NexantECA

Markets & Profitability

Market Insights: Sustainable Aviation Fuel – 2023

Market Insights: Sustainable Aviation Fuel - 2023 is one in a series of reports published as part of NexantECA's Markets & Profitability program.

NexantECA's forthcoming Market Insights report provides a comprehensive review of the global market for drop-in fuels for aviation – commonly referred to as Sustainable Aviation Fuel or SAF – detailing the major established and emerging pathways to low/zero carbon jet fuel. The report covers the following scope:

- Discussion of key market drivers and constraints for each region including up-to-date analysis of major regulatory programs in Europe and the United States
- Supply and demand history and projections for nine regions: North America, South America, Western Europe, Central Europe, Eastern Europe, Middle East, Africa, Asia Pacific (excluding China) and China
- Plant-level tracking of existing, expected and forecast production capacity by individual SAF route
- Discussion of the separate evolution of production of HVO, BG-FT, ATJ and PTL SAF
- Competitiveness analysis, including competitive landscape, major suppliers and cost competitiveness for each major pathway
- Price forecasts with commentary regarding latest trends
- Historic data from 2010 onwards, forecast data to 2040.

Along with the written report, data is provided in Excel including global capacity listings

Report Abstract

As governments and industries begin to face up to the hard work of making good on their net zero emission commitments, the scale of the technical challenge posed by real world decarbonization has become more and more apparent. Aviation is one of the sectors where the rockiness of the road from current reliance on fossil fuels to a decarbonized future is particularly evident, with fewer viable routes than is the case for other transport sectors. Accordingly, Sustainable Aviation Fuel (SAF) has emerged as the preferred option for regulators and aviation industry players, with a range of ambitious targets and mandates being set out that envisage the near-complete displacement of petroleum-derived jet fuel by renewable "drop-in" fuels by 2050. For example, the European Union is pursuing a 70 percent share of jet transport energy for SAF in 2050, while the United States is aiming for 100 percent and the aviation industry has committed to achieving net zero emissions. These targets are highly ambitious, given the fact that overall SAF production currently stands at below 0.5 percent of jet consumption. Meeting them will require major investments in production capacity, and is likely to require the scaling up of multiple routes to the production of SAF.

Currently almost all SAF in production is from Hydrogenated Vegetable Oil (HVO), but other processes are at varying stages of commercialization, led by Alcohol- to-Jet (ATJ), Biomass Gasification Fischer-Tropsch (BG-FT) and in the longer-term, Power-to-Liquids (e-fuels). Each has advantages and disadvantages that will determine where and to what extent they play into the future aviation fuel mix.

SAF Production Routes

	Process Description	Key feedstocks	Key Players
Hydrotreated Vegetable Oil (HVO)	Feedstock is converted using H_2 to remove O_2 and produce hydrocarbon fuel components	Vegetable oils UCO Tallow	Neste Eni TotalEnergies
Alcohol-to-Jet (ATJ)	Fermentation of lignocellulosic, sugar or starch feedstocks into alcohols, which is further processed into SAF	Ethanol Isobutanol	Gevo LanzaJet
Gasification and Fischer Trospch (G-FT)	Converts carbon-containing material to synthesis gas and subsequently FT products including SAF	Crop waste Forest residue MSW	Fulcrum Velocys
Power-to-Liquid (PTL) / e-Fuels	Similar to FT process, but using green H_2 and captured CO_2 for synthesis gas generation	Green H_2 Captured CO_2	Arcadia e-Fuels Nordic Electrofuels

Most commerc

Least commerc

UCO: Used cooking oil; MSW: Municipal solid waste

This report addresses the key developments driving growth for these pathways. Notably, it identifies the gap between the likely scale-up of production and the massive task of replacing petroleum jet fuel use to drive planned emission cuts, suggesting that the market will remain supply-constrained through the forecast period.

For more information, please visit www.NexantECA.com

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Table of Contents

Each region section in Chapter 3 includes:

- Market Overview
- Market Drivers
- Market Constraints
- Competitive Landscape
- Supply and Demand

Related Reports

Latest reports covering this industry include:

- Biorenewable Insights: Sustainable Aviation Fuel (SAF) (2021 Program)
- Biorenewable Insights: Hydrogenated Vegetable Oil (HVO) (2022 Program)
- Market Insights: Hydrotreated Vegetable Oils – 2023
- Market Analytics: Fuels and Feedstocks - 2023

Report License Details

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- Consultation time with the project team
- Customised subscriptions are also available.

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The **Markets and Profitability** program tracks over 60 feedstocks, petrochemicals, polymers, chemical intermediates and fertilizers on an ongoing basis and provides regularly updated reports covering all commercial aspects of these global industries. The accompanying database, provides global analysis and forecasts in two major inter- related areas: **Markets and Profitability**.

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