



| ICAO

INTERNATIONAL CIVIL AVIATION ORGANIZATION

A UN SPECIALIZED AGENCY



Financing for Sustainable Aviation: Opportunities and Challenges in the Pursuit of Net Zero by 2050

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Panel Speakers



Moderator

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Organization (ICAO)



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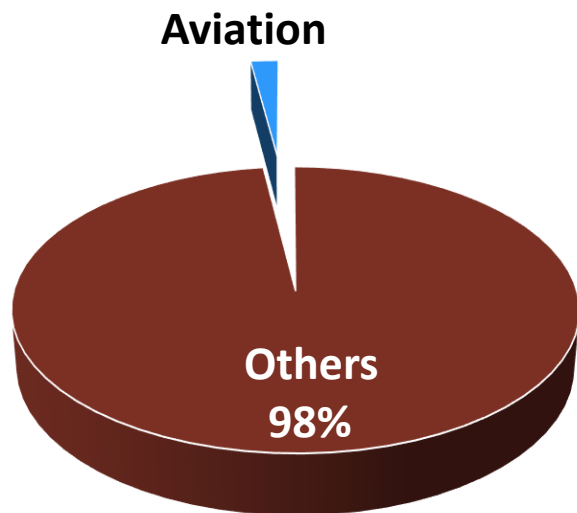
Scene-setting by Ms. Jane Hupe Deputy Director Environment Section, ICAO



Sustainable Aviation in Perspective

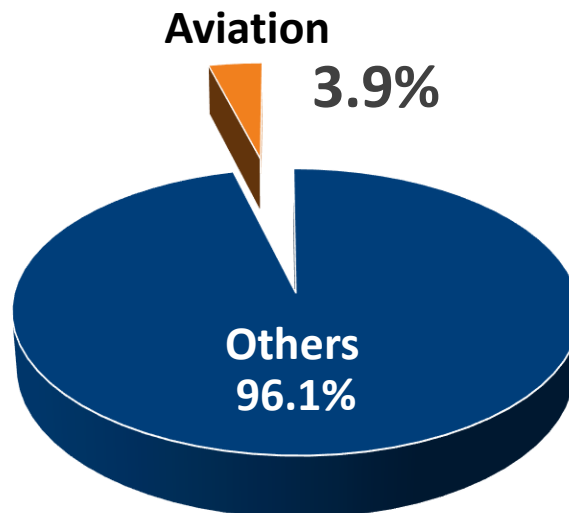
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CO₂ Emissions



IPCC(1999,2007,2014)

Global GDP



In developing countries,
aviation supported nearly
61 million jobs and
\$1.3 trillion in GDP.

Aviation: Benefits Beyond Borders (2024)

Contributions to Sustainable Development Goals



Sustainable Aviation in Perspective

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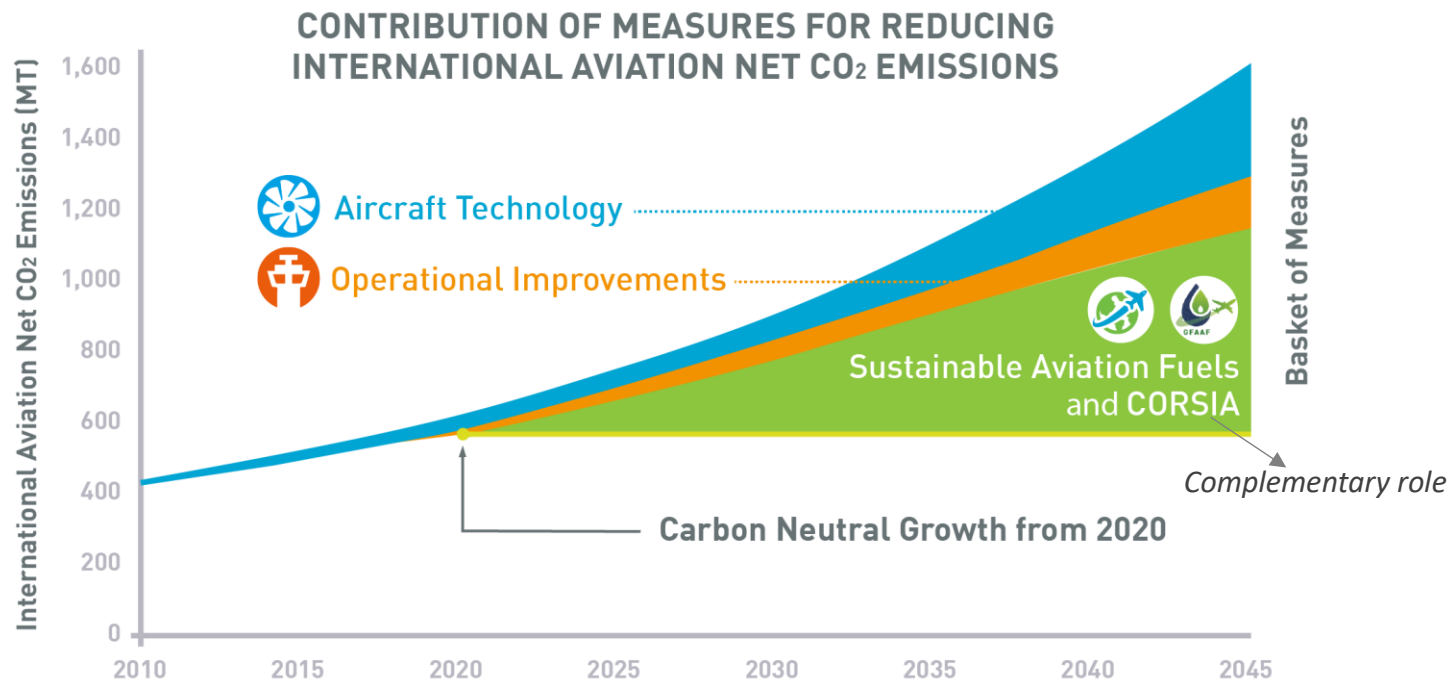
37th ICAO Assembly (2010) global aspirational goals:

