

Global Biorefinery Market Forecast: Growth from US\$ 148.4 Billion to US\$ 360.5 Billion by 2034 - TMR

Global Biorefinery Market to Reach US\$ 360.5 Bn by 2034, Growing at an 8.0% CAGR from US\$ 148.4 Bn in 2023

WILMINGTON, DE, UNITED STATES, December 20, 2024 /EINPresswire.com/ -- The global [biorefinery market](#) is poised for remarkable growth in the coming decade, reflecting the increasing emphasis on renewable energy solutions and sustainable resource utilization. Valued at approximately US\$ 148.4 billion in 2023, the industry is projected to expand at a compound annual growth rate (CAGR) of 8.0% from 2024 to 2034, reaching an estimated US\$ 360.5 billion by the end of 2034. This promising trajectory underscores the growing demand for alternative fuel sources, stringent environmental regulations, and technological advancements in biomass refining.



Biorefinery Market Outlook 2034: Valued at US\$ 148.4 Bn in 2023, the market is estimated to grow at a CAGR of 8.0%, reaching US\$ 360.5 Bn by 2034"

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Analyst Viewpoint

The biorefinery market is set to play a pivotal role in the global transition toward low-carbon economies. Analysts highlight the significance of biorefineries in decarbonizing multiple sectors by offering sustainable alternatives to fossil fuels. The surge in government regulations promoting renewable energy adoption and increasing investments in biorefinery infrastructure further bolster market growth. Key industry players are strategically repurposing traditional refineries into state-of-the-art biorefineries and channeling resources into research and development to unlock new possibilities for sustainable biofuels and bioproducts.

Market Introduction

A biorefinery is a facility that converts biomass feedstock into a diverse range of valuable products, including energy, fuels, chemicals, and materials. The feedstock used in biorefineries encompasses energy crops, sugar and starch crops, agricultural residues, and multi-feedstock. These facilities produce traditional products like electricity and heat, along with transportation fuels, biochemicals, and biomaterials.

Biorefineries employ feedstocks classified into three generations:

- First Generation: Utilizes crops such as sugarcane and corn.
- Second Generation: Derives feedstock from residues and non-edible crops.
- Third Generation: Relies on algae for feedstock.

The advantages of biomass refining include cost-effectiveness, reduced primary product pricing, and enhanced production efficiency for low-volume/high-margin coproducts. These benefits position biorefineries as integral to achieving energy security, sustainable resource supply, and rural economic development.

Key Drivers of Growth

1. Rising Demand for Alternative Fuel Sources

The depletion of fossil fuels and concerns over energy security are driving global interest in alternative energy solutions. According to current estimates, existing fossil fuel reserves may be exhausted by 2060. Biorefineries offer viable pathways to a bio-based economy and contribute to the vision of a zero-waste society.

Biorefineries produce three main product categories:

- Biofuels: Fuels derived from biomass, including ethanol and biodiesel.
- Bio-energy: Renewable energy generated from biomass.
- Bio-based Chemicals and Materials: Alternatives to petrochemical-based products.



Biorefinery Market

The demand for biofuels is rising rapidly. The International Energy Agency (IEA) reported a record-high biofuel demand of 4.3 exajoules (EJ) in 2022, exceeding pre-pandemic levels. Notably, most biofuels are derived from waste, residues, and non-food crops, further emphasizing sustainability.

2. Regulatory Support for Renewable Energy Roll-out

Governments worldwide are enacting stringent regulations to reduce reliance on fossil fuels and promote renewable energy adoption. The European Union's REPowerEU Plan, introduced in 2022, aims to accelerate renewable energy deployment and enhance energy security. This initiative has catalyzed investments in biorefinery infrastructure across Europe.

In March 2024, NordFuel partnered with Chempolis Ltd. to establish a next-generation bioproduct facility in Finland, primarily catering to Europe's demand for sustainable solutions. Such developments underscore the alignment of biorefinery projects with regional and global energy goals.

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Regional Market Insights

North America

North America emerged as the leading market for biorefineries in 2023, driven by robust growth in the biofuels sector. The demand for renewable diesel and sustainable aviation fuels (SAFs) in the United States and Canada is surging. According to Rystad Energy, U.S. biofuel production is expected to increase by 53% by 2035, reaching approximately 1.3 million barrels of oil equivalent per day (boepd).

Europe

Stringent energy regulations and an emphasis on reducing greenhouse gas (GHG) emissions are propelling the biorefinery market in Europe. The European Union aims to cut GHG emissions by at least 55% by 2030 compared to 1990 levels. Biorefineries are integral to achieving this target by providing sustainable alternatives to conventional fuels.

Asia Pacific

The Asia Pacific region is witnessing substantial investments in biorefinery infrastructure, particularly in China, India, and ASEAN countries. Rapid industrialization, coupled with government incentives for renewable energy adoption, is creating significant growth opportunities in this region.

Key Players and Competitive Landscape

Prominent players in the biorefinery market include:

- Neste
- Valero Energy Corporation
- Chevron
- TotalEnergies
- Borregaard AS
- Wilmar International Ltd.
- Vivergo Fuels
- Cargill, Incorporated

These companies are actively investing in expanding their biorefinery capabilities and introducing innovative technologies to enhance production efficiency and sustainability. For instance:

- In February 2024, Eni SPA announced plans to construct a third biofuel production plant in Livorno, Italy.
- In 2023, Numaligarh Refinery Ltd. (NRL) initiated efforts to start ethanol production at its Assam-based biorefinery by March 2024.

Market Segmentation

The biorefinery market is segmented based on feedstock, type, product, and technology:

By Feedstock:

- Energy Crops
- Sugar and Starch Crops
- Multi-feedstock
- Agricultural Residues

By Type:

- First Generation
- Second Generation
- Third Generation

By Product:

- Material-Driven
- Energy-Driven

By Technology:

- Thermochemical
- Physicochemical
- Industrial Biotechnology

Future Outlook and Opportunities

The biorefinery market's growth is driven by increasing demand for sustainable solutions across various sectors, including transportation, energy, and chemicals. Innovations in biorefining technologies and strategic partnerships are expected to unlock new opportunities for market players.

Key developments to watch include:

- The expansion of biorefineries focused on renewable natural gas (RNG) and bioethanol production.
- Growing adoption of integrated biorefinery models that maximize feedstock utilization.
- Advancements in second and third-generation feedstock processing.

Conclusion

The biorefinery market is at the forefront of the global shift toward sustainability and energy independence. With supportive regulations, technological advancements, and a clear focus on reducing carbon footprints, the industry is poised for sustained growth over the next decade. Key players' strategic initiatives and collaborations will further shape the market landscape, fostering innovation and ensuring alignment with global energy and environmental goals.

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