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Energy Infrastructure Condition Monitoring Market Forecasts to 2034 – Global Analysis By Product Type (Online Monitoring Systems, Portable Diagnostic Systems, Predictive Maintenance Solutions and Asset Health Management Platforms), Component, Deployment Approach, Asset Criticality, Application, End User and By Geography

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Abstracts

According to Stratistics MRC, the Global Energy Infrastructure Condition Monitoring Market is accounted for $2.1 billion in 2026 and is expected to reach $7.1 billion by 2034 growing at a CAGR of 16.7 % during the forecast period. Energy Infrastructure Condition Monitoring involves continuous assessment of power assets such as transformers, cables, substations, and pipelines. Using sensors, IoT devices, and predictive analytics, it tracks parameters like temperature, vibration, and electrical performance to detect early signs of wear or failure. This proactive approach reduces maintenance costs, prevents outages, and extends asset lifespans. Condition monitoring is vital for modern grids, enabling utilities to ensure safety, reliability, and efficiency while integrating renewable energy and distributed resources.

Market Dynamics:

Driver:

Need for predictive asset maintenance

Energy infrastructure operators are increasingly prioritizing predictive asset maintenance to reduce unplanned outages and extend equipment lifespan. Aging power

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grids, renewable assets, and oil & gas infrastructure require continuous condition assessment to ensure operational reliability. Condition monitoring solutions enable early fault detection, performance optimization, and lifecycle cost reduction. As utilities and industrial operators face rising reliability expectations and regulatory scrutiny, investment in real-time monitoring technologies becomes critical. This demand strengthens adoption across generation, transmission, distribution, and renewable energy infrastructure assets.

Restraint:

High deployment and monitoring costs

High deployment and ongoing monitoring costs remain a significant restraint for the energy infrastructure condition monitoring market. Installation of advanced sensors, communication networks, and analytics platforms requires substantial upfront capital investment. Smaller utilities and asset owners often face budget constraints, limiting large-scale implementation. Additionally, maintenance of monitoring hardware, calibration requirements, and skilled workforce needs increase operational expenses. These cost-related challenges can delay adoption, particularly in developing regions or for standard infrastructure assets with lower perceived criticality.

Opportunity:

AI-driven asset health analytics

AI-driven asset health analytics present a strong growth opportunity for energy infrastructure condition monitoring solutions. Advanced analytics enable predictive failure modeling, anomaly detection, and remaining useful life estimation for critical assets. Integration of machine learning algorithms enhances data interpretation accuracy and reduces reliance on manual inspections. As digital transformation accelerates across energy infrastructure, AI-based platforms support proactive maintenance strategies and operational efficiency. Increasing availability of cloud-based analytics further expands scalability and adoption potential across diverse infrastructure environments.

Threat:

Data accuracy and sensor failures

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Data accuracy issues and sensor failures pose a notable threat to the effectiveness of condition monitoring systems. Inaccurate data inputs caused by sensor drift, calibration errors, or harsh operating environments can compromise analytical outputs. Faulty sensors may generate false alarms or miss early-stage failures, undermining trust in monitoring platforms. Additionally, cybersecurity risks affecting data integrity add complexity to system reliability. These challenges require continuous validation, redundancy strategies, and robust quality assurance measures, increasing system complexity and operational oversight requirements.

Covid-19 Impact:

The COVID-19 pandemic influenced the energy infrastructure condition monitoring market by restricting on-site inspections and delaying installation activities. Travel limitations and workforce shortages disrupted routine maintenance schedules and infrastructure upgrades. However, the crisis highlighted the importance of remote monitoring and digital asset management solutions. Operators increasingly adopted online monitoring systems to maintain visibility without physical presence. Post-pandemic recovery accelerated investments in automation and digital monitoring, reinforcing long-term demand for condition monitoring technologies across energy infrastructure segments.

