

India Sustainable Aviation Fuel Market Assessment, By Fuel type [Biofuel, Power to Liquid Fuel, Hydrogen Fuel, Gas-to-Liquid], By Technology [Fischer-Tropsch and Synthetic Paraffinic Kerosene, Hydroprocessed Esters and Fatty Acids, Alcohol-to-Jet (ATJ) technology, FT-SPK with Aromatics, Hydrocarbon-Hydroprocessed Esters and Fatty Acids, Others], By Application [Commercial, Defense, Others], By Region, Opportunities and Forecast, FY2024-FY2033F

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Report description:

India sustainable aviation fuel market has feedstock for potential production of 19 to 24 million tons of SAF per year, for 5% blending target of SAF, India would require 0.14 billion liters of SAF annually. The third-largest aviation market in the world, India's aviation industry has grown remarkably because of rising income levels, the emergence of low-cost carriers, and encouraging government programs such as the Ude Desh Ka Aam Naagrik (UDAN) Policy. The Nextgen Airports for Bharat Nirman (NABH) plan, which seeks to greatly increase airport capacity to accommodate a billion trips annually by 2028, supports this growth. The aviation sector in India had a 2.5-fold growth in emissions between 2005 and 2018, indicating that the industry plays a significant role in the country's greenhouse gas emissions. Due to factors such as radiative forcing, aircraft emissions are predicted to have a 2 to 4 times greater global impact than existing projections. The aviation industry is expected to expand its greenhouse gas emissions by 3.6 to 3.8 times by 2030 and up to 14 times by 2050.

In India, aviation emissions are growing at a CAGR of 7.34%. The Indian market for sustainable aviation fuel is receiving more attention in response to these issues. With its sustainable source, SAF presents a competitive option to traditional Aviation Turbine Fuel (ATF), with the potential to lower greenhouse gas emissions and reduce the environmental impact of the industry. SAF integration into the fuel mix offers the aviation industry a critical chance to strike a balance between growth and sustainability as

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the country's aviation market continues to rise. This change could benefit both economic development and climate goals by assisting in managing the environmental impact of one of the aviation markets that is expanding at the fastest rate in the world.

Government Focus on Sustainability to Influence Market Growth

The National Biofuel Coordination Committee (NBCC) of the Indian government is stepping up its efforts to promote sustainability in aviation. The NBCC has published the first targets for the blend ratio of conventional aviation turbine fuel to sustainable aviation fuel. The first targets for international flights are 1% SAF by 2027 and 2% by 2028. The International Civil Aviation Organization's (ICAO) Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), which requires airlines worldwide to offset emissions growth starting in 2027, aligns with this plan. Compared to ATF, SAF has a substantially lower carbon footprint as it is made from renewable feedstocks.

India's CORSIA compliance and aircraft emissions are anticipated to benefit from the government's push for SAF blending. Involvement from the private sector is vital. Establishing SAF production plants in partnership with technology providers including major players such as Indian Oil Corporation (IOC) and Mangalore Refinery and Petrochemicals. Used cooking oil and non-edible oils will be used as feedstocks in these units, using pathways such as alcohol-to-jet fuel. With major advantages for the environment and the agriculture industry, the government plans to scale the SAF blending to 4-5%. For instance, in May 2023, the Oil Minister Hardeep Singh Puri has declared that India will implement a ground-breaking policy by 2025 requiring the blending of 1% Sustainable Aviation Fuel in Jet Fuel. In keeping with global trends toward sustainable fuels, this effort seeks to drastically cut emissions from the aviation industry.

Rapid Technology Innovation in the Market

Technological developments are expected to drive significant growth in India sustainable aviation fuel market. India aims to reduce the dependency of fossil fuel by promoting clean energy such as SAF, Biodiesel, Bio CNG, etc. This is accomplished by utilizing a variety of feedstocks, including sugarcane, agricultural wastes, used cooking oil, and municipal solid waste, in conjunction with cutting-edge technologies, such as Gasification/Fischer-Tropsch, Alcohol-to-Jet, and Hydroprocessed Esters and Fatty Acids (HEFA). While Isobutanol (IBA) production from operating sugar mills and ethanol facilities may produce 1.5 million tons of SAF yearly, HEFA technology employing used cooking oil (UCO) could produce up to 2 million tons. Up to 11 million tons of SAF might be produced annually with improved segregation infrastructure.

