
ICAO
INTERNATIONAL CIVIL AVIATION ORGANIZATION
A UN SPECIALIZED AGENCY
RECONNECTING THE WORLD

Recent developments in the field of Environmental Protection

North Atlantic (NAT) 2030 Vision Workshop

Blandine Ferrier

Regional Officer Environment, ICAO

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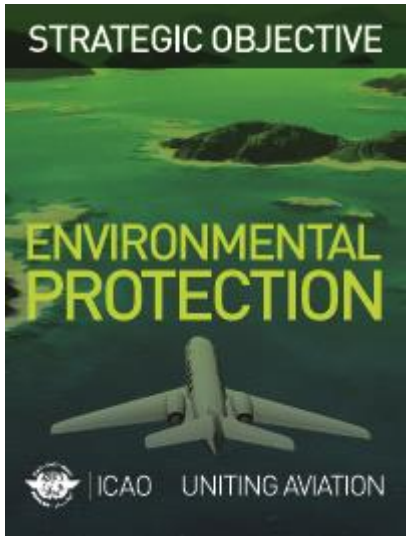
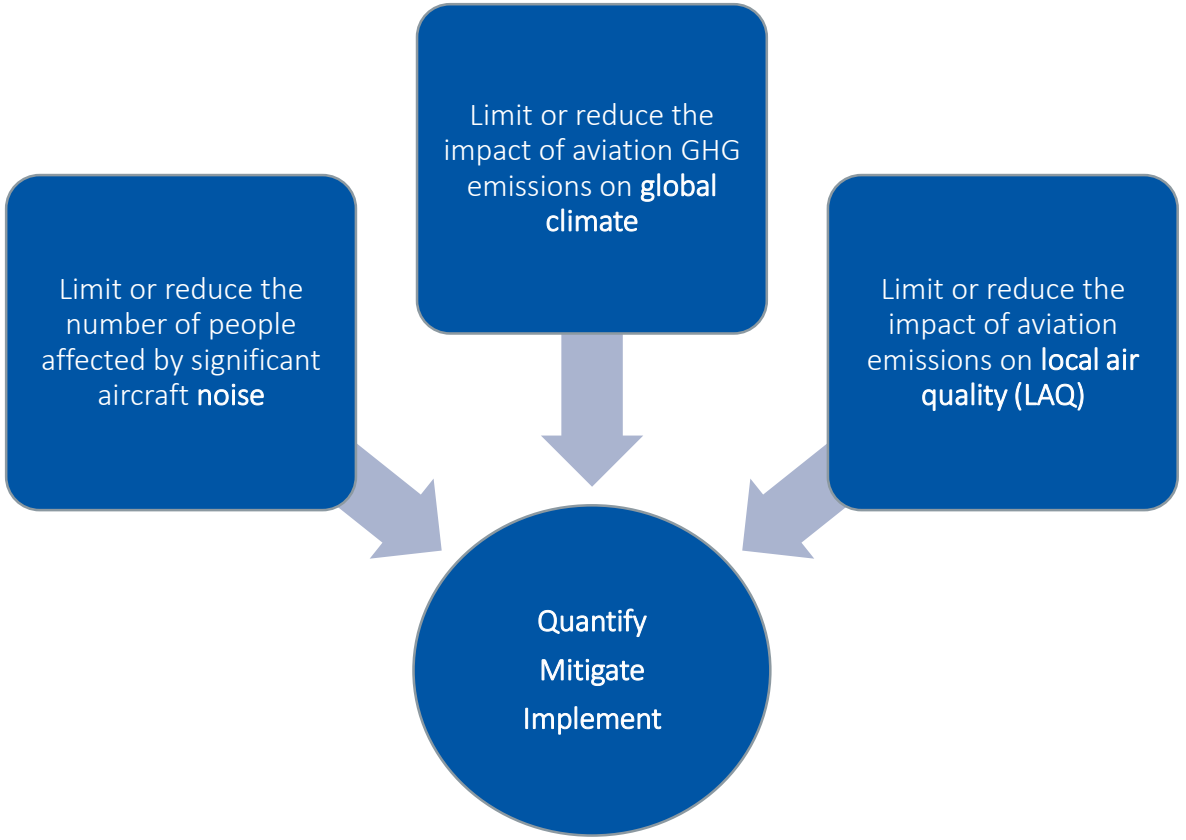
ICAO STRATEGIC OBJECTIVE