The online monitoring systems segment is expected to be the largest during the forecast period

The online monitoring systems segment is expected to account for the largest market share during the forecast period, owing to its ability to provide continuous real-time asset performance insights. These systems support early fault detection, condition-based maintenance, and reduced operational downtime. Utilities and industrial operators prefer online solutions for mission-critical assets where reliability is essential. Integration with centralized analytics platforms further enhances decision-making capabilities. The growing emphasis on automation and remote infrastructure management reinforces widespread adoption of online monitoring systems.

The sensors & transmitters segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the sensors & transmitters segment is predicted to witness the highest growth rate, reinforced by expanding monitoring coverage across diverse energy assets. Increasing deployment of advanced temperature, vibration, pressure,

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and acoustic sensors supports granular data collection. Technological advancements improve sensor durability, accuracy, and wireless connectivity. Rising investments in renewable energy infrastructure and grid modernization further increase sensor demand. As monitoring architectures scale, sensors and transmitters remain foundational components driving market expansion.

Region with largest share:

During the forecast period, North America is expected to hold the largest market share, supported by its extensive aging energy infrastructure and high reliability standards. Fueled by large-scale investments in grid modernization, utilities across the region are increasingly deploying advanced sensors, predictive analytics, and digital monitoring platforms. Strong adoption of IoT, AI-driven diagnostics, and regulatory emphasis on minimizing outages further reinforce market dominance, particularly across power transmission, oil & gas pipelines, and renewable energy assets.

Region with highest CAGR:

Over the forecast period, Asia Pacific is anticipated to exhibit the highest CAGR, driven by rapid expansion of power generation capacity and cross-border transmission networks. Spurred by urbanization, industrial growth, and renewable energy integration, utilities are prioritizing real-time condition monitoring to enhance asset reliability. Rising government investments in smart grids, coupled with increasing deployment of digital substations and advanced monitoring systems in emerging economies, are accelerating adoption and positioning the region as the fastest-growing market.

Key players in the market

Some of the key players in Energy Infrastructure Condition Monitoring Market include Siemens AG, ABB Ltd, General Electric Company, Schneider Electric SE, Emerson Electric Co., Honeywell International Inc., Enel S.p.A., Itron Inc., Mitsubishi Electric Corporation, NextEra Energy Resources, SMA Solar Technology AG, Eaton Corporation plc, Accenture plc, Trimble Inc., Power Factors, LLC, AlsoEnergy, Inc., Greenbyte AB, and Solar-Log GmbH.

Key Developments:

In December 2025, Siemens AG introduced an upgraded condition monitoring offering within its Simatic Edge AI portfolio for energy infrastructure, enhancing real-time

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diagnostics at substations and grid assets while reducing data overhead and strengthening adaptive maintenance capabilities.

In November 2025, ABB Ltd expanded its condition monitoring production capacity with a USD 150 million investment in Germany and Singapore, aiming to scale advanced industrial IoT sensors for power and energy grid components under harsh operating conditions.

In November 2025, Emerson Electric Co. launched AMS Machine Works v2.1 with enhanced Wi-Fi and edge connectivity for wireless condition monitoring, boosting automated fault detection and scalable diagnostics in energy infrastructure networks.

Product Types Covered:

- Online Monitoring Systems
- Portable Diagnostic Systems
- Predictive Maintenance Solutions
- Asset Health Management Platforms

Components Covered:

- Sensors & Transmitters
- Data Acquisition Units
- Analytics Software
- Communication Networks

Deployment Approachs Covered:

- Continuous Online Monitoring
- Periodic Offline Inspection

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Hybrid Monitoring Systems

Asset Criticalities Covered:

Mission-Critical Assets

High-Value Equipment

Standard Infrastructure

Applications Covered:

Power Generation Assets

Transmission & Distribution Assets

Renewable Energy Infrastructure

Oil & Gas Energy Assets

End Users Covered:

Utilities & Energy Providers

Industrial Energy Operators

Asset Management Service Providers

Government & Infrastructure Authorities

Regions Covered:

North America

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- 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

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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 2023, 2024, 2025, 2026, 2027, 2028, 2030, 2032 and 2034
- 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

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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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