

Bioethanol Market Report by Type (Sugarcane-based Ethanol, Cellulosic Ethanol, Starch-based Ethanol, and Others), Fuel Blend (E10, E20 and E25, E70 and E75, E85, and Others), Generation (First Generation, Second Generation, Third Generation), End Use Industry (Automotive and Transportation, Power Generation, Pharmaceutical, Food and Beverage, Cosmetics and Personal Care, and Others), and Region 2025-2033

Market Report | 2025-09-01 | 149 pages | IMARC Group

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Report description:

The global bioethanol market size reached USD 10.7 Billion in 2024. Looking forward, IMARC Group expects the market to reach USD 18.7 Billion by 2033, exhibiting a growth rate (CAGR) of 6.05% during 2025-2033. At present, North America holds the largest market share, driven by government mandates for renewable fuels, the increasing demand for low-emission energy sources, advancements in biofuel technology, and rising awareness about the environmental benefits of bioethanol as a sustainable alternative to fossil fuels.

Bioethanol is a clear, colorless liquid produced from biomass by hydrolysis and sugar fermentation or using the chemical process of reacting ethylene with steam. It is biodegradable, less toxic, and does not cause environmental pollution as compared to conventional fuels. Consequently, it is gaining traction as a petrol substitute for road transport vehicles around the world. It is blended with petrol without modifying engine designs, which results in reduced greenhouse gas (GHG) emissions and air pollution. Presently, the ongoing research and development activities to produce bioethanol fuel using municipal solid waste are escalating the demand for bioethanol worldwide.

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Bioethanol Market Trends:

Increasing Government Policies and Renewable Fuel Standards

Government regulations, especially in Europe and North America, have been instrumental in improving the bioethanol market value. Initiatives such as the U.S. Renewable Fuel Standard (RFS) and Canada's Clean Fuel Standard establish targets for the use of renewable fuel, ensuring steady demand for bioethanol as a renewable gasoline substitute. Taxation benefits and subsidies also stimulate production and usage, triggering investments in bioethanol manufacturing plants. According to the bioethanol market analysis, these regulatory frameworks aim to reduce greenhouse gas (GHG) emissions and fossil fuel dependency, encouraging oil refineries to blend bioethanol with conventional fuels to meet environmental standards. Compliance with these mandates has become a key factor propelling market growth as nations pursue ambitious decarbonization goals. In India, the National Biofuels Policy - 2018, revised in 2022, among other things, brought forward the goal of 20% ethanol blending in petrol to the Ethanol Supply Year (ESY) 2025-26 from 2030. Public Sector Oil Marketing Companies (OMCs) reached the goal of 10% ethanol blending in petrol in June 2022, completing it five months earlier than the target set for ESY 2021-22.

Rising Environmental and Consumer Demand for Sustainable Fuels

The increasing realization of climate change and environmental footprint has resulted in the higher demand for cleaner, renewable energy sources, thereby rising the bioethanol market price. Bioethanol, being made from plant materials, is significantly lower in carbon emissions compared to fossil fuels, and is thus appealing for those seeking to lower emissions. Bioethanol vehicles produce fewer pollutants, reflecting better air quality and public health advantages. With rising focus on sustainability, the position of bioethanol as a renewable fuel becomes more compelling. Complementing this, demand spurs innovation in production efficiency, crop yield, and bioethanol blends, making it even stronger in the renewable energy sector. The governing agencies are also taking proactive steps to launch biofuels. For instance, Petroleum Minister Hardeep S Puri highlighted India's bioenergy progress at India Bio-Energy & Tech Expo 2024. Minister Shri Hardeep Singh Puri also emphasized the extensive distribution of E20 fuel, available at more than 15,600 retail locations throughout India. He praised the Pradhan Mantri JI-VAN Yojana for its vital function in offering financial assistance to advanced biofuel initiatives, which is essential for establishing a sustainable ethanol production framework.

Substantial Developments in Bioethanol Production Technologies

As per the bioethanol market report, progress in technology in bioethanol production, such as cellulosic bioethanol and enzyme engineering, is propelling the market growth. Innovations allow for more effective utilization of feedstocks, such as farm waste, and lower production costs, which make bioethanol compete favorably with traditional fuels. Cellulosic bioethanol, which is made from non-food crop residues, minimizes competition for food, thereby extending bioethanol's sustainability advantage. Moreover, breakthroughs in biotechnology, including genetically modified yeasts and enhanced fermentation techniques, boost yields in production and raise process efficiency. These advancements render bioethanol a more and more feasible and scalable substitute for gasoline, promoting investments and driving the growth of the bioethanol market. In 2024, Arkema, a frontrunner in specialty materials, generated Ethyl Acrylate solely from bioethanol at its acrylic monomer plant in Carling, France. Arkema's bio-based ethyl acrylate contains a bio carbon content (BCC) of 40% and achieves a reduction of up to 30%* in product carbon footprint (PCF).

