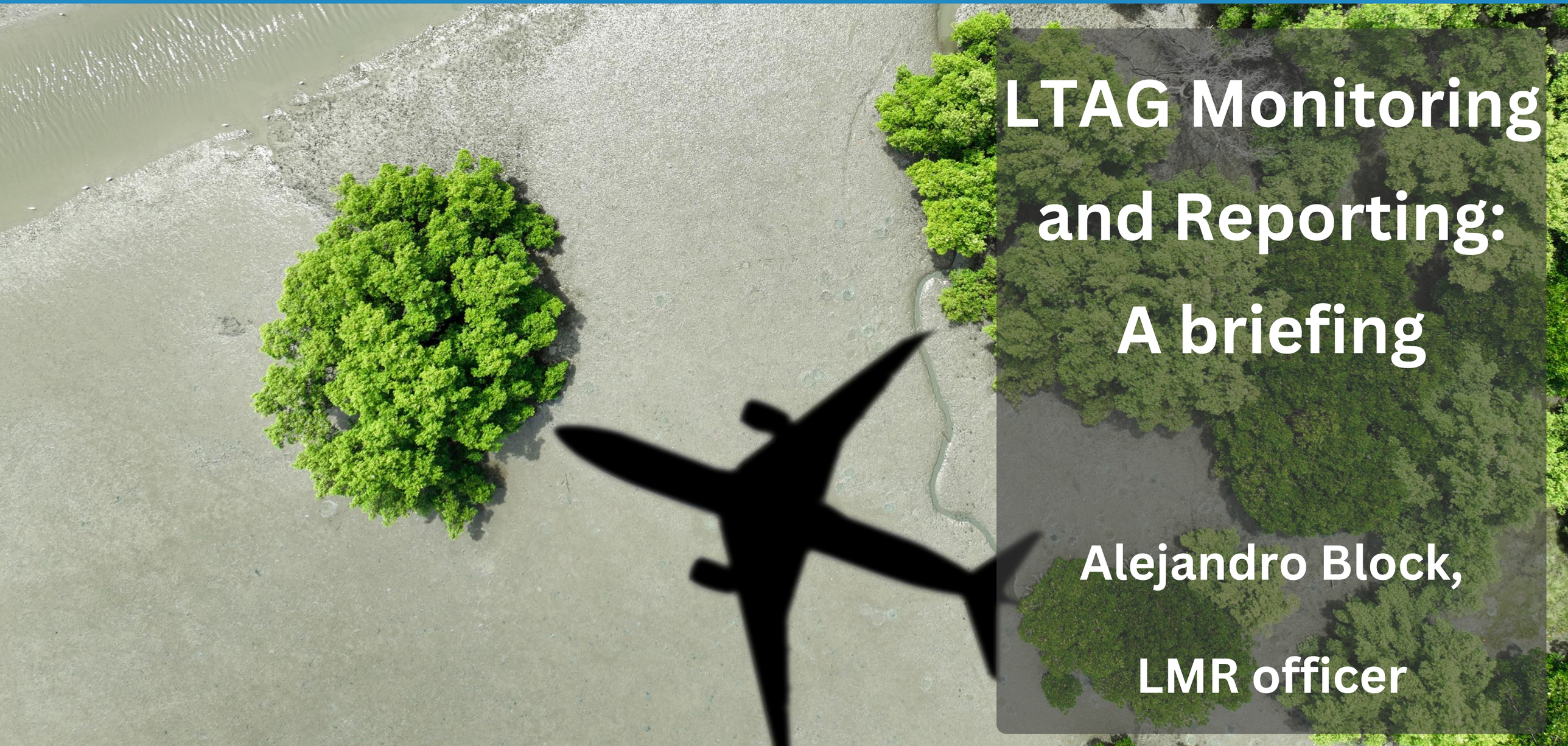

LTAG Monitoring and Reporting: A briefing

Alejandro Block,

LMR officer

Contents

- **Background:** From the LTAG report to the methodology
- **The methodology**: Time and complexity
- Sources of **information**
- How will moving towards Net Zero affect the **development of the sector**?
- **Next steps,** summary, and questions

Introduction

LTAG Report

2019 **2022** 2023 **2025**

A40-18 request to explore the feasibility of a LTAG.

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2025 — Feb. 2025: CAEP/13 recommended the LMR Methodology.

June 2025: Council reviewed and approved the methodology.

A42-21 requested the Council, to implement the LMR methodology.

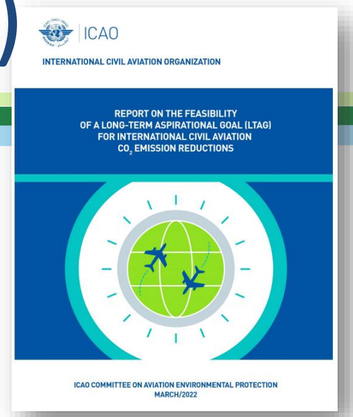
Background: The request for a long-term goal

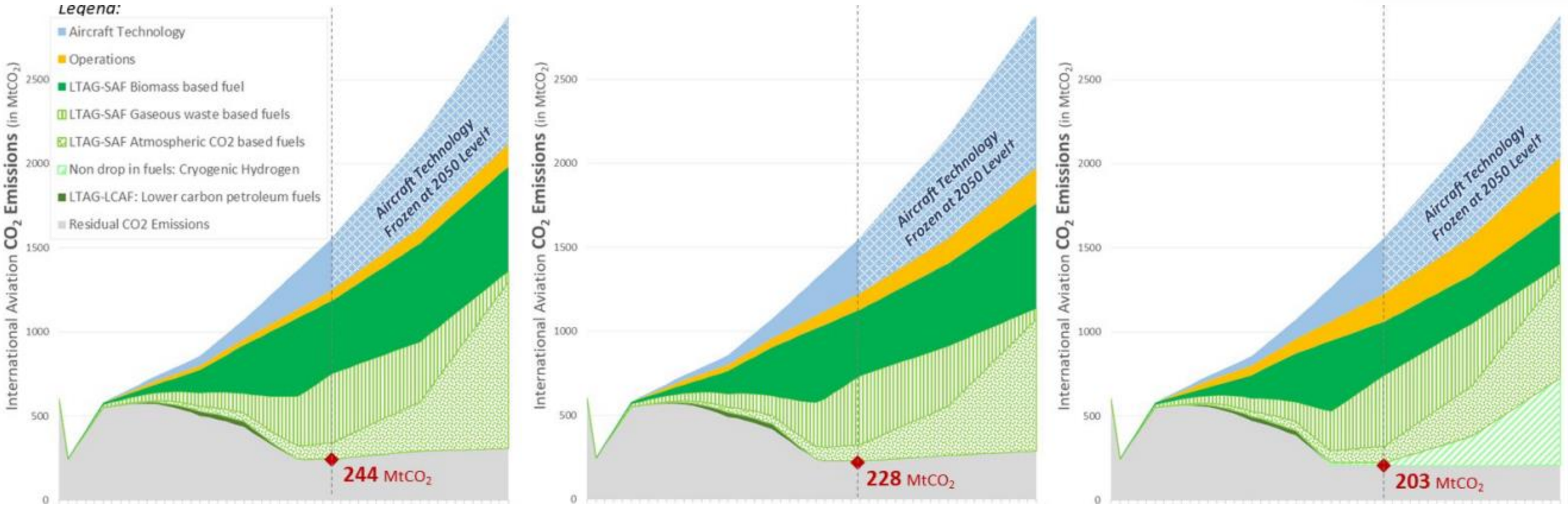
2019: A40-18*

9. *Requests* the Council to continue to explore the feasibility of a long-term global aspirational goal for international aviation, through conducting detailed studies assessing the attainability and impacts of any goals proposed, including the impact on growth as well as costs in all countries, especially developing countries, for the progress of the work to be presented to the 41st Session of the ICAO Assembly. Assessment of long-term goals should include information from Member States on their experiences working towards the medium term goal;

ICAO ENVIRONMENT

Background: The LTAG Report (2022)





