



ICAO

INTERNATIONAL CIVIL AVIATION ORGANIZATION

A UN SPECIALIZED AGENCY

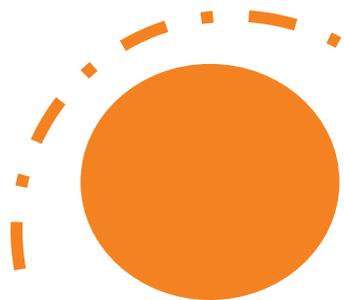
RECONNECTING **THE** WORLD

Environmental Impact of Airport Activities & ICAO work on Green Airports

ICAO ESAF/WACAF Webinar on Green Airports

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*Regional Officers, Environment,
ICAO ESAF and WACAF Offices*



Agenda

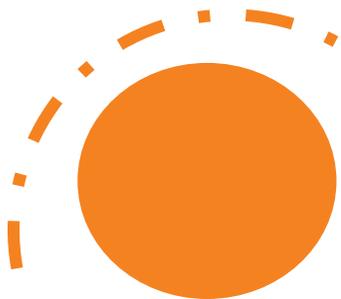


- Concept of Green Airports
- ICAO work on Airports
- Airports and SAF development



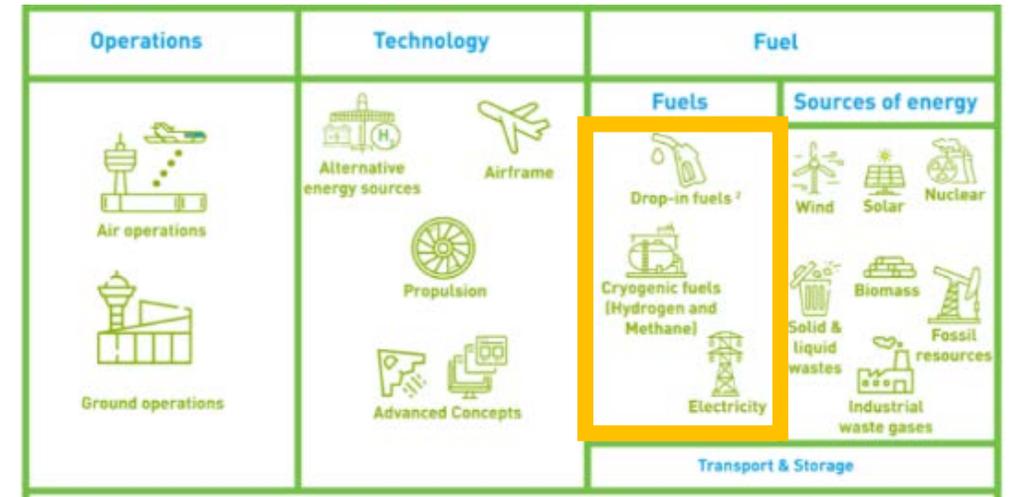
The Concept of 'green airports'

- Key to a States' national and international trade relations;
- Catalysts for tourism growth;
- Interface between ground and air;
- Interface with the public and surrounding community;
- Initial point of passenger experience: from pre-travel & check-in, to in-flight & arrivals



To play a lead role in reducing the aviation sector's emission

- Smart, **innovative** air and ground **operations**
- New breakthrough aircraft technologies
- Range of clean energy types of fuels
 - Drop-in fuels (sustainable Aviation Fuels/Lower carbon Aviation Fuels)
 - Non-drop-in fuels(hydrogen / electricity)



Airports will play a lead role in clean energy production, transport and storage. Airports are “future clean energy hubs”