- 2 per cent annual fuel efficiency improvements
- Stabilize CO₂ emissions at 2020 levels (CNG2020).



Advantages of CORSIA

- Cost-effective and administrative simplicity
- Incentivizes emissions reduction
- Fair distribution of requirements
- Accommodates special circumstances and respective capabilities of States
- Minimize market distortion
- Accounts for the concerns of developing States over their growing aviation industry



Sustainable Aviation in Perspective

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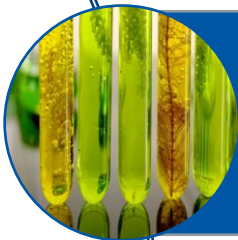
2022



41st ICAO Assembly: Long-term global aspirational goal (LTAG) of net zero carbon emissions from international aviation by 2050



2023



ICAO Global Framework for SAF, LCAF and other aviation cleaner energies.
Collective global aspirational Vision to reduce CO₂ emissions by **5% by 2030** using cleaner energies

2024



ICAO Council: Roadmap for the implementation of CAAF/3 outcomes and LTAG
Progress across the four building blocks: 1) Policy and Planning, 2) Regulatory Framework, 3) implementation support and 4) financing



2025



ICAO Aviation Climate Week (2 to 4 June 2025)

2025 ICAO Environment Report, launched at the Aviation Climate Week

42nd ICAO Assembly - updates to the three Assembly Resolutions related to environment.

Long-Term Global Aspirational Goal (LTAG)

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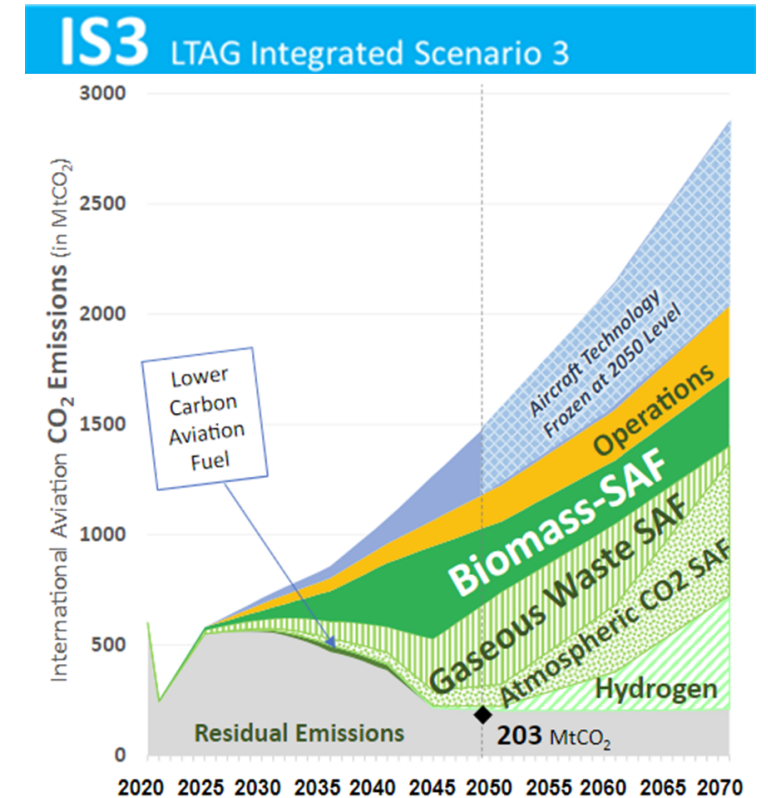
A collective long-term global aspirational goal of **net-zero carbon emissions from international aviation by 2050.**



Emissions in 2050 would be reduced by 87% from the baseline scenario (through in-sector measures)

