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Biomass and Waste-to-Power Market Forecasts to 2034 – Global Analysis By Feedstock (Agricultural Residues, Forestry Residues, Municipal Solid Waste (MSW) and Industrial Waste), Technology, Application, End User and By Geography

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Abstracts

According to Stratistics MRC, the Global Biomass and Waste-to-Power Market is accounted for $156.0 billion in 2026 and is expected to reach $237.6 billion by 2034 growing at a CAGR of 5.4% during the forecast period. Biomass and waste-to-power solutions transform organic resources like farm residues, wood waste, urban garbage, and industrial discards into useful energy. They cut reliance on landfills and lower emissions by extracting value from waste flows. Technologies such as incineration, gasification, anaerobic digestion, and pyrolysis enhance performance and support combined heat and power output. Government incentives and circular economy goals are accelerating deployment globally. Issues like inconsistent feedstock, pollution management, and high upfront costs persist, yet ongoing innovation and integrated waste systems are reinforcing biomass's contribution to cleaner energy landscapes worldwide and improving resilience across regions while supporting local economies and jobs.

According to the World Bioenergy Association (WBA), bioenergy contributed 56 EJ to global energy supply in 2023, maintaining a steady 9% share of total energy and producing 711 TWh of electricity in 2024, which represented 7% of global renewable electricity.

Market Dynamics:

Driver:

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Growing demand for renewable energy

Increasing energy needs worldwide, along with the push to move away from fossil fuels, are boosting the use of biomass and waste-to-energy systems. Policymakers and industries are focusing on cleaner energy sources to meet emission reduction goals and enhance energy independence. Unlike solar or wind, biomass provides consistent power generation. Its reliance on locally sourced organic inputs adds to its attractiveness. Compatibility with current energy systems further supports adoption. As countries intensify efforts toward low-carbon development, biomass and waste-to-power solutions are emerging as dependable and flexible renewable energy options across global markets.

Restraint:

High capital and operational costs

The establishment of biomass and waste-to-energy facilities involves high upfront expenditure on equipment, infrastructure, and system deployment. Ongoing costs related to sourcing, transporting, and managing feedstock add further financial pressure. Sophisticated technologies require skilled workforce and consistent upkeep, increasing operational spending. In many regions, especially developing economies, limited financial support and investment access hinder growth. Variations in energy pricing can also affect returns. These financial challenges make it difficult for new projects to emerge and restrict broader market expansion, particularly where low-cost conventional energy sources are still widely available.

Opportunity:

Technological innovation and efficiency improvements

Ongoing progress in biomass processing technologies is unlocking opportunities to enhance system performance and reduce costs. Modern techniques like gasification, pyrolysis, and anaerobic digestion allow more efficient conversion of varied organic materials into energy. The use of automation and digital tools improves operational reliability and minimizes risks. These systems can generate multiple energy forms, including power, heat, and fuels. Continued research is helping to overcome technical and environmental limitations. As these innovations advance, biomass and waste-to-energy solutions are becoming more viable and attractive, driving their adoption across

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different sectors and applications.

Threat:

Fluctuating feedstock availability and pricing

The dependence on organic materials makes biomass and waste-to-energy projects sensitive to changes in feedstock supply and cost. Factors like seasonal shifts, weather conditions, and alternative uses for biomass can lead to inconsistent availability. Logistics and transportation expenses also impact pricing. Rising feedstock costs can strain financial performance and disrupt operations. Supply chain interruptions may further hinder steady energy production. These challenges pose risks for investors and operators, as maintaining reliable supply and cost control becomes critical for ensuring long-term viability and efficiency of biomass and waste-to-power facilities.

Covid-19 Impact:

The pandemic created both setbacks and opportunities for the biomass and waste-to-energy sector. Early disruptions included supply chain interruptions, halted projects, and reduced investments due to lockdowns. Industrial slowdowns decreased certain waste streams, while household waste increased. Workforce shortages and logistical issues impacted operations and feedstock supply. Despite these challenges, the situation emphasized the need for reliable and localized energy solutions. Governments later reintroduced incentives and recovery measures supporting renewable energy. Consequently, the market began recovering steadily, with growing emphasis on sustainable practices, efficient waste handling, and strengthening long-term energy resilience.

