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Second Generation Biofuel Market Forecasts to 2032 – Global Analysis By Biofuel Type (Cellulosic Ethanol, Biodiesel, Bio Butanol and Other Biofuel Types), Process, Feedstock, Application, End User and By Geography

https://marketpublishers.com/r/S73DF0CE2201EN.html
Date: April 2025
Pages: 150
Price: US$ 4,150.00 (Single User License)
ID: S73DF0CE2201EN

Abstracts

According to Stratistics MRC, the Global Second Generation Biofuel Market is accounted for $17.52 billion in 2025 and is expected to reach $103.03 billion by 2032 growing at a CAGR of 28.8% during the forecast period. Advanced biofuels known as second-generation biofuels are made from non-food biomass sources like waste materials, woody crops, and agricultural wastes. They provide greater sustainability and don't compete with the food supply like first-generation biofuels do. These biofuels are produced by thermochemical or biochemical processes that transform lignocellulosic biomass into fuels such as synthetic biofuels, biodiesel, and ethanol. They improve energy security and lower greenhouse gas emissions. Second-generation biofuels are essential to the shift to cleaner energy sources, notwithstanding commercialisation obstacles.

Market Dynamics:

Driver:

Energy security & independence

A steady and sustained energy supply is ensured by the biofuels' utilisation of non-food biomass. Governments support them by enacting laws that improve economic stability and national energy resilience. Local economies are strengthened and employment is created by domestic biofuel production, which also lessens reliance on changes in the

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price of oil globally. A cleaner substitute that promotes long-term energy sustainability is provided by advanced biofuels. Investments in second-generation biofuels are increasing as countries strive for self-sufficiency, which is driving market expansion.

Restraint:

Infrastructure & supply chain gaps

Large-scale commercialisation is slowed back by inadequate refining facilities and costly capital expenditures. The delivery of raw materials is delayed and transportation expenses are raised by an ineffective logistics network. Price and production stability are impacted by feedstock availability fluctuations. Inadequate infrastructure for blending and fuelling stations hinders market adoption, particularly in the transportation sector. Second-generation biofuels are less competitive than established energy options because of these issues.

Opportunity:

Rising demand for renewable energy

Globally, governments encourage the use of biofuels by enacting laws and offering incentives in order to meet sustainable energy goals. Non-food biomass is used to make second-generation biofuels, which guarantee sustainability without compromising the availability of food. Efficiency gains in biofuel production make them a competitive option for power generation and transportation. Growing investments in bio-refineries increase their commercialisation and production capacity. Market expansion is also fuelled by rising consumer awareness and corporate sustainability objectives.

Threat:

Competition from alternative green energy

Alternative green energy sources like solar, wind, and hydrogen are a threat. Because they frequently get larger government subsidies and incentives, these alternatives are more appealing to investors. Technological developments in electric vehicles and battery storage have decreased the need for biofuels in transportation. Furthermore, facilities for producing biofuel are not growing as quickly as those for renewable electricity. Their standing in the market is further weakened by the belief that biofuels

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are less sustainable because of land-use issues. Because of this, second-generation biofuels find it difficult to compete with the quickly changing green energy options.

Covid-19 Impact

The COVID-19 pandemic disrupted the second-generation biofuel market due to supply chain constraints, reduced transportation fuel demand, and delays in biofuel projects. Lockdowns led to lower ethanol and biodiesel consumption, impacting production and investments. However, the crisis also highlighted the need for sustainable energy, prompting government incentives and policies to boost biofuel adoption. As economies recover, the market is expected to rebound with increased focus on decarbonization, energy security, and reduced dependence on fossil fuels, driving long-term growth.

The biodiesel segment is expected to be the largest during the forecast period

The biodiesel segment is expected to account for the largest market share during the forecast period by offering a sustainable alternative to conventional diesel with lower carbon emissions. It utilizes non-food feedstocks like waste oils, algae, and agricultural residues, reducing dependency on edible crops. Government policies and incentives promoting cleaner fuels further boost biodiesel adoption in transportation and industrial sectors. Advances in production technologies enhance efficiency, making biodiesel more cost-competitive. Growing environmental concerns and the push for net-zero emissions accelerate its demand, strengthening the overall market.