ICAO work on Airports



ICAO work on Airports

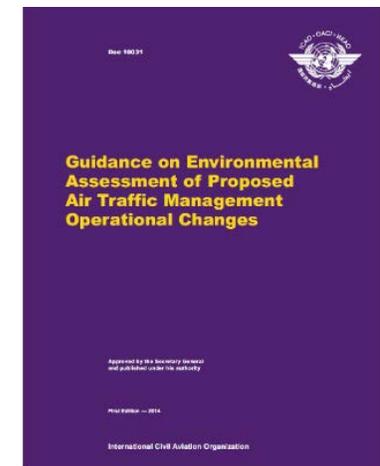
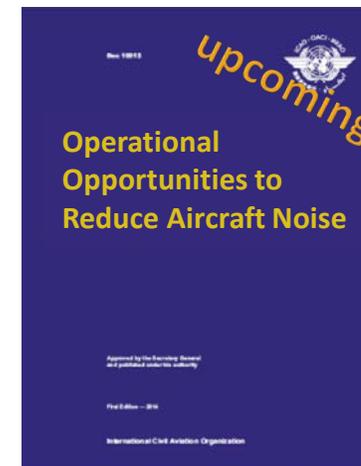
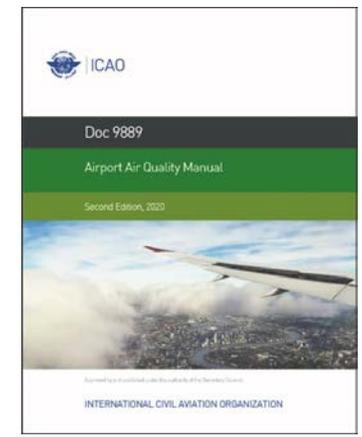
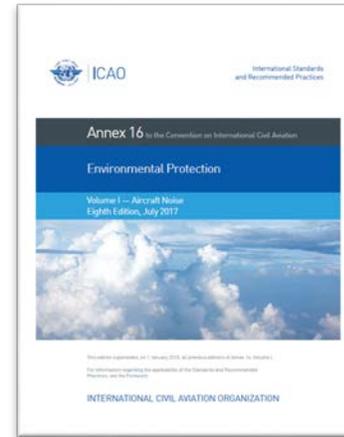
ICAO has responded to these challenges through various initiatives:

ICAO Committee on Aviation Environmental Protection (CAEP) Working Group 2 –

Airports and Operations

- ICAO Standards
- wide range of guidance materials related to airports and operations
- practical and ready-to-use information to support the planning and implementation of airport infrastructure projects:

Eco Airport e-collection



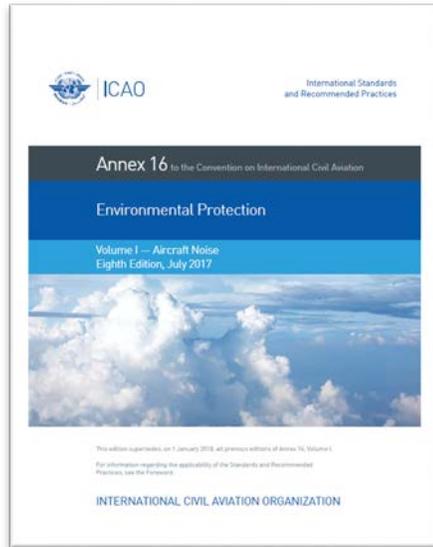
Part I. DEFINITIONS, NOMENCLATURE: SYMBOLS AND UNITS

Part II. AIRCRAFT NOISE CERTIFICATION

Part III. **NOISE MEASUREMENT FOR MONITORING PURPOSES**

Part IV. **ASSESSMENT OF AIRPORT NOISE**

Part IV. **BALANCED APPROACH TO NOISE MANAGEMENT**



APPENDICES

APPENDICES 1-5 : Evaluation methods for noise certification

APPENDIX 5. Monitoring aircraft noise on and in the vicinity of aerodromes

APPENDIX 6. Verification Evaluation method for noise certification

Purpose of Volume I

- ensure that the latest available noise reduction technology is incorporated into aircraft design
 - demonstrated by procedures that are relevant to day-to-day operations