Minimize the adverse effect of global civil aviation on the environment



ICAO ENVIRONMENTAL GOALS



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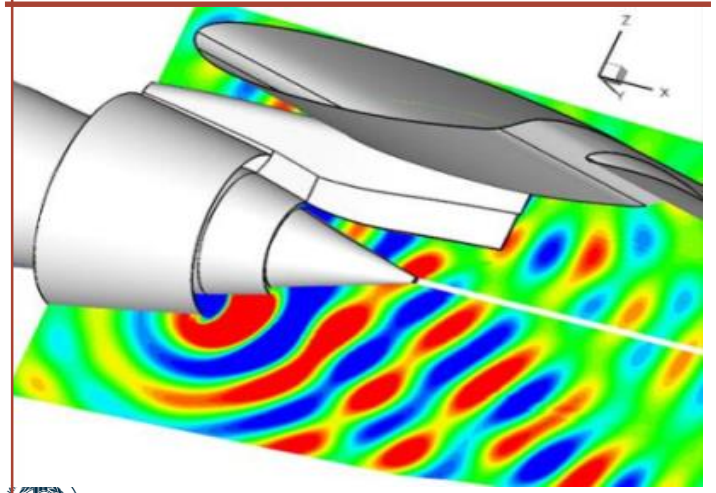
ICAO's work on Environment

NOISE: late '60s SARPs on Annex 16, Volume I since 1971



LOCAL AIR QUALITY: late '70s SARPs on Annex 16, Volume II, since 1981

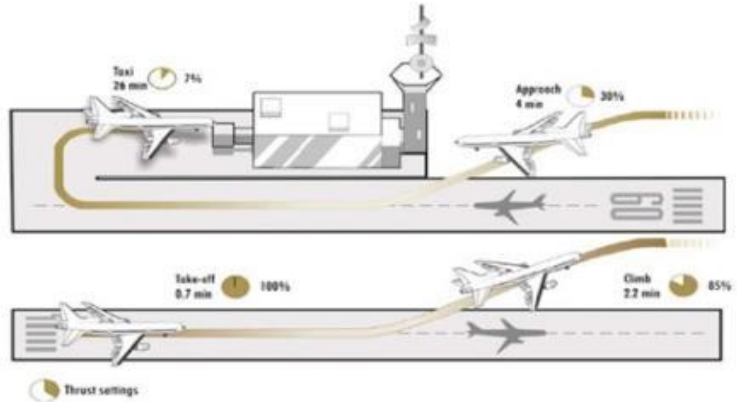
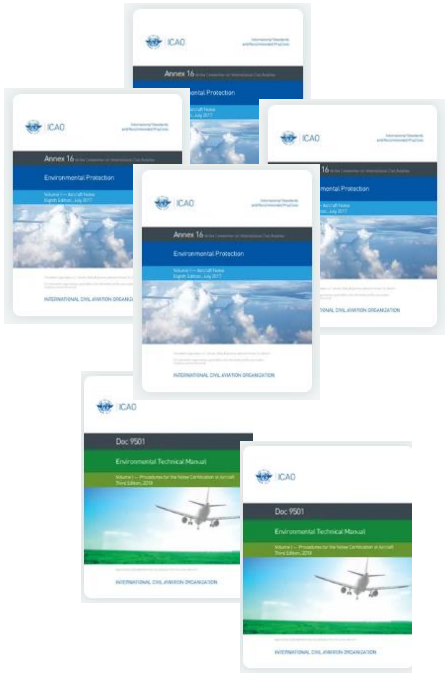


Figure 1 - Illustration of ICAO Emissions Certification Procedure LTO Cycle.
Source: ICAO.

