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Renewable/Bio Jet Fuel Market - Global Industry Size, Share, Trends, Opportunity, and Forecast, Segmented, By Conversion Pathways (Fischer Tropsch Synthetic Paraffinic Kerosene (FT-SPK), Hydroprocessed Esters and Fatty Acids (HEFA), Synthetic Iso-paraffin from Fermented Hydroprocessed Sugar (SIP) and Alcohol to Jet SPK (ATJ-SPK)), By Feedstock (Agriculture Crops, Aquaculture Crops, Energy Crops, Multiple Solid Waste, and Others), By Region, By Competition, 2020-2030F

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Abstracts

Global Renewable/Bio Jet Fuel Market was valued at USD 18.23 billion in 2024 and is expected to reach USD 36.35 billion by 2030 with a CAGR of 12.02% during the forecast period. The Renewable/Bio Jet Fuel Market refers to the global industry focused on the production, distribution, and adoption of sustainable aviation fuels (SAFs) derived from renewable and biological sources such as used cooking oil, vegetable oils, algae, waste biomass, and agricultural residues. These bio-based jet fuels serve as a sustainable alternative to conventional fossil-based aviation fuels, aiming to reduce greenhouse gas (GHG) emissions, enhance energy security, and comply with increasingly stringent environmental regulations imposed by international aviation bodies such as the International Civil Aviation Organization (ICAO) and national regulatory frameworks.

Key Market Drivers

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Stringent Environmental Regulations and Carbon Reduction Targets

Governments and regulatory bodies worldwide are implementing stringent environmental policies to curb carbon emissions, a key driver of the Renewable/Bio Jet Fuel market. The aviation sector is a significant contributor to greenhouse gas emissions, and with growing concerns about climate change, regulatory frameworks such as the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) by the International Civil Aviation Organization (ICAO) are compelling airlines to reduce their carbon footprint. Additionally, national policies such as the European Union's Renewable Energy Directive (RED II) and the U.S. Renewable Fuel Standard (RFS) mandate the integration of sustainable aviation fuels (SAFs) into the energy mix.

These regulations impose penalties on excessive carbon emissions while incentivizing the use of alternative fuels with lower lifecycle emissions. Airlines are also facing increasing pressure from environmental advocacy groups, investors, and consumers who demand greener travel options. Consequently, aviation companies are investing heavily in biofuels to comply with evolving emission standards and avoid financial penalties associated with carbon taxation. The demand for Renewable/Bio Jet Fuel is further supported by government subsidies, grants, and research funding aimed at accelerating the production and adoption of SAFs. This regulatory push is driving technological advancements in biofuel production, including innovations in feedstock utilization and fuel processing technologies, making Renewable/Bio Jet Fuel more viable and commercially attractive. Additionally, some countries have introduced blending mandates, requiring a certain percentage of biofuels in aviation fuel supplies, which is further boosting market growth.

Key Market Challenges

High Production Costs and Limited Economies of Scale

The Renewable/Bio Jet Fuel market faces a significant challenge in terms of high production costs, which hinder its competitiveness against conventional fossil-based jet fuel. The cost of producing bio jet fuel remains substantially higher due to several factors, including expensive feedstock acquisition, complex refining processes, and limited production capacity. Unlike traditional petroleum-based jet fuel, which benefits from well-established supply chains and large-scale refineries, bio jet fuel production relies on feedstocks such as used cooking oil, agricultural residues, and algae-derived lipids, which are often expensive and inconsistent in supply. The processing of these raw materials into bio jet fuel requires advanced technological interventions, including

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hydroprocessing and Fischer-Tropsch synthesis, which add to the operational and capital expenditure. Additionally, many biofuel production facilities operate at a much smaller scale compared to conventional refineries, leading to a lack of economies of scale that could otherwise drive down costs. The absence of sufficient large-scale investments further exacerbates this challenge, as funding for bio jet fuel projects remains uncertain due to long payback periods and regulatory hurdles.

Key Market Trends

Rising Adoption of Sustainable Aviation Fuel (SAF) Policies and Incentives

Governments and international aviation regulatory bodies are increasingly implementing policies and financial incentives to accelerate the adoption of renewable or bio-based jet fuels, often referred to as Sustainable Aviation Fuel (SAF). With the aviation industry accounting for approximately 2-3% of global CO? emissions, reducing its carbon footprint has become a top priority. In response, organizations such as the International Air Transport Association (IATA) and the International Civil Aviation Organization (ICAO) have set ambitious decarbonization targets, including a net-zero emission goal by 2050. Policies such as the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) aim to curb aviation emissions by mandating the use of SAF. Additionally, countries like the United States have introduced the Inflation Reduction Act (IRA), which provides tax credits for SAF production, while the European Union’s ReFuelEU Aviation initiative sets minimum SAF blending mandates for airlines.

Financial support through grants, subsidies, and loan guarantees is further driving investments in SAF production capacity. As a result, fuel producers, airlines, and technology firms are forming strategic partnerships to scale up SAF production, improve cost-efficiency, and meet the growing regulatory requirements. These supportive policies have also encouraged major oil companies and biofuel startups to invest in new refining technologies, including Fischer-Tropsch synthesis, hydro-processed esters and fatty acids (HEFA), and alcohol-to-jet pathways. However, policy inconsistencies across different regions remain a challenge, making international coordination crucial for large-scale adoption. With increased regulatory support, SAF production is expected to grow significantly, helping airlines transition toward a more sustainable future while mitigating long-term compliance risks associated with fossil-based jet fuels.

Key Market Players

Gevo, Inc.

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Red Rock Biofuels LLC

Honeywell International Inc.

Virent Inc.

Fulcrum BioEnergy, Inc.

Neste Oil Corporation

AltAir Paramount LLC

S.G. Preston Company

Eni SpA Total S.A.

BP PLC

Report Scope:

In this report, the Global Renewable/Bio Jet Fuel Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

Renewable/Bio Jet Fuel Market, By Conversion Pathways:

Fischer Tropsch Synthetic Paraffinic Kerosene (FT-SPK)

Hydroprocessed Esters and Fatty Acids (HEFA)

Synthetic Iso-paraffin from Fermented Hydroprocessed Sugar (SIP)

Alcohol to Jet SPK (ATJ-SPK)

Renewable/Bio Jet Fuel Market, By Feedstock:

Agriculture Crops

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Aquaculture Crops

Energy Crops

Multiple Solid Waste

Others

Renewable/Bio Jet Fuel Market, By Region:

North America

United States

Canada

Mexico

Europe

France

United Kingdom

Italy

Germany

Spain

Asia-Pacific

China

India

Japan

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Australia

South Korea

South America

Brazil

Argentina

Colombia

Middle East & Africa

South Africa

Saudi Arabia

UAE

Kuwait

Turkey

Competitive Landscape

Company Profiles: Detailed analysis of the major companies presents in the Global Renewable/Bio Jet Fuel Market.

Available Customizations:

Global Renewable/Bio Jet Fuel Market report with the given Market data, TechSci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

Company Information

Detailed analysis and profiling of additional Market players (up to five).

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