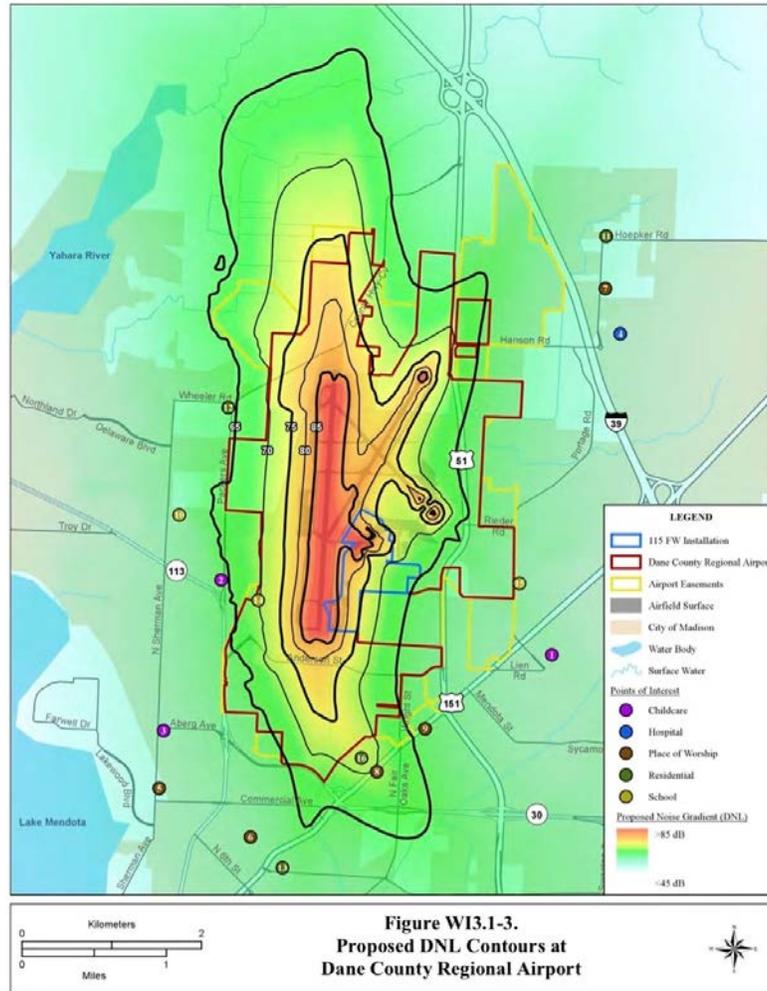
noise reductions offered by technology are reflected in reductions around airports



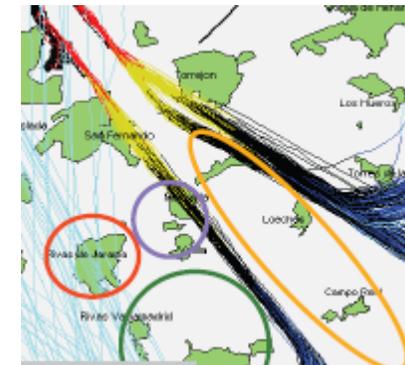
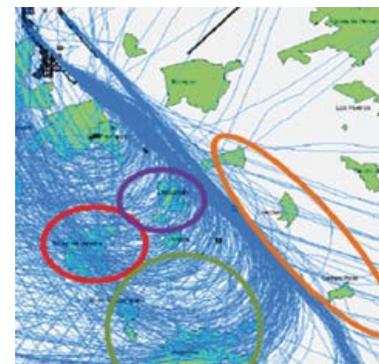
For illustration purposes

- Noise contour

is the area influenced by the same noise level



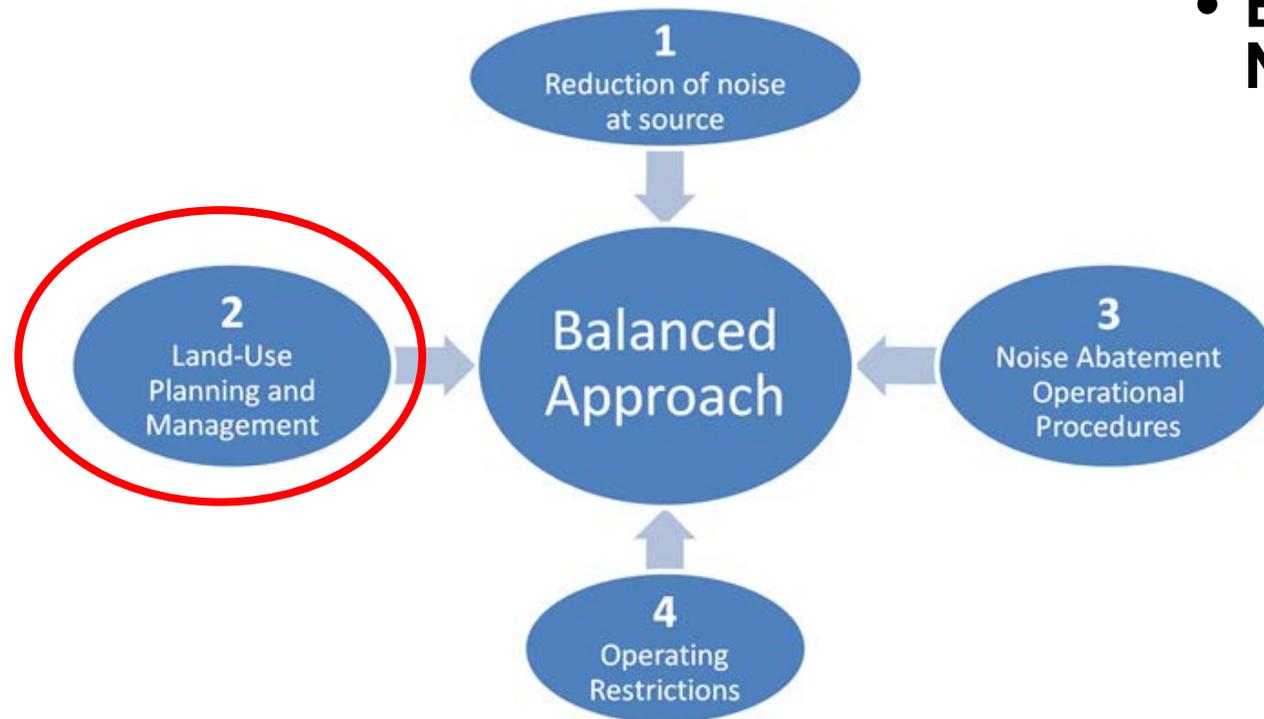
Before noise abatement After noise measures



