Aviation Biofuels: Progress and Policies in India

written by King Stubb & Kasiva | December 2, 2023

Introduction:

India is collaborating with world leaders to disentangle GDP development from carbon dioxide (CO2) and other greenhouse gas (GHG) emissions. India could potentially be able to accomplish this aim with the improvement of air travel efficiency. Despite accounting for less than 1% of India's current emissions[1]. The aviation sector is one of the fastest-growing in the country's economy.

India is expected to move up from ninth place currently to third place globally in the aviation sector by 2024[2]. In spite of minimal decarbonization efforts in power, road transport, and other industries, aviation could account for a large portion of India's overall emissions.

The aviation sector has pledged to cut carbon emissions by 50% by the year 2050 compared to 2005. Reaching this target will require blending fossil jet fuel with lower carbon Sustainable Aviation Fuel (SAF). The IEA's Sustainable Development Scenario (SDS), which projects that biofuels would account for over 20% of aviation fuel consumption by 2040[3], and roughly 10% of the fuel demand by 2030, reflects this.

The aviation sector has a significant dedication to the sustainable use of aviation fuel:

In 2008, blended biofuel was used in the inaugural flight Virgin Atlantic airline[4], blending 20% of biofuel with conventional fuel. Over 150,000 flights have utilized biofuels since then. Currently, only five airports (Bergen, Brisbane, Los Angeles, Oslo, and Stockholm) regularly distribute biofuel; the remaining airports only do so occasionally. However, due to the centralized structure of aviation fueling, which accounts for 90% of international flights handled by fewer than 5% of all airports, a small number of airports may be able to meet a sizable portion of the demand for SAF availability.

The signing of long-term off-take agreements between airlines and suppliers of biofuel is another sign of aviation's commitment to increase the use of SAF. They currently cover over 6 billion litres of fuel when added together. Some airlines have made direct investments in aviation biofuel refinery projects, and more production facilities will be needed to meet this demand. In order to meet the demands of the aviation sector for SAF production and maintain compliance with SDS regulations, significantly faster market development is needed.

Improved aviation biofuel cost competitiveness with fossil jet kerosene is also needed:

Currently, the cost premium of SAF over jet fuel is a major impediment to their broader adoption. Fuel expenditures are the biggest overhead expense for airlines, making up an average of 22% of direct costs[5]. Using aviation biofuels comes at a high cost premium, which makes it a difficult undertaking.

The cost of production of SAF compared to fossil jet kerosene (whose price fluctuates with crude oil prices) determines its competitiveness. Since feedstocks are the primary factor influencing production costs, securing a reasonable supply of feedstocks is essential for all biofuels to attain competitiveness. Refineries built for continuous production could generate economies for HEFA-SPK.

Long-term ticket prices may include extra SAF usage fees charged by airlines. When considering other factors that affect ticket costs, like seating class, time of ticket purchase, and taxation, the increased cost per passenger for a 15% blend of HEFA may not seem like a significant amount at present rates, and the fleet average energy efficiency. However, because the aviation business is so competitive, airlines prioritize their customers' price sensitivity.

Fostering sustainable aviation fuel demand necessitates policy measures:

Increased technological advancement and better economics are required to realize aviation biofuels' potential to lessen the climatic effect of rising air travel demand.

Policy frameworks are important during this critical early stage of the growth of the SAF sector. The aviation sector is unlikely to increase its use of biofuel to the point where costs decline and SAF becomes self-sustaining without a favourable legislative environment.

A subsidy of around $6.5 billion would be needed to support the SAF consumption projected in the SDS scenario for 2025, or around 5% of the overall demand for aviation jet fuel (based on closing a cost premium of USD 0.35 litre between HEFA-SPK and fossil jet kerosene at USD 70/bbl oil prices). This is a far cry from the $143 billion in support for producing renewable power in 2017.

Additional legislative actions that could encourage the growth of the SAF market include:

1. Financial de-risking strategies (such as subsidies and loan guarantees) for refinery project investments.
2. Actions like mandates, objectives, and public procurement that ensure SAF off-take.
3. Additional strategies, like carbon pricing, reduce the cost difference between SAFs and fossil jet fuel.

Conclusion:

In conclusion, nations possess greater authority over national policy support for domestic aviation as opposed to international aviation, and national policy instruments aimed at easing the consumption of SAF are increasingly being implemented. Recently, the policy frameworks that will assist the use of aviation biofuels have been established by the United States, the European Union, Norway, the Netherlands, and the United Kingdom. Such funding must be connected to strict fuel sustainability standards in order to win over decision-makers and the public.

FAQs:

What is Aviation Biofuel and how will it impact the future?

Aviation biofuel is a type of renewable fuel derived from sustainable sources such as plant oils, agricultural residues, or algae. It is designed to replace or blend with traditional jet fuels, reducing the carbon footprint of aviation by lowering greenhouse gas emissions.

How will Aviation Biofuel impact the future?

Aviation biofuel is expected to help reduce the aviation industry's carbon emissions, mitigate climate change impact, and enhance sustainability by providing a cleaner alternative to traditional jet fuels.

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[1] Radhakrishnan, U. (2012), CO2 Emissions from Indian Aviation Sector Less than the Global Average, DownToEarth, https://www.downtoearth.org.in/news/co2-emissions-from-indian-aviation-sector-less-than-the-global-average-39313

[2] Hindustan Times (2018), India to Become World's Third Largest Aviation Market around 2024: IATA,

https://www.hindustantimes.com/india-news/india-to-become-world-s-third-largest-aviation-market-around-2024-iata/ story-1zhwhqJxFwBEG3gdWJ1o7M.html

[3]Are Aviation Bio-fuels Ready for Take-off?

https://www.iea.org/commentaries/are-aviation-biofuels-ready-for-take-off

[4]https://ec.europa.eu/research-and-innovation/en/horizon-magazine/aeroplanes-could-cut-emissions-flying-waste-cooking-oil-fuel

[5] Are Aviation Bio-fuels Ready for Take-off?

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