

# **Oil & Gas Robotics Market Forecasts to 2030 – Global Analysis By Robot Type (Remotely Operated Vehicles (ROVs), Autonomous Underwater Vehicles (AUVs), Unmanned Aerial Vehicles (UAVs), Unmanned Ground Vehicles (UGVs), Inspection Robots, Collaborative Robots (Cobots) and Other Robot Types), Component, Operation, Application, End User and By Geography**

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## **Abstracts**

According to Statistics MRC, the Global Oil & Gas Robotics Market is accounted for \$1.82 billion in 2024 and is expected to reach \$2.82 billion by 2030 growing at a CAGR of 11.8% during the forecast period. Oil & Gas Robotics refers to the use of automated systems, robotic technologies, and AI-driven machines in the exploration, drilling, production, inspection, and maintenance of oil and gas infrastructure. These robots enhance operational efficiency, safety, and precision by performing tasks in hazardous or remote environments, such as deep-sea rigs, pipelines, and refineries. By reducing human intervention in dangerous tasks, oil and gas robotics help minimize risks, lower costs, and improve overall productivity in the energy sector.

According to the Association for Advancing Automation (A3), which monitors industrial robot sales in North America, companies ordered 44,196 robots in 2022, 11% more than in 2021.

Market Dynamics:

Driver:

Growing demand for automation

Automation reduces reliance on manual labor, minimizes human error, and accelerates operations in exploration, drilling, inspection, and maintenance. Robots equipped with AI, IoT, and machine learning optimize real-time data analysis, improving decision-making and productivity. As companies seek to enhance safety, reduce operational costs, and improve sustainability, the integration of robotics in automated processes significantly propels market growth in the oil & gas sector.

Restraint:

Technical challenges & complexity

Oil & gas robotics face technical challenges and complexity due to harsh operating conditions like extreme temperatures, high pressure, and corrosive environments, requiring rugged, highly durable robots. Developing robots that can function reliably in deepwater, confined spaces, and explosive atmospheres is difficult. Companies hesitate to invest due to operational risks, high maintenance needs, and integration difficulties with aging infrastructure, slowing widespread deployment.

Opportunity:

Rising offshore exploration activities

Rising offshore exploration activities drive the demand for oil & gas robotics by enhancing efficiency, safety, and cost-effectiveness in deepwater and ultra-deepwater operations. Harsh and remote offshore environments require autonomous underwater vehicles (AUVs), remotely operated vehicles (ROVs), and robotic drilling systems to perform complex tasks like pipeline inspection, maintenance, and leak detection. As offshore exploration expands, the adoption of robotics accelerates, boosting market growth significantly.

Threat:

Integration issues with legacy systems

Oil & Gas robotics face integration issues with legacy systems due to outdated infrastructure, incompatible software, and lack of standardized communication protocols. Many existing facilities rely on manual processes and aging equipment, making it difficult to seamlessly integrate advanced robotics. This hampers the market

by increasing deployment costs, requiring custom adaptations, and causing operational disruptions.

#### Covid-19 Impact:

The covid-19 pandemic significantly impacted the oil & gas robotics market, accelerating automation due to workforce shortages and safety concerns. However, companies invested in robotics for remote monitoring, pipeline inspection, and maintenance, minimizing human exposure in hazardous environments. Declining oil prices initially slowed investments, but the push for cost efficiency, safety, and operational resilience drove long-term adoption of robotic solutions in the industry.

The inspection, monitoring & surveillance segment is expected to be the largest during the forecast period

The inspection, monitoring & surveillance segment is expected to account for the largest market share during the forecast period owing to its enhanced safety, efficiency, and cost savings by automating hazardous tasks. Robots like drones, crawlers, and autonomous underwater vehicles (AUVs) inspect pipelines, offshore rigs, and refineries, reducing human exposure to risks. They use AI, thermal imaging, and sensors to detect leaks, corrosion, and structural weaknesses in real time.

The petrochemical plants segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the petrochemical plants segment is predicted to witness the highest growth rate. Oil & Gas Robotics in petrochemical plants perform inspection, maintenance, leak detection, and material handling, reducing human exposure to risks like toxic gases and high temperatures. Autonomous drones, robotic arms, and crawler robots are used for pipeline monitoring, tank cleaning, and equipment diagnostics. Robotics drive operational efficiency and safety advancements in petrochemical industries.

