CAAF/3-IP/9
16/10/23
English only

THIRD CONFERENCE ON AVIATION AND ALTERNATIVE FUELS (CAAF/3)

Dubai, United Arab Emirates, 20 to 24 November 2023

Agenda Item 2: Supporting policies to promote the development and deployment of cleaner energy for aviation

SULTANATE OF OMAN'S ACTION PLAN ON REDUCING CO_2 EMISSIONS FROM INTERNATIONAL AVIATION AND AVIATION ALTERNATIVE FUEL

(Presented by Oman)

SUMMARY

This paper provides background on Oman's progress on international aviation and climate change, including their recently approved voluntary State Action Plan as part of an ICAO initiative for aviation CO_2 emissions reduction. The SAP provides information on baseline scenarios and mitigation measures to reduce the environmental impact on the civil aviation industry. Gap analysis and correlation with alternative aviation fuel were discussed. Thus, SAP will help to realize the ICAO's LTAG of the Decarbonization Strategy 2050 and its contribution to sustainable aviation in the Sultanate to achieve the objectives of Oman's Vision 2040.

1. INTRODUCTION

1.1 Recalling that the Assembly recognized ICAO's tremendous progress during the 2013 - 2016 triennium and reaffirmed the collective aspirational goals that were established by the 37th Session of the ICAO Assembly. It agreed on a comprehensive strategy to progress all elements of its "basket of measures", namely: technology-design, SAF, operational improvements, and (MBMs) in international aviation.

1.2 The 39th Session of the ICAO Assembly held in 2016 adopted Resolution A39-2: Consolidated statement of continuing ICAO policies and practices related to environmental protection — Climate change, which reflects the determination of ICAO's Member States to provide continuous leadership to international civil aviation in limiting or reducing its emissions that contribute to global climate change. A central element of Resolution A39-2 is for States to voluntarily prepare and submit action plans to the ICAO.

1.3 Whereas, the 41st ICAO Assembly Resolution, held in 2022, agreed to a collective global Long-term Aspirational Goal (LTAG) of net-zero carbon emissions from international aviation by 2050.

The expectation from LTAG's scenarios revealed that a drop-in SAF will play a significant role in the mitigation of aviation CO_2 emissions using the existing global fleet and will reach 55% of the formulated scenario, where the technology-design, operations, and market-based measures (CORSIA) will ensure the remaining.

1.4 Climate change and reducing carbon emissions are of great importance to the Sultanate of Oman, as their environmental impacts may be a fundamental constraint on air transportation growth, and this can be achieved through our first approved voluntary State Action Plan as a part of the ICAO initiative for CO_2 emissions reduction. SAP was submitted to ICAO in July 2023 and is regarded as a reporting tool for States to communicate information on actions to address CO_2 emissions from international aviation to ICAO to achieve the aspirational goals. At a minimum, a SAP should contain five elements (Doc 9988):

i- **Focal Point Information:** Contact information of the officially nominated SAP Focal Point.

ii- **Baseline Scenario:** Estimated fuel consumption, CO_2 emission, and RTK (without action).

iii- **Mitigation Measures:** Details of the actions to be taken to mitigate CO_2 emissions.

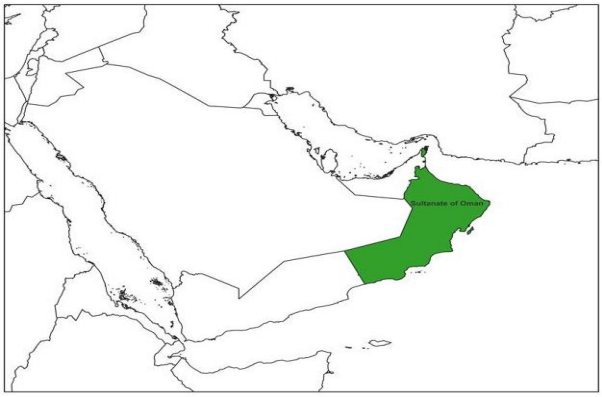
iv- **Expected Results:** Estimated impact of selected mitigation measures on the baseline, including fuel consumption, and CO_2 emissions.

v- **Assistance (if needed):** Details of any assistance needed by the State.