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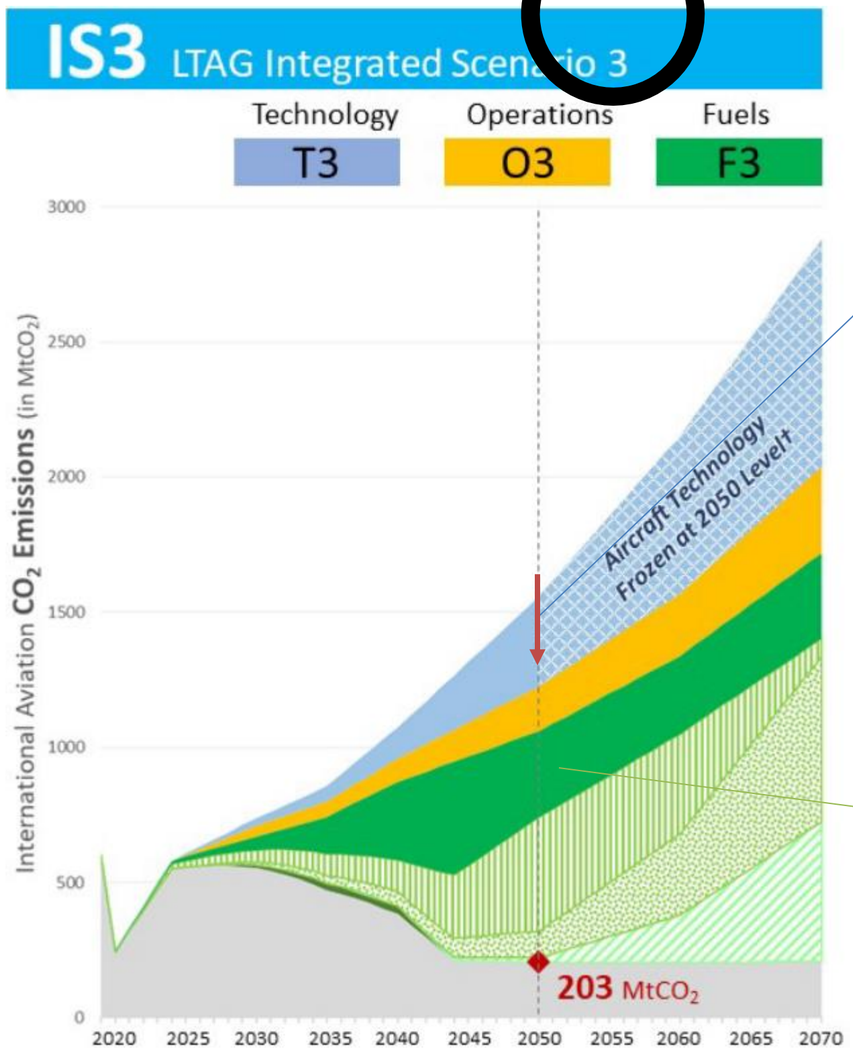

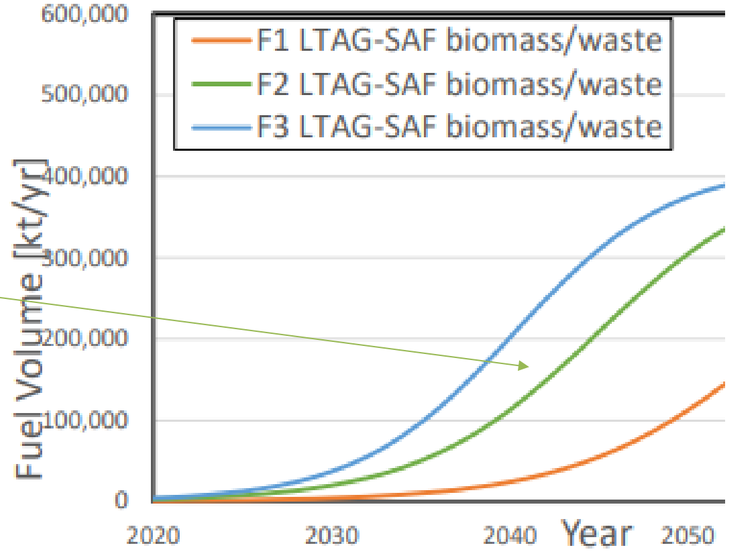

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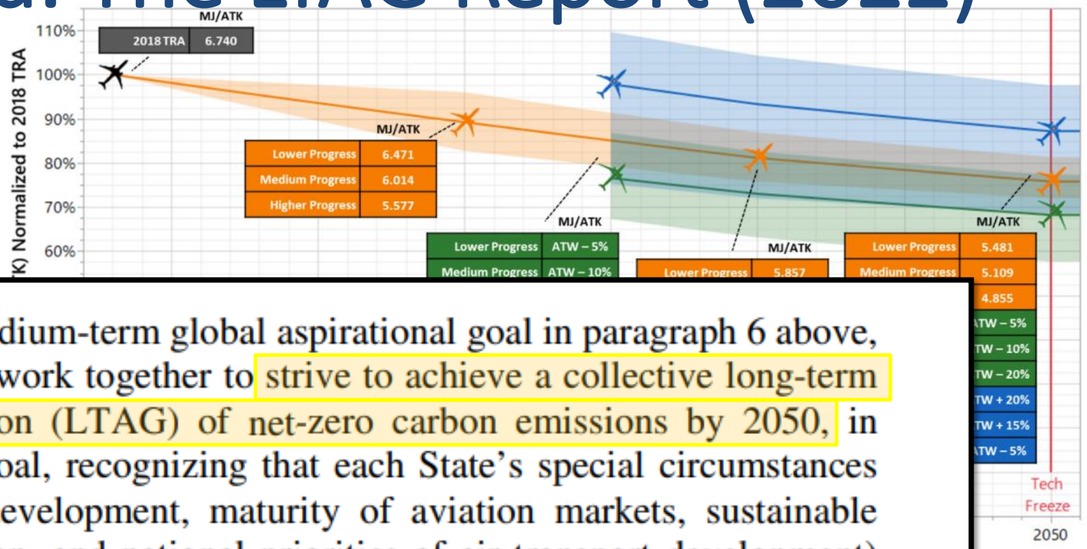

2022: A41-21

7. *Further resolves* that, in addition to the medium-term global aspirational goal in paragraph 6 above, ICAO and its Member States are encouraged to work together to strive to achieve a collective long-term global aspirational goal for international aviation (LTAG) of net-zero carbon emissions by 2050, in support of the Paris Agreement's temperature goal, recognizing that each State's special circumstances and respective capabilities (e.g. the level of development, maturity of aviation markets, sustainable growth of its international aviation, just transition, and national priorities of air transport development) will inform the ability of each State to contribute to the LTAG within its own national timeframe;

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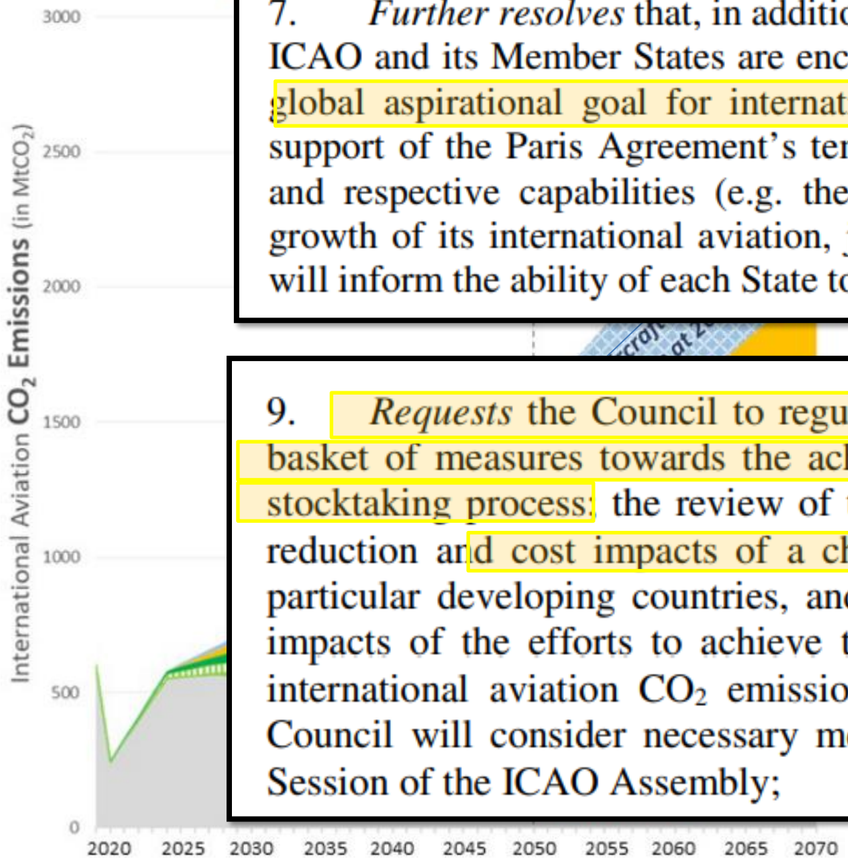

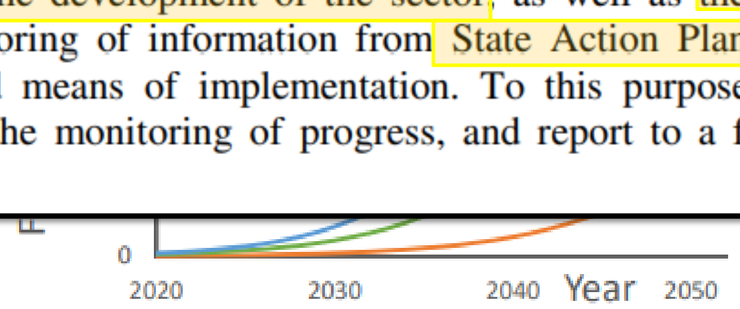

Background: The LTAG Resolution

Request for monitoring progress ->

October **2022**, A41-21*

- How do we **monitor** progress?
- Where can the **data** come from?
- How often do we **report**?
- How much will it **cost**?
- How will this affect the **development of the sector**, particularly in developing States?
- How will **climate change impact** aviation?