The aviation & aerospace segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the aviation & aerospace segment is predicted to witness the highest growth rate, due to reduced carbon emissions. Airlines and aerospace companies adopt biofuels made from waste oils, algae, and agricultural residues to meet strict environmental regulations. Government mandates and incentives further accelerate SAF development and integration into commercial flights. Technological advancements improve fuel efficiency and scalability, making biofuels a viable alternative to conventional jet fuel. Increasing commitments to net-zero emissions and carbon neutrality push the industry toward greater biofuel adoption.

Region with largest share:

During the forecast period, the Asia Pacific region is expected to hold the largest market

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share due to increasing demand for sustainable energy solutions. Governments in countries like China, India, and Japan are promoting biofuels through policies and incentives, driving production and adoption. Advanced biofuels derived from non-food biomass, such as agricultural waste and algae, are gaining traction due to their lower carbon footprint. Key players are investing in research and development to enhance efficiency and scalability. Growing environmental awareness, coupled with technological advancements, positions the region as a major hub for second-generation biofuel innovation and commercialization.

Region with highest CAGR:

Over the forecast period, the North America region is anticipated to exhibit the highest CAGR, owing to strong government support, technological advancements, and rising demand for cleaner energy. The U.S. and Canada are leading in biofuel production, with policies like the Renewable Fuel Standard (RFS) and Low Carbon Fuel Standards (LCFS) promoting adoption. Advanced biofuels from agricultural residues, algae, and waste materials are gaining prominence due to their sustainability benefits. Investments in research and development, along with collaborations between energy firms and biotech companies, are accelerating commercialization, making North America a key player in the global biofuel industry.

Key players in the market

Some of the key players profiled in the Second Generation Biofuel Market include Abengoa Bioenergy, Air Liquide, Alto Ingredients, Amyris Inc., Aurora Algae, BBI Biotech, Beta Renewables, BioGasol, BlueFire Renewables, Chemrec, Clariant, ClimeWorks, Danisco, Enerkem, Gevo, GranBio, Indian Oil Corporation (IOC) and Renewable Energy Group (REG).

Key Developments:

In November 2024, Air Liquide announced a renewable hydrogen production project at TotalEnergies' La Mede biorefinery in France. Under a long-term contract, Air Liquide will construct, own, and operate a hydrogen production unit with an annual capacity of 25,000 tonnes.

In February 2023, Amyris and Givaudan announced a strategic partnership wherein Givaudan acquired certain cosmetic ingredients from Amyris, including Neossance® Squalane, Neossance® Hemisqualane, and CleanScreen™. This collaboration aimed to

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leverage Amyris's biotechnology platform to develop sustainable beauty ingredients.

Biofuel Types Covered:

- Cellulosic Ethanol
- Biodiesel
- Bio Butanol
- Other Biofuel Types

Processes Covered:

- Biochemical Process
- Thermochemical Process
- Other Processes

Feedstocks Covered:

- Simple Lignocellulose
- Complex Lignocellulose
- Syngas
- Algae
- Other Feedstocks

Applications Covered:

- Transportation

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- Power Generation
- Residential & Commercial Heating
- Other Applications

End Users Covered:

- Aviation & Aerospace
- Automotive
- Marine & Shipping
- Industrial Sector
- Other End Users

Regions Covered:

- North America
  - US
  - Canada
  - Mexico
- Europe
  - Germany
  - UK
  - Italy
  - France

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- Spain
- Rest of Europe

Asia Pacific

- Japan
- China
- India
- Australia
- New Zealand
- South Korea
- Rest of Asia Pacific

South America

- Argentina
- Brazil
- Chile
- Rest of South America

Middle East & Africa

- Saudi Arabia
- UAE
- Qatar

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South Africa

Rest of Middle East & 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 2024, 2025, 2026, 2028, and 2032
- 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

Free Customization Offerings:

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)

SWOT Analysis of key players (up to 3)

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 Middle East & Africa Regions are also represented in the same manner as above.

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