

Green Energy Shift Drives Biomass Power Generation Market to \$124.5 Billion by 2033

Biomass power generation offers a sustainable energy solution by converting organic waste into electricity, reducing emissions and supporting energy security.

WILMINGTON, DE, UNITED STATES, June 25, 2025 /EINPresswire.com/ -- According to a new report published by Allied Market Research, titled, "Biomass Power Generation Market size was valued at \$91.3 billion in 2023, and is projected to reach \$124.5 billion by 2033, growing at a CAGR of 3.2% from 2024 to 2033.



Biomass power generation refers to the production of electricity and heat by utilizing organic materials such as wood pellets, agricultural residues, and animal waste. This renewable energy

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Biomass power generation transforms waste into energy, offering a sustainable path to meet growing energy needs while reducing carbon emissions.”

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source converts biological matter into usable energy through processes like combustion, gasification, and anaerobic digestion. It plays a crucial role in reducing dependence on fossil fuels, lowering greenhouse gas emissions, and promoting sustainable waste management practices.

The global biomass power generation market is witnessing significant growth due to increasing energy demand, supportive government policies, and the push toward

clean energy alternatives. Advancements in biomass conversion technologies, coupled with rising environmental concerns and carbon reduction targets, have further fueled the adoption of biomass power projects across both developed and developing nations.

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The biomass power generation market is driven by the increasing global focus on renewable energy and the urgent need to reduce greenhouse gas emissions. Governments across the globe are implementing supportive policies, tax incentives, and feed-in tariffs to encourage the use of biomass for power generation. These initiatives promote the shift away from fossil fuels and help countries meet their climate goals under international agreements such as the Paris Accord. As environmental regulations become more stringent, industries and utilities are increasingly adopting biomass as a cleaner alternative.

Another significant driver is the abundance and diversity of biomass feedstock. Agricultural residues, forest waste, organic municipal waste, and even algae can be utilized to produce energy, making biomass a highly accessible and versatile resource. This wide availability ensures a consistent and sustainable supply of fuel for biomass power plants, especially in rural and agricultural regions. In addition, the integration of biomass energy into combined heat and power (CHP) systems enhances overall energy efficiency, making it an attractive option for industrial applications.

However, the market faces challenges such as high initial capital investment and complex logistics related to biomass collection, processing, and transportation. Establishing and maintaining a stable biomass supply chain requires significant coordination and infrastructure, which can be a barrier for small and medium-sized enterprises. Furthermore, feedstock availability may fluctuate due to seasonal variations, land-use conflicts, or climate-related issues, potentially affecting the reliability of biomass power plants.

[Technological advancements](#) and innovations are expected to mitigate some of these challenges and create new opportunities for growth. Developments in gasification, pyrolysis, and anaerobic digestion technologies are improving efficiency, reducing emissions, and expanding the range of usable biomass materials. Additionally, the incorporation of digital monitoring systems and automation is optimizing biomass plant operations, lowering operational costs, and improving scalability.

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The rise in circular economy initiatives and growing interest in waste-to-energy solutions are also boosting the demand for biomass power generation. Industries are increasingly investing in biomass plants to manage organic waste sustainably while generating energy. Moreover, emerging markets in Asia-Pacific, Latin America, and Africa are witnessing increased investment in biomass infrastructure, driven by rapid urbanization, energy access needs, and agricultural productivity, further supporting the long-term growth of the global biomass power generation market.

Segment Overview

The [biomass power generation market analysis](#) is segmented based on feedstock type, technology, application, and region. By feedstock, the market includes woody biomass,

agricultural residues, animal manure, and municipal solid waste. Based on technology, it is categorized into combustion, gasification, anaerobic digestion, and pyrolysis. Applications of biomass power generation span across industrial, commercial, and residential sectors. Region-wise, the market is analyzed across North America, Europe, Asia-Pacific, and LAMEA, with Asia-Pacific dominating due to high agricultural output and supportive government initiatives.

Regional Analysis

Asia-Pacific dominates the biomass power generation market and is expected to maintain its lead throughout the forecast period. This growth is driven by a large agricultural base producing abundant biomass feedstock, along with strong government support for renewable energy adoption in countries such as China, India, and Japan. For instance, India's National Bio-Energy Mission and China's 14th Five-Year Plan for renewable energy highlight their commitments to bioenergy expansion. Additionally, rapid industrialization, rising energy demand, and a focus on reducing greenhouse gas emissions further propel market growth in this region.

Europe holds a significant share of the biomass power generation market due to its stringent environmental regulations and long-standing commitment to sustainability. Countries like Germany, Sweden, and Finland have integrated biomass as a key component of their energy mix. The European Union's Renewable Energy Directive, which mandates increased use of renewable sources, has further accelerated biomass adoption. Meanwhile, North America is witnessing moderate growth, with the U.S. and Canada leveraging forest residues and municipal solid waste for power generation. However, market growth is slightly restrained by competition from other renewable sources like solar and wind.

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Competitive Analysis

The biomass power generation market is characterized by the presence of several prominent players who are actively involved in capacity expansions, technological innovations, and strategic partnerships to strengthen their market position. Key players such as Drax Group plc, Ørsted A/S, Veolia, Babcock & Wilcox Enterprises, and Mitsubishi Heavy Industries, Ltd. are leading the way by integrating advanced combustion technologies, gasification systems, and co-firing techniques to enhance efficiency and reduce emissions. These companies are also investing in sustainable feedstock sourcing and circular economy practices to ensure long-term biomass supply and regulatory compliance.

In addition to established players, numerous regional and emerging companies are entering the biomass power generation market, contributing to competitive intensity. These players are leveraging government subsidies, favorable feed-in tariffs, and public-private partnerships to expand their operational capabilities. Moreover, with the growing emphasis on decentralized energy systems and rural electrification, many firms are focusing on developing small- and medium-scale biomass plants to serve localized demand. This dynamic and competitive landscape fosters innovation and collaboration, accelerating the global adoption of biomass as a

reliable and sustainable energy source.

Key Findings of the Study:

- **Rising Energy Demand:** Increasing global demand for clean and renewable energy sources is driving the adoption of biomass power generation across industrial, commercial, and residential sectors.
- **Supportive Policies:** Government initiatives such as subsidies, feed-in tariffs, and renewable energy targets are playing a significant role in promoting biomass-based power solutions.
- **Asia-Pacific Dominance:** The Asia-Pacific region holds the largest market share due to agricultural biomass availability, rural electrification efforts, and expanding industrialization.
- **Technological Advancements:** Continuous innovations in combustion, gasification, and anaerobic digestion technologies are improving efficiency and reducing emissions in biomass power plants.
- **Sustainability Challenges:** While the market is growing, issues related to sustainable feedstock sourcing and land use constraints pose challenges to large-scale biomass deployment.

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