*ICAO, Resolution A41-21: Consolidated statement of continuing ICAO policies and practices related to environmental protection — Climate change, available at: www.icao.int/environmental-protection/Documents/Assembly/Resolution_A41-21_Climate_change.pdf

ICAO ENVIRONMENT

From the LTAG to the monitoring of the LTAG

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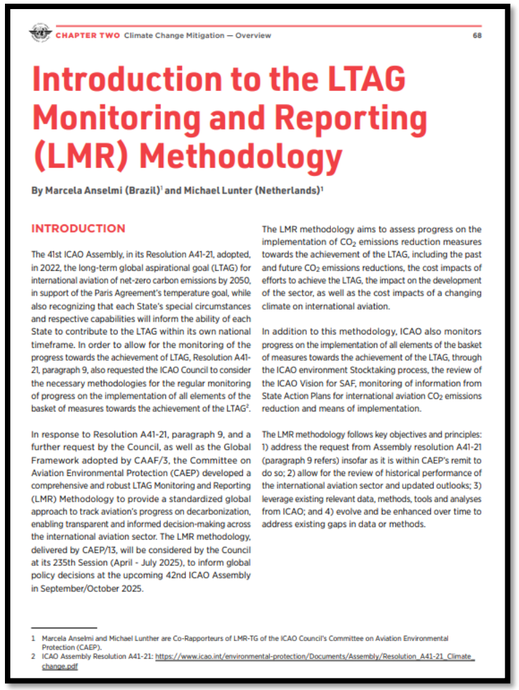
The LTAG monitoring & reporting methodology



CHAPTER TWO Climate Change Mitigation — Overview 68

Introduction to the LTAG Monitoring and Reporting (LMR) Methodology

By Marcela Anselmi (Brazil)[1] and Michael Lunter (Netherlands)[1]

INTRODUCTION

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In response to Resolution A41-21, paragraph 9, and a further request by the Council, as well as the Global Framework adopted by CAAF/3, the Committee on Aviation Environmental Protection (CAEP) developed a comprehensive and robust LTAG Monitoring and Reporting (LMR) Methodology to provide a standardized global approach to track aviation's progress on decarbonization, enabling transparent and informed decision-making across the international aviation sector. The LMR methodology, delivered by CAEP/13, will be considered by the Council at its 235th Session (April - July 2025), to inform global policy decisions at the upcoming 42nd ICAO Assembly in September/October 2025.

The LMR methodology aims to assess progress on the implementation of CO_2 emissions reduction measures towards the achievement of the LTAG, including the past and future CO_2 emissions reductions, the cost impacts of efforts to achieve the LTAG, the impact on the development of the sector, as well as the cost impacts of a changing climate on international aviation.

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The LMR methodology follows key objectives and principles: 1) address the request from Assembly resolution A41-21 (paragraph 9 refers) insofar as it is within CAEP's remit to do so; 2) allow for the review of historical performance of the international aviation sector and updated outlooks; 3) leverage existing relevant data, methods, tools and analyses from ICAO; and 4) evolve and be enhanced over time to address existing gaps in data or methods.

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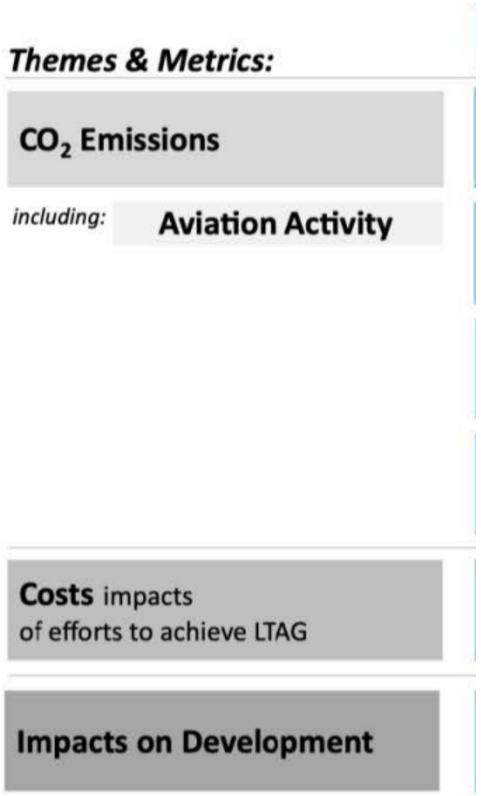

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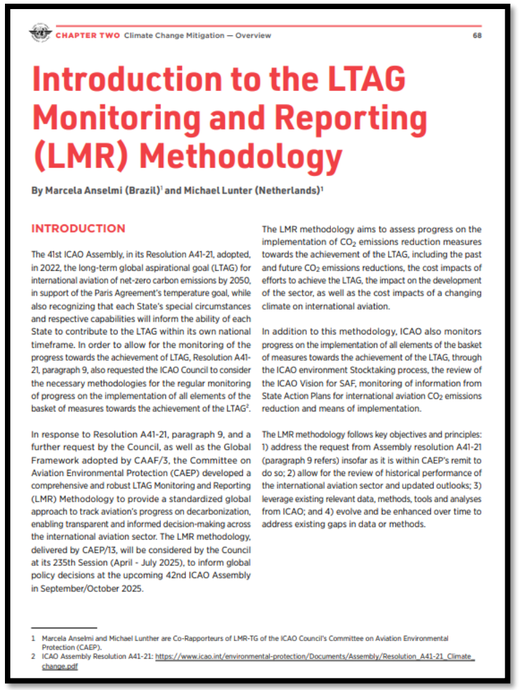
The LTAG monitoring & reporting methodology