2. AIR TRANSPORT INDUSTRY AND ENVIRONMENT

2.1 The Sultanate of Oman is positioned astride the Tropic of Cancer at the south-eastern corner of the Arabian Peninsula between latitudes 16°40'N and 26°20'N and between longitudes 51°50'E and 59°50'E. It is situated in the southeast corner of the Arabian Peninsula, encompasses a land area of 309,500 km^2, and is characterized by a diverse range of topography, including mountain ranges, arid deserts, and fertile plains.

a) **Map of the Sultanate of Oman to be on ICAO's green map for our approved SAP**



2.2 Accordingly, Oman's Vision 2040 (www.oman2040.om) was officially endorsed to guide the nation over the next two decades to an advanced nation's position by focusing on four key pillars: a society of creative individuals, a competitive economy, responsible state agencies, and an environment with sustainable components. In addition, the Sultanate of Oman has the 5th largest economy in the (GCC) region. In 2017, the GDP reached US$ 70.78 billion, compared to US$ 19.507 billion in 2000 (World Bank, 2019). The average annual GDP growth rate from 2014 to 2017 was nearly 2.9%.

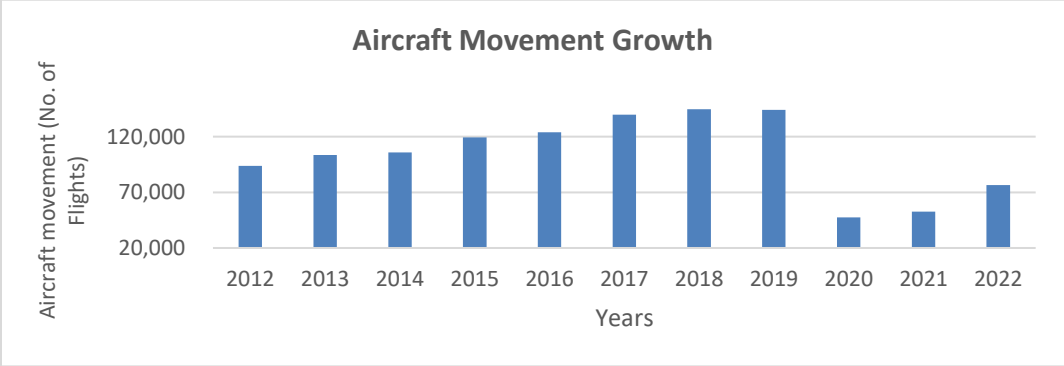
2.3 However, Oman is already subject to extreme climatic conditions, like severe cyclonic storms, that will likely be due to climate change. Over the past several decades, average temperatures have increased by around 0.4°C per decade (1980-2013). In the future, temperatures will increase by up to 5.0°C while annual rainfall will decrease by up to 20 mm per year by the end of the century, according to RCP 8.5.

2.4 The Sultanate of Oman announced in 2022 its commitment to achieving net-zero emissions by 2050. Six leading decarbonisation technologies would support an orderly transition: energy and resource efficiency, electrification and renewables, battery electric technology, sustainable hydrogen, carbon capture and storage, and negative-emission solutions. Thus, Oman aims to implement a national strategy establishing structure and action plans with practical policies to ensure a smooth transition.

2.5 Civil aviation in Oman plays a critical role in the country's national economy and social development. Over the last decade, our aviation sector has seen a significant increase in air traffic, and it is forecast to grow considerably in the coming years. While a boost in air traffic is a positive sign of progress, detrimental impacts on the environment lead to an urgent need to address these environmental effects. In 2018, the new Muscat International Airport was opened. Building modern airports with state-of-the-art technology and all the amenities and facilities necessary creates a unique experience for passengers traveling through Omani airports. During the first phase of expansion, the MCT had a total capacity of 20 million passengers, and is expected to accommodate 56 million passengers per year in later stages.

