



International Civil Aviation Organization

WORKING PAPER

ATConf/7-WP/49

24/09/26

(Information Paper)

English and Chinese only¹

**SEVENTH WORLDWIDE AIR TRANSPORT CONFERENCE
(ATCONF/7)**

Montréal, HQ, 16 to 20 November

**Agenda Item 4: Emerging technologies, new business models and other associated aspects
4.2: Support and economic opportunities of access to aviation cleaner energies**

**PROMOTING THE FAIR AND ORDERLY DEVELOPMENT OF SUSTAINABLE AVIATION
FUEL IN LINE WITH NATIONAL CIRCUMSTANCES**

(Presented by China)

EXECUTIVE SUMMARY

Sustainable Aviation Fuels (SAF) is an important option for advancing energy transition in the aviation sector. However, its large-scale adoption continues to be constrained by a combination of factors, including feedstock availability, the maturity of refining technologies, security assessment, sustainability certification and high prices. Approximately 1.9 million tonnes of SAF were produced globally in 2025, accounting for only around 0.6% of global jet fuel consumption², indicating a significant gap between supply capacity and the needs of energy transition. States differ significantly in terms of biomass resources, renewable energy availability, industrial foundations, aviation market size and capacity to bear associated costs. Therefore, SAF development pathways should not simply be replicated across States; instead, application targets, technical pathways and policy instruments should be adapted to respective national circumstances and resource availability. China has conducted practical exploration of SAF supply assurance, quality control, carbon footprint accounting and market mechanisms through two phases of SAF application pilot programmes. This paper recommends that, within the International Civil Aviation Organization (ICAO) framework, the principles of common but differentiated responsibilities, a gradual and progressive approach, technology neutrality and mutually beneficial cooperation be upheld to promote the coordination of technical standards and mutual recognition of certifications. Developed countries should provide developing countries with predictable support in terms of financing, technology transfer and capacity building, helping them establish sustainable, affordable and verifiable local value chains, so that the transition to cleaner aviation energy can benefit all States.

*Strategic
Goal:*

This information paper relates to Strategic Goal: *The Economic Development of Air Transport Assures the Delivery of Economic Prosperity and Societal Well-Being for All.*

¹ English and Chinese versions provided by China

² IATA. Mandates see SAF production fall short of expectations [Press Release]. 10 Dec 2025. Available at: <https://airlines.iata.org/2025/12/10/mandates-see-saf-production-fall-short-industry-expectations>

1. INTRODUCTION

1.1 The global framework adopted by the Third ICAO Conference on Aviation and Alternative Fuels (CAAF/3) sets out a collective global vision to reduce CO₂ emissions in international aviation through the use of SAF, LCAF (Lower Carbon Aviation Fuels) and other aviation cleaner energies by 5% (compared to the situation where cleaner energy is not used) by 2030. The framework also emphasizes four interconnected pillars: policy and planning; regulatory frameworks; implementation support; and financing.

1.2 The global supply of SAF remains significantly below the level required to enable energy transition. In June 2026, the International Air Transport Association (IATA) estimated that global SAF production would reach approximately 2.4 million tonnes in 2026, accounting for around 0.8% of global jet fuel consumption³. The interplay among insufficient supply, relatively low capacity utilization and high prices demonstrates that the large-scale adoption of SAF is not simply a matter of fuel substitution, but a systemic undertaking involving resources, technologies, certification, infrastructure, markets and policy.

1.3 As one of the world's largest air transport markets, China attaches great importance to the development of the SAF industry. On 19 September 2024, China officially launched a SAF application pilot programme comprising two phases. In the first phase (September 2024 to February 2025), Air China, China Eastern Airlines and China Southern Airlines conducted regular SAF refueling for 12 flights at four airports including Beijing Daxing, Chengdu Shuangliu, Zhengzhou Xinzheng and Ningbo Lishe. In the second phase (since March 2025), the pilot programme has been expanded to cover all domestic flights at the above-mentioned airports, using a “book-and-claim” approach. To date, six Chinese enterprises have obtained airworthiness certificates from the Civil Aviation Administration of China (CAAC), bringing China's nationally certified SAF production capacity to 1.2–1.4 million tonnes per year⁴. Building on its own practical experience, China is willing to work with other States to explore viable pathways and international cooperation mechanisms for the development of the SAF industry.