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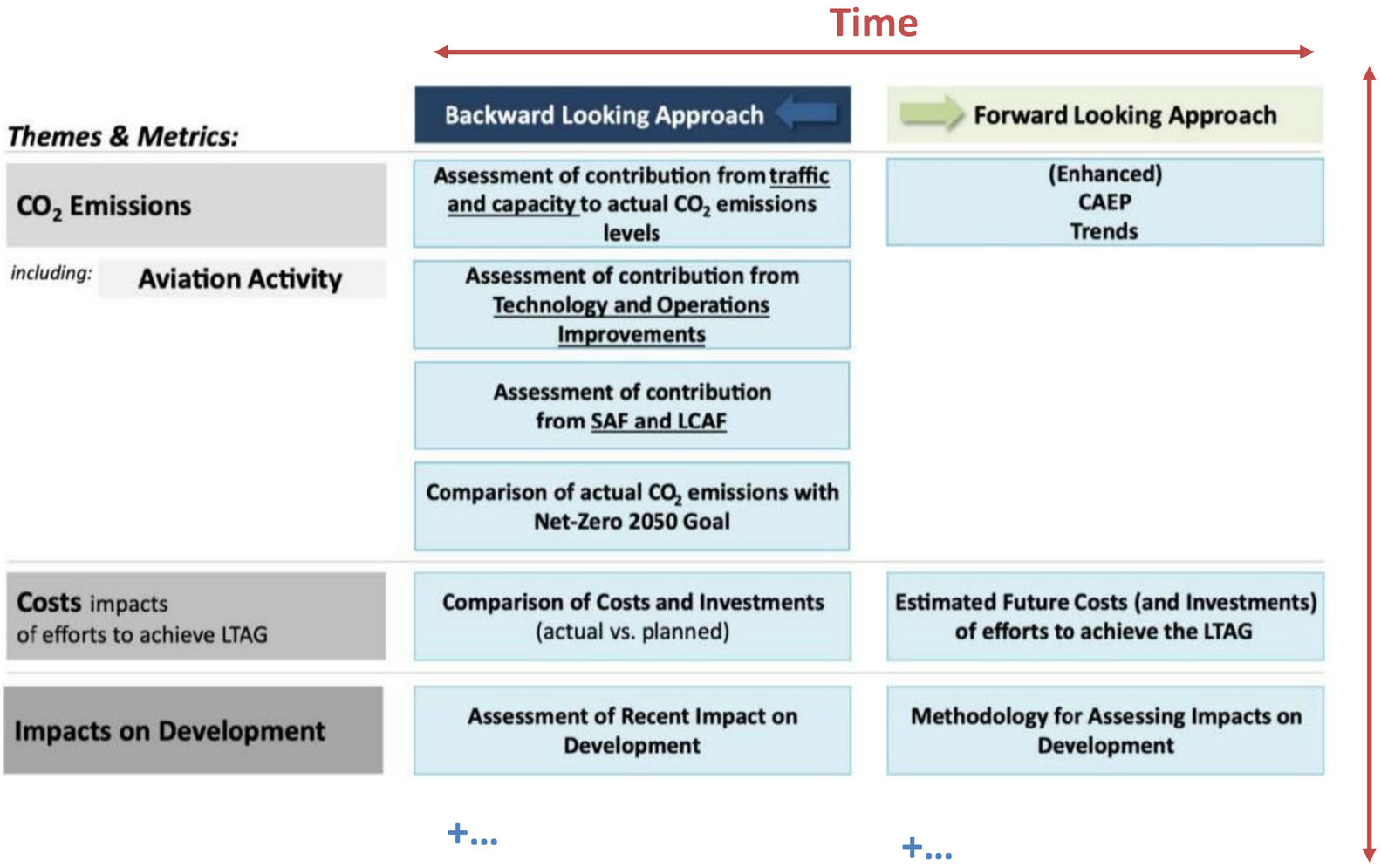

See: ICAO Environment Report 2025- Introduction to the LTAG Monitoring and Reporting Methodology

The LTAG monitoring & reporting: Tiers

T1

Descriptive approach

- CO_2 - CCR
- Cleaner Energies Use – CCR
- Compare vs existing CAEP trends
- Basic costs
- Impact on sector’s development
- Tech & Ops together (CO_2/ATK)
- Global analysis

The LTAG monitoring & reporting: Tiers

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- CO_2 - CCR
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T2

Explanatory approach, T1+…

- Fill identified gaps
- Data sources: CCR + others
- Tech & Ops separate
- Bottom-up assessments

T3

Explanatory approach, T2+…

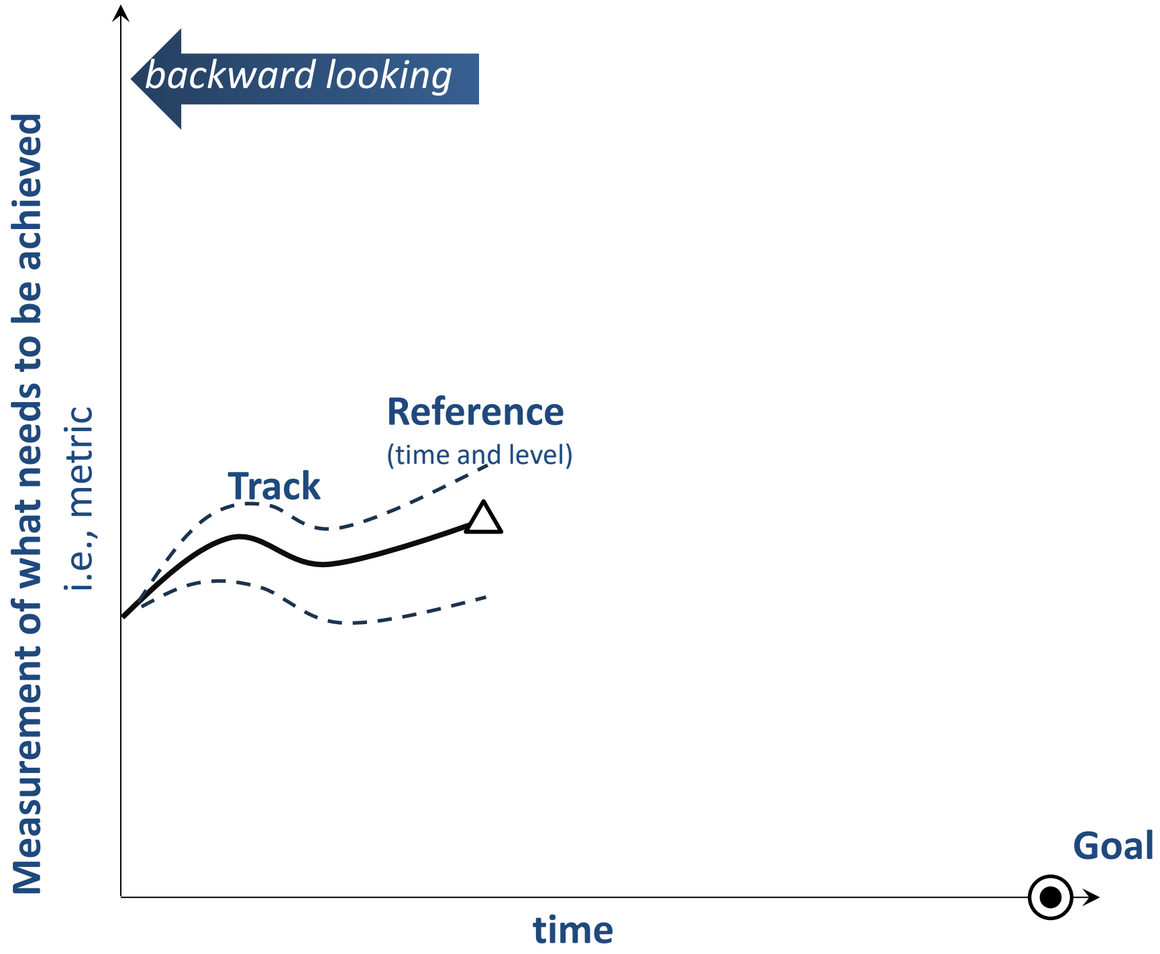
- Details on H_2 & electric
- Regional analysis
- Electricity and H_2 supply

Increased complexity

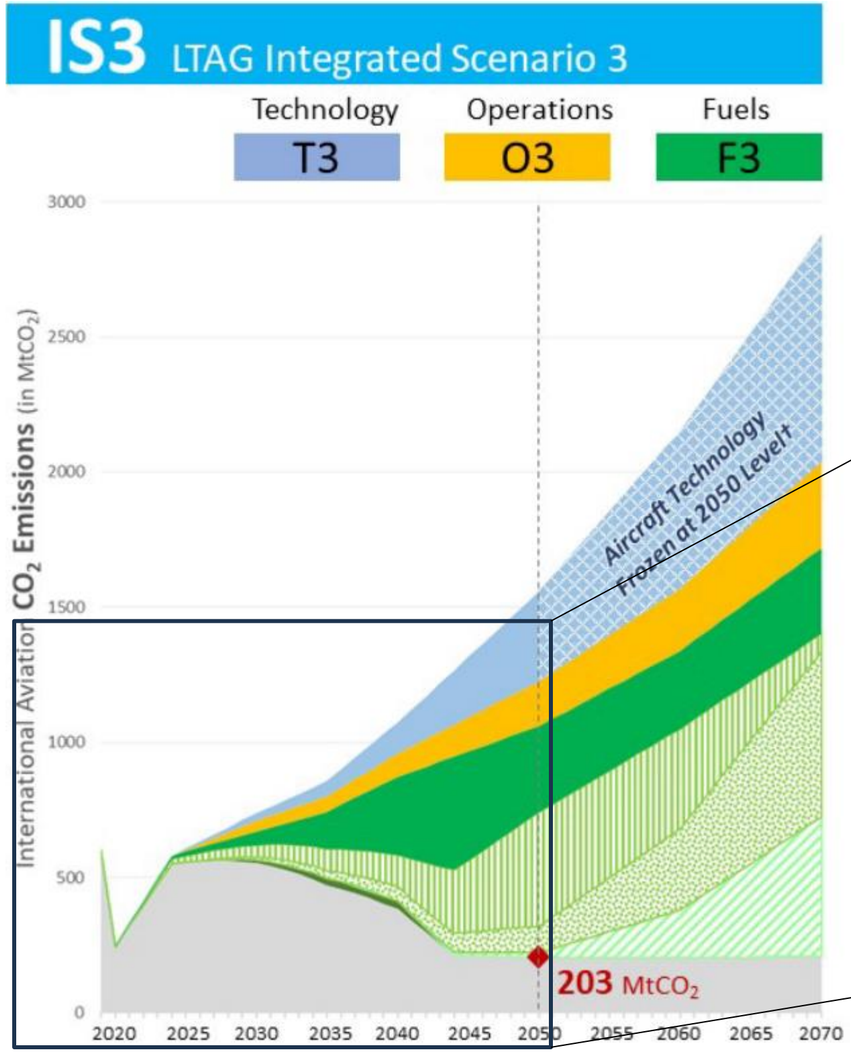
The LTAG monitoring & reporting: Time (past vs future)