CLIMATE CHANGE: late '80s SARPs on Annex 16, Volume III, and Volume IV

ICAO's work on Environment



Annex 16 - Environmental Protection

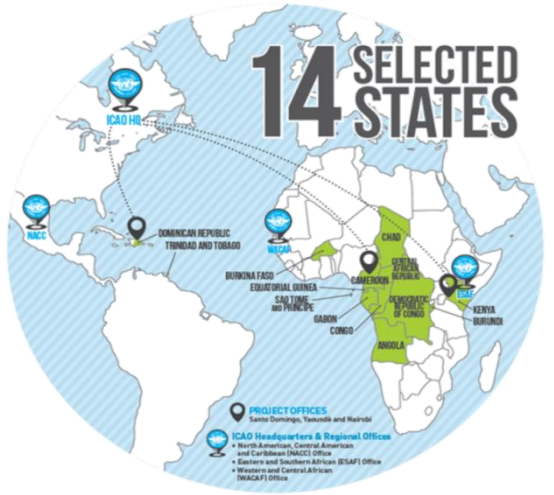
Volume I - Aircraft Noise
Volume II - Aircraft Engine Emissions
Volume III - Aeroplane CO2 Emissions
Volume IV - CORSIA

Environmental Technical Manuals

Volume I – Procedures for the Noise Certification of Aircraft
Volume II - Procedures for Emissions Certification of Aircraft Engine
Volume III - Procedures for the CO2 Emissions Certification of Aeroplanes
Volume IV – Procedures for demonstrating compliance with CORSIA

ICAO Assistance and Capacity building activities

Assistance Projects with financing from the EU
Project with UNITAR
Assistance Projects with financing from UNDP, GEF



ICAO documents, Manuals, Tools, etc.

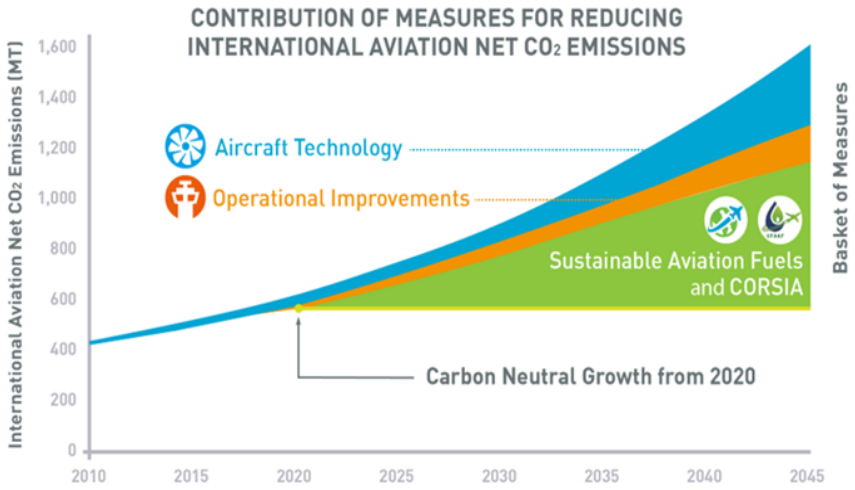
Sustainable Aviation ; Noise
Airports and Operations; CORSIA
Engine Emissions ; CERT
States' Action Plan;
Integrated Goals (Noise and Emissions)
Independent Expert Reviews
Renewable Energy for aviation
Airport Tool- Kits ; Database
Adaptation and Resilience; IFSET
Carbon Emissions Calculator
Etc.

