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AGENDA ITEM 7: AVIATION AND ENVIRONMENT

## ENCOURAGING CLEAR PATHWAYS FOR SUSTAINABLE AVIATION FUEL (SAF) PRODUCTION IN THE ASIA PACIFIC REGION

(Presented by the Association of Asia Pacific Airlines and Supported by India, Indonesia, Malaysia, Singapore)

**SUMMARY**

The aviation sector, which contributes 2-3% of global CO2 emissions, plays a crucial role in meeting global climate goals. Sustainable Aviation Fuels (SAF) offer a solution that significantly reducing lifecycle greenhouse gas emissions and supporting national climate goals under the Paris Agreement. SAF production creates jobs, boosts incomes and enhances energy security. Challenges include high costs, infrastructure gaps, and regulatory barriers. Supportive policies, strategic infrastructure investments and the fostering of public-private partnerships are essential considerations. Successful SAF initiatives, such as those in Singapore, Malaysia, India, Indonesia and Japan demonstrate regional progress. Early SAF investment promises long-term environmental, economic and social benefits.

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## 1. INTRODUCTION

1.1 The aviation sector accounts for about 2-3% of global $CO_2$ emissions and up to 12% of transport-related emissions. As global air traffic is expected to double by 2040, reducing emissions from aviation is crucial for meeting international climate goals. Sustainable Aviation Fuels (SAF), together with other measures in the ICAO roadmap, namely Technology Acceleration, Efficiency Enhancements and CORSIA, provide a viable solution to meet the industry's emission reduction goals. A multi-pronged approach is necessary as aviation is one of the few hard-to-abate sectors.

1.2 This Discussion Paper aims to encourage States in the Asia Pacific region to adopt measures that create clear pathways for SAF production and usage, in a timely manner. States with a head start in SAF development stand to benefit environmentally, socially and economically.

## 2. DISCUSSION

### 2.1 Overview

2.1.1 **Environmental Benefits:** SAF can significantly reduce life-cycle greenhouse gas emissions compared to traditional jet fuels, as reported by WEF, Airbus, IATA and BP[1]. This substantial reduction helps in meeting global climate goals and national commitments under the Paris Agreement to limit global temperature rise to below 2 °C above pre-industrial levels, by 2050, as well as the ICAO Conference on Aviation Alternative Fuels (CAAF) commitment of 5% reduction in CO2 intensity from aviation fuel burn by 2030.

2.1.2 **Support for National Climate Goals**: By providing policy support for the adoption of SAF, States can make significant strides towards their Nationally Determined Contributions (NDCs) under the Paris Agreement, supporting the global efforts on climate action envisioned at the United Nations.

### 2.2 Economic and Social Benefits

2.2.1 **Job Creation:** SAF production can create thousands of jobs, especially in rural areas, by utilizing local feedstocks such as agricultural waste. This includes jobs in feedstock collection, SAF production facilities, and distribution networks. For instance, collecting and processing agricultural residues can provide employment to rural communities, reducing migration to urban areas.

2.2.2 **Income Generation for Farmers:** SAF can increase incomes for farmers and other feedstock suppliers by creating a market for agricultural residues and other waste materials. Farmers can sell crop residues that would otherwise be burned, contributing to both economic upliftment and improved air quality.

2.2.3 **Economic Growth and Energy Security:** Developing a SAF industry can stimulate economic growth by attracting investments, fostering innovation, and creating new market opportunities. Additionally, producing SAF domestically can reduce dependence on imported fossil fuels, enhancing national energy security and stability. State economies can benefit from the export of sustainable jet fuel to other States that do not have sufficient feedstock since SAF can be produced anywhere, not just where there are natural oil reserves.

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1 https://www.weforum.org/agenda/2021/07/the-future-of-flying-is-closer-than-ever-sustainable-fuel-is-the-key/ ; https://www.airbus.com/en/innovation/energy-transition/sustainable-aviation-fuels; https://www.bp.com/en/global/air-bp/news-and-views/views/what-is-sustainable-aviation-fuel-saf-and-why-is-it-important.html; https://www.iata.org/en/programs/environment/sustainable-aviation-fuels/

2.3 **Current Challenges**

2.3.1 **High Production Costs:** SAF is currently more expensive than conventional jet fuel, primarily due to scarcity and limited economies of scale. This cost disparity can be addressed through various way, including financial incentives and technological advancements.

