

**61ST CONFERENCE OF
DIRECTORS GENERAL OF CIVIL AVIATION
ASIA AND PACIFIC REGION**

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AGENDA ITEM 7: AVIATION AND ENVIRONMENT

**INDIA'S STATE ACTION PLAN ON CO₂ EMISSIONS REDUCTION
IN AVIATION**

(Presented by India)

INFORMATION PAPER

SUMMARY

India's updated State Action Plan on CO₂ Emissions Reduction in Aviation underscores its commitment to ICAO's climate goals, balancing rapid growth as the world's third-largest domestic aviation market with sustainability imperatives. This paper presents the comprehensive portrait of the Indian aviation sector, its emissions baseline, and mitigation measures in progress and planned. . Supported by international cooperation and capacity building, these measures position India as a proactive leader in global aviation Decarbonization, aligned with the long-term goal of net-zero emissions by 2050.

INDIA'S STATE ACTION PLAN ON CO₂ EMISSIONS REDUCTION IN AVIATION

1. INTRODUCTION

1.1 The ICAO State Action Plan initiative is recognized as one of ICAO's most successful voluntary climate programmes, reflecting strong global commitment to aviation decarbonization. It enables ICAO to track progress through quantified data submitted by States, thereby assessing advancement toward its aspirational climate goals: achieving a 2% annual fuel efficiency improvement, maintaining carbon-neutral growth from 2020 onwards, realizing the collective Long-Term Global Aspirational Goal (LTAG) of net-zero emissions by 2050, and securing a 5% reduction in CO₂ emissions by 2030 through the adoption of cleaner aviation energies.

1.2 To support its 193 Member States in advancing aviation decarbonization, ICAO developed the *Guidance on the Development of State Action Plan on CO₂ Emissions Reduction Activities: Towards LTAG Implementation (Doc 9988)*. This guidance provides a structured, step-by-step approach for preparing State Action Plans, offers standardized templates for harmonized emissions reporting, outlines methods for integrating SAF, LCAF, and other cleaner aviation energies, assists in identifying technical assistance needs, and shares good practices and lessons learned from over a decade of implementation.

1.3 Based on this guidance, India has prepared and submitted its updated State Action Plan. The document presents a comprehensive portrait of the Indian aviation sector, its emissions baseline, and mitigation measures in progress and planned. It highlights achievements such as fleet modernization, airport decarbonization, and SAF blending, while reaffirming India's commitment to responsible choices and alignment with global climate goals.

2. DISCUSSION

2.1 Growth and Emissions Baseline

- India's civil aviation industry has emerged as one of the fastest-growing globally, now ranking as the third-largest domestic aviation market. Passenger traffic more than doubled between 2014–15 and 2024–25, with domestic traffic growing at nearly 9% annually and international traffic at close to 5% (asshown in T 1). IATA projects average annual growth of 6.1% over the next 20 years, with journeys expected to reach 520 million by 2037. This growth is driven by favorable demographics, rising disposable incomes, and government initiatives such as UDAN (Ude Desh ka Aam Nagrik), which has expanded regional connectivity.