Backward-looking assessments:

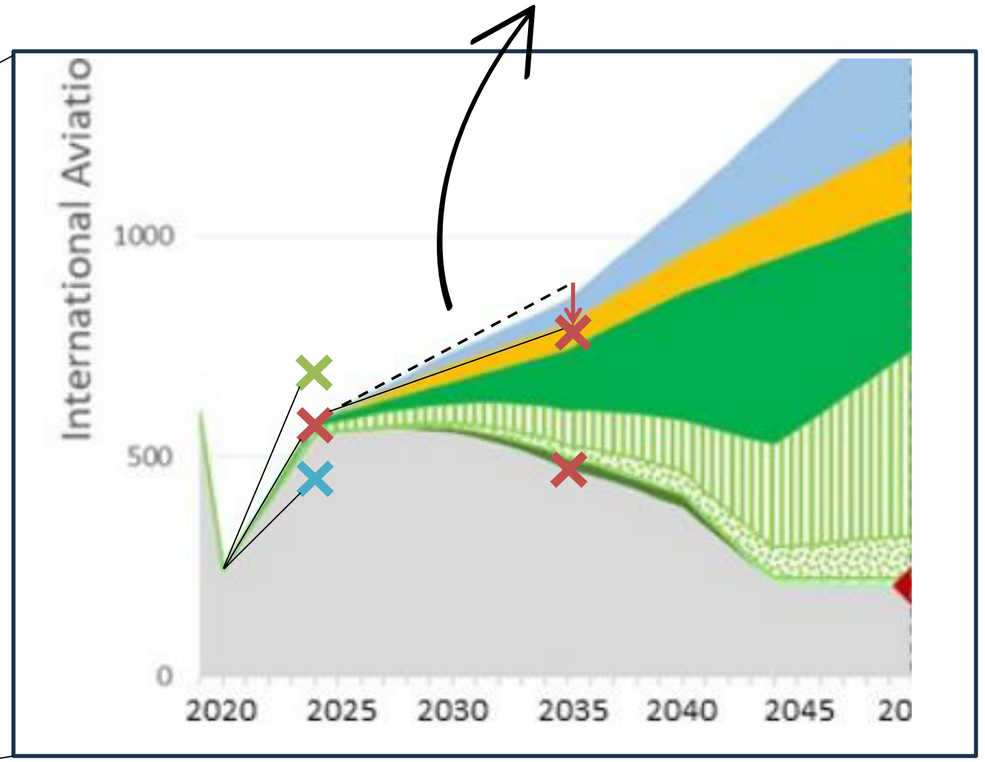
- **Compare actual performance** to previously projected paths to the net zero 2050 goal



The LTAG monitoring & reporting



Tier 1: Compares CO_2 calc. vs actual
Tier 2: Explains reductions Tech/Ops



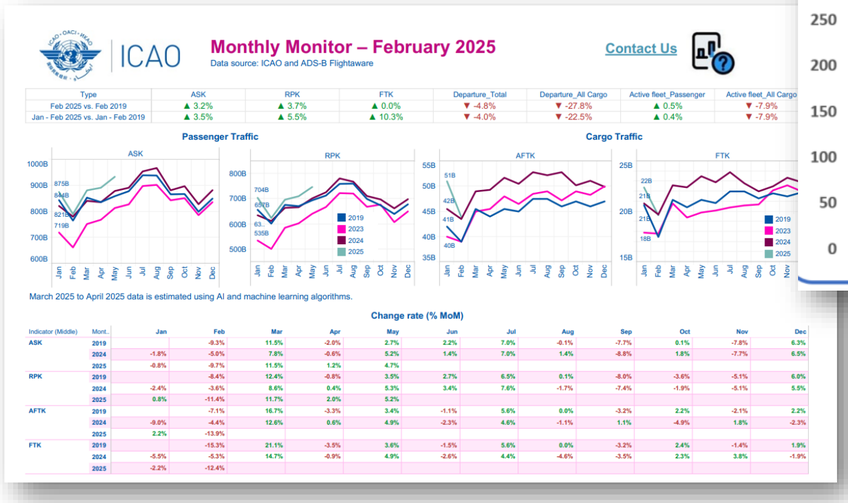
The LTAG monitoring & reporting: Tier 1=existing data

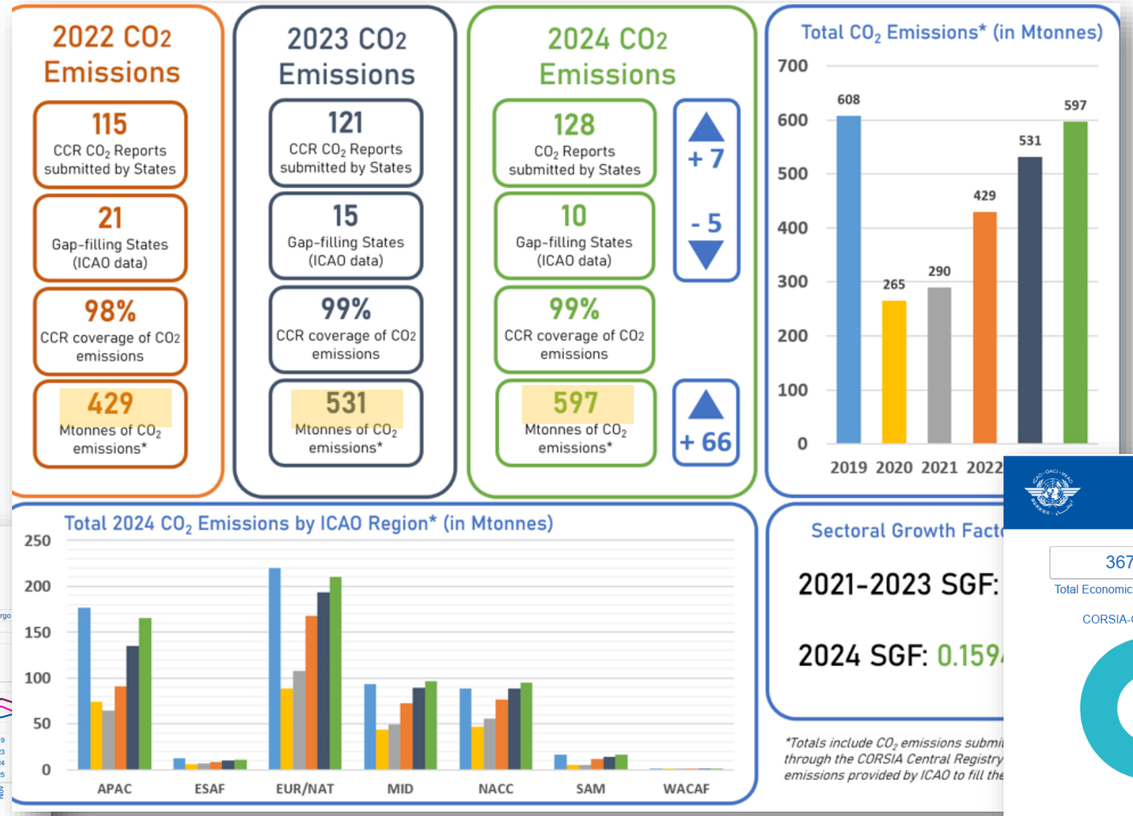
CO_2 Emissions

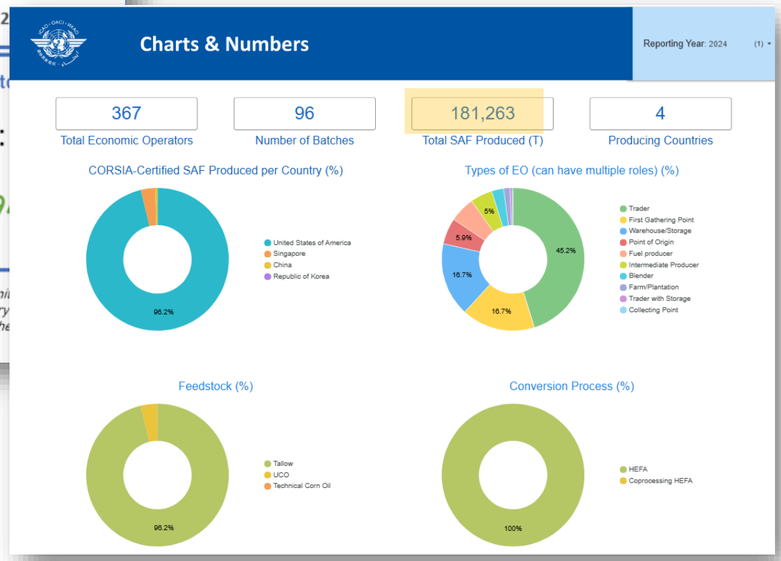
Tier 1: SAF from ICAO CCR only:0.18 Mt
Tier 2: IATA: 1 Mt, EASA: 0.19 Mt

