatile organic compounds (VOCs) and volatile hazardous air pollutants (VHAPs) from chemical manufacturing facilities and petroleum refineries. The agency also estimated that around 9,357 metric tons per year of HAPs and 70,367 metric tons per year of VOCs had been emitted from equipment leaks.
- Leak detection and repair (LDAR) programs are required by many State Implementation Plans (SIPs), National Emission Standards for Hazardous Air Pollutants (NESHAP), New Source Performance Standards (NSPS), the Resource Conservation and Recovery Act (RCRA), and other state and local requirements. There are nearly 25 federal standards that require facilities to implement LDAR programs.
- Furthermore, building on the US government's strategy to achieve net-zero greenhouse gas (GHG) emissions by 2050, the US Environmental Protection Agency (EPA) issued a proposal under Clean Air Act to considerably expand regulations of methane from oil and gas industry operations in the United States.
- According to Baker Hughes, in the last week of November last year, there were 784 operational oil and gas rigs in the United States. This was a rise from the previous month and reflected stronger oil demand predicted toward the end of the year despite

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lower benchmark oil prices. Such a huge rise in the oil rigs would drive the studied market due to the increasing safety regulations,

Growing Wireless and Miniaturization Trends

- The evolution of communication platforms such as the Internet of Things (IoT) and 5G wireless communication networks makes it possible to develop smart gas sensor networks for real-time monitoring of chemical safety and personal health. This application scenario requires a combination of characteristics of gas sensors, including small form factor, ultralow power consumption, superior sensitivity, low cost, and high intelligence.
- Market players are utilizing these technologies to integrate gas sensors for performance improvement and ease operations. Air quality sensors have been distributed in urban areas for wireless node network applications. Functional materials such as carbon nanomaterials, metal oxides, and hybrid composites allow chemical sensing technologies.
- Low-cost sensors incorporated in low-power sensor systems have been operated in wireless sensor networks for urban air quality monitoring of toxic gases and particulate matter at the outdoor level with high temporal and spatial resolution. Stationary sensor networks, mobile sensing on ground vehicles, and unmanned aerial vehicles (UAV) are used in smart and sustainable cities and Internet-of-Things (IoT) applications to supplement expensive air quality monitoring stations.
- Currently, applications of wireless gas detection are feasible for reliable operations in the long-term, fixed installations with minimal operating costs. This offers operators more options to increase gas detection coverage, improving plant safety. The standard requirements from the customers were to expand coverage and reduce the number of people in the field to ensure safety.
- According to CTIA, wireless subscriber connections in the United States have expanded dramatically, with close to 499 million connections the previous year, an increase of almost 30 million users from the past two years.

US Gas Sensors Industry Overview

The US gas sensors market is partially fragmented owing to the presence of limited major players in the market supplying their products in the market. The market appears to be moderately concentrated, with players adopting strategies like product innovation, mergers, and acquisitions to stay competitive. Some major players in the market are Honeywell International Inc., Emerson Electric Co., MSA Safety Incorporated, Figaro USA Inc., and Amphenol Advanced Sensors.

- Sep 2022 - Industrial Scientific Corporation introduced a new Photo-Ionization Detector sensor for the Ventis Pro5 Multi-gas monitor, making it the most compact, versatile, and connected five-gas personal monitor that allows users to detect VOCs while improving situational awareness reliably.
- Feb 2022 - Crowncon Detection Instruments Limited launched a new sensor for its T4. Crowncon Detection Instruments Ltd has extended its sensor technology for the popular T4 Multi-Gas detector. With its new MPS and LLO2 sensors, along with a dual toxic sensor, the capability of the T4 (now T4x) portable gas detector has been greatly extended.

Additional Benefits:

- The market estimate (ME) sheet in Excel format
- 3 months of analyst support

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