



ICAO

Sixth Meeting of the Aerodromes Operations and  
Planning Sub-Group (AOP/SG/6)

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**Agenda Item 6: Airport Environmental Initiatives**

**LATEST DEVELOPMENTS ON ICAO'S WORK ON AIRPORTS AND OPERATIONS**

(Presented by the Secretariat)

**SUMMARY**

This paper presents progress made by ICAO on airports and operations including the work of Committee on Aviation Environmental Protection (CAEP) Working Group 2, ICAO events related to airport initiatives, ICAO tracker tools to follow up the latest innovations that can generate in-sector CO<sub>2</sub> emissions reductions and ICAO LTAG process and upcoming 2022 Stocktaking.

The proposed actions are presented in Section 5.

**1. INTRODUCTION**

1.1 This paper reports on progress made by ICAO on airports and operations including the work of Committee on Aviation Environmental Protection (CAEP) Working Group 2, ICAO events related to airport initiatives and ICAO tracker tools developed to following up with the latest innovations that can generate in-sector CO<sub>2</sub> emissions reductions.

**2. CAEP WORKING GROUP 2 ON AIRPORTS AND OPERATIONS**

2.1 The CAEP's Working Group 2 (WG2) - Airports and Operations addresses environmental issues relating to airports, aircraft operations near airports, and aircraft operations in general. The objective of WG2's work programme is to develop and disseminate environmental guidance to States, aviation authorities, and planners on airport expansion, building, and operation, as well as to identify operational procedures, strategies, and opportunities. Global best practice in these areas are constantly evolving, and they can lead to better environmental management strategies.

2.2 The technical recommendations from the CAEP/12 meeting and its full report were considered by the Council and its subsidiary bodies (i.e. ANC and CEC) during the 226<sup>th</sup> Session. The Council reviewed and adopted the CAEP/12 Report which includes set of 31 recommendations, including recommendations related to amendments of Annex 16, Volumes I, II, III and IV, as well as three recommendations related to a Long-term Aspirational Goal (LTAG) and four recommendations related to Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) eligible fuels.

2.3 Regarding recommendations from CAEP/12 cycle on airports and operations, CAEP undertook a very ambitious work programme. The work programme for the CAEP/12 cycle (2019-2022) included various topics on airports and operations, such as:

**Airport Planning – Land Use and Environmental Management:**

- Investigation on possible indicators for encroachment;
- Eco-Airport Toolkit collection new publications; and
- Monitor developments and maintenance of ICAO Publications including the Doc 9984: *Airport Planning Manual – Part II: Land Use and Environmental Management*.

**Climate Change Risk Assessment, Adaptation, and Resilience:**

- Determine a methodology and timeline for ensuring the information in the synthesis stays current and incorporates the latest scientific information;
- Review and assess the synthesis information for suitability and relevance for dissemination by facts sheets; and
- Develop and distribute a report on identified steps to develop climate change risk assessments, adaptation and resilience measures for aviation stakeholders to consider in air and ground planning.

**Operational Measures to Reduce Noise and Emissions:**

- Operational Opportunities to Reduce Aircraft Noise; and
- Assessment of the potential for an airport database on noise and emissions management initiatives.

**Air Navigation and Traffic Management (ATM):**

- Review of the 2019 update to the Global Air Navigation Plan (GANP);
- Understanding Aviation Stakeholder Community Engagement needs in the context of delivering ATM change;
- Environmental metrics of relevance to the Global Aviation System;
- Flight efficiency; and
- Environmental impact of Unmanned Aircraft Operations at and around airports.

2.4 The development of the new ICAO Manual “Operational Opportunities to Reduce Aircraft Noise” encompassed the identification, and review of both standard and innovative operational opportunities and techniques for minimising noise in civil aviation operations. The manual provides background on current practices that are available to aircraft operators, airport operators, air navigation services providers (ANSPs), other industry organisations and States to reduce aircraft noise impacts. It also highlights recent developments - resulting from emerging innovation - and considers what concepts and enabling technologies currently being developed by the aerospace manufacturing industry and airspace service providers may become available in the near future.

2.5 WG2 delivered a State of Play report on the “Environmental Impact of Unmanned Aircraft at and around Airports”. WG2 found that this subject matter was extremely dynamic with new material on the subject emerging on a monthly basis, exacerbated by a wealth of new use cases appearing during the pandemic. In the CAEP/13 cycle, WG2 will continue to work on this dynamic subject and will develop a new eco-airport toolkit publication dedicated to this subject.

2.6 Another State of Play report was prepared on the "Investigation of Possible Encroachment Indicators", which focused on the challenges and best practises associated with population encroachment into airport noise contours, as well as the metrics utilised to measure this challenge. WG2 looked at both ICAO and non-ICAO (i.e. State) papers to compile and integrate all

relevant accessible information into a single study that outlined some common encroachment concerns for airports. Accessing data and information to track levels of encroachment, maintaining positive dialogue and negotiations between the airport and municipality, competing economic interests and competing planning priorities between the airport and municipalities, and resolving conflicts with the interests of residents and property owners in the vicinity of airports were among the issues addressed. The report will be made available on ICAO CAEP WG2 website.