2.6 As part of its strategic direction, Oman Airport has designated environmental sustainability as a focused strategic driver. Environmental sustainability includes several key success measures adopted from Oman Vision 2040, including a percentage of Carbon Reduction and non-hazardous waste recovery. Oman Airports joined the Airports Council International (ACI) Carbon Accreditation Program in 2017 to drive carbon emission neutralization in the airport community. Travel and tourism expenditures have been growing at 8% per year since 2009. More than 590,000 aircraft used Oman's airspace in 2019, and about 75 destinations were from and to Muscat, Salalah, and Suhar airports. In the same regard, passenger traffic increased by 12% annually between 2013 and 2019, reaching 17828387 passengers at Muscat, Salalah, Suhar, and Duqm airports. Cargo traffic grew by 11% annually (2013-2019), reaching 236414 tons.

b) **Aircraft Movement Growth in Oman for the period 2012 – 2022 (Omani CAA)**

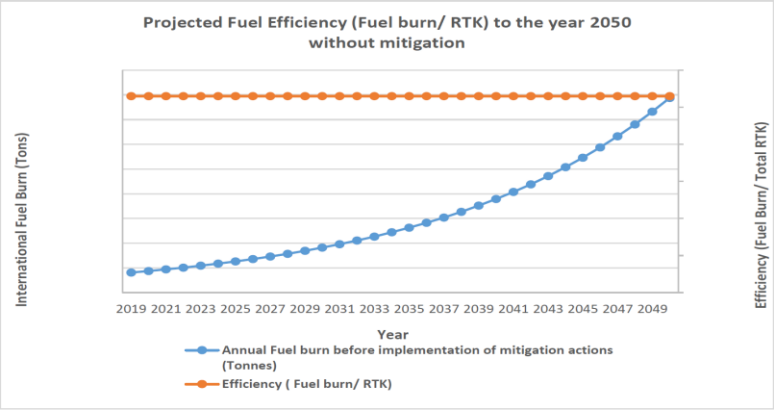


3. STATE ACTION PLAN INITIATIVES

3.1 Establishing the baseline is a key part of an action plan because it provides the opportunity to determine the historical levels of international aviation fuel consumption, traffic and to project into the future the growth in fuel consumption and traffic in the absence of the actions described in the plan. It provides a reference point against which the state can understand the expected progress of their actions.

3.2 A baseline scenario (business as usual) was developed using the ICAO methodology "Method C" for international transport to estimate expected fuel consumption and traffic data (RTK) over a continuous time frame given the extension of trends observed in the past by the use of the ICAO EBT tool. The evolution and trend of international fuel burning show that since 2020 there has been a significant increase, confirming the increasingly important role Oman may be playing in the region. This information on fuel burned by aircraft type was obtained by both air carriers, "Oman Air" and "Salam Air".

c) Baseline scenario (Business as usual without any mitigation measures; CAA)



4. MITIGATION MEASURES AND EXPECTED CO_2 EMISSIONS REDUCTION

4.1 Selected mitigation measures were calculated and quantified, and they should be expected to save a certain amount, that is, out of the total 100 % tonne of fuel in the upcoming 30 years (up to 2050), which will reduce the amount of CO_2 emissions by % tonne for the same period.

a) Expected quantified fuel saving (% / 30 years) using different types of mitigation measures.

Type of the Mitigation Measures and Category	Total expected fuel saving (Tons)
Purchase of new aircraft for replacement.	88.33 %
More efficient operations (Single engine taxi, Minimizing/delaying flaps, Minimizing reverse use).	8.99 %
Improved Air Traffic Management (CDA).	2.19 %
Economic/Market-Based Measures.	0.48 %
Total Amount (Fuel Savings / CO_2 reduction (tonne))	**100 %**

5. GAP ANALYSIS AND CONCLUSION

5.1 The quantified analysis of the submitted Oman's action plan revealed that the mitigation measures will mainly depend on the purchase of new aircraft for replacement, with 88.33%, and the more efficient operations, such as single-engine taxi, and minimizing reverse use, will contribute by 8.99%, while the improved ATM and CORSIA implementation ensure the remaining. Thus, the gap analysis revealed that the current uses of alternative aviation fuel are not yet ready to be included in the action plan, but regarding Oman's Vision, the feasibility study and investment in cleaner energies are under progress.

5.2 This paper discussed the ongoing preparation for the Sultanate of Oman's SAP, which is regarded as the most vital and strategic document that summarizes the development of the aviation environment and infrastructure in Oman and quantifies the intended list of our ambitious mitigation measures to achieve ICAO's LTAG of the Decarbonisation Strategy 2050. Oman will continue to actively work alongside ICAO to support the development of a global sustainability framework for SAF, LCAF, and cleaner energy.

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