

Drones in Energy Sector Market Forecasts to 2030 – Global Analysis By Drone Type (Fixed-Wing Drones, Multi-Rotor Drones and Hybrid Drones), Power Source (Batteries, Fuel Cells and Hybrid Systems), Payloads and Sensors, Application, End User and By Geography

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Abstracts

According to Statistics MRC, the Global Drones in Energy Sector Market is accounted for \$681.5 million in 2024 and is expected to reach \$2139.1 million by 2030 growing at a CAGR of 21% during the forecast period. Drones in the energy sector are unmanned aerial vehicles (UAVs) used for inspection, monitoring, and maintenance of energy infrastructure. They enhance efficiency by providing real-time data, high-resolution imagery, and thermal scans for assets like power lines, wind turbines, and pipelines. Drones reduce operational costs, improve safety by minimizing human involvement in hazardous tasks, and support renewable energy development through site surveys, performance analysis, and predictive maintenance applications.

According to World Economic Forum (WEF), drones could slash the costs of inspection of energy infrastructure by nearly 50%.

Market Dynamics:

Driver:

Growing demand for renewable energy

The increasing focus on renewable energy sources drives the demand for drones in the

energy sector. Drones are instrumental in inspecting and maintaining solar farms, wind turbines, and other renewable energy infrastructure. They offer cost-effective, efficient, and safer alternatives to traditional inspection methods, ensuring uninterrupted operations. With global efforts to reduce carbon emissions and expand renewable energy capacity, the adoption of drones for monitoring and maintenance is expected to grow significantly, supporting the transition to sustainable energy systems.

Restraint:

High initial investment

The high initial investment required for drone deployment in the energy sector acts as a major restraint. Costs associated with purchasing advanced drones equipped with thermal imaging, LiDAR sensors, and AI capabilities can be prohibitive for small or mid-sized companies. Furthermore, training personnel and integrating drone technology into existing workflows add to operational expenses. These financial barriers can delay adoption despite the long-term cost savings and efficiency improvements drones provide.

Opportunity:

Integration with artificial intelligence

The integration of artificial intelligence (AI) presents a significant growth opportunity for drones in the energy sector. AI-powered drones can analyze vast amounts of data collected during inspections, enabling predictive maintenance and real-time decision-making. This reduces downtime and enhances operational efficiency. The use of AI also facilitates autonomous flight capabilities, allowing drones to navigate complex environments without human intervention. As industries increasingly adopt AI-driven solutions, the demand for intelligent drone systems is expected to rise.

Threat:

Data security concerns

Data security concerns pose a significant threat to the adoption of drones in the energy sector. Drones collect sensitive information during inspections, such as infrastructure vulnerabilities or operational data, which could be targeted by cyberattacks. Ensuring secure data transmission and storage requires robust cybersecurity measures,

increasing operational complexity and costs. Failure to address these concerns can lead to regulatory penalties, reputational damage, and reduced trust among stakeholders.

Covid-19 Impact:

The COVID-19 pandemic accelerated the adoption of drones in the energy sector as companies sought contactless solutions for inspection and maintenance. Drones enabled remote monitoring of infrastructure during lockdowns, ensuring continuity of operations while minimizing human exposure to hazardous environments. Post-pandemic recovery efforts focused on renewable energy projects have further driven demand for drone-based solutions.

The multi-rotor drones segment is expected to be the largest during the forecast period

The multi rotor drones segment is expected to account for the largest market share during the forecast period due to their versatility and ease of maneuverability. These drones are widely used for close-range inspections of wind turbines, solar panels, and power lines. Their ability to hover in place allows detailed data collection in hard-to-reach areas. The growing demand for efficient inspection tools across renewable and traditional energy sectors ensures sustained growth for this segment.

The multispectral/hyperspectral imaging segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the multispectral/hyperspectral imaging segment is expected to witness the highest CAGR due to its advanced capabilities in detecting infrastructure anomalies. These imaging technologies provide detailed insights into material degradation, thermal performance, and vegetation encroachment around power lines or pipelines. Their application in precision monitoring aligns with increasing investments in smart energy management systems, driving rapid adoption.

Region with largest share:

The North America region is anticipated to account for the largest market share during the forecast period due to its advanced technological infrastructure and early adoption of drone technology. The presence of leading drone manufacturers and strong government support for renewable energy projects drive regional growth. Additionally, stringent safety regulations encourage energy companies to adopt drone-based

inspection solutions for improved operational efficiency.

Region with highest CAGR:

The Asia Pacific region is anticipated to register the highest growth rate over the forecast period owing to rising investments in renewable energy infrastructure across countries like China and India. The region's vast geographic landscapes and challenging terrains necessitate efficient inspection tools like drones. Government initiatives promoting clean energy projects further boost demand, making Asia-Pacific a key growth market.

Key players in the market

Some of the key players in Drones in Energy Sector Market include AeroVironment, DroneDeploy, Fortem Technologies, Scopito, Aevius, Archon, Industrial SkyWorks, Iris Unmanned, Draganfly, Cyberhawk Innovations, Martek Aviation, Mistras Group, Percepto, SEIKEY Srl, Sky-Futures, Sphere Drones, Terra Drone and Viper Drones.

Key Developments:

In May 2024, Sphere Drones is excited to announce the introduction of HubT, the next iteration of their innovative Hub solutions for farms and regional properties. The HubT system makes it easier for companies to use drones from a fixed location, without the complicated setup that was previously required.

In July 2023, Viper Drones announced the launch and immediate availability of Viper Vantage – the ultimate enterprise solution for Gas Leak detection. Using Viper Drone's industry-leading "Viper Vantage" solution, operators can visualize and pinpoint gas leaks without shutting down operations. Viper Drones' unique solution integrates the UAV and FLIR G300a OGI camera using a single controller for the pilot. This seamless integration allows the operator to use "Viper Vantage" for gas leak detection safely and cost-effectively.

In May 2023, Cyberhawk™, world leader in visual data management, adopts Intelligent Energy's IE-SOAR™ fuel cells to offer customers better quality data and increased operational efficiency. IE-SOAR™ is Intelligent Energy's range of lightweight hydrogen fuel cell modules for fixed wing, rotary wing and VTOL applications, and enables UAVs to fly further, for longer, and to achieve more. The modules are increasing operational efficiency and unlocking previously impossible applications with businesses no longer

constrained by flight time. The two companies will be exhibiting together at AUVSI Xponential 2023 in Denver in May.

Drone Types Covered:

Fixed-Wing Drones

Multi-Rotor Drones

Hybrid Drones (VTOL)

Power Sources Covered:

Batteries

Fuel Cells

Hybrid Systems

Payloads and Sensors Covered:

Visual Imaging

Thermal Imaging

LiDAR (Light Detection and Ranging)

Gas Sensors

Multispectral/Hyperspectral Imaging

Corona Discharge Detection (UV Imaging)

Acoustic Sensors

Electromagnetic Sensors

Applications Covered:

Inspection and Monitoring

Surveying and Mapping

Asset Management

Disaster Response

Other Applications

End Users Covered:

Oil & Gas

Power Generation

Renewable Energy

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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Note: Tables for North America, Europe, APAC, South America, and Middle East & Africa Regions are also represented in the same manner as above.

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