

SAF Advancement in India

ICARUS Webinar on Sustainable Aviation Fuel policies
Webinar
22 Sep 2026

Ramakrishna Y B
Managing Partner - BEST Associates
Sr. Vice President - Indian Federation of Green energy
Email: ybramakrishna@gmail.com

ATF-SAF Current Scenario -1

- ATF Consumption for the year 2025-26 (provisional) was 9.2 MMT
- ATF Consumption by International flights is 27% which is approximately 2.5 MMT
- India is in tune with ICAO's aspirational goal of Carbon Neutral Growth
- There is a need to give necessary thrust to the indigenous renewable sources of Bio-Jet or SAF from standpoint of:
 - ❖ Local & National Supply Security (IAF : Strategic Oil Reserve)
 - ❖ Environmental Concern
 - ❖ Boosting Indian Rural Economy
- It is already mandated to blend 1% SAF 2027-28, 2% SAF by 2028-29 and 5% by 2030 for all international flight
- SAF requirement would be 0.025MMT for 1%, 0.05MMT for 2% and 0.125MMT for 5% blending

ATF-SAF India Initiative -1

- In India key body work has been done in 2010 consortium mode involving Indian Institute of Petroleum, Dehradun (IIP-Dehradun), Indian Oil Corporation Limited (IOCL), Hindustan Petroleum Corporation Limited (HPCL), Indian Institutes of Technology (IIT) Kanpur and Indian Institute of Science (IISc) Bangalore
 - ❖ IIP Dehradun : Development of process for Bio-jet fuel from Jatropha oil
 - ❖ IOCL/HPCL : Testing of Bio-Jet blended in ATF, purpose testing, additive optimisation, material compatibility tests etc
 - ❖ IIT Kanpur : Numerical & computational fluid dynamics modelling, droplet size & distribution and combustion model studies
 - ❖ IISc, Bangalore : Fuel spray atomisation testing & establishment of co-relation with spray properties & fuel blends
 - ❖ Infotech Bangalore : Can combustor design, rig combustor modelling, CFD modelling etc,
 - ❖ Pratt & Whitney, Canada : Engine testing, material compatibility testing, Flame kinetics, bench tests, emission studies, ASTM approvals etc.
- Final report submitted on 28th Feb 2023

ATF-SAF India Initiative -2

- Further to consolidate these efforts a sub committee was constituted by Working group on Biofuels under the aegis of Ministry of Petroleum comprising of members from OMCs, CSIR-IIP Dehradun, IIT Kanpur, CBDA, DGCA, DST & Spice Jet with the objectives of
 - ❖ Document various global & indigenous Bio-jet fuel specifications, Policies and examine its suitability for India
 - ❖ Aspects of R&D to cover Feedstock & product development, scaling up, storage & distribution, blending studies, long term engine testing, in-flight performance studies, emission studies, LCA
 - ❖ Techno-feasible analysis of indigenous and global technologies
 - ❖ Risks associated with commercialisation and risk mitigation strategies
- Final report submitted in August 2018

Developments on Home made SAF & trials

- SAF from Jatropha oil was blended in ratio of 1:4 (SAF:ATF) was used in one engine of Bombardier Q400 for 1 hour flight from Dehradun to Delhi in Aug 2018
- Indian Air force have been carrying out test on various carriers with 1-10% blends for more than 4 years now successfully with SAF supplied by CSIR-IIP
- Air Asia IS-767 a commercial flight from Pune to Delhi was flown on 19 May with 1% SAF produced at Praj Matrix and tested and supplied by IOCL laboratories
- DGCA has granted approval to one of its airlines to carry out its first international ferry flight with 5% blended fuel from Toulouse to Delhi on 17 Feb 2022. The flight was successful.
- Vistara's B-787 ferry flight from USA to India used 28% SAF blend in 2023
- Engine performance was satisfactory and parameters were within limits
- Bureau of Indian Standard (BIS) – issued Indian Standard for Bio-jet ATF IS:17081 in January 2019

Production initiatives - HEFA/Coprocessing

Project Promoter	Location	Pathway	Feedstock	Capacity
IOCL-M11	Paradip, Odisha	HEFA (Neat)	UCO/Fats/Oil/Grease	100 KTPA
OIL India-NRL	Paradip, Odisha	HEFA (Neat)	Imported Palm Oil	200 KTPA
Essar Future Energy	Dwaraka, Gujarat	HEFA (Neat)	UCO/Tallow/Non edible oils	800 KTPA
IOCL, Panipat	Panipat, Haryana	HEFA Coprocessing	UCO	35000 TPA
BPCL, Mumbai	Mumbai	HEFA Coprocessing	UCO	10000 TPA
EIL-CSIR- MRPL	Mangalore	HEFA (Neat)	Bio Vegetable oils	20000 LPD
BPCL Green field	Mumbai/Kochi/Bina	HEFA (Neat)	UCO/Waste oil	Sized for meeting 5% blending
M11 Energy	Mangalore	HEFA (Neat)	UCO/POME/Waste oil	350 TPD

Production initiatives – Alcohol to Jet

Project Promoter	Location	Pathway	Feedstock	Capacity
IOCL - LanzaJet	Panipat, Haryana	ATJ	2G & Ethanol from Gas fermentation	86,800 TPA
NTPC – GPS Renewables	Pudimadka, AP	ATJ	Ethanol from CO2	1800 TPA
Praj Industries	Pune, Maharashtra	ATJ	Ethanol & Iso-butanol	Demo
Numaligarh refineries	Numaligarh, Assam	ATJ	2G Ethanol from Bamboo	49,000 TPA
TruAlt Bioenergy	Bagalkot, Karnataka	ATJ	Ethanol from Bagasse gasification and fermentation	100 Mil. Litres/Year
TruAlt Bioenergy	Andra Pradesh	ATJ	Ethanol from Molasses	80,000 TPA

Draft SAF Policy – Ready for circulation

- Mandates in place for phased & pragmatic approach to SAF adoption, aligned with supply chain readiness & technology maturity
- India has potential to produce 8-10 MMT by 2040
- Policy objectives aimed at : 1) Blending targets 2)drive innovation & technology deployment 3)Establish robust regulatory and incentive frame work 4) Energy security & circular economy 5)Strengthening institutional capability and stakeholder engagement 6) Enabling global leadership & carbon market integration
- Ministry of Civil Aviation and Ministry of Petroleum & Natural gas will play the lead role. Roles of other ministries defined and an Inter ministerial SAF Council to be formed for effective implementation

Draft SAF Policy – Highlights

- Feedstock flexibility & aggregation strategy – Role of state governments and line departments defined
- Sustainability criteria verification requirements defined
- SAF production and certification benchmarks for approved pathways to be put in place
- For the purpose of market regulation and traceability, economic operators categorised and compliance criteria established
- SAF registry system to be operationalised
- Incentives and financing mechanisms – through production linked incentive, viability gap funding, concessional financing instruments
- SAF projects achieving verifiable emission reduction shall be eligible to generate Carbon credits under CORSIA, Indian carbon credit trading system or voluntary carbon markets

Draft SAF Policy – Pricing & incentive Strategy

- Pricing Model – Cost plus guaranteed return
- Guranteed feedstock pricing
- Differentiated fixed pricing by conversion pathway
- Integrating FP-SAF into the fixed aviation fuel price
- GST exemption or reduction on SAF
- Income tax holiday for 5-7 years
- Accelarated depreciation
- Blending obligation linked subsidy to OMCs
- Viability gap funding upto 30% of CAPEX for new SAF plants
- Carbon credit linkage

Thank You