Longer trajectories =
More fuel burn

Aircraft noise

- the most significant cause of adverse community reaction related to the operation and expansion of airports.



• **Balanced Approach to Aircraft Noise Management**

- main overarching ICAO policy on aircraft noise;
- adopted by the ICAO Assembly in its 33rd Session (2011) and reaffirmed in all the subsequent Assembly Sessions;
- ICAO Doc 9829- *Guidance on the balanced approach to aircraft noise management*

Four principal elements of the Balanced Approach to Aircraft Noise Management



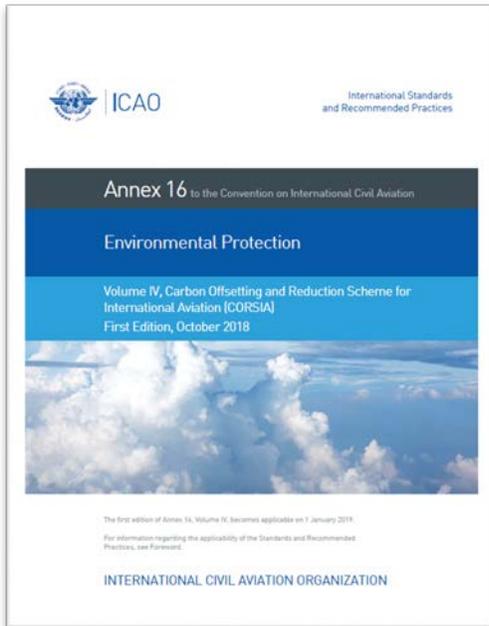
The need for environmental management in and around the vicinity of airports

!!! To the extent that safety and operational considerations permit



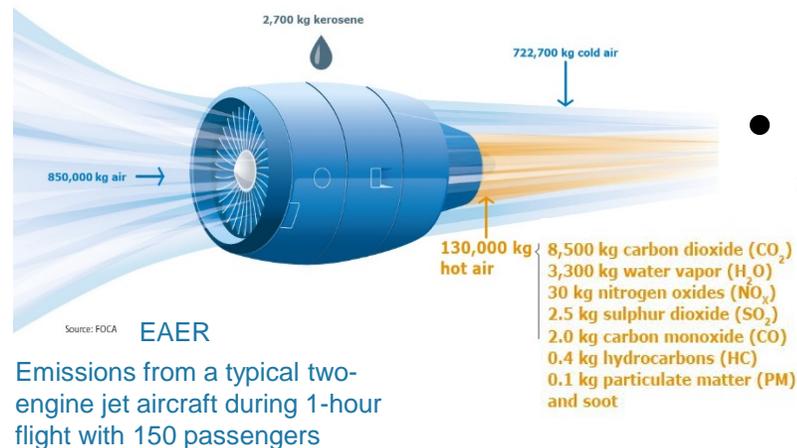
- The compatibility of an airport with its environs:
 - achieved by proper planning of the airport, management of pollution-generating sources, and land-use planning of the area surrounding the airport
 - “**Land-use planning**” or “planning for compatible land uses takes into account the needs of airport development”
 - more adequately describes the **process of achieving an optimum relationship between an airport and its environs**

