

# Fueling the Future

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## Fueling the Future: SAF as a Catalyst for Sustainable Air Travel

### Why in the News?

Recently, during a meeting with the Civil Aviation Minister, representatives from Indian airlines **requested tax relief on Aviation Turbine Fuel (ATF)**. This highlights the increasing pressure on airline companies due to rising operational costs, especially from fuel, which is a major expense in aviation.

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### What is Aviation Turbine Fuel (ATF)?

- **ATF**, also known as **jet fuel**, is a **refined petroleum-based fuel** used primarily in aircraft powered by **gas-turbine engines** (like jets and turboprops).
- It is a highly **refined kerosene**, sometimes blended with additives for improved performance and safety.
- It is produced by refining crude oil in **petroleum refineries**, where the kerosene fraction is **hydrotreated** to remove impurities like sulphur, and then **blended** to meet international standards.

### Types of ATF:

- **Jet A** - Common in the U.S.
- **Jet A-1** - Global standard due to better cold weather performance.

### Special Characteristics:

- Contains **anti-static, anti-corrosion, and anti-microbial additives**.
  - Designed to perform in extreme conditions (like -40°C at 35,000 feet altitude).
  - Subjected to **strict international quality standards** (ASTM, DEF STAN).
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### What is Sustainable Aviation Fuel (SAF)?

- SAF is a **bio-based, low-carbon alternative** to conventional ATF.
- It is made from **renewable feedstocks** such as:
  - Waste oils (like used cooking oil)
  - Non-food crops
  - Agricultural residues
  - Municipal solid waste

### Types of SAF include:

- **HEFA-SPK** - From plant oils/fats
- **FT-SPK** - From Fischer-Tropsch synthesis
- **ATJ-SPK** - From alcohols (ethanol, isobutanol)

### Benefits of SAF:

- Can **reduce CO<sub>2</sub> emissions by up to 80%** over its life cycle.
- Fully **compatible with existing aircraft and infrastructure** when blended with regular jet fuel.

## Global Framework:

- The **International Civil Aviation Organization (ICAO)** has introduced a **Global Framework for SAF** to guide and promote the use of clean fuels in aviation.
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## Why is SAF Important?

### 1. High Emissions from Aviation:

- Aviation contributes around **2.5% of global CO<sub>2</sub> emissions**.
- Its carbon emissions grew faster (2000–2019) than from other transport sectors like road and rail.

### 2. Rising Air Travel Demand:

- Global aviation demand is projected to **increase by 4.3% annually** over the next two decades.
- Without alternatives, emissions will continue to rise.

### 3. Global Climate Goals:

- Meeting targets under the **Paris Agreement** and **Net-Zero pledges** requires the aviation sector to transition to greener fuels like SAF.
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## Challenges in SAF Production and Adoption

### 1. High Production Cost:

- SAF is **50–200% more expensive** than traditional ATF due to advanced technologies and limited economies of scale.

## 2. **Limited Feedstock Supply:**

- Feedstocks like waste oils, fats, and residues are limited and also in demand from other industries (e.g., food, cosmetics).

## 3. **Supply Chain Issues:**

- Collection, processing, and transportation of diverse raw materials for SAF is complex and requires significant infrastructure.

## 4. **Inadequate Production Capacity:**

- Current global SAF production is far too low to meet future aviation needs.

## 5. **Regulatory Barriers:**

- Absence of uniform global standards for SAF limits cross-border trade and slows investments.

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## **ATF in India: Cost and Taxation Issues**

- **ATF constitutes around 40% of operating costs** for Indian airlines.
- It is currently subject to **high taxes (excise duty + VAT)** in India, making it more expensive compared to many other countries.
- **ATF is not under GST**, leading to varied state taxes and complex logistics.
- Airlines are demanding **tax relief** or inclusion of ATF under **GST** to ensure uniformity and reduce costs.

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## **Way Forward**

### 1. **Policy Reforms:**

- Consider inclusion of ATF under **GST** for uniform taxation.
- Provide **tax incentives or subsidies** for SAF producers and users.

## 2. Investment in SAF Infrastructure:

- Promote **public-private partnerships** to develop SAF plants.
- Encourage R&D in **cost-effective SAF technologies**.

## 3. Feedstock Strategy:

- Identify and scale up **domestic feedstock** sources, such as agricultural waste and algae.

## 4. International Collaboration:

- Engage in **global alliances** (like ICAO, CORSIA) to harmonize SAF standards and share best practices.

## 5. Airline Incentives:

- Offer **carbon credits or financial incentives** for airlines adopting SAF.

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## Conclusion

Aviation Turbine Fuel is the backbone of the aviation industry but also a **major contributor to emissions and operational costs**. With growing environmental concerns and rising air traffic, there is an urgent need to **transition toward Sustainable Aviation Fuel**. However, the journey is filled with challenges—from cost and feedstock to regulations and supply chains. A **coordinated approach involving policy support, investment, and innovation** is essential to fuel India's aviation sector sustainably and competitively.