

# Biomass Market Surges to \$121 Billion by 2033 | Fueled by Power Generation & CHP Applications

*Biomass Market to Reach \$121 Billion by 2033 □ Driven by Bioenergy Demand & Green Policies*

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## □ Biomass Industry Overview

The global [biomass market](#) size was valued at \$59.0 billion in 2023 and is projected to soar to \$121.0 billion by 2033, growing at a CAGR of 7.5% from 2024 to 2033. This strong growth reflects the global push toward renewable and carbon-neutral energy sources amid rising environmental concerns and fossil fuel limitations.

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Biomass market to hit \$121B by 2033 □, driven by biofuels, power generation, and demand for carbon-neutral energy alternatives.”

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Biomass energy—derived from organic materials such as wood pellets, agricultural residues, and bio-waste—is gaining traction due to its role in decarbonizing the energy system, reducing landfill waste, and supporting circular economies □.

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## □ Key Drivers Boosting Market Growth

## □ Climate Change & Carbon Neutrality Goals

Global initiatives such as the Paris Agreement and national net-zero targets have accelerated the shift toward renewable energy. Biomass, being carbon-neutral when sustainably sourced, plays a



vital role in reducing greenhouse gas emissions ☐.

## ☐ Waste Management & Circular Economy

Biomass uses organic waste that would otherwise go to landfills. This aligns with global circular economy models, especially in waste-rich regions, turning residues into resources ☐☐.

## ☐ Policy Incentives & Subsidies

Governments worldwide are supporting biomass adoption through tax credits, renewable energy mandates, feed-in tariffs, and capital grants. These incentives are spurring industrial and commercial biomass adoption.

## ☐ Challenges in the Biomass Market

Despite its promise, the biomass market faces several hurdles:

**Feedstock Availability & Logistics:** Consistent supply of raw biomass is critical; transportation and storage costs can be high.

**Land Use Concerns:** Over-reliance on energy crops can compete with food production.

**Emission Scrutiny:** Although carbon-neutral, combustion of biomass can release particulate matter and NOx, requiring careful emissions control.

**Capital-Intensive Projects:** Biomass plants require substantial upfront investment, which can deter small-scale adopters.

## ☐ Market Segmentation Insights

### ☐ By Type

**Solid Biomass:** Includes wood chips, pellets, and agricultural waste. This segment holds the largest share due to its widespread use in heat and electricity generation.

**Liquid Biomass:** Primarily used for biofuels such as [biodiesel](#) and bioethanol, which power vehicles and machinery.

**Gaseous Biomass:** Includes biogas and syngas, mainly generated through anaerobic digestion or gasification, used in both power and heat production.

### ☐☐ By Technology

**Combustion:** The most common technology for biomass conversion, used in industrial boilers and power plants.

**Gasification:** Converts organic material into syngas for clean, efficient power generation.

**Anaerobic Digestion:** Converts biodegradable material into methane-rich biogas, ideal for small-scale and off-grid applications.

**Others:** Includes pyrolysis and torrefaction, emerging technologies offering potential for [advanced biofuels](#).

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#### □ By Application

**Power Generation:** Dominates the biomass market as utilities invest in renewable baseload power sources.

**Heat Production:** Used extensively in industrial and residential heating systems, particularly in Europe and Asia.

**Biofuels:** An essential part of transport sector decarbonization strategies, especially in aviation and road freight.

**Combined Heat and Power (CHP):** Gains popularity due to its high efficiency, offering simultaneous electricity and heat from a single biomass source.

#### □ By End-Use

**Residential:** Biomass stoves and boilers continue to be adopted in rural and off-grid areas.

**Commercial:** Hotels, campuses, and hospitals are turning to biomass for sustainable heating and energy solutions.

**Industrial:** Manufacturing, pulp & paper, and food processing sectors use biomass for energy-intensive operations, contributing significantly to the market size.

#### □ Regional Landscape

**North America:** The U.S. and Canada lead in bioenergy projects, especially wood pellet exports and biogas initiatives.

Europe: Holds a dominant position due to favorable regulatory frameworks such as the EU's Renewable Energy Directive (RED II). Countries like Germany, UK, and Sweden are pioneers in biomass use for district heating and power generation.

Asia-Pacific: The fastest-growing region, with China, India, and Japan investing in biomass to reduce coal dependence and meet climate goals.

LAMEA: Countries like Brazil are capitalizing on abundant sugarcane residues for bioethanol production, while South Africa and Saudi Arabia explore waste-to-energy potential.

#### □ Key Market Players

Leading global and regional companies are investing in technology upgrades and geographical expansion. Notable players include:

Viridis Energy Inc.

German Pellets GmbH

Fram Fuels

Verdo

Drax Global

Enviva

Bioenergy International

RWE

ANDRITZ

ENERGEX PELLET FUEL, INC.

These companies are focusing on sustainable feedstock sourcing, automation in biomass processing, and integrating digital control systems for efficiency optimization.

#### □ Future Outlook

The future of the biomass market is promising, with expected breakthroughs in advanced biofuels, hybrid renewable systems, and biomass co-firing with other green technologies like hydrogen. Innovations in supply chain digitization, AI-based feedstock assessment, and carbon

capture with bioenergy (BECCS) will likely shape the next decade.

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## □ Conclusion

The biomass market is on a strong growth trajectory, driven by environmental sustainability goals, renewable energy mandates, and technological innovation. With its ability to provide baseload power, reduce emissions, and utilize organic waste effectively, biomass will remain a crucial player in the global clean energy mix □□.

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