Annex 16, Vol II

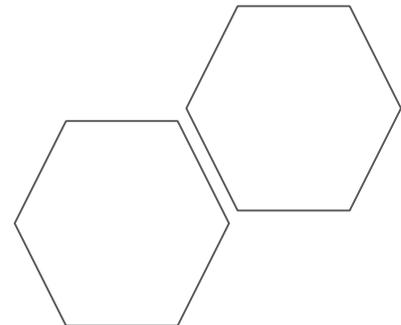
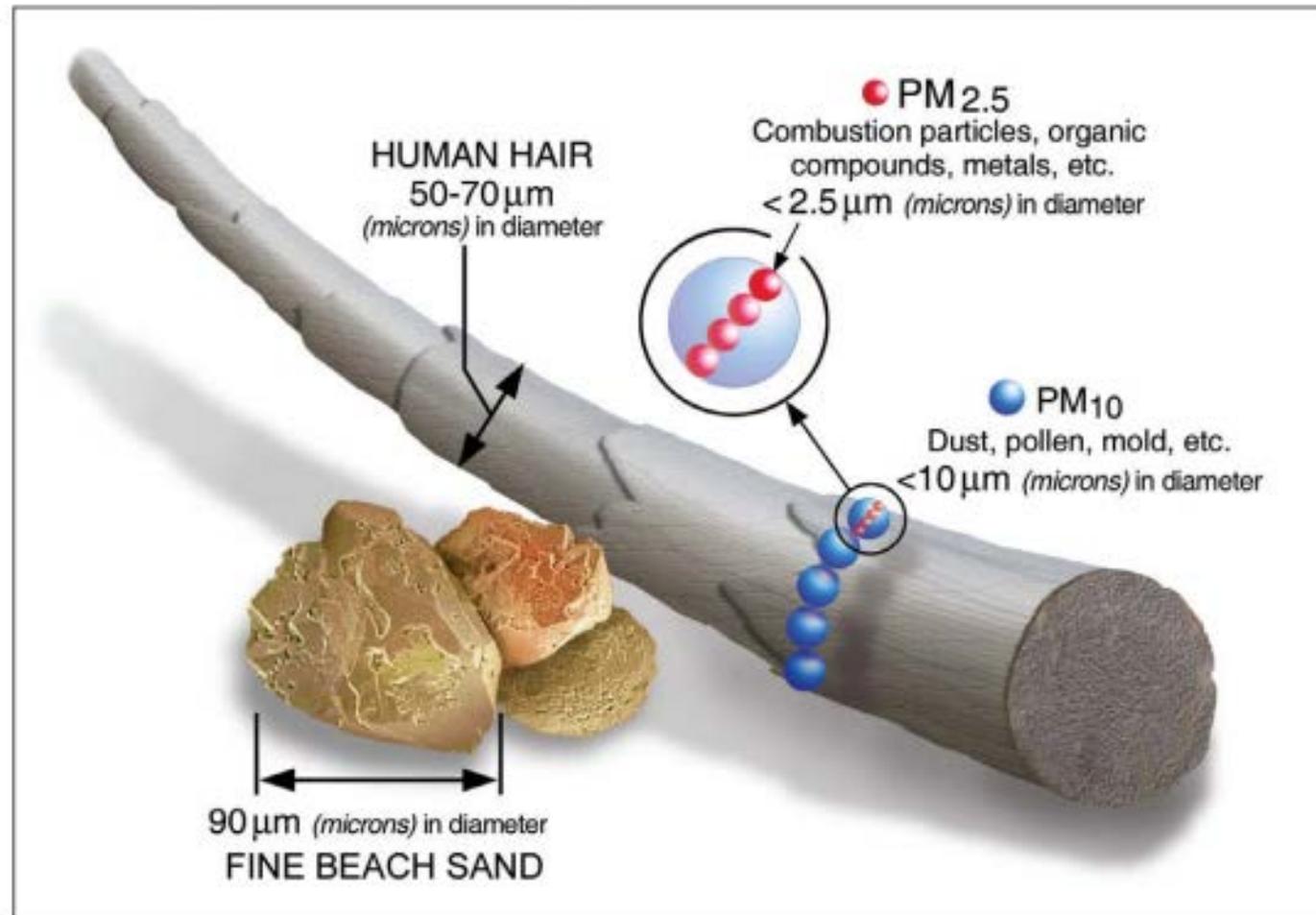