2.7 WG2 worked on the first global Vertical Flight Efficiency (VFE) analysis with the work initially focusing on the climb and descent phases with the availability of sufficient global data from Flightradar24. Table 1 shows the results of the climb and descent parts of the global VFE study per ICAO Region.

**Table 1 - Climb and descent parts of the global VFE study**

| ICAO Region    | CDO                    |                         | CCO                    |                         |
|----------------|------------------------|-------------------------|------------------------|-------------------------|
|                | Excess fuel / CO2 (kg) | Fuel costs (million \$) | Excess fuel / CO2 (kg) | Fuel costs (million \$) |
| <b>APAC</b>    | 47/149                 | 336.9                   | 13/41                  | 94.2                    |
| <b>ESAF</b>    | 23/73                  | 8.2                     | 2/6                    | 0.6                     |
| <b>EUR/NAT</b> | 37/117                 | 218.7                   | 4/13                   | 22.5                    |
| <b>MID</b>     | 60/190                 | 50.9                    | 9/28                   | 7.9                     |
| <b>NAM</b>     | 43/136                 | 336.6                   | 5/16                   | 41.2                    |
| <b>CAR/SAM</b> | 24/76                  | 44.3                    | 3/9                    | 6.4                     |
| <b>WACAF</b>   | 20/63                  | 2.7                     | 1/3                    | 0.1                     |
| <b>Total</b>   | <b>41/130</b>          | <b>992.2</b>            | <b>7/22</b>            | <b>161.5</b>            |

2.8 This analysis revealed that for the descent phase, the average per flight inefficiency (or non-optimised Continuous Descent Operation (CDO)), generated an average extra consumption of 41kg fuel per flight across all ICAO regions. The ratio between the extra consumption in the most efficient regions and least efficient regions was three-fold (20-60kg per flight). The cost of fuel from the inefficiencies per region were determined by multiplying the additional fuel burn with the kerosene price and number of flights for each region. For the climb phase, the average per flight inefficiency (or non-optimised Continuous Climb Operation (CCO)), generated an average extra consumption of 7kg fuel per flight across all ICAO regions.

2.9 During the CAEP/12 cycle four additional e-publications were completed in the areas of Climate Resilience, Water Management, Air Quality Management and Sustainable Surface Access and were approved by the CAEP/12 meeting. The e-publications contain practical and ready-to-use information to support States and aviation stakeholders and available on Eco-Airport Toolkit e-collection<sup>1</sup> website.

2.10 WG2 also developed a guidance on Climate Risk Assessment, Adaptation and Resilience, which provides the steps for aviation organisations to conduct climate change risk assessments and adaptation planning; an identification of key vulnerabilities they may face; and a “menu” of adaptation and resilience options for aviation stakeholders to consider in their own planning. The document also contains guidance on performing a climate change risk assessment and on developing and implementing a climate change adaptation plan, which is intended for use by airports, aircraft operators and air navigation service providers (ANSP) across the global aviation network. It

<sup>1</sup> Eco-Airport Toolkit e-collection: <https://www.icao.int/environmental-protection/pages/ecoaairports.aspx>

can also be used at the national level by States that are engaging in climate change risk assessment of their aviation sector either as an aviation-specific assessment or as part of a wider national or transportation sector assessment. The guidance will be available on the ICAO website in the second half of 2022.

2.11 WG2 will continue some current threads of work during the CAEP/13 cycle while also addressing several of these priorities, taking into account the experiences gained during the CAEP/12 cycle, as well as emerging priorities identified by CAEP WG2 Members and Observers and ongoing engagement with aviation stakeholders. States and international organizations are encouraged to bring all aviation environmental related topics including airports and operations to the attention of CAEP and its working groups for coordination and consideration. Topics agreed for CAEP/13 work programme are listed below:

- Reviewing the ICAO CCO and CDO Manuals with a view to updating them;
- Identifying operational opportunities to reduce non-CO<sub>2</sub> emissions;
- Identifying best practices of noise monitoring systems;
- Taking into account the experiences / outcomes of the CAEP/12 reports to deliver enhanced community engagement guidance;
- Undertaking an analysis of environmental interdependencies in various operational scenarios;
- Updating the 2018 Climate Adaptation Synthesis; and
- Continuing developing the eco-airport toolkit e-publications to support global aviation environmental practitioners at and around airports.

### **3. ICAO EVENTS AND INITIATIVES**

#### ***ICAO Green Airports Seminar<sup>1</sup>***

3.1 Building upon the ICAO Seminars on Green Airports held in 2017 and 2019, the 2021 seminar was held virtually from 29 to 30 November 2021. The seminar provided an update on the progress achieved thus far; addressed new and emerging innovations in the field of airport management and environmental best practices as well as a diverse range of activities involved in the planning and management of a “green airport”; and showcased ambitious airport projects with panellists discussing next steps in global environmental policy and strategy. The ICAO Secretariat will continue to monitor the latest innovations on green airports and the crucial role they play in delivering clean energy and the infrastructure needed for the sustainable future of aviation.