➤ 21% from aircraft technologies, 11% from operations and **55% from fuels.**

Drop-in fuels have the largest impact driving the overall reductions by 2050....but requires **significant costs and investments.**



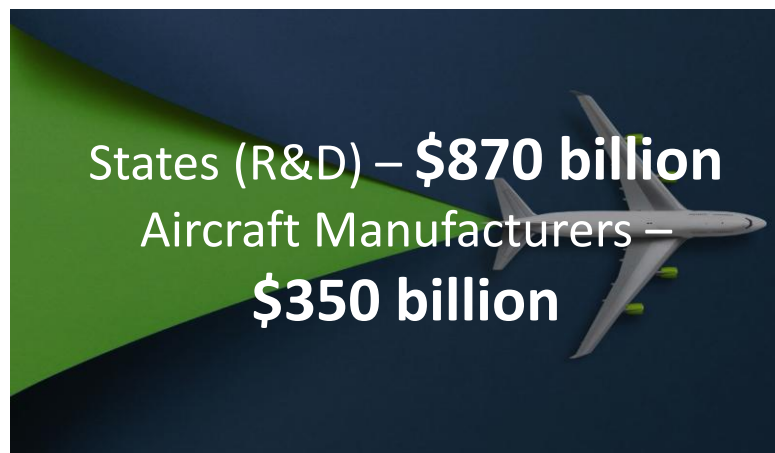
Scale of Investments Needed to Achieve LTAG

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Sustainable Aviation Fuels (SAFs)



Aircraft Technology

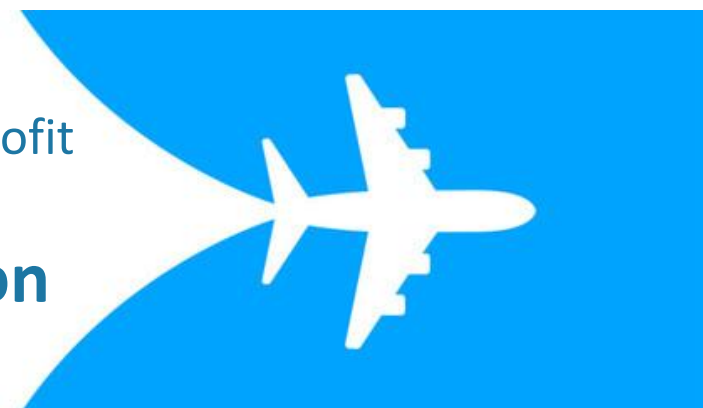


Operations



ICAO Sustainable Aviation Fuels Guide (2017)

Airlines' net profit
in 2025
~\$36 billion



IATA (2025)

Four Building Blocks to Achieve the Vision & LTAG

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ICAO Cleaner Energy Tracker Tools



ICAO ENVIRONMENT

ICAO adopted a Vision to reduce CO₂ emissions in international aviation by **5 per cent by 2030 through the use of SAF, LCAF, and other aviation cleaner energies**

This requires **23 million tonnes (Mt)** of cleaner energies use in international aviation on 2030

(source: LTAG report data)

This aviation cleaner energy trackers monitors progress under the **ICAO Global Framework on this building blocks**