Purpose of Volume II

- **Burning of hydrocarbons in aircraft engines emits gaseous and Particulate Matter (PM);**
 - PM- small particles of solid or liquid suspended in the air that do not sink to the ground directly but stay in the atmosphere for a while;
 - Non-volatile PM (nvPM)- Emitted particles that exist at a gas turbine engine exhaust nozzle exit plane that do not volatilize when heated to a temperature of 350°C
- **emissions standards have an impact on the air quality around airports:**
 - Goal b) to limit or reduce the impact of aviation emissions on local air quality (LAQ);
- **main gaseous exhaust emissions from jet engines:**
 - hydrocarbons (HC), oxides of nitrogen (NO_x), carbon monoxide (CO)



Comparison of particle sizes from different sources (from US EPA)

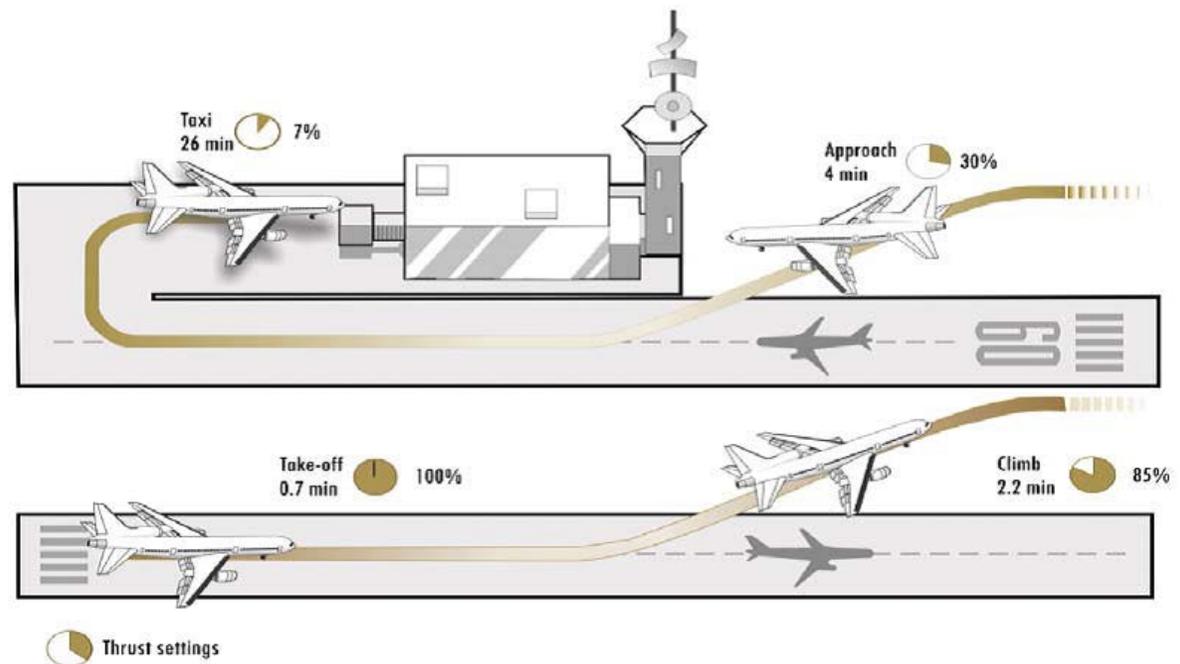


Local Air Quality (LAQ)

Focus on the effects of aircraft engine emissions released below 3 000 ft.

Landing and Take Off Cycle (LTO) (around airports)