#### Region with largest share:

During the forecast period, the Asia Pacific region is expected to hold the largest market share due to rising automation adoption, safety concerns, and efficiency demands in upstream, midstream, and downstream operations. Countries like China, India, and Australia are investing in robotic drilling, pipeline inspection, and underwater exploration

to enhance productivity and reduce human risk. Advancements in autonomous robots and AI-driven analytics are expected to drive further adoption in the region.

Region with highest CAGR:

Over the forecast period, the North America region is anticipated to exhibit the highest CAGR due to rising automation, safety concerns, and cost-efficiency demands. The U.S. and Canada lead in offshore and onshore exploration, adopting drones, autonomous underwater vehicles (AUVs), and robotic arms for inspections, maintenance, and pipeline monitoring. Government support for energy efficiency and technological innovation further drives market growth.

Key players in the market

Some of the key players in Oil & Gas Robotics market include Baker Hughes, Chevron, Equinor, ExxonMobil, Kawasaki Heavy Industries, ABB, Siemens, TotalEnergies, Shell, Sekal AS, Yaskawa Electric Corporation, Fanuc Corporation, Rockwell Automation, Cognex Corporation, KION Group, Intuitive Surgical, iRobot Corporation, Boston Dynamics, Repsol and Saudi Aramco.

Key Developments:

In October 2024, Rockwell Automation unveiled innovative solutions at ADIPEC 2024, focusing on automation, AI, and robotics to assist the energy sector in reducing its carbon footprint, improving safety, and enhancing operational efficiency.

In August 2024, Chevron announced that it has begun deploying submersible robots for tank inspections at several U.S. refineries. These robots, equipped with high-definition cameras and advanced sensors, enhance safety by reducing the need for human entry into hazardous environments and provide superior data for evaluating tank integrity.

Robot Types Covered:

Remotely Operated Vehicles (ROVs)

Autonomous Underwater Vehicles (AUVs)

Unmanned Aerial Vehicles (UAVs)

Unmanned Ground Vehicles (UGVs)

Inspection Robots

Collaborative Robots (Cobots)

Other Robot Types

#### Components Covered:

Hardware

Software

Services

#### Operations Covered:

Autonomous Robotics

Semi-Autonomous Robotics

Remote-Controlled Robotics

#### Applications Covered:

Inspection, Monitoring & Surveillance

Maintenance & Repair

Pipe & Tank Cleaning

Material Handling

Welding & Cutting

Subsea Operations

Drilling Support

Decommissioning

Other Applications

End Users Covered:

Refineries

Petrochemical Plants

Distribution Companies

Oilfield Service Providers

Other End Users

Regions Covered:

North America

US

Canada

Mexico

Europe

Germany

UK

Italy

France

Spain

Rest of Europe

Asia Pacific

Japan

China

India

Australia

New Zealand

South Korea

Rest of Asia Pacific

South America

Argentina

Brazil

Chile

Rest of South America

Middle East & Africa

Saudi Arabia

UAE

Qatar

South Africa

Rest of Middle East & Africa

What our report offers:

- Market share assessments for the regional and country-level segments
- Strategic recommendations for the new entrants
- Covers Market data for the years 2022, 2023, 2024, 2026, and 2030
- Market Trends (Drivers, Constraints, Opportunities, Threats, Challenges, Investment Opportunities, and recommendations)
- Strategic recommendations in key business segments based on the market estimations
- Competitive landscaping mapping the key common trends
- Company profiling with detailed strategies, financials, and recent developments
- Supply chain trends mapping the latest technological advancements

Free Customization Offerings:

All the customers of this report will be entitled to receive one of the following free customization options:

#### Company Profiling

Comprehensive profiling of additional market players (up to 3)

SWOT Analysis of key players (up to 3)

#### Regional Segmentation

Market estimations, Forecasts and CAGR of any prominent country as per the client's interest (Note: Depends on feasibility check)

#### Competitive Benchmarking

Benchmarking of key players based on product portfolio, geographical presence, and

strategic alliances

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