The EUR/NAT Office carries out a number of capacity-building and assistance activities. These assistance activities are most often related to the ICAO State Action Plan Initiative, CORSIA and a new initiative related to Sustainable Aviation Fuels ACT-SAF

- Capacity building strategy of the EUR/NAT Office

  - Direct support to States
  - Workshops and virtual events to strengthen States FPs knowledge
  - Share information on latest developments at ICAO on ENV
  - Exchange of best practices and lessons learned
  - ACT-CORSIA
  - Promotion of States partnerships
  - Training on ICAO SARPs and Tools
  - Technical assistance
  - Invite Regional Organizations to work in coordination with ICAO
  - ACT-SAF

ICAO Aspirational Goals



2019

ICAO Assembly requested the ICAO Council to:

- explore the feasibility of a long-term global aspirational goal (LTAG)

2010

ICAO adopted two Global Aspirational Goals

2% annual fuel efficiency improvement through 2050

Carbon neutral growth from 2020 (CNG2020)

BASKET OF MEASURES

Complemented by

CORSIA

2022

LTAG High-Level Meeting (HLM)

41st ICAO General Assembly

Adoption of collective long-term global aspirational goal (LTAG) of net-zero carbon emissions by 2050

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ICAO LTAG Report and Supporting Material

LTAG Report Appendixes (English only)

Appendix B1
Background
(18 pages)

Appendix R1
Summary Sheets
(61 pages)

Appendix R2
Comparison to Trends
(8 pages)

Appendix R3
Results in the Climate Science Context
(10 pages)

Appendix S1
Climate Science Contex
(24 pages)

Appendix M1
Overview of the Modelling Approaches
(99 pages)

Appendix M2
COVID-19 Forecast Scenario Development
(8 pages)

Appendix M3
Technology
(181 pages)

Appendix M4
Operations
(12 pages)

Appendix M5
Fuels
(84 pages)