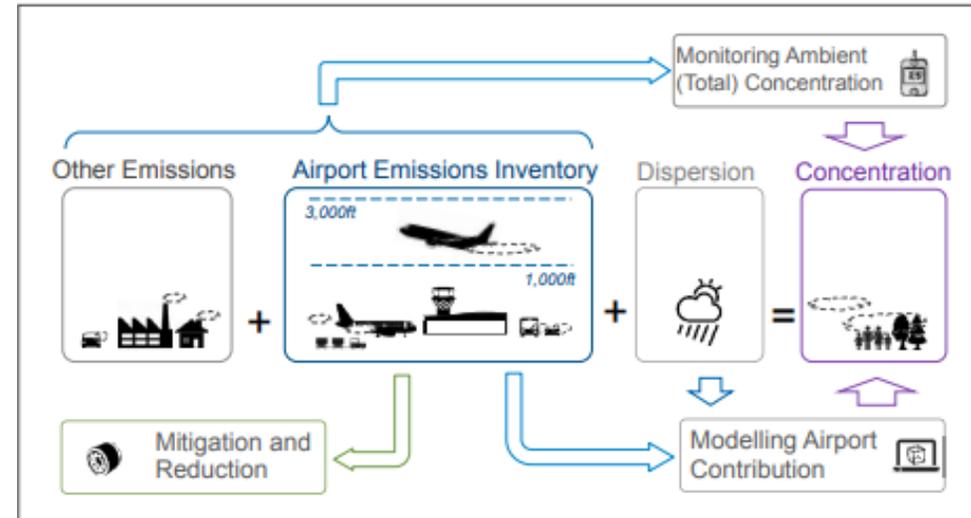
This LTO cycle representing pollutant emissions in the vicinity of airports consists of four operating modes, which involve a thrust setting and a time-in mode



ICAO emissions certification procedure representing the LTO cycle

Update of ICAO's Airport Air Quality Manual (Doc 9889)

Airport Air Quality Manual provides guidance and essential information for ICAO Member States to implement **best practices with respect to airport-related air quality**



Local air quality elements and their interactions (figure courtesy of E. Fleuti, Zurich Airport)

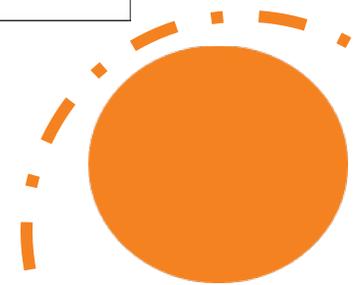


Other considered sources of airport **emissions include**

- ground service vehicles and airside ground transportation;
- de-icing and refueling operations, which produce evaporative emissions of non-volatile organic compounds

Airport Planning Manual, Part 2 (Doc 9184) that focuses on land use and environmental management on and around an airport

- Environmental Impacts Associated with Aviation Activities
- Environmental Management Measures and Considerations
- Infrastructure for Environmental Management
- Land Use
- Land-Use Planning
- Land-Use Administration
- Heritage Considerations
- Climate Change Resilience and Adaptation



- **International airports:**
 - are the backbone of international civil aviation
 - in the context of air traffic growth, airports are key players in ensuring that the sector's growth is environmentally-friendly
- **What is the Eco-Airport Toolkit e-collection:**
 - a new tool for States to take informed decisions when financing a new airport infrastructure project or environmental management enhancement programmes
- **Objective:**
 - to provide practical and ready-to-use information to support the development of airport infrastructure projects
 - The themes of the publications:
 - based on immediate operational needs of States
 - each publication focuses on a specific aspect of environmental planning at airports

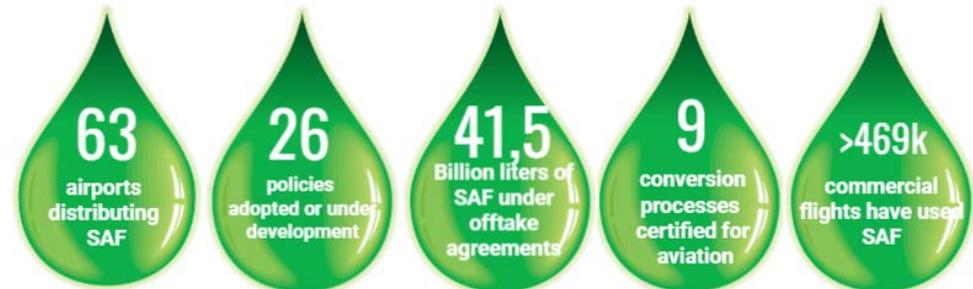
Airports and SAF development

Airports and distribution of Sustainable Aviation Fuels (SAFs)

- Investments in airports and air navigation service providers are needed to bring about improvements in operations → **Scaling the production of sustainable aviation fuels and other energy sources** requires substantial investment and financial support from both fuel suppliers and governments on top of what would be needed for associated infrastructural changes
- **Sustainable Aviation Fuels (SAF) development and deployment** is particularly important, considering that the drop-in fuels have the largest potential to reduce the overall emission from international aviation by 2050, according to the recent ICAO Report on the feasibility of a LTAG for international civil aviation CO2 emission reductions