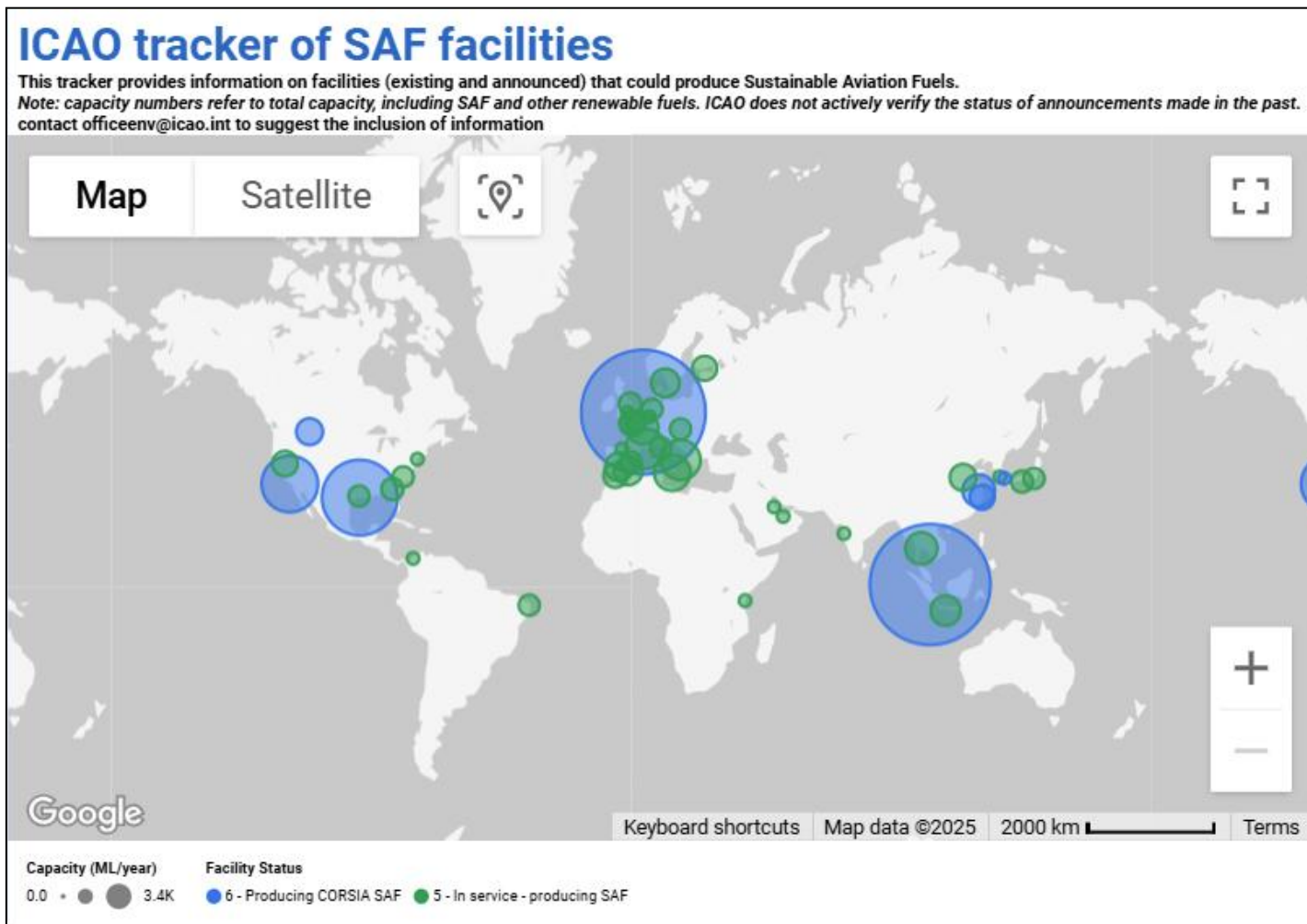
(Click on each number to open the full Tracker dashboard)



- SAF and other aviation cleaner energies must meet the **CORSIA sustainability criteria** (ICAO Annex 16, Volume IV and five supporting ICAO documents)
- **No specific fuel source, pathway, feedstock, or technology is excluded**, provided it meets the CORSIA sustainability criteria
- Harmonized standards to provide regulatory certainty and support investment decisions

Current SAF Production

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- 47 facilities producing SAF (30 commercial-scale)

- 20 facilities entered into production since CAAF/3

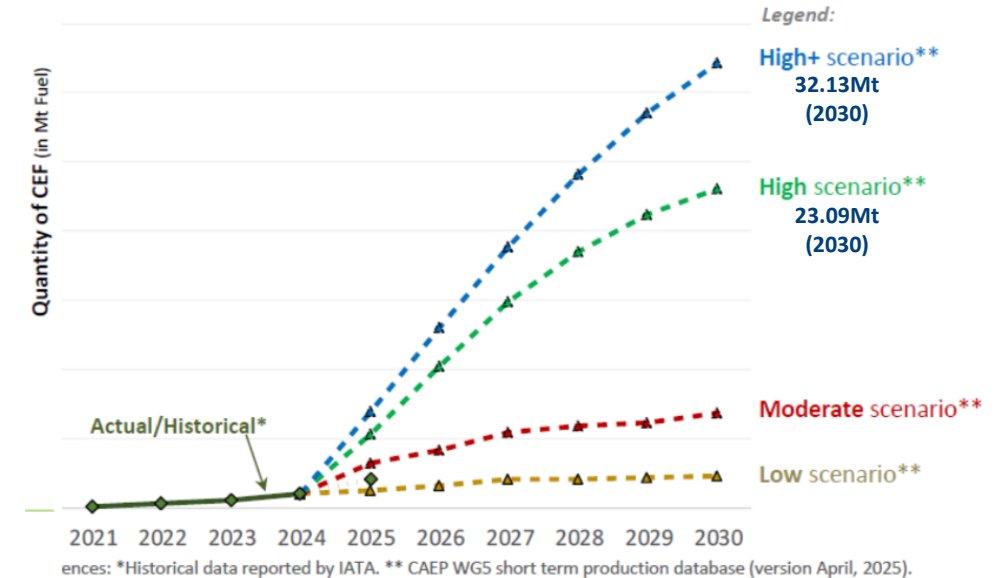
- 2.8 MT/year of SAF production capacity currently available**

- 23 facilities under construction – additional 3.1 MT/year of SAF production capacity

Vision: Are we on track?

