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# Quantum Sensors - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts (2024 - 2029)

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## Abstracts

The Quantum Sensors Market size is estimated at USD 0.67 billion in 2024, and is expected to reach USD 1.24 billion by 2029, growing at a CAGR of 12.95% during the forecast period (2024-2029).

Key Highlights

Government investments in quantum research to gain economic and military advantage have been increasing. The National Strategic Overview for Quantum Information Science released by the United States defined quantum sensing as ‘leveraging quantum mechanics to enhance the fundamental accuracy of measurements and enabling new regimes or modalities for sensors and measurement. Such new capabilities could afford clear military advantages and positively influence the market globally.

Innovation in the quantum sensors industry is being driven by developments in quantum technology, especially in fields like sensing communication and computation.

For instance, high-resolution imaging is now possible for industrial inspection and medical diagnostic applications because of the advent of quantum-enhanced imaging techniques. Similarly, the use of quantum sensors for secure communication networks is being fueled by advancements in quantum key distribution (QKD) technology.

Growing research and developmental activities related to quantum technology are expected to provide ample opportunities for market growth in different fields, such as positioning systems, electric and magnetic field sensors, communication technology, microscopy, mineral prospecting, and seismology, along with applications in military,

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construction industry, and automotive. High credibility and accuracy make this technology accessible across various sectors.

There is a high level of initial investment required in end-user industries for integrating such sensors in applications such as autonomous driving, improved imaging technologies at short and long distances, medical progress, and enabling detailed underground mapping. The high costs of setting up these systems are concerned with proper installation, design, and fabrication.

Quantum Sensors Market Trends

Oil and Gas Industry to Grow Significantly

The oil and gas industry faces remarkable challenges as hydrocarbon product exploration, production, and transportation are conducted in ever-more challenging environments. Quantum technologies bring new capabilities to the sector as they are adopted to provide increased safety and security. These range from new forms of gravimeters to discover further oil reserves to fiber optic distributed temperature and strain sensing and optical gas imaging systems to detect and locate gas leaks.

Furthermore, to explore developing chemistry applications using quantum computing, Japanese chemical companies JSR and Mitsubishi Chemical joined a quantum computing ecosystem, the IBM Q Hub, at Keio University in Japan. Both companies expect to leverage the Hub’s collaborative partnership with Fortune 500 companies, academic institutions, national research labs, and access to 20-qubit and 50-qubit quantum computers to investigate developing quantum computing solutions specific to their businesses.

Based on geography, North America is expected to hold a substantial share of the oil and gas industry. Countries like the United States have a strong presence of leading oil and gas companies and technology innovators, which signifies the potential adoption of quantum sensors in the oil and gas industry.

According to IEA’s Stated Policies Scenario (STEPS), which takes into account the current situation of energy policies already in place and those under development, global oil production is expected to increase to 99 million barrels per day by 2030.

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Asia-Pacific is Expected to Register Major Growth

Asia-Pacific is home to several emerging markets experiencing significant economic growth. This growth drives demand for advanced technologies like quantum sensors to improve efficiency, productivity, and industry competitiveness.

In the region, China is a significant country that invests in quantum sensors and conducts research to develop new quantum sensing devices, which could be applicable in various fields. Over the next few years, quantum technology is expected to have significant implications for future military operations. China is focused on utilizing this technology for its military applications and aims to become a significant player in quantum information science.

For instance, Chinese scientists have created a single-photon quantum radar, which takes advantage of entanglement between photon pairs, capable of detecting targets up to 100 kilometers away with high accuracy. This test offers an initial overview of the scope of quantum technology in military applications, which is expected to drive the quantum sensors market.

Furthermore, the region's manufacturing industry is rapidly growing, which is expected to aid the market's growth. The Chinese government's programs, such as the Made in China 2025 plan, promote R&D activities in factory automation and technologies and invest in them. As most of the automation equipment is imported from other countries, the 'Made in China' initiative aims to expand the country’s domestic production of automation equipment.

Governments in Asia-Pacific recognize the potential of quantum technologies and invest in research, development, and commercialization initiatives. Funding and policy support from governments stimulate innovation and create favorable conditions for the growth of quantum sensor industries.

Quantum Sensors Industry Overview

The quantum sensors market is fragmented and competitive, with the presence of major players like AOSense Inc., Apogee Instrument Inc., M Squared Laser Limited, Muquans SAS, and Robert Bosch GmbH. Players in the market are adopting strategies such as partnerships, mergers, investments, and acquisitions to enhance their product offerings

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and gain sustainable competitive advantage.

In March 2024, Chevron Corporation announced an investment in quantum computing development for the oil and gas market. For this, Chevron Technology Ventures, part of Chevron Corporation, joined a USD 100 million Series B funding round. Such investments signal growing interest in quantum technologies within the oil and gas industry.

In January 2024, CNES, German Aerospace Center (DLR), Airbus Defence & Space, GMV, FORTH/PRAXI, and the European Commission kicked off phase A of the European CARIOQA project, a technology demonstration mission to space-rate quantum sensor measuring accelerations using cold atoms. CARIOQA is encouraging the future French, German, and European industries to leverage French and German excellence in quantum sensors, with contributions from the European Commission through its Horizon Europe program. The CARIOQA mission aims to test the first atomic accelerometer on a satellite by 2030.

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