Traffic

SAF

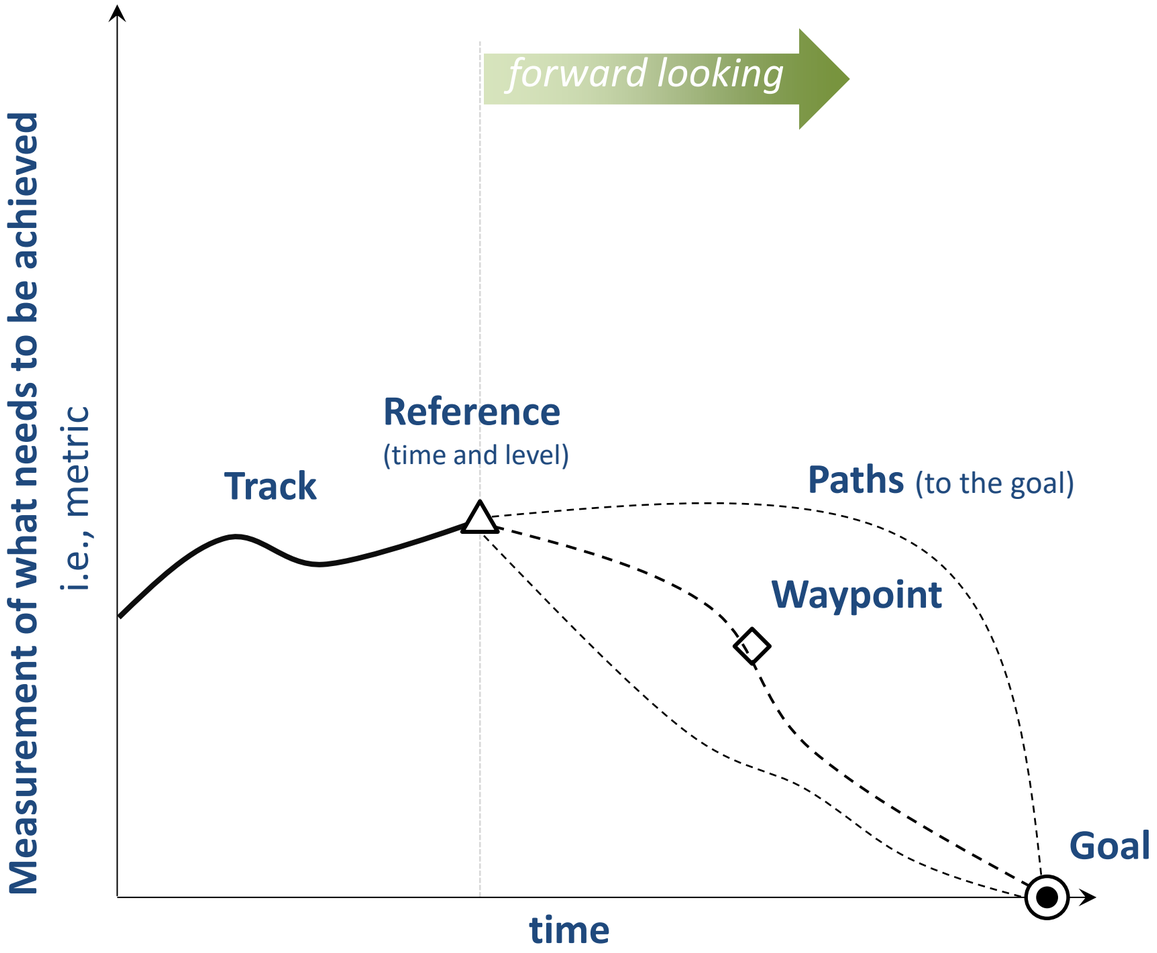


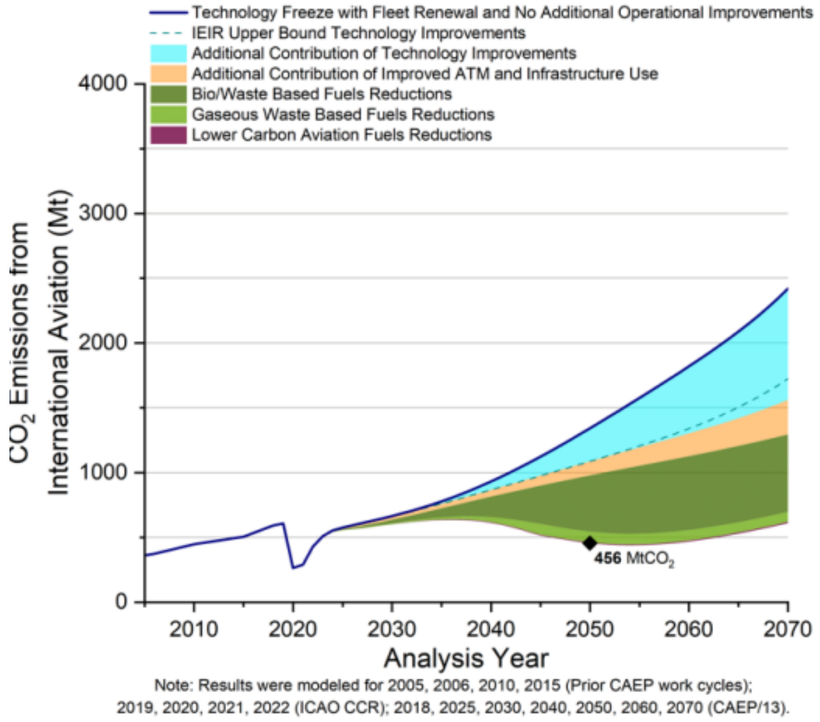




The LTAG monitoring & reporting: Forward-looking

Update the forward-looking assessments to **generate "new/updated" projections towards the 2050 goal** based on the latest historical data available at the time.



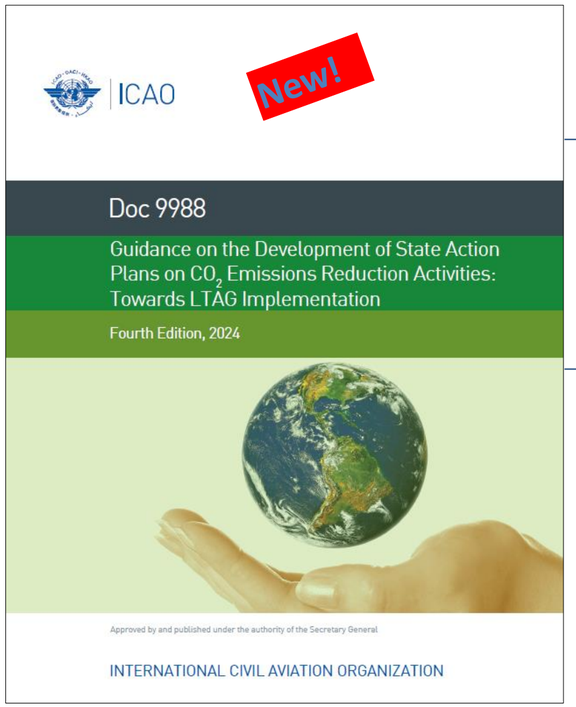


Note: Results were modeled for 2005, 2006, 2010, 2015 (Prior CAEP work cycles); 2019, 2020, 2021, 2022 (ICAO CCR); 2018, 2025, 2030, 2040, 2050, 2060, 2070 (CAEP/13).