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- **5% Vision requires ~23 Mt of cleaner energy use in international aviation by 2030**
- In 2024
 - ~1 Mt of SAF produced
 - Certified as CORSIA eligible fuels – ~0.2 million tonnes
- ICAO CAEP Projections show **Vision is possible, but requires emphasis on SAF** in supporting policies from ICAO Member States.
- Progress on all the four building blocks under the ICAO global framework will be required to achieve this Vision.





Developing States can benefit from SAF too!

- ✓ **Diverse feedstock** (e.g., agricultural waste, municipal waste, algae etc).
- ✓ **Geographically flexible** allowing developing states to establish SAF industries.
- ✓ **Economic opportunity** from possible job creation in agriculture, refining, logistics etc.
- ✓ **Energy security** by reducing exposure to volatile fossil fuel markets.
- ✓ **Environmental benefits** with up to 80% lifecycle emissions reduction.
- ✓ Brings about **technology transfer** and **investment**

No Country Left Behind in Aviation Clean Energy Transition

ICAO ACT-SAF

- Tailored support for States
- Facilitate partnerships and cooperation on SAF initiatives
- Platform to facilitate knowledge sharing and recognition of all SAF initiatives around the globe.



ACT-SAF Participants and Initiatives

Visualization by:

Charts & numbers

Map (States)

Map (organizations)

State and participation

Name	Year
Trinidad and Tobago	2022
Afghanistan	2024
Albania	2022
Algeria	2025
Angola	2024
Argentina	2022
Australia	2023
Austria	2023
Azerbaijan	2024
Bahamas	2023
Bangladesh	2023
Barbados	2023
Belize	2023
Bhutan	2022
Bolivia (Plurinational State of)	2025
Botswana	2022
Brazil	2022
Brunei Darussalam	2023
Burkina Faso	2022

Participation States and status of acceptance T&C

Acceptance status: Pending Yes



Advocacy & Outreach on Financing

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2022



- Four exchanges with 19 public and private financing institutions, covering all ICAO regions.

2023



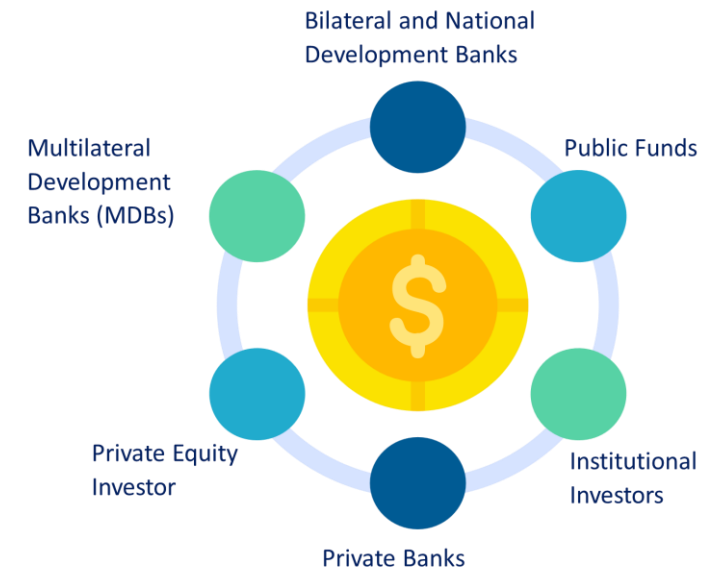
- Council discussions with international financing institutions, industry, private banks, investors & energy companies; LTAG Stocktaking.

2024

-2025



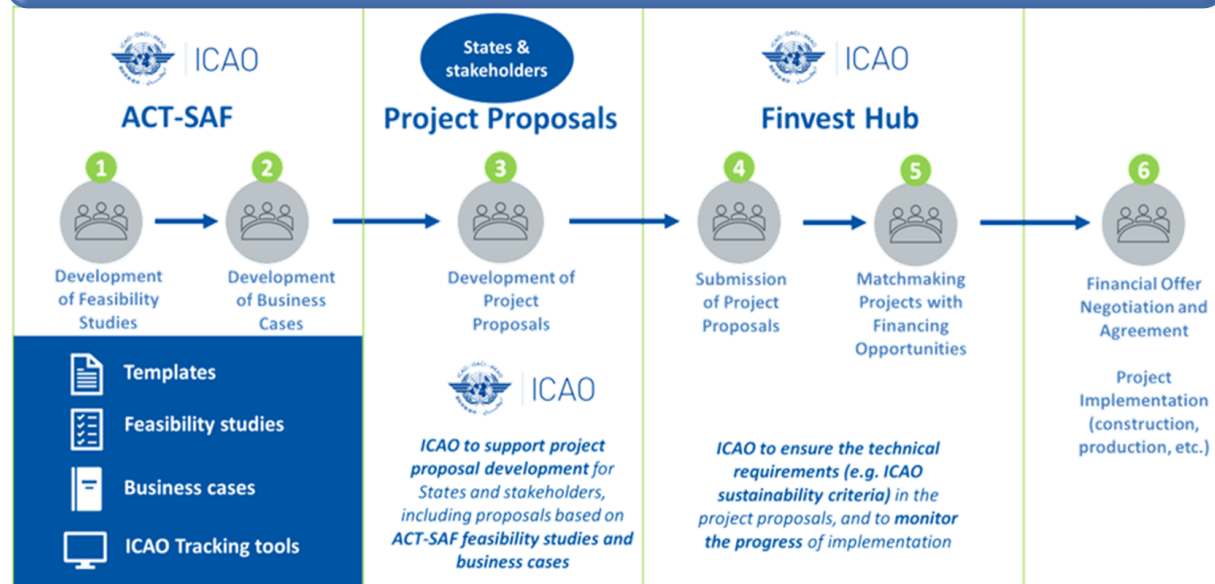
- ICAO GISS Symposia, LTAG Stocktaking events, Aviation Climate Week, upcoming A42.