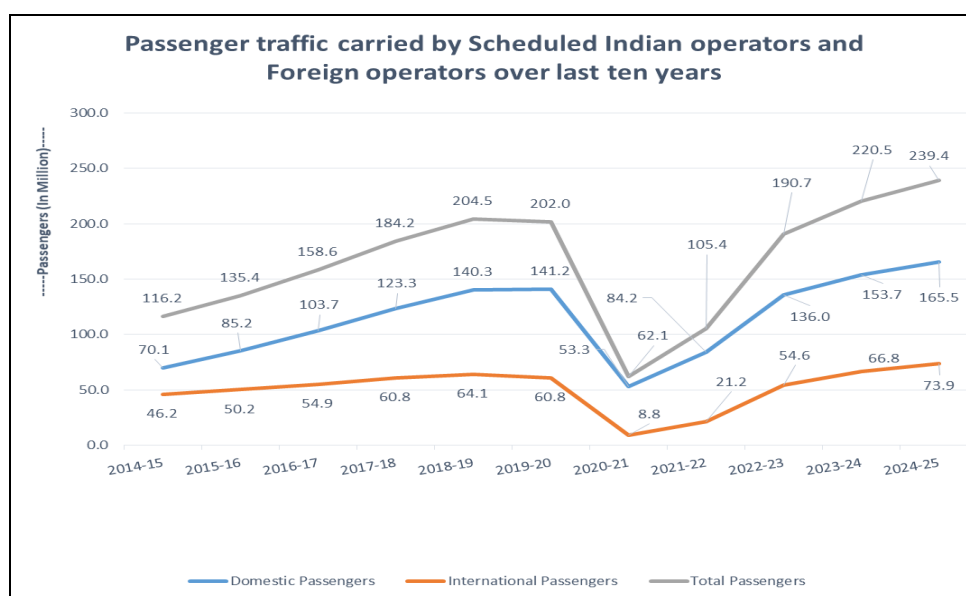


Figure 1: Passenger Traffic

- The baseline emissions scenario underscores the environmental implications of this expansion. From approximately 11,950 kt of CO₂ in 2013, emissions rose to 20,746 kt in 2024 and are projected to reach nearly 146,000 kt by 2050 under a business-as-usual trajectory, reflecting a 7.8% annual growth rate. While the COVID-19 pandemic temporarily reduced emissions in 2020–21, recovery was swift, with traffic returning to pre-pandemic levels by 2023. Without intervention, emissions could increase more than twelvefold by 2050, highlighting the urgency of mitigation.

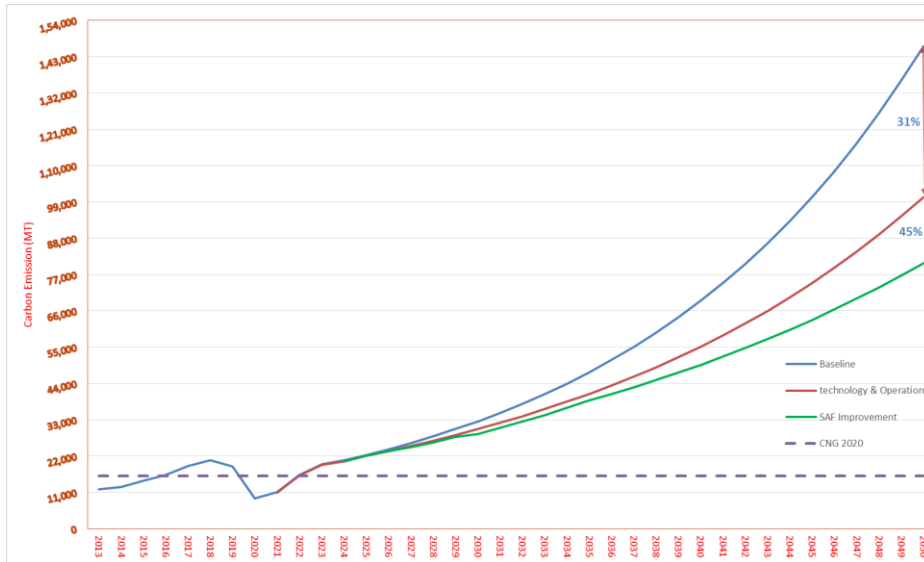


Figure2: Baseline Emissions scenario

2.2 Mitigation Measures to Reduce Co2 Emissions

Projection analyses underscore the importance of mitigation. Without intervention, emissions could increase more than twelvefold by 2050. However, technology improvements in aircraft efficiency, aerodynamics, and engine performance could reduce emissions by about 31% compared to the baseline, while progressive adoption of Sustainable Aviation Fuels (SAF) could achieve reductions of up to 45%. These pathways demonstrate that India's aviation sector must deploy a combination of fuel-efficient technologies, SAF blending, and operational measures to align with global carbon-neutral growth objectives and ICAO's long-term aspirational goals.

- **Fleet Modernization:** Adoption of Boeing 787 Dreamliner, Airbus A320neo, ATR 72-600, and B737 MAX, offering **15–20% fuel savings**.
- **Engine & Airframe Improvements:** ECO wash, predictive maintenance, sharklets, drag reduction, and weight optimization.
- **Operational Efficiency:** Performance-Based Navigation, Continuous Descent Operations, Airport Collaborative Decision Making (A-CDM), and Central ATFM system.
- **Airport Initiatives:** Solar-powered airports (e.g., Cochin), IGBC/LEED certifications, carbon neutrality targets by 2030–2040.