2.3.2 **Infrastructure Gaps:** Significant investment is needed to develop infrastructure for feedstock collection, SAF production, and distribution. This includes building new facilities, upgrading existing ones, and ensuring efficient logistics for transporting SAF to airports.

2.3.3 **Lack of Suppliers**: The conventional aviation fuel (CAF) suppliers that today supply fossil-based jet fuel to airlines at airports globally, are an integral part of the supply chain that should be encouraged to join the production and supply of SAF. Co-processing to create SAF by integrating a small percentage of sustainable feedstock into the production process of jet fuel at existing fossil fuel facilities, is an economical way to produce SAF and to keep the price of SAF as low as CAF jet fuel.

2.3.4 **Co-processing**: While not the only method, this serves as an economical and scalable approach for airlines and fuel suppliers to collaborate in increasing SAF availability. This method allows for the gradual integration of SAF into existing fuel supply chains at more airports, making SAF more accessible to airlines and promoting a wider adoption across the region.

2.3.5 **Policy and Regulatory Barriers:** Lack of supportive national policies and financial incentives hinders the widespread adoption of SAF. Consistent and supportive regulatory frameworks are essential to encourage investment and development in SAF production.

**RECOMMENDATIONS FOR REGULATORS AND GOVERNMENTS**

2.4 **Policy Frameworks:**

2.4.1 **Establish Clear and Supportive Regulatory Frameworks:** States can further their emissions reduction goals through supportive regulatory frameworks that promote SAF production and usage. This could include incentives for fuel suppliers that have existing infrastructure and clear guidelines for certification, blending objectives and sustainability criteria for SAF.

2.4.2 **The Role of Incentives:** Proactive policies that encourage the production, supply and adoption of SAF with the participation of airlines and fuel suppliers act as enablers. Such Public-Private partnerships to spur decarbonisation efforts would help to stimulate a viable supply chain for a sustainable adoption of SAF. The US Government has introduced revenue guarantees and tax incentives for fuel suppliers to produce SAF with an objective to transition to 100% SAF use by 2050. Acknowledging the higher cost of SAF versus CAF, measures that result in sudden and significant increase in the cost of travel should be avoided. Mandates without the necessary incentives and enablers may be counterproductive as airlines would face increasing difficulty in sourcing viable sources of SAF.

2.4.3 **Higher Priority for Air Transport**: Only 3% of sustainable feedstock is currently allocated to air transport. As it is a hard-to-abate sector which already has adopted challenging targets, States should ensure sufficient feedstock allocation is provided to air transport.

2.5 **Investment in Infrastructure**

2.5.1 **Support the Development of Infrastructure for Feedstock Collection, SAF Production and Distribution:** States guidance and support in the provision of the necessary logistics and infrastructure further contribute towards the desired outcome. This includes facilities for collecting and processing feedstocks, SAF production plants, and distribution networks to transport SAF to airports.

2.6 **Encourage Public-Private Partnerships:** Collaboration between the public and private sectors can leverage investment and expertise in SAF technologies. Public-private partnerships can help scale up SAF production and distribution, ensuring that the industry grows sustainably. Such

partnerships should be convened by the States ahead of policy formulation so that regulations can take into consideration the needs and constraints of the fuel suppliers and airlines, ensuring that the supply as well as demand parts of the supply chain are addressed.

2.7 **Development and Collaboration**

2.7.1 **Support Pilot Projects and Scale-Up Successful Initiatives:** Funding pilot projects can demonstrate the feasibility and benefits of SAF. Successful pilot projects can pave the way for larger-scale adoption and attract further investment in the SAF industry.

2.7.2 **Foster Regional Cooperation to Share Best Practices and Technologies:** Regional cooperation is essential for sharing knowledge, experiences and technological advancements related to SAF. Forums, workshops, and joint research initiatives can facilitate knowledge exchange and capacity building. Sharing best practices of successful policies and measures are essential to support a global effort.

2.7.3 **Establish Joint Ventures and Partnerships:** Encouraging partnerships between States and companies in the Asia Pacific region can develop a robust SAF supply chain. Collaborative efforts can accelerate progress and create synergies, ensuring that the region benefits from economies of scale.