The municipal solid waste (MSW) segment is expected to be the largest during the forecast period

The municipal solid waste (MSW) segment is expected to account for the largest market share during the forecast period because of its steady and widespread availability in cities. Growing urban populations and expanding commercial activities produce large quantities of waste, ensuring a dependable resource for energy generation. Authorities are encouraging waste-to-energy adoption to address landfill challenges and improve waste handling practices. Modern processing technologies enhance the efficiency of converting MSW into usable power and heat. Well-established collection and distribution systems further strengthen its position, making it a key feedstock for large-

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scale projects and supporting sustainable urban waste management efforts worldwide.

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

Over the forecast period, the residential segment is predicted to witness the highest growth rate, driven by increasing emphasis on managing household waste efficiently and adopting localized energy systems. Expanding urban populations are producing large amounts of domestic waste suitable for energy conversion. Greater awareness of environmental sustainability and supportive government programs are encouraging communities to adopt cleaner energy solutions. Advancements in small-scale waste processing and improved waste collection systems are also contributing to this growth. Together, these factors make the residential segment the most rapidly expanding area in the biomass and waste-to-power market.

Region with largest share:

During the forecast period, the Asia-Pacific region is expected to hold the largest market share because of its fast urban growth, large population base, and expanding industrial activities. It produces vast amounts of agricultural waste, municipal garbage, and industrial byproducts, ensuring a steady supply of feedstock. Supportive government policies focused on renewable energy adoption, waste reduction, and emission control are boosting market development. Major economies such as China, India, and Japan are heavily investing in waste-to-energy projects. Rising energy requirements and environmental sustainability goals are further strengthening the region’s position as the largest contributor in this global market.

Region with highest CAGR:

Over the forecast period, the North America region is anticipated to exhibit the highest CAGR, driven by strong investments in clean energy infrastructure and modern waste treatment technologies. Supportive government policies, such as subsidies and renewable energy targets, are encouraging market expansion. Utilities and industrial sectors are increasingly adopting sustainable practices to lower emissions. Continuous technological improvements in biomass conversion processes are improving efficiency and project feasibility. With a strong presence of key energy companies and ongoing innovation, the region is experiencing rapid development, positioning it as the fastest-growing market for biomass and waste-to-power solutions.

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Key players in the market

Some of the key players in Biomass and Waste-to-Power Market include Veolia, EEW Energy from Waste, Covanta, WT Energy, WOIMA, Metso Outotec, Fluence, GGI, Welle Group, Yokogawa, Perkins, MAN, Arup Group, Eco Waste Solutions, Renewable Energy Group, POET, Green Plains and VERBIO.

Key Developments:

In February 2026, Veolia has secured two 15-year operations and maintenance (O&M) contracts for Mumbai's upcoming Bhandup and Panjrapur Water Treatment Plants (WTPs), strengthening its presence in India's municipal water sector. The contracts mark the largest municipal water sector agreements signed by a French company in India. The combined treatment capacity of the two plants will be 2,910 million litres per day (MLD), equivalent to 2.91 million cubic metres per day.

In November 2025, POET Technologies Inc. and Quantum Computing Inc. announced a strategic collaboration to develop 400GLane thin-film lithium niobate (TFLN) modulator-based 3.2Tbps engines that will be designed to lead the next era of computing.

In September 2025, Yokogawa Corporation of America and Repligen announce a collaboration to integrate Yokogawa's OpreX Bio Pilot with Repligen's MAVERICK®, enhancing automated control of glucose and lactate levels in cell cultures. The combination of these solutions allows scientists in process development to measure critical process parameters in bioprocessing without building complicated calibration models.

Feedstocks Covered:

- Agricultural Residues
- Forestry Residues
- Municipal Solid Waste (MSW)
- Industrial Waste

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Technologies Covered:

- Direct Combustion
- Gasification
- Anaerobic Digestion
- Pyrolysis
- Landfill Gas Recovery

Applications Covered:

- Electricity Generation
- Combined Heat & Power (CHP)
- Industrial Process Heat
- District Heating

End Users Covered:

- Utilities
- Industrial
- Commercial
- Residential

Regions Covered:

- North America

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United States

Canada

Mexico

Europe

United Kingdom

Germany

France

Italy

Spain

Netherlands

Belgium

Sweden

Switzerland

Poland

Rest of Europe

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Singapore

Vietnam

Rest of Asia Pacific

South America

Brazil

Argentina

Colombia

Chile

Peru

Rest of South America

Rest of the World (RoW)

Middle East

Saudi Arabia

United Arab Emirates

Qatar

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- Israel
- Rest of Middle East

Africa

- South Africa
- Egypt
- Morocco
- Rest of 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

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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)

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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 Rest of the World (RoW) Regions are also represented in the same manner as above.

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