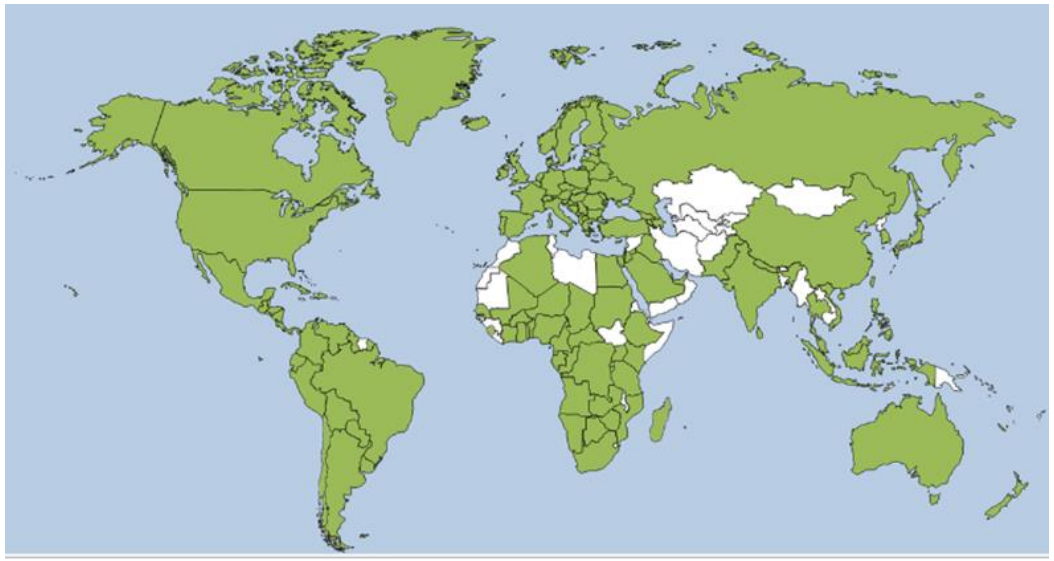
- **ICAO Council briefing**

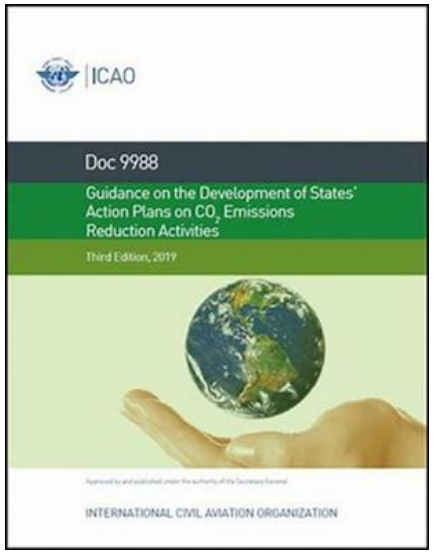
- **Videos on LTAG Report**

https://www.icao.int/environmental-protection/LTAG/Pages/LTAGreport.aspx

State Action Plan (SAP) initiative

In the EUR/NAT region, **48 States** have voluntarily submitted action plans to ICAO, **31 States** have updated their action plans and **1 State** has developed its first action plan





The Assembly reiterated the important role of State Action Plans, encouraging all States to **submit** and **update action plans to reduce CO2 emissions from international aviation**, outlining policies, actions and roadmaps, including long-term projections, and requested the Council to provide guidance and assistance

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Basket of Mitigation Measures

Aircraft technology	First-ever **global CO2 certification Standard** for new types and in-production aeroplanes. **Fast-paced innovation** (new designs, composite materials, hybrid-electric aircraft, renewable energy sources, etc.).
Operational improvements	CO2 benefits from **air traffic management**; **air navigation; green airports**; etc.
Sustainable aviation fuels	**9 conversion processes**; **60 airports** distributing SAF, **25 policy** adopted or under development, **39.9 billion liters of SAF** under offtake agreements
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) **CORSIA implementation fully on track** 107 States for 2022, over 115 States for 2023, **118 for 2024 as of today**

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Technology Goals and Standard

To foster the **development of new technologies**, ICAO regularly sets technology goals, with the purpose of providing targets for industry research and development, in cooperation with States

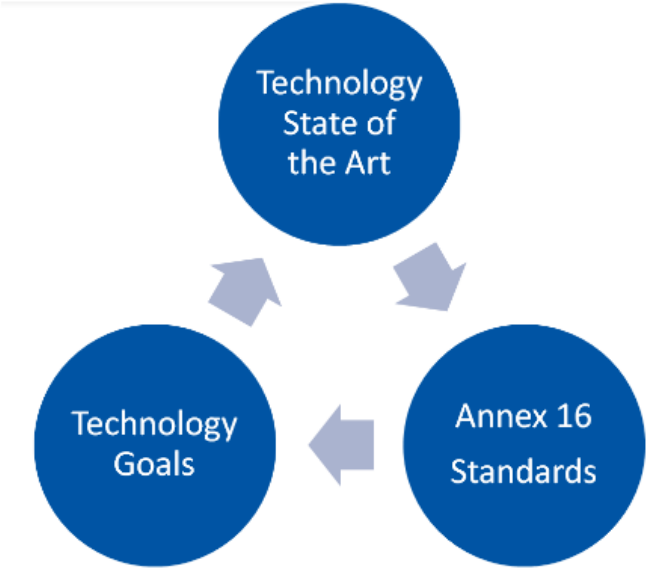
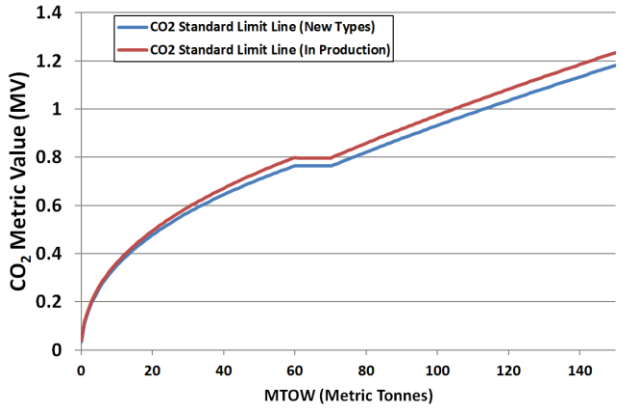