Category	Estimated Emissions Reduction
Fleet modernization	10–20%
Engine performance optimization	2–3%
Airframe drag reduction	2–3%
Weight reduction initiatives	1–2%

Category	Estimated Emissions Reduction
Battery retrofit (specific case)	~0.5% per flight

- **Emerging Technologies:** Advanced Air Mobility (AAM) and drones with **zero tailpipe emissions**, offering scalable logistics, disaster response, and urban air mobility solutions.
- **SAF Roadmap-** SAF blending targets notified for international flights. ICAO feasibility study projects potential for **40% SAF blend by 2050**, reducing emissions by up to **45% compared to baseline**.

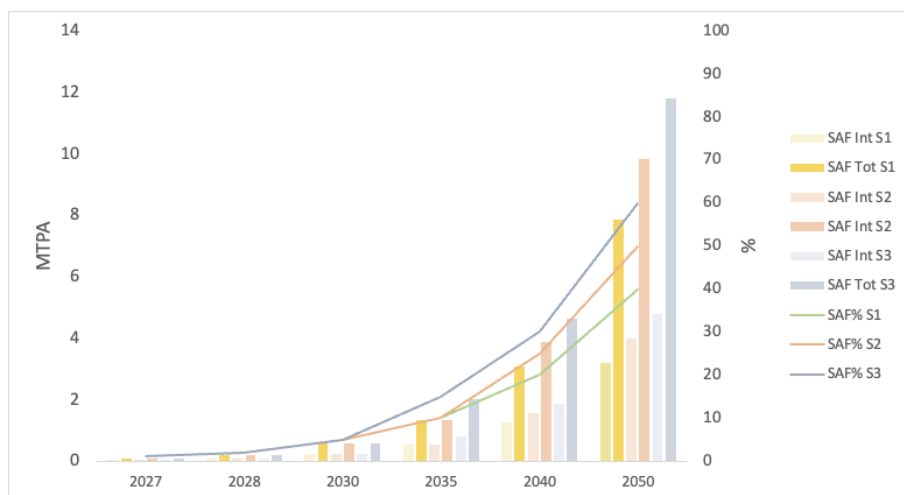


Figure 3: SAF demand (as a % blend) for three scenarios based on Jet Fuel demand for International (Intl) flights only or for total jet fuel demand

2.3 Market Based Measures

CORSIA, adopted by ICAO in 2016, is the first global market-based measure designed to offset international aviation emissions above a baseline, providing a harmonized approach that avoids fragmented national regulations. It complements technological, operational, and fuel measures by allowing airlines to use Sustainable Aviation Fuel (SAF) or purchase carbon credits from ICAO-approved programs. The 41st ICAO Assembly established baselines and offsetting rules, including the use of 2019 emissions as reference and revised sectoral versus individual growth factors for 2030–2035. India, while not participating voluntarily, will begin offsetting from 2027, but has already implemented monitoring, reporting, and verification (MRV) obligations through CAR Section 10 Series C Part 1, aligned with ICAO SARPs. These regulations apply to operators exceeding 10,000 tonnes of CO₂ annually on international flights, with exemptions for humanitarian, medical, and firefighting operations, supported by additional circulars for operator guidance.

2.4 Assistance & Capacity Building

As one of the fastest-growing aviation markets, India emphasizes the need for international support in accessing cleaner technologies, SAF infrastructure, and green airport operations. Key priorities include inclusive training programs, case-based learning, peer-to-peer exchanges, regional knowledge hubs, and collaborative capacity-building initiatives to ensure equitable and effective climate action.

3. ACTION BY THE CONFERENCE

3.1 The Conference is invited to:

- a) note India's ambitious aviation sustainability commitments aligned with ICAO and UNFCCC;
- b) recognize ongoing mitigation measures including SAF blending, fleet modernization, operational efficiency, and airport decarbonization; and
- c) support collaborative R&D, technology transfer, and financing mechanisms to accelerate SAF adoption and innovative aviation technologies.

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