Unlocking Climate Financing for Aviation

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ICAO Fininvest Hub



Climate Finance
Initiative or
Funding
Mechanism



Challenges with Aviation Decarbonization

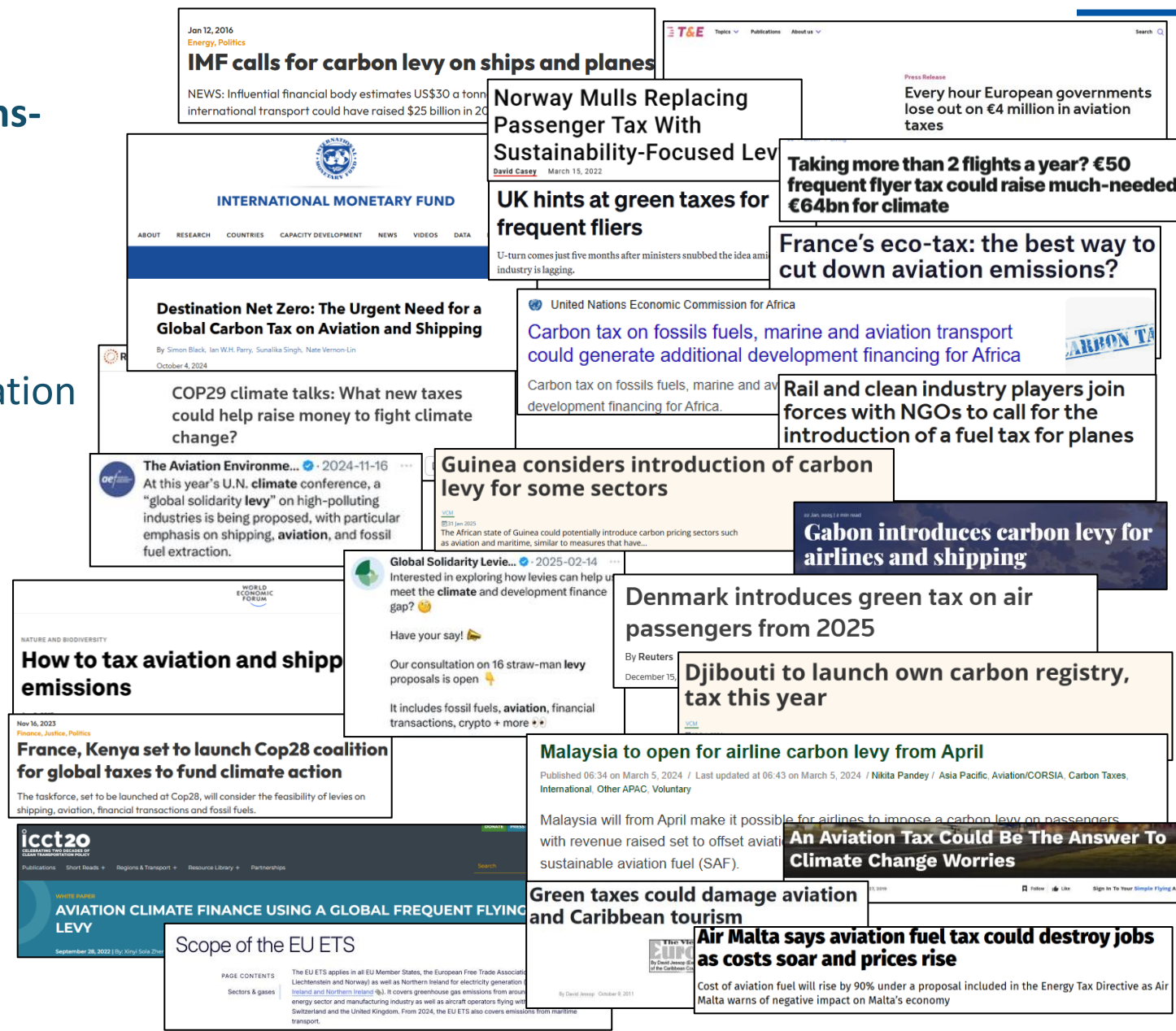
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Overlapping proposals for aviation emissions-related levies/taxes to mobilize financial resources for other purposes:

- No direct correspondence to emissions reduction.
- Diverts financial resources away from aviation decarbonization.
- Negative impact on connectivity, socio-economic development.