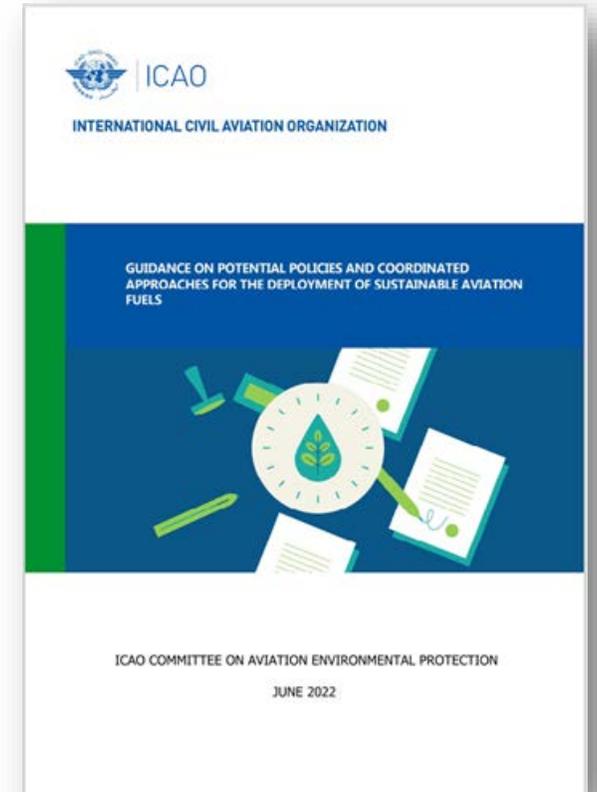
Illustration: Airport distributing SAF and airports in on-going alternative fuel purchase agreements

SAF Tracking tools



SAF

- renewable or waste-derived aviation fuels that meets sustainability criteria
- **CORSIA**
 - specific methodologies that allow aircraft operators to **reduce its offsetting requirements through the use of SAF and LCAF**, including globally-accepted sustainability criteria and life cycle methodologies



Guidance on potential policies and coordinated approaches for the deployment of SAF (2022)

Airports and distribution of Sustainable Aviation Fuels (SAFs)

THE 3rd Conference on Aviation and Alternative Fuels (CAAF/3)

- States' commitments to embracing the introduction of SAF
 - in line with the **2050 ICAO Vision**.
 - will be updated at the CAAF/3, to be held in **November 2023**

ICAO Environmental Regional Seminars

- objective of focusing on the implementation of the LTAG including recent developments on the ACT-SAF programme, financing cleaner energy, etc.
 - (18-19 April, Nairobi, Kenya)



ACT-SAF (Assistance, Capacity Building and Training for SAF)

- ICAO initiative to **facilitate the development and deployment of sustainable fuels**, while recognizing “not one approach fits all”
- Tailored support for States in various stages of SAF development and deployment

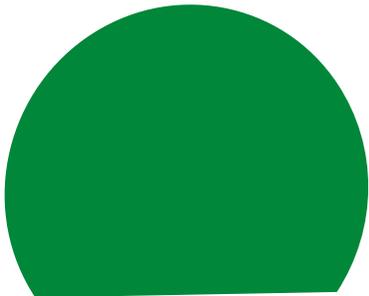


You can become an **ACT-SAF Partner** by agreeing to the [ACT-SAF Terms and Conditions](#)

<p>1) Interested party expresses interest in becoming an ACT-SAF Partner</p>	<p>2) ICAO coordinates with the interested party the details of the offers and requests, and suggest possible projects</p>	<p>3) Agreement is signed and projects defined</p>	<p>4) ICAO connects ACT-SAF Partners</p>
<p>Supporting State / Organization* can participate by providing experts and/or resources</p> <p>Requesting State can participate by providing a focal point for coordination</p>	<p>Possible projects:</p> <p>Feasibility Studies Training programmes Support for SAF certification Support for Policy implementation</p>	<p>The Agreement will contain:</p> <p>Details on the cooperation terms, including the roles and responsibilities of ICAO and each participant</p>	<p>Criteria for connection</p> <ul style="list-style-type: none"> • Matching expertise • Language, cultural and geographical aspects • Resources availability

Conclusion

- In the concept of green airports –there are many ways of GOING GREEN;
- The upcoming ICAO Regional Seminar will provide detailed information on SAFs- 18 and 19 April - Nairobi





Thank You