2. DISCUSSION

2.1 Stages of the SAF value chain are interdependent and mutually constraining. Feedstocks determine the applicable technical pathways and the level of life-cycle emissions reduction that can be achieved; technical maturity affects product yield and investment costs; and security assessment and sustainability certification requirements determine whether the fuel can enter the international market. These factors ultimately affect the procurement price paid by airlines. Therefore, it is not feasible to set end-use blending targets alone while overlooking upstream resources, technical and institutional conditions.

2.2 Feedstock supply is subject to multiple constraints in terms of quantity, quality, geographical and temporal distribution, and competition from alternative uses. Now, commercial-scale SAF production mainly relies on Hydroprocessed Esters and Fatty Acids (HEFA), for which the supply of waste oils and animal fats is limited and competes with demand from sectors such as road transport and the chemical industry. Agricultural feedstocks may also involve risks related to food and water security, land-use changes and biodiversity. Although resources such as agricultural and forestry residues and municipal solid waste are relatively abundant, significant challenges remain in terms of collection radius, impurity control, seasonal fluctuations and pre-treatment costs. States should establish national resource inventories and sustainable supply limits, prioritize the use of wastes and residues, and avoid equating theoretical

³ IATA. Global outlook for air transport—June 2026: Energy in crisis[R/OL]. Montreal: IATA, 2026.

<https://www.iata.org/en/iata-repository/publications/economic-reports/global-outlook-for-air-transport-june-2026/>

⁴ S&P Global Commodity Insights. Shandong Haike Obtains SAF Certification, Raising China's SAF Production Capacity to 1.38 Million Tonnes per Year [EB/OL]. (2025-12-25) [2026-08-10].

resource availability directly with the quantities that can be sustainably and economically collected⁵. China has extensive marginal land resources that can provide significant opportunities for developing non-food energy crops and expanding the feedstock base for SAF.

2.3 SAF conversion technologies are characterized by a concentration of mature pathways, while advanced pathways have yet to achieve full commercialization. To date, 11 SAF conversion pathways have been approved, but the applicable feedstocks and maximum blending ratios vary significantly among the pathways, and most pathways still require blending with conventional jet fuel. HEFA technology is relatively mature but constrained by the availability of oil and fat feedstocks. Gasification–Fischer-Tropsch, Alcohol-to-Jet and Power-to-Liquid pathways can widen the range of feedstocks, but have more requirements on large-scale facilities, low-carbon hydrogen, reliable electricity supply, sources of carbon dioxide and system integration capabilities. China will take into account resource availability, energy security and technological maturity in a coordinated manner, and promote the orderly development and integration of pathways based on oils and fats, agricultural and forestry residues, Power-to-Liquid fuels and other feedstocks and technologies⁶.

2.4 The existing ASTM D4054 assessment process is costly and time-consuming. More importantly, component testing and engine bench testing in the third and fourth stages are led by original equipment manufacturers (OEMs). The test equipment, test items and final safety acceptance criteria are not quantitatively specified in the standard, resulting in a lack of objectivity and standardization. Such uncertainty discourages many enterprises from pursuing the process and significantly constrains the commercialization of the new pathways. China has pioneered the idea of regarding SAF as an “engine component” and, drawing on the Technical Standard Order (TSO) management approach, has established a fuel security assessment methodology based on a standard combustor and a standard engine with quantitative acceptance criteria. This approach aims to decouple the assessment of fuel from that of the engine, improve the applicability of the assessment and reduce the resources required for assessment, thereby providing an alternative pathway for states that lack access to OEM resources⁷.