Figure 1. ICAO Standard Setting Principle

ICAO new aeroplane CO_2 emissions certification Standard was published as a new Annex 16, Volume III – Aeroplane CO_2 Standard (2017)



ICAO Doc 10127 *Independent Expert Integrated Technology Goals Assessment and Review for Engines and Aircraft (2019)*

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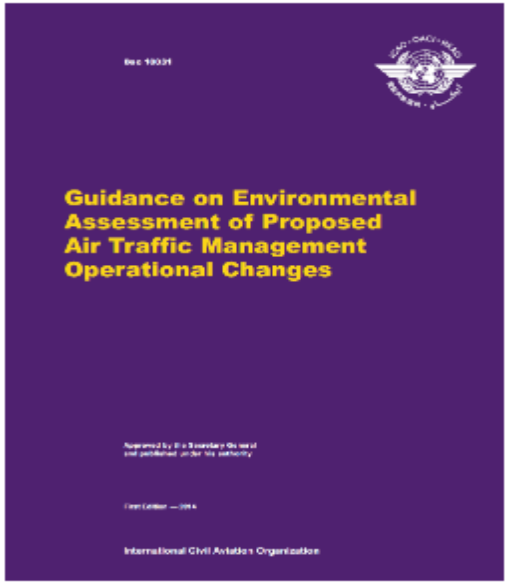
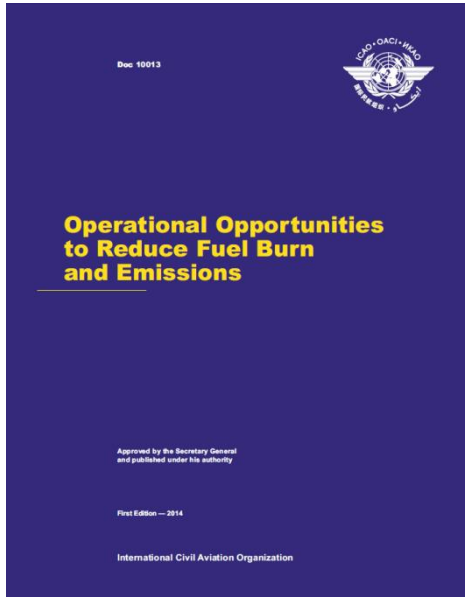
Operational Measures

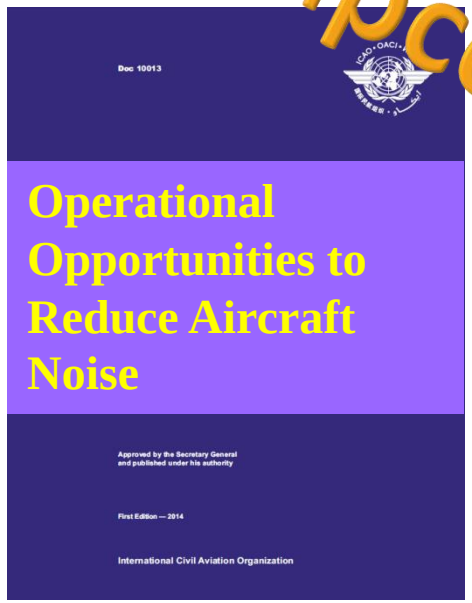


The guidance provides high-level environmental assessment principles intended to facilitate the use of a **consistent approach for assessing the environmental impacts of operational changes**



ICAO Doc 10013

upcoming



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First global analysis on vertical flight efficiency (VFE)

ICAO Region	CDO		CCO	
	Excess fuel / CO_2 (kg)	Fuel costs (million $)	Excess fuel / CO_2 (kg)	Fuel costs (million $)
APAC	47/149	336.9	13/41	94.2
ESAF	23/73	8.2	2/6	0.6
EUR/NAT	37/117	218.7	4/13	22.5
MID	60/190	50.9	9/28	7.9
NAM	43/136	336.6	5/16	41.2
CAR/SAM	24/76	44.3	3/9	6.4
WACAF	20/63	2.7	1/3	0.1
Total	**41/130**	**992.2**	**7/22**	**161.5**