For Instance, in May 2023, one of the constituent laboratories of the Council of Scientific & Industrial Research (CSIR), the Indian Institute of Petroleum (IIP), created an indigenous one-step catalytic technology that produces SAF by hydro-processing waste lipids such as UCO and tree-borne oils. Additionally, CSIR-IIP has set up a pilot scale testing facility that can process up to 50 kg of feed per day.

West and Central India is Expected to Dominate Market Share

India's west and central regions are becoming important players in India SAF market, which is growing significantly due to their strategic advantages. SAF manufacturing and distribution are concentrated in major aviation hubs and airports in cities like Mumbai, Pune, and Ahmedabad. Large investments in infrastructure, such as production facilities and supply systems have strengthened the availability and use of SAF in these regions. Increased SAF production and usage have been fueled by government subsidies and initiatives meant to lower carbon emissions and promote sustainable aviation. The advancement of SAF technology and integration necessitates active industry collaborations between fuel suppliers, research institutions, and airlines. SAF has a positive market outlook that sets the standard for the rest of India due to the robust current aviation infrastructure and growing demand for air travel.

For instance, in January 2024, Expanded DigiYatra and non-DigiYatra capabilities at Mumbai Airport have helped the airport process up to 8,000 passengers per hour and cut wait times to less than a minute. The airport now has 68 entry lanes, the highest number in the country, including 34 dedicated to DigiYatra. Terminal 1 features six dedicated DigiYatra e-gates and six non-DigiYatra e-gates. Additionally, 118 new e-gates at Terminal 2 will streamline security checks.

Biofuel Dominating the Market Share

Biofuels are gaining prominence in India sustainable aviation fuel market due to environmental benefits and raw material availability. When compared to conventional fossil fuels, biofuels are made from organic materials such as vegetable oil and other waste biomass in India. The National Biofuel Policy and business partnerships, along with government assistance are leading

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biofuels to dominate market share. Indian Oil Corporation (IOC) launched India's first bio-jet fuel-powered flight in 2018, using a blend of Jatropha-based biofuel and conventional aviation fuel. SpiceJet operated the country's first test flight with biofuel between Dehradun and Delhi. Praj Industries is developing advanced technologies for producing SAF blended aviation turbine fuel (ATF), as a result, biofuels are expected to significantly shape India's SAF market.

Key Players Landscape and Outlook

In India sustainable aviation fuel market, key players include major public sector oil companies such as Indian Oil Corporation and international companies such as World Energy, Neste Oyj, and LanzaJet. The market is buoyed by substantial investments in SAF production facilities and government initiatives promoting green aviation. The outlook is optimistic with plans for SAF blending mandates and infrastructure expansion to support a burgeoning aviation sector. Collaborations between Indian firms and international technology providers are driving innovation, while the diverse feedstock potential and supportive regulatory framework are expected to position India as a significant player in the global SAF market.

In February 2023, Indian Oil Corp planned to sign an agreement with LanzaJet to produce cleaner aviation fuel at its Panipat refinery in northern India. Indian Oil already has a partnership with LanzaTech to transform trash into ethanol, thus this contract will enhance ethanol to cleaner jet fuel. By 2030, 2% of the fuel used in aircraft at the state-run refinery will come from renewable sources.

In November 2022, India's largest airline, IndiGo, has committed to use 10% sustainable aviation fuel by 2030. Its most recent ESG report, Flying Responsibly, showcases early successes in lowering the intensity of airplane emissions and raising the usage of electric vehicles at airports. To develop SAF in line with the World Economic Forum's Clean Skies for Tomorrow project, IndiGo and the Indian Institute of Petroleum have signed a Memorandum of Understanding.

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