

‘Green’ aviation fuel yet to take off

Updated - January 29, 2024 at 09:49 PM.

To decarbonise the aviation sector, a long-term policy on SAF is needed

[BY RICHA MISHRA](#)



Given India’s established ethanol blending ecosystem, the alcohol-to-jet pathway to produce SAF would be the most viable policy option | Photo Credit: -

In May 2023, Union Minister of Petroleum & Natural Gas Hardeep Singh Puri received India’s first commercial passenger flight using indigenously produced Sustainable Aviation Fuel (SAF) blend.

Air Asia flight (I5 767) flew from Pune to Delhi powered by SAF blended aviation turbine fuel (ATF) produced by Praj Industries Ltd using indigenous feedstock, supplied by Indian Oil Corporation Ltd.

Puri had then said, “This would be the first domestic commercial passenger flight with SAF blending up to 1 per cent as demonstration mode. By 2025, if we target to blend 1 per cent SAF blending in jet fuel,

India would require around 14 crore litre of SAF/annum. More ambitiously, if we target for 5 per cent SAF blend, India required around 70 crore litre of SAF/ annum.”

In the recently concluded Wings India 2024, there was a session on sustainability, but it attracted little attention. Was this due to lack of awareness or was it due to lack of access ? To make it accessible what kind of governmental support is required?

The Centre has been vocal about energy transition and in the soon to be presented Vote-on-Account (or interim Budget) the green energy industry is expecting an announcement on this issue.

But what exactly is SAF and why is it needed?

Muthukrishnan M, Head Sustainability and HSE, GMR Airports, said SAF is a biofuel, used for powering aircraft. “It has similar properties to conventional jet fuel but with a smaller carbon footprint. SAF can reduce life cycle of GHG emissions dramatically compared to conventional jet fuel.”

“Some typical feed stocks used are sugarcane, Agri residue, used cooking oil etc. International Civil Aviation Organization (ICAO) defines sustainable aviation fuels (SAF) as renewable or waste-derived aviation fuels that meets ICAO’s sustainability criteria. SAF can be blended at different levels depending on the characteristic of the SAF produced,” he said.

On the need for SAF, Sachin Raole - CFO, Praj Industries, said: “Aviation is widely acknowledged as the most challenging sector to decarbonise, contributing around 3 per cent of all GHG emissions worldwide.

Decarbonisation efforts in the transportation sector for long have focused on land transport. However, there is a big push now for SAF globally across the regions, mainly driven by mandates, incentives, or airlines. The reason is that decarbonisation of aviation is difficult without SAF, particularly for long-haul flights. The countries and the

aviation industry agencies have set aggressive targets by 2050 as part of their net-zero strategy.”

Policy action

So what kind of policy action does it require? Since it involves two or more ministries, how will it play out?

“Both the Ministry of Petroleum and Natural Gas and the Ministry of Civil Aviation are bullish on the prospects of India becoming a global hub for SAF production owing to growing prowess in the global bio-economy,” Raole said.

“The government may roll out the policies for SAF soon as it plans a 1 per cent SAF blending mandate by 2025 focused on the sugarcane ATJ (Alcohol to Jet) pathway. Eventually, the mandated target could reach 50 per cent in the medium to long term,” he added.

On the viability aspect, Muthukrishnan said, “Approved technologies are available and new and efficient technologies are evolving across the globe and also in India. Indian oil companies are gearing up to set up the plants to support the SAF needs of India’s civil aviation sector. Commitments from Airlines and policy framework from Ministry of Civil Aviation on SAF will help the aviation industry and its stakeholders to be SAF ready.”

SAF Production

India is blessed with a variety of feedstocks (both sugar, starch, and lignocellulosic) in abundance. These feedstocks are the basic ingredients for SAF production via the Alcohol-to-Jet (ATJ) pathway.

There are nine pathways already approved and certified by ASTM globally. “For India, the ATJ is the preferred pathway because of the substantial availability of ethanol with supportive policies and an ecosystem well established with the Ethanol Blending Program in action. Under the ATJ pathway, multiple alcohol like ethanol, isobutanol, etc., can be converted into SAF,” Raole said.

In India, blending 1 per cent SAF (via ATJ pathway) with the jet fuel would require around 15 crore litres of SAF and about 30 crore litres of ethanol as feedstock, he said adding, “With growing ethanol production capacities for meeting the E20 mandate and the availability of sufficient feedstock, ethanol requirement for SAF production won’t be a stumbling block.”

Producing the fuel is one part, creating the eco-system is another and then comes the pricing of this fuel.

“A clear and firm long-term policy is necessary for the SAF growth in the country (India). The expectation from the government would be to come up with a definite pricing framework. For some early projects, special pricing, or viability gap funding (VGF) is required. Similarly, clarity on offtake agreements, take or pay agreements, would help participating stakeholders make concrete investments and decisions in the SAF sector,” Raole said.

Globally the SAF cost is about 2-3 times that of jet or aviation turbine fuel. This is largely due to the high prices of the feedstock i.e., low CI ethanol, which is the main contributor to the cost of SAF production via the ATJ pathway.

Aviation fuel accounts for a substantial portion of an airline’s operating expenses, necessitating fare adjustment to address such costs. To promote SAF this aspect will need to be considered.

India is still taking baby steps, but if the oil companies, feedstock producers and aviation industry put their heads together they can work out a reasonable way of promoting SAF, considering the domestic market’s price sensitivity.