Published in 2022

Table 1: Results of the climb and descent parts of the global VFE study per ICAO region

https://www.icao.int/environmental-protection/Documents/EnvironmentalReports/2022/ICAO%20ENV%20Report%202022%20F4.pdf

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LTAG Assessment from a Operations Perspective

- ✓ Remote Tower
- ✓ Enhanced MET information
- ✓ Flexible use of airspace
- ✓ Flex routes
- ✓ Free Route Airspace
- ✓ User Preferred Routings
- ✓ Space-based ADS-B surveillance
- ✓ Datalink En-route
- ✓ Datalink Departure Clearance
- ✓ FF-ICE Planning Service
- ✓ Continuous Descent Operations
- ✓ Continuous Climb Operations
- ✓ PBN STARs
- ✓ PBN SIDs
- ✓ Flight-based Interval management
- ✓ Ground-based Interval Management
- ✓ ATFM
- ✓ Short-Term ATFCM Measures
- ✓ Advanced FUA (ATFM / Airspace Management)
- ✓ RNP-AR approaches
- ✓ Airport – Collaborative Decision Making
- ✓ Wake Vortex Re-categorization
- ✓ Time-Based Separation
- ✓ Arrival Manager
- ✓ Extended Arrival Manager
- ✓ Terminal Flight Data Manager
- ✓ Advanced – Surface Movement Guidance and Control System
- ✓ PBN approaches (Radius to Fix)
- ✓ PBN to xLS approaches
- ✓ GBAS CAT I/II/III
- ✓ Multi-segment approaches / glideslopes

- ✓ Dynamic Sectorization
- ✓ Reduced Extra Fuel On-board
- ✓ Best Practices in Operations Minimizing Weight
- ✓ In-Trail Procedure (ITP)
- ✓ Airline Fuel Management System
- ✓ Optimized Runway Delivery Support tool and Reduced Pair-Wise Weather Dependent Separation between Arrivals
- ✓ Electrical Tug Detachable Aircraft Towing Equipment
- ✓ Support for Optimized Separation Delivery and Reduced Pair-Wise Weather Dependent Separation between Departures
- ✓ Formation Flight
- ✓ Geometric Altimetry and RVSM Phase 2
- ✓ Global Air Traffic Flow Management
- ✓ Satellite Based VHF for oceanic/remote areas
- ✓ APU Shut Down
- ✓ MAINTENANCE - difference between maintenance and modification to aircraft, technology related

in-sector measures in the area of operations that contribute to reducing CO2 emissions from international civil aviation

Most of the measures been captured in the work undertaken in the environmental assessment of the Global Air Navigation Plan – Aviation System Block Upgrades (GANP ASBU)

List of Operational Measures considered by CAEP

https://www.icao.int/environmental-protection/LTAG/Pages/LTAGreport.aspx

ICAO action on Sustainable Aviation Fuels (SAF)

2009
First ICAO Conference on Aviation and Alternative Fuels (CAAF/1)

2010 – Inclusion of SAF as a measure to reduce CO_2 emissions (ICAO resolution A37-17)

2012 –
Rio + 20 conference – **SAF flight from Montréal to Rio with the ICAO Secretary General**

2013
Creation of the CAEP Alternative Fuels Task Force (AFTF)

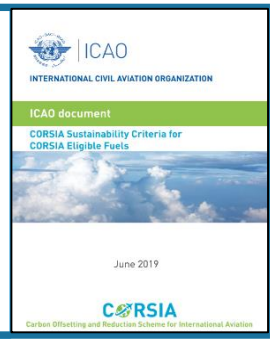
2017
Second Conference on Aviation and Alternative Fuels (CAAF/2)
ICAO vision on SAF

2018 – CORSIA adoption (including SAF provisions)