#### ***ICAO Global Coalition for Sustainable Aviation***

3.2 Following the 2020 ICAO Stocktaking, the ICAO Global Coalition for Sustainable Aviation<sup>2</sup> was established with the objective of providing a forum of stakeholders to facilitate the development of new ideas and accelerate the implementation of environmental innovative solutions. In the context of the Coalition, ICAO developed the Tracker Tools website<sup>3</sup>, where all the latest information on aviation CO<sub>2</sub> emissions reduction initiatives is updated from three streams – technology, operations and fuels, as well as on aviation net zero initiatives. The Operations tracker provides a variety of information on initiatives related to operational measures aimed at reducing the environmental footprint of aviation, including details of past and ongoing initiatives.

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1 2021 ICAO Green Airport Seminar: <https://www.icao.int/Meetings/greenairports2021/Pages/default.aspx>

2 ICAO Coalition: <https://www.icao.int/environmental-protection/SAC/Pages/learn-more.aspx>

3 ICAO Tracker Tools website: [Aviation CO<sub>2</sub> emissions reduction initiatives - Tracker Tool \(icao.int\)](https://www.icao.int/aviation-co2-emissions-reduction-initiatives-tracker-tool/)

3.3 The ICAO Secretariat continued to facilitate the monitoring of the latest environment-driven technologies and innovations to reduce aviation CO<sub>2</sub> emissions, through the continued ICAO Stocktaking processes in 2021, with the next Stocktaking event to be held in July 2022.

#### **4. ICAO LTAG PROCESS AND 2022 STOCKTAKING**

4.1 The ICAO Assembly Resolution A40-18 requested to continue to explore the feasibility of a long-term global aspirational goal for international aviation CO<sub>2</sub> emissions reductions (LTAG). The [ICAO Report on the feasibility of an LTAG was published online](#) on 21 March 2022. As part of the outreach and consultation process, ICAO organized a second round of Global Aviation Dialogues (GLADs) on LTAG, which were held from 28 March to 8 April 2022 in a series of five regional events.

4.2 These LTAG-GLADs aimed to raise awareness on the ICAO work on LTAG and facilitate the exchange of views amongst Member States, with the following two objectives: 1) communicate the latest ICAO technical work on LTAG; and 2) discuss how to facilitate a decision on LTAG. The 2022 LTAG-GLADs material, as well as the compilation of the expressed views are available on the dedicated public [web-page](#).

4.3 The progress of the LTAG work will be further presented to the ICAO High-level Meeting on LTAG (HLM-LTAG), which will be held at ICAO Headquarters in Montréal, Canada, from 19 to 22 July 2022, as a hybrid event with in-person and virtual participation. The HLM-LTAG will be invited to discuss the CO<sub>2</sub> emissions reduction scenarios and options for a goal, along with the means of implementation and the monitoring of progress, before concluding with recommendations. The meeting will bring together high-level officials from States who will have the authority to make policy commitments, as well as a number of international organizations with direct involvement in aviation and/or environment are also being invited to participate as Observers. An Exhibition to showcase the latest innovations on CO<sub>2</sub> emissions reductions will also be held in parallel to the HLM-LTAG.

4.4 The HLM-LTAG will be preceded by the 2022 ICAO Stocktaking on 18 July 2022 as a virtual event to enable the sharing with delegates of the latest relevant information, including the latest innovations on technology, operations and fuels.

4.5 The 2022 ICAO Stocktaking will set the scene for the subsequent ICAO High-level Meeting on the Feasibility of a Long-term Global Aspirational Goal (HLM-LTAG), and it will provide another opportunity to hear from the ICAO Coalition partners about the achievement of innovations in aviation CO<sub>2</sub> emissions reduction. All stakeholders who wish to showcase their latest initiatives during the 2022 ICAO Stocktaking and during the Exhibition in parallel to the HLM-LTAG are encouraged to join the ICAO Global Coalition for Sustainable Aviation by emailing [stocktaking@icao.int](mailto:stocktaking@icao.int).

#### **5. ACTION BY THE MEETING**

5.1 The meeting is invited to:

- a) note the information contained in this paper, particularly on airports and operations;
- b) encourage States and international organizations in the region to bring all aviation environmental related topics including airports and operations to the attention of CAEP and its working groups for coordination and consideration through CAEP Members and Observers;

- c) attend the virtual 2022 ICAO Stocktaking (18 July 2022) by registering on the ICAO website;
- d) encourage aviation stakeholders in the region to showcase CO<sub>2</sub> emissions reduction initiatives at the exhibition to be held in parallel with the ICAO High-level Meeting on LTAG (HLM-LTAG), by contacting emailing [stocktaking@icao.int](mailto:stocktaking@icao.int);
- e) encourage aviation stakeholders in the region to join ICAO Global Coalition for Sustainable Aviation to showcase their latest initiatives by emailing [stocktaking@icao.int](mailto:stocktaking@icao.int); and
- f) note the arrangements for the ICAO High-level Meeting on LTAG (HLM-LTAG), which will be held at ICAO Headquarters in Montréal, Canada, from 19 to 22 July 2022 as a hybrid event.

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