Bioethanol Market Growth Drivers:

Reduced Reliance on Fossil Fuels and Heightened Energy Security

Among the primary factors driving the bioethanol industry is the worldwide move toward energy self-sufficiency. Nations are going out of their way to reduce their dependence upon foreign crude oil, which tends to be plagued by unstable pricing and geopolitical uncertainties. By generating bioethanol within the country from sustainable agricultural crops like corn, sugarcane, and wheat, countries are able to obtain a steadier and more predictable fuel source. This shift not only boosts national energy security but also bolsters domestic economies, curtails trade deficits, and assists in achieving long-term sustainability objectives.

Growth of Flex-Fuel Vehicles (FFVs)

The increasing popularity of Flex-Fuel Vehicles (FFVs) that can run on gasoline-ethanol blends with up to 85% ethanol (E85) is increasingly driving the demand for bioethanol. Countries such as Brazil and North America are at the forefront of FFV deployment, providing a robust platform for high-ethanol fuel markets. As more and more automotive manufacturers produce

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more ethanol-compatible vehicles, and motorists become increasingly confident in their performance and availability, the marketplace for mid- to high-ethanol blends expands. This expanding fleet of FFVs is a key driver in expanding the use of bioethanol and spurring its integration into widespread fuel markets.

Growing Investment and Infrastructure Development

Supportive government policies, regulatory encouragement, and increasing demand for clean fuels are pushing massive investment in bioethanol production facilities. New facilities are being commissioned, and those in operation are being enlarged to enhance production and efficiency. Concurrently, investment in storage, blending terminals, and distribution networks is picking up pace, providing for the delivery of bioethanol in a reliable and cost-effective manner over regions. This investment in infrastructure is essential in attaining economies of scale and positioning bioethanol as a long-term viable option in the shift towards low-carbon transport fuels.

Key Market Segmentation:

IMARC Group provides an analysis of the key trends in each sub-segment of the global bioethanol market report, along with forecasts at the global, regional and country level from 2025-2033. Our report has categorized the market based on type, fuel blend, generation and end use industry.

Breakup by Type:

- Sugarcane-based Ethanol
- Cellulosic Ethanol
- Starch-based Ethanol
- Others

Breakup by Fuel Blend:

- E10
- E20 and E25
- E70 and E75
- E85
- Others

Breakup by Generation:

- First Generation
- Second Generation
- Third Generation

Breakup by End Use Industry:

- Automotive and Transportation
- Power Generation
- Pharmaceutical
- Food and Beverage
- Cosmetics and Personal Care
- Others

Breakup by Region:

- North America
 - o□ United States
 - o□ Canada
- Asia-Pacific
 - o□ China
 - o□ Japan
 - o□ India
 - o□ South Korea
 - o□ Australia

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- o□Indonesia
- o□Others
- Europe
- o□Germany
- o□France
- o□United Kingdom
- o□Italy
- o□Spain
- o□Russia
- o□Others
- Latin America
- o□Brazil
- o□Mexico
- o□Others
- Middle East and Africa

Competitive Landscape:

The report has also provided a comprehensive analysis of the competitive landscape in the global bioethanol market. Detailed profiles of all major companies have also been provided. Some of the companies covered include:

- Abengoa S.A.
- Archer-Daniels-Midland Company
- BP plc
- Cristalco (Cristal Union)
- CropEnergies AG (Sudzucker AG)
- Flint Hills Resources, LLC (Koch Industries, Inc.)
- Green Plains Inc.
- Honeywell International Inc.
- INEOS Capital Limited
- Petroleo Brasileiro S.A.
- POET LLC
- Royal Dutch Shell plc
- Valero Energy Corporation

Key Questions Answered in This Report:

- How has the global bioethanol market performed so far and how will it perform in the coming years?
- What has been the impact of COVID-19 on the global bioethanol market?
- What are the key regional markets?
- What is the breakup of the market based on the type?
- What is the breakup of the market based on the fuel blend?
- What is the breakup of the market based on the generation?
- What is the breakup of the market based on the end use industry?
- What are the various stages in the value chain of the industry?
- What are the key driving factors and challenges in the industry?
- What is the structure of the global bioethanol market and who are the key players?
- What is the degree of competition in the industry?

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