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AGENDA ITEM 7: AVIATION AND ENVIRONMENT

PROGRESS OF SUSTAINABLE AVIATION FUEL IN CHINA

(Presented by the People's Republic of China)

INFORMATION PAPER

SUMMARY

Sustainable Aviation Fuel (SAF) has the potential to significantly reduce carbon emissions throughout its entire lifecycle, and is a practical and feasible solution for achieving deep decarbonization of the civil aviation industry by the middle of this century. This article provides an overview of the production, commercial application, and research innovation related to SAF in China.

PROGRESS OF SUSTAINABLE AVIATION FUEL IN CHINA

1. INTRODUCTION

1.1 Sustainable Aviation Fuel (SAF) is a renewable and sustainable alternative to fossil fuels that meets safety and sustainability certifications. It is derived from renewable sources or waste materials, and has a "drop-in" feature, which means it can be used without modifications to existing aircraft and infrastructure. SAF has been proven to significantly reduce carbon dioxide emissions over the entire lifecycle compared to fossil fuels. The widespread adoption of SAF is a crucial step for the aviation industry to achieve its green transformation goals.

1.2 Currently, the widespread utilization of SAF is restricted by various factors, including but not limited to raw material supply, refining, safety certification, sustainability certification, and pricing.

1.3 In order to tackle the aforementioned challenges, China is actively promoting research and implementing practices related to SAF.

2. DISCUSSION

2.1 China has been an early adopter of SAF. The Civil Aviation Administration of China (CAAC) has been actively promoting the development and use of SAF since 2010. In 2011, China completed its first SAF verification flight, and in 2014, the first domestic SAF product received airworthiness approval. Since 2015, multiple commercial SAF flights have been completed. The CAAC has set a target of consuming 50,000 tons of SAF by 2025 and promoting its use in an orderly manner.

2.2 At present, China has the capability to produce SAF using the Hydro-processed Esters and Fatty Acids (HEFA) process, which is based on waste oil hydrogenation. Moreover, China is actively accelerating the construction of relevant facilities and expanding its production capacity.

2.3 The CAAC has implemented an airworthiness approval system for fuel as an aircraft component, and has updated and released the significant certification technical standard order, "Civil Aviation Jet Fuel Containing Synthetic Hydrocarbons" (CTSO-2C701a), for SAF. This regulation is in line with ASTMD7566 and ASTMD4054 standards, and has undergone Qualification Process approval.

2.4 As a prominent aviation fuel supplier in China, China National Aviation Fuel Group Limited (CNAF) is dedicated to facilitating the establishment and growth of the SAF industry chain. To this end, CNAF has made significant investments in upgrading fueling facilities at airports in Beijing, Chengdu, Zhengzhou, and Ningbo to ensure uninterrupted reception, storage, and distribution of SAF.

2.5 Starting from September 2022 until June 2024, multiple commercial airlines, including Air China, China Eastern Airlines, Xiamen Airlines, Shanghai Airlines, Colorful Guizhou Airlines, and Loong Airlines, have commenced operating commercial flights with SAF.

2.6 China is committed to diversifying its raw materials and is intensifying its research on energy plant breeding, biomass pyrolysis, syngas production, Fischer-Tropsch direct conversion aviation fuel. Additionally, China is optimizing process system integration to promote research on carbon sequestration, carbon capture technology, green hydrogen, and power-to-liquid technology.

2.7 In order to ensure engine system safety, it is necessary to map fuel composition and physicochemical properties to key safety parameters for engines. This mapping should be continuously enriched to fully utilize the experience of aviation kerosene use in determining safety margin parameters. Parameter sensitivity analysis can be employed to optimize SAF refining processes and engine fuel system design, thereby reducing the overall cost of SAF while maintaining safety requirements. These efforts will promote the commercial application of SAF while ensuring safety

objectives are met.

2.8 To align with China's national conditions and resource endowment characteristics, it is imperative to expedite the establishment of an aviation fuel carbon footprint certification mechanism.

2.9 Establish SAF technology research and exchange centers in Tianjin and Chengdu to promote the development of SAF certification scheme and cutting-edge research. These centers will also facilitate international exchange and cooperation on the deployment and application of SAF.

3. ACTION BY THE CONFERENCE

3.1 The Conference is invited to note the information contained in this Paper.

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