Figure 2. Combustion CO_2 Emissions from International Aviation, 2005 to 2070, Including Life Cycle Emissions Reductions from SAF, LCAF and other aviation cleaner energies.

See: A42-WP/42 Appendix A: ICAO Global Environmental Trends-Present and Future Aircraft Noise and Emissions

Other sources of information:
State Action Plans and ICAO environment events



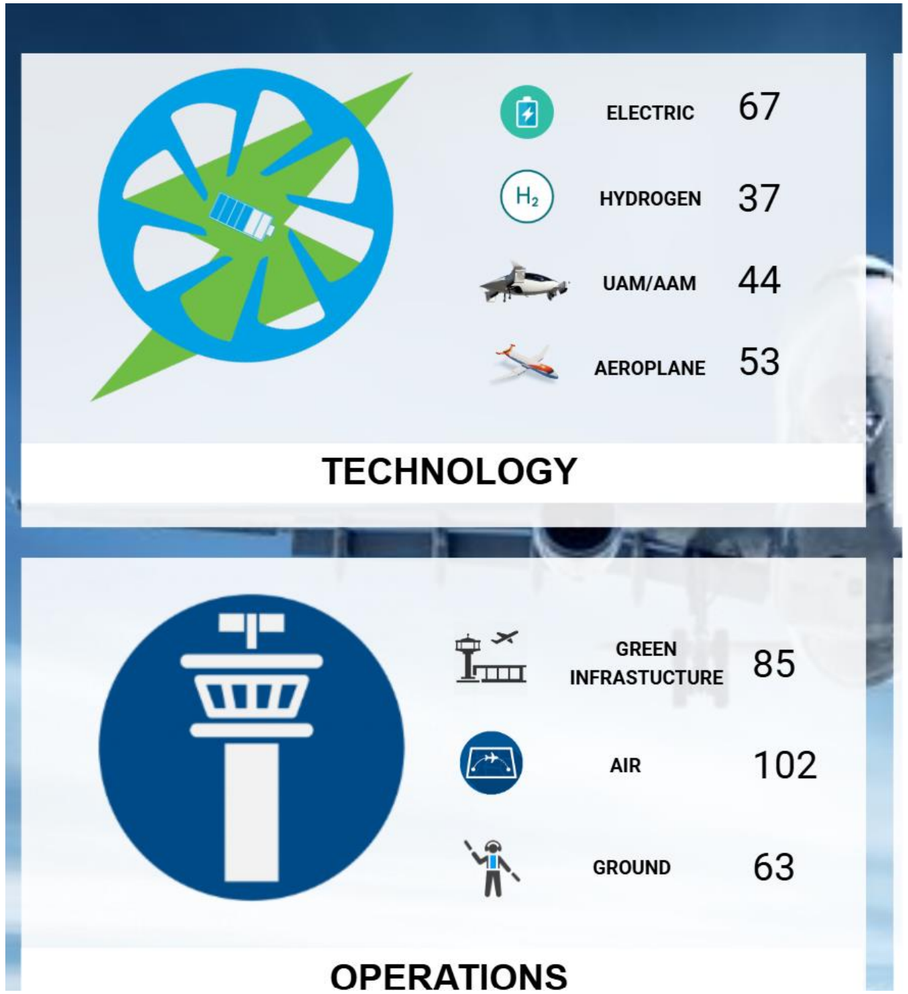
Baseline calculation

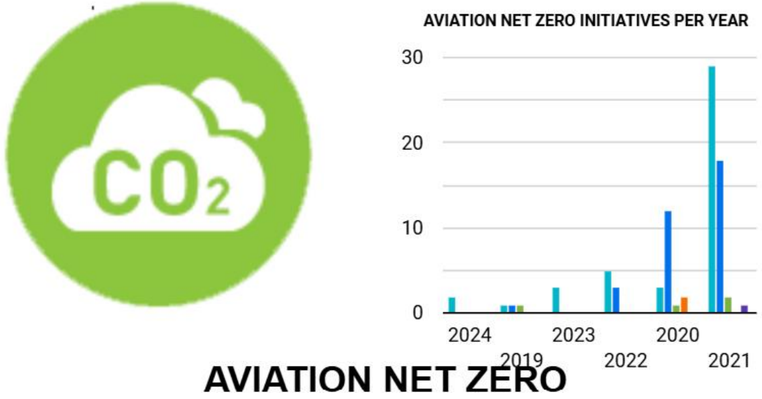
Mitigation measures and expected results

Implementation and assistance

Appendix with examples and detailed information

Other sources of information: ICAO trackers





https://www.icao.int/environmental-protection/innovations-reduction-aviation-co2-emissions-tracker-tools

Impact on the development of the sector

2022: A41-21

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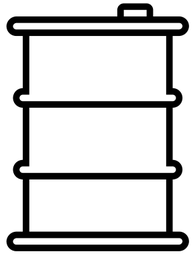
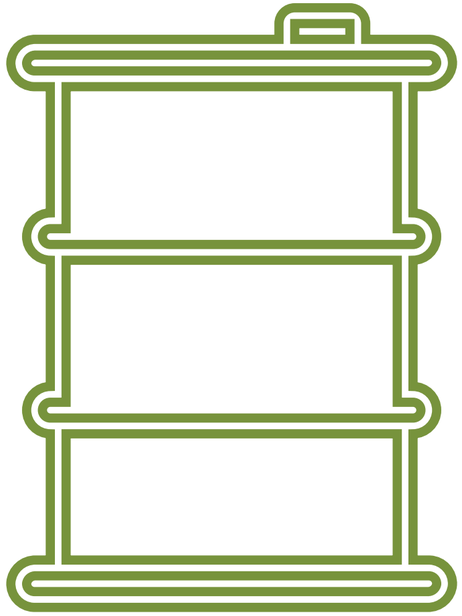
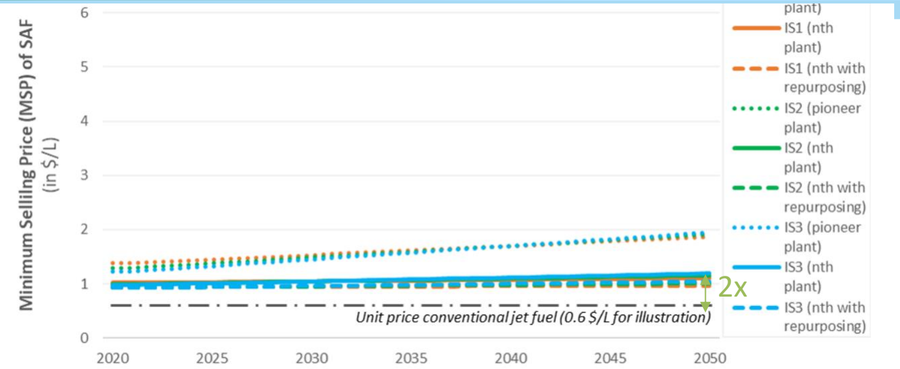
Impact on the development of the sector

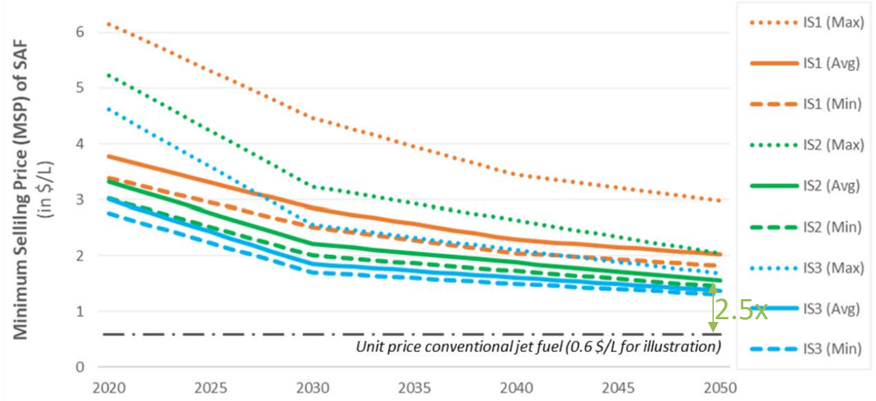


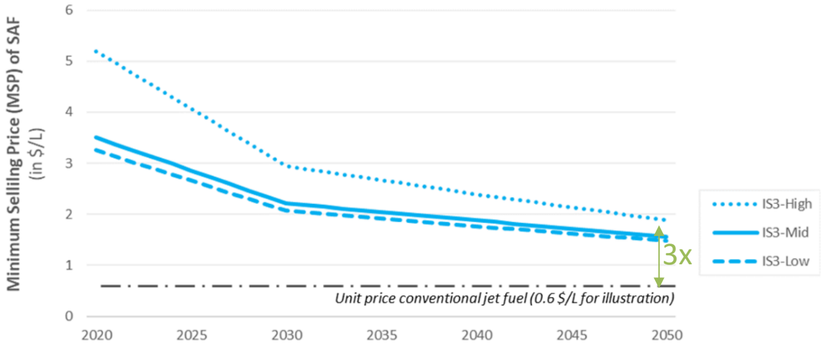
Jet (2024): **850 USD/t[1]**



SAF (2024): **2,411 USD/t[1]**







1: https://www.easa.europa.eu/en/newsroom-and-events/press-releases/easa-publishes-report-sustainable-aviation-fuel-scale-progress

Impact on the development of the sector

Guiding Questions

To what extent is air travel demand sensitive to the incremental costs introduced by achieving ICAO's LTAG?