2.8 **Examples of Progress in Asia and the Pacific**

2.8.1 **Singapore:** Singapore has made significant strides in SAF production. A state-of-the-art bio-refinery that produces SAF from used cooking oil and waste animal fats has been established. To kickstart the use of SAF in Singapore, Singapore has announced a 1% SAF target from 2026. Singapore will also introduce a SAF levy on users to support the achievement of the target. Unlike a fixed SAF blend mandate, Singapore's SAF policy takes a fixed cost envelop approach whereby the SAF levy will be fixed based on the SAF target and projected SAF premium. This will provide certainty to airlines and air transport users on the price they need to pay for the SAF.

2.8.2 **Japan:** Japan has developed support measures to make the price of SAF internationally competitive, including measures to support investment in SAF production facilities and tax credits based on production and sales volume, and is aiming for the early formation of an SAF market in cooperation with the supply side, the demand side, and organizations concerned utilizing SAF Public-Private Council.

2.8.3 **Malaysia:** Malaysia is emerging as a key player in SAF production, leveraging its abundant biomass and used cooking oil. Government initiatives under the National Energy Transition Roadmap aim for up to 47% SAF blending by 2050. Collaborations, such as PETRONAS' agreement with Malaysian Aviation Group, and investments in production facilities, like the upcoming plant in Pasir Gudang, underscore Malaysia's commitment. These efforts align with global carbon reduction goals, positioning Malaysia as a regional hub for sustainable aviation fuel (Selangor Journal) (markets.businessinsider.com) (Selangor Journal) (New Straits Times).

2.8.4 **Indonesia:** Indonesia has developed a new SAF roadmap that aligns with global SAF targets while considering the national context. The roadmap aims to boost SAF usage in the domestic aviation market, with the goal of stimulating both industry demand and supply. It sets a timeline from 2027 to 2060, starting with an initial SAF blend of 1% in 2027, with periodic increases thereafter. Initial SAF production will potentially utilize used cooking oil (UCO) and Palm Fatty Acid Distillate (PFAD). Leveraging its abundant and diverse feedstock resources, Indonesia is committed to playing a pivotal role in the advancement of SAF development.

2.8.5 **India:** India is advancing in Sustainable Aviation Fuel (SAF) production, driven by a partnership between Indian Oil Manufacturing Companies, International technology providers, and large aircraft manufacturers. In addition, CSIR-Indian Institute of Petroleum (CSIR-IIP) is working for developing additional pathway for the SAF production taking into consideration locally available feedstock and technology. This initiative supports India's decarbonization efforts in aviation, with a focus on different

technologies for SAF production. The collaboration, backed by the Indian government, aims to scale SAF availability and position India as a key player in the global SAF supply chain, ensuring regulatory compliance and enhancing its competitiveness in the aviation industry.

2.9 **Analogy with Renewable Energy Development**

2.9.1 **Renewable Energy as a Model:** The development of solar and wind energy over the past decade serves as a powerful analogy for SAF. Countries that invested in renewable energy early on, such as Germany and Denmark, now benefit from cleaner, more affordable energy sources. These countries have reduced their reliance on coal and fossil fuels, leading to improved air quality, energy security and economic resilience.

2.9.2 **Long-Term Benefits of SAF Investment:** Similarly, countries that invest in SAF today will reap the benefits in the future. By fostering a robust SAF industry, these States will not only reduce their aviation sector's carbon footprint but also enhance their energy security, create jobs and stimulate economic growth. The transition to SAF is an investment in the future, promising environmental, economic, and social returns.

## 3. ACTION BY THE CONFERENCE

3.1 The Conference is invited to:

a) Discuss the need for greater regional efforts in creating a conducive regulatory environment for SAF production and the needed infrastructure.

b) Recognise that the time to act is now. The supply of SAF is scarce. Although improvements in technology and efficiency will complement a more sustainable aviation future, SAF is potentially the most effective. With proper frameworks, co-processing is an economical and scalable approach for airlines and fuel suppliers to collaborate in increasing SAF availability.

c) Acknowledge that States with a head start in SAF development stand to benefit environmentally, socially and economically. Success stories exist and this includes the successes of countries in transitioning to more cleaner and affordable energy sources.

References:


- World Economic Forum. (2021). Deploying Sustainable Aviation Fuels at Scale in India: A Clean Skies for Tomorrow Publication.

- International Civil Aviation Organization (ICAO) reports and guidelines on SAF.


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