2019 – First ICAO Stocktaking Seminar on SAF

2020
CORSIA methodologies on sustainability and life cycle analysis

2021
Socio-economic and environmental sustainability criteria



2022 LTAG Agreement
SAF has the greatest potential to reduce CO2 emissions

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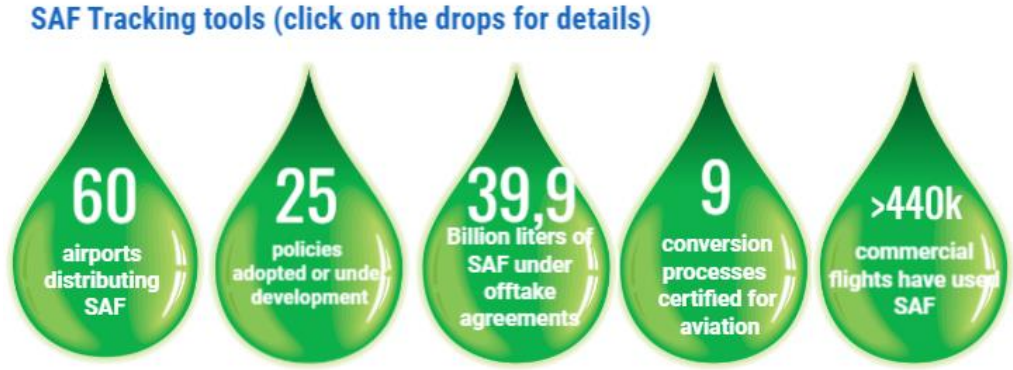
SAF & LCAF

- **Sustainable aviation fuels** (SAF) are defined as renewable or waste-derived aviation fuels that meets sustainability criteria

- CORSIA includes specific methodologies that allow aircraft operators to **reduce its offsetting requirements through the use of SAF and Lower Carbon Aviation Fuels** (LCAF), including globally-accepted sustainability criteria and life cycle methodologies

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



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- 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

1) Interested party expresses interest in becoming an ACT-SAF Partner	2) ICAO coordinates with the interested party the details of the offers and requests, and suggest possible projects	3) Agreement is signed and projects defined	4) ICAO connects ACT-SAF Partners
Supporting State / Organization* can participate by providing experts and/or resources **Requesting State** can participate by providing a focal point for coordination	**Possible projects:** Feasibility Studies Training programmes Support for SAF certification Support for Policy implementation	**The Agreement will contain:** Details on the cooperation terms, including the roles and responsibilities of ICAO and each participant	**Criteria for connection** •Matching expertise •Language, cultural and geographical aspects •Resources availability

You can become an **ACT-SAF Partner** by agreeing to the ACT-SAF Terms and Conditions and participate on the ACT-SAF Series of **training sessions**

All ICAO Member States with aeroplane operators conducting international flights are required to monitor, report and verify CO2 emissions from these flights every year from 2019, independent of their participation in CORSIA

In the EUR/NAT region, **46 volunteer States** to participate in CORSIA

All Member States are encouraged to participate in the pilot and first phase of the CORSIA

Adjustments to CORSIA baseline emissions:

- **2019 CO2 emission as the CORSIA baseline for pilot phase**
- **85% of 2019 CO2 emissions as the CORSIA baseline after pilot phase**

Exemptions:

- **LDCs, LLDCs, SIDS**

ACT - CORSIA

ACT CORSIA is a coordinated approach to harmonize and bring together all relevant actions and promote coherence to capacity building efforts for CORSIA implementation – also enabling the monitoring of global progress / transparency

- Seminars, Online Tutorials
- Frequently Asked Questions
- Brochures, Leaflets, Videos
- CORSIA Newsletters

In the EUR/NAT Regions

5 States supporting other States

14 States beneficiating of ACT CORSIA

- Cornerstone of ICAO's plan to support States to prepare for CORSIA implementation
- Under the partnerships, technical experts provided by supporting States work together with the CORSIA focal points of requesting States to provide on-site training, and to closely follow-up on the preparation and implementation of the requesting States' CORSIA MRV system

Thank You

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