- How does this differ between developing vs developed States?
- How do increases in costs get passed through to consumers and how does this affect demand?

Impact on the development of the sector

Consumer Profile Examples

- High vs Low Income
- Business vs leisure travelers
- Luxury vs economy travelers

Market Structure Examples

- Airline business models
- Geographic routes
- Market concentration

ICAO ENVIRONMENT

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ICAO ENVIRONMENT

So… where are we now?

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ICAO ENVIRONMENT

Summarizing…

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7. *Further resolves* that, in addition to the medium-term global aspirational goal in paragraph 6 above, ICAO and its Member States are encouraged to work together to strive to achieve a collective long-term global aspirational goal for international aviation (LTAG) of net-zero carbon emissions by 2050, in support of the Paris Agreement's temperature goal, recognizing that each State's special circumstances and respective capabilities (e.g. the level of development, maturity of aviation markets, sustainable growth of its international aviation, just transition, and national priorities of air transport development) will inform the ability of each State to contribute to the LTAG within its own national timeframe;

2025: A42-21

10. *Requests* the Council, with the technical contribution of CAEP, to implement the LTAG Monitoring and Reporting (LMR) methodology to assess progress on the implementation of CO_2 emissions reduction measures towards the achievement of the LTAG, while the LMR will be supported by information from annual ICAO LTAG Stocktaking, ICAO Tracker Tools, State Action Plans for international aviation CO_2 emissions reduction and other information sources, including the monitoring of progress on means of implementation support and financing. The LMR also incorporates the monitoring and review of the global aspirational Vision and the ICAO Global Framework on SAF, LCAF and other Aviation Cleaner Energies, including through the annual ICAO LTAG Stocktaking and the convening of CAAF/4 no later than 2028 with a view to updating the ambition on the basis of market developments in all regions. In this regard, the Council will present necessary updates on the LMR, for consideration by the 43rd Session of the ICAO Assembly;

Pathway reflected in A42-21 (2025)

A42-21, 13th preamble:

Recognizing that the ICAO *Report on the Feasibility of a Long-Term Aspirational Goal for International Civil Aviation CO_2 Emission Reductions*, which assessed the global-level technical feasibility of various aviation in-sector CO_2 emissions reduction scenarios, served as the basis for the consideration and adoption at the 41st Session of the ICAO Assembly of the collective long-term global aspirational goal for international aviation (LTAG) of net-zero carbon emissions by 2050 …

A42-21, 15th preamble:

Recognizing the LTAG Monitoring and Reporting (LMR) methodology developed by the Council, with the technical contribution of the Committee on Aviation Environmental Protection (CAEP), to assess progress on the implementation of CO_2 emissions reduction measures towards the achievement of the LTAG, including the past and future CO_2 emissions reduction and the cost impacts of efforts to achieve the LTAG, the impact on the development of the sector, as well as the cost impacts of climate change on international aviation;

A42-21, operative paragraph 10:

10. *Requests* the Council, with the technical contribution of CAEP, to implement the LTAG Monitoring and Reporting (LMR) methodology to assess progress on the implementation of CO_2 emissions reduction measures towards the achievement of the LTAG, while the LMR will be supported by information from annual ICAO LTAG Stocktaking, ICAO Tracker Tools, State Action Plans for international aviation CO_2 emissions reduction and other information sources, including the monitoring of progress on means of implementation support and financing. The LMR also incorporates the monitoring and review of the global aspirational Vision and the ICAO Global Framework on SAF, LCAF and other Aviation Cleaner Energies, including through the annual ICAO LTAG Stocktaking and the convening of CAAF/4 no later than 2028 with a view to updating the ambition on the basis of market developments in all regions. In this regard, the Council will present necessary updates on the LMR, for consideration by the 43rd Session of the ICAO Assembly;

Conclusions

- The “LMR” is the process by which ICAO will monitor progress to the **Net-Zero CO_2 by 2050** goal, and the **global framework** for cleaner energies (5% less CO_2 by 2030 through aviation cleaner energies).

- The LMR-TG is successfully **progressing towards implementing** the methodology (tier 1)

- The LMR-TG will **report its progress** in 3 Working Papers at the 1st CAEP Steering Group this week

- The group will work to **consider additional sources** of information (SAP, trackers, stocktaking), as these most likely belong to Tier 2, Tier 3 implementation and more qualitative.

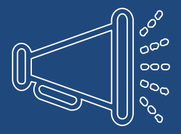
SKYTALKS

Want to know more?

Check out A42-WP/25!

Appendix C

Questions?



International Civil Aviation Organization

WORKING PAPER

A42-WP/25
EX/12
16/07/25

ASSEMBLY — 42ND SESSION

EXECUTIVE COMMITTEE

Agenda Item 16: Environmental Protection – International Aviation and Climate Change

CLIMATE CHANGE – GLOBAL FRAMEWORK FOR SAF, LCAF AND OTHER AVIATION CLEANER ENERGIES

(Presented by the Council of ICAO)

EXECUTIVE SUMMARY

This paper reports on progress made by ICAO since the 41st Session of the Assembly relating to international aviation and climate change, focusing on the implementation of the long-term global aspirational goal for international aviation (LTAG). It highlights the outcomes arising from the Third ICAO Conference on Aviation and Alternative Fuels (CAAF/3) held in Dubai, United Arab Emirates in November 2023, namely the ICAO Global Framework for Sustainable Aviation Fuels (SAF), Lower Carbon Aviation Fuels (LCAF) and other Aviation Cleaner Energies, and the ICAO Roadmap for the implementation of the CAAF/3 outcomes and the LTAG, with four interdependent Building Blocks: 1) policy and planning; 2) regulatory framework; 3) implementation support; and 4) financing.

Action: The Assembly is invited to:

a) acknowledge the substantial progress achieved by the Organization since the 41st Session of the Assembly on international aviation and climate change, including the adoption of the ICAO Global Framework for SAF, LCAF and other Aviation Cleaner Energies by CAAF/3, and the approval of the ICAO Roadmap for the implementation of the CAAF/3 outcomes and the LTAG by the Council;

b) recognize the development and implementation of the LTAG monitoring and reporting methodology (LMR) and progress on the ICAO State Action Plans on CO_2 Emissions Reduction Activities initiative, LTAG stocktaking events and Tracker Tools;

c) reiterate that CORSIA sustainability criteria, sustainability certification, and the methodology for the assessment of life cycle emissions used for CORSIA eligible fuels, should be used as the accepted basis for the eligibility of SAF, LCAF and other aviation cleaner energies used in international aviation, in order to provide regulatory transparency, certainty, stability and assurances of environmental integrity to feedstock producers, fuels producers and financial institutions;

d) encourage States to further engage in the ICAO activities to accelerate the analysis and approval of life cycle values for new fuel sources and pathways, and their sustainability certification;

e) recognize the progress on implementation support and financing to aviation decarbonization measures, including through the ICAO Assistance, Capacity-building and Training for Sustainable Aviation Fuels (ACT-SAF) programme, operationalization of the ICAO Finvest Hub, and consideration of the establishment of a climate finance initiative or funding mechanism under ICAO;

f) recognize the urgency and importance of scaling-up the financing to aviation decarbonization measures, and request the Council to take urgent action for implementation of the near-term recommendations identified in Appendix G to enhance the existing framework and schemes on funding and financing initiatives to further support the progress towards achieving and implementing the LTAG and the Global Framework on SAF, LCAF and other Aviation Cleaner Energies, in particular for developing countries and States having particular needs;

https://www.icao.int/sites/default/files/Meetings/a42/Documents/WP/wp_025_en.pdf