2.5 Sustainability certification. SAF certification involves not only verifying feedstock sources, but also accounting for life-cycle emissions associated with cultivation or collection, transport, processing, blending and use, while addressing direct and indirect land-use changes, co-product allocation, carbon capture benefits and mass balance. Differences in databases, system boundaries and model parameters may result in a lack of comparability among the emissions reduction results for the same fuel. Under the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), eligible fuel producers are required to undergo independent certification through the sustainability certification scheme approved by ICAO. In 2025, China also released general principles and requirements for the quantification of carbon footprints of aviation fuel products, as well as a standard for kerosene components produced through HEFA, providing an institutional basis for improving the transparency and comparability of emissions accounting⁸.

2.6 Price is the most direct barrier to large-scale application. In 2025, the global average price of SAF was approximately twice that of conventional jet fuel. SAF prices are affected by factors including technical pathways, feedstock prices, product yields, facility scale, capital investment and utilization rates. China is currently exploring economically viable pathways for SAF promotion through pilot programmes,

⁵ Civil Aviation Administration of China. Statistical Bulletin on the Development of the Civil Aviation in 2024. https://www.caac.gov.cn/XXGK/XXGK/TJSJ/202505/t20250515_227513.html

⁶ National Energy Administration (NEA). Grid-Connected Operation of Renewable Energy in 2024. <https://www.nea.gov.cn/20250221/e10f363cabe3458aaf78ba4558970054/c.html>

⁷ Ding Shuiting, Qiu Tian, Wang Xinming, et al. Development Strategy of Sustainable Aviation Fuels [J]. *Acta Aeronautica et Astronautica Sinica*, 2025,46(17):6-21.

⁸ Civil Aviation Administration of China MH/T 6138.1—2025、MH/T 6138.2—2025. <https://www.caac.gov.cn/XXGK/XXGK/BZGF/HYBZ/202508/P020250812580783929875.pdf>

taking into account the industry's capacity to bear the associated costs.

2.7 International cooperation should be based on mutual respect, equal consultation and mutually beneficial results. It is recommended that ICAO strengthen cooperation in areas such as standard coordination, alignment of data and accounting methodologies, mutual recognition of certification, personnel training and demonstration programs, while supporting open and transparent technological exchanges and diversified supply chains. Developed countries should provide developing countries with additional, predictable and accessible support through grants, concessional financing, risk-sharing mechanisms, technology licensing, joint research and development, and the development of laboratory and certification capabilities, helping them translate resource potential into bankable projects and local employment opportunities. Mechanisms such as ICAO's (Assistance, Capacity-building and Training for Sustainable Aviation Fuels (ACT-SAF) program can play a role in project preparation and financing facilitation, but funding sources and implementation scale still need to be expanded⁹. SAF development should not become a zero-sum game. Under the framework of the "Green Air Silk Road" initiative, China is willing to share its pilot experience with the States and work together to promote the healthy, orderly and inclusive development of the global SAF industry.

3. CONCLUSION

3.1 The industrial-scale development of SAF needs to consider the interconnected constraints arising from feedstocks, technologies, safety, sustainability and price. Specific pathways, timelines and policy packages should be adapted to the national circumstances, resource availability and stages of development of the States.

3.2 China will continue to leverage its application pilot programmes to improve SAF supply assurance, quality control, carbon footprint accounting, traceability and registration, and market mechanisms, promote the orderly development of diverse technical pathways, and share its practical experience and engage in equal and pragmatic cooperation with other States.

3.3 China calls on all parties to uphold the principles of technology neutrality and a gradual and progressive approach, and to avoid requiring all States to adopt a single feedstock, a single technical pathway or a uniform timeline. China also calls on developed countries to substantially increase their support for developing countries in financing, technology transfer and capacity building. Subject to ensuring aviation safety, food and energy security, and the affordability of the aviation sector, all parties should work together to scale up the supply of sustainable, affordable and certifiable SAF, ensuring that no country is left behind in the transition to cleaner aviation energy.

— END —

⁹ ICAO, Assistance, Capacity-building and Training for Sustainable Aviation Fuels (ACT-SAF): <https://www.icao.int/ACT-SAF>