

Greener Miles: Why the pivot to sustainable aviation fuels is necessary

By reducing GHG emissions, curbing environmental impact, and enhancing energy security, sustainable aviation fuels offer a promising solution to address the challenges of climate change and sustainable development



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The aviation industry plays a vital role in shaping the global economy, connecting people, facilitating business and trade, and facilitating tourism. The sector creates enormous job opportunities while significantly contributing to a nation's GDP growth. It not only plays a critical role in national security and defence capabilities but also serves as reliable support during emergencies and humanitarian operations.

ENVIRONMENTAL IMPACT

Traditional jet fuels, derived from fossil fuels, release substantial amounts of carbon dioxide (CO₂), nitrogen oxides (NO_x), and sulfur oxides (SO_x) into the atmosphere. These emissions contribute to climate change and air pollution, resulting in adverse health effects. The aviation industry is responsible for approximately 2-3 percent of global CO₂ emissions and will rise further. To mitigate these detrimental effects, transitioning to sustainable aviation fuels is crucial.

GLOCAL INFERENCE

Globally, the civil aviation industry consumes around 250 million tons of fossil-based Aviation Turbine Fuel (ATF), generating approximately 1 billion tons of Greenhouse Gases (GHG) emissions. In India, the civil aviation sector consumed around 8 million tons of ATF and emitted around 20 million tons of GHGs in 2019. The aviation industry is one of the largest consumers of fossil fuels and emitters of GHGs. Its decarbonisation is not a matter of choice but an imperative for positive climate action.

UNDERSTANDING SUSTAINABLE AVIATION FUELS

Sustainable aviation fuels are derived from renewable resources such as sugary and starchy feedstocks, waste oils, and agricultural and forestry residues. SAFs offer a promising solution by significantly reducing carbon emissions and minimising the environmental impact. They are designed to be drop-in replacements for conventional jet fuels, requiring no modifications to aircraft. SAFs offer a range of benefits, including improved air quality and increased energy security.

MITIGATING ENVIRONMENTAL IMPACT

The International Air Transport Association (IATA) agrees that using sustainable aviation fuels and carbon offsetting will contribute more than 80 percent of the reduction in GHG emissions. By utilising sustainable feedstocks and advanced refining processes, SAFs can be produced with minimal life cycle emissions. These fuels can also act as a carbon sink, effectively removing CO₂ from the atmosphere during their production process.

FOSTERING TECHNOLOGICAL ADVANCEMENTS

The initial cost of producing SAFs may be higher than conventional jet fuels. However, technological advancements and economies of scale will make them increasingly affordable in the future. As the demand for SAF increases, a growing need to refine and enhance production processes, encouraging innovation and investment will arise. These advancements will benefit the aviation sector and have a ripple effect across industries, spurring progress toward a sustainable and low-carbon economy.

A PERFECT ECOSYSTEM

During the 41st assembly, International Civil Aviation Organisation (ICAO) announced the Long-Term Aspirational Goal (LTAG) to achieve Net-Zero by 2050. The expected SAF requirement is around 449 billion litres (350 million tons) per year to achieve this goal. Carbon Offsetting & Reduction Scheme in International Aviation (CORSIA) established by ICAO has created policies and market drivers to trigger demand to produce SAF. At COP26 Glasgow Summit, Prime Minister Narendra Modi announced that the nation will achieve NetZero by 2070. It was a watershed moment in India's fight against climate change and will help reduce emissions by around 20 million tonnes annually.

Governments have started implementing measures such as tax incentives, blending mandates, and research grants to promote the use and production of SAFs. Collaboration between airlines, airports, and fuel suppliers is crucial to establish robust supply chains and distribution networks. Constructive policymakers, adaptive industries, and conducive markets are willing to embrace sustainable alternatives.

SOCIO-ECONOMIC-ENVIRONMENTAL IMPACT

Traditional jet fuels are derived from fossil fuels, which are finite resources and subject to price volatility. SAF contributes to a stable and resilient energy supply chain, mitigating the risks associated with geopolitical tensions and fluctuating oil prices. As the demand for SAF increases, it will drive investment in research, infrastructure, and manufacturing facilities, increasing employment opportunities. The production of around 360,000 tons of SAF per year will positively impact India's GDP by approximately \$2.8 billion. This would result in additional income for farmers, enhanced energy security, boosting the rural economy, efficient waste management, and cleaner skies.

EMERGING INTERNATIONAL HUB

India is blessed with surplus feedstock availability like agricultural residues and sugary and starchy streams. India has feedstock for the potential production of 19 to 24 million tons of SAF annually. In contrast, the estimated maximum requirement of SAF in India, considering a 50 percent blend, is around 8 to 10 million tons per year by 2030. With the availability of surplus feedstock and access to rapidly maturing indigenous technologies, India has the golden opportunity to become the international hub for SAF production.

CONCLUSION

Adopting sustainable aviation fuels represents a pivotal step towards achieving a cleaner and greener future for the aviation industry. By reducing GHG emissions, curbing environmental impact, and enhancing energy security, SAF offers a promising solution to address the challenges of climate change and sustainable development. Investment in research, supportive policies, and stakeholder collaborations will help it scale up. By embracing SAF, the aviation industry can lead toward a greener future and contribute to global efforts to combat climate change.

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