CORSIA

“only global market-based measure applying to CO₂ emissions from international aviation ...ensuring that international aviation CO₂ emissions should be accounted for only once”.



The collage includes the following snippets:

- IMF calls for carbon levy on ships and planes** (Jan 12, 2016, Energy, Politics): NEWS: Influential financial body estimates US\$30 a tonne for international transport could have raised \$25 billion in 2015.
- Norway Mulls Replacing Passenger Tax With Sustainability-Focused Levy** (David Casey, March 15, 2022): U-turn comes just five months after ministers snubbed the idea amid industry is lagging.
- Every hour European governments lose out on €4 million in aviation taxes** (Press Release).
- Taking more than 2 flights a year? €50 frequent flyer tax could raise much-needed €64bn for climate**.
- UK hints at green taxes for frequent fliers** (U-turn comes just five months after ministers snubbed the idea amid industry is lagging).
- France's eco-tax: the best way to cut down aviation emissions?**
- Destination Net Zero: The Urgent Need for a Global Carbon Tax on Aviation and Shipping** (By Simon Black, Ian W.H. Perry, Sumalika Singh, Nate Vernon-Lin, October 4, 2024).
- United Nations Economic Commission for Africa**: Carbon tax on fossils fuels, marine and aviation transport could generate additional development financing for Africa.
- Carbon tax on fossils fuels, marine and aviation transport could generate additional development financing for Africa**.
- Rail and clean industry players join forces with NGOs to call for the introduction of a fuel tax for planes**.
- COP29 climate talks: What new taxes could help raise money to fight climate change?**
- The Aviation Environment** (2024-11-16): At this year's U.N. climate conference, a "global solidarity levy" on high-polluting industries is being proposed, with particular emphasis on shipping, aviation, and fossil fuel extraction.
- Guinea considers introduction of carbon levy for some sectors** (2024-11-16): The African state of Guinea could potentially introduce carbon pricing sectors such as aviation and maritime, similar to measures that have...
- Gabon introduces carbon levy for airlines and shipping** (2024-11-16): The African state of Guinea could potentially introduce carbon pricing sectors such as aviation and maritime, similar to measures that have...
- Global Solidarity Levies** (2025-02-14): Interested in exploring how levies can help meet the climate and development finance gap? Have your say! Our consultation on 16 straw-man levy proposals is open. It includes fossil fuels, aviation, financial transactions, crypto + more.
- Denmark introduces green tax on air passengers from 2025** (By Reuters, December 15).
- Djibouti to launch own carbon registry, tax this year** (By Reuters, December 15).
- Malaysia to open for airline carbon levy from April** (Published 06:34 on March 5, 2024 / Last updated at 06:43 on March 5, 2024 / Nikita Pandey / Asia Pacific, Aviation/CORSIA, Carbon Taxes, International, Other APAC, Voluntary): Malaysia will from April make it possible for airlines to impose a carbon levy on passengers with revenue raised set to offset aviation sustainable aviation fuel (SAF).
- An Aviation Tax Could Be The Answer To Climate Change Worries** (By David Irving, October 9, 2021): The EU ETS applies in all EU Member States, the European Free Trade Association (Liechtenstein and Norway) as well as Northern Ireland for electricity generation (Ireland and Northern Ireland). It covers greenhouse gas emissions from annual energy sector and manufacturing industry as well as aircraft operators flying within Switzerland and the United Kingdom. From 2024, the EU ETS also covers emissions from maritime transport.
- Green taxes could damage aviation and Caribbean tourism** (By David Irving, October 9, 2021): The EU ETS applies in all EU Member States, the European Free Trade Association (Liechtenstein and Norway) as well as Northern Ireland for electricity generation (Ireland and Northern Ireland). It covers greenhouse gas emissions from annual energy sector and manufacturing industry as well as aircraft operators flying within Switzerland and the United Kingdom. From 2024, the EU ETS also covers emissions from maritime transport.
- Air Malta says aviation fuel tax could destroy jobs as costs soar and prices rise** (By David Irving, October 9, 2021): Cost of aviation fuel will rise by 90% under a proposal included in the Energy Tax Directive as Air Malta warns of negative impact on Malta's economy.
- How to tax aviation and shipping emissions** (NATURE AND BIODIVERSITY, 16 Nov 2023, Finance, Justice, Politics): The taskforce, set to be launched at Cop28, will consider the feasibility of levies on shipping, aviation, financial transactions and fossil fuels.
- ICCT20** (International Council on Clean Transportation): AVIATION CLIMATE FINANCE USING A GLOBAL FREQUENT FLYING LEVY (September 28, 2022 | By: Xinyi Song, Zhen).



**Importance of aviation to
socio-economic development**

**Aviation is committed to climate
action and a just transition.**



**Resources are needed within the
sector to decarbonize**

Collaboration. Innovation. Commitment.

Thank You



Financing for Sustainable Aviation: Opportunities and Challenges in the Pursuit of Net Zero by 2050

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Panel Speaker



Mr. César Velarde Catolfi-Salvoni

ACT-SAF Project Coordinator,
ICAO

ICAO ACT-SAF

ICAO Assistance, Capacity-building and Training for Sustainable Aviation Fuels



Launched on 1 June 2022, in an event
Associated to the Stockholm+50
Conference



Promoting SAF together

- All stakeholders in collaboration to advance ACT-SAF efforts



Financing SAF Studies through global contributions to the ICAO ENV Fund



Projects coming to fruition thanks to the voluntary contributions:

- **EU** : Feasibility studies in 9 African States and India
- **France** : Business Implementation Studies in 3 African States
- **Netherlands** : Feasibility Studies in 3 States
- **Airbus** : 3 Feasibility Studies in South America
- **UK**: Feasibility Studies in 3 States in Africa



Exploring SAF Potentials



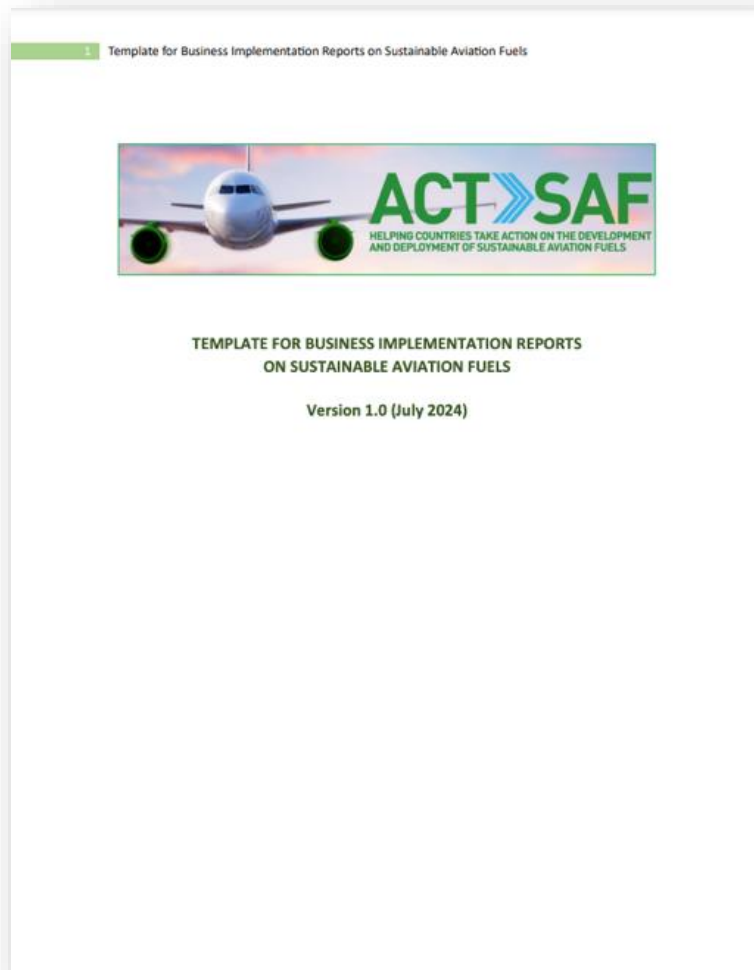
Vision: To identify and establish viable SAF supply chains in Rwanda	
Opportunities:	Challenges:
- Strong government commitment in developing the Green Economy - Diversion of solid wastes from dumpsites to fuels production, including SAF, is aligned with climate change mitigation actions and waste management strategies - Potential for social benefits through adding value and diversification of agriculture and waste management sectors	- Waste collection systems are limited or non-existent in many areas - Lack of technical expertise in relevant technology areas - Fuel refining, blending and testing/certification infrastructure is lacking - Competition for waste and byproduct streams with animal feed, electricity, and solid fuel applications - Agricultural land required for food production and cannot be diverted to biomass crops

- Executive Summary
- Section 1: State-specific Information
- Section 2: Evaluation of Feedstocks and Pathways for SAF Production
- Section 3: Implementation Support and Financing
- Section 4: Action Plan

Table 3. Summary of opportunities and challenges related to the use of domestic feedstocks for the production of SAF.

Feedstock considered	Conversion pathway	Feedstock evaluation (supply)	Sustainability evaluation	Economic/market evaluation	Overall
Starch and sugar crops	ATJ	Very Low • Lack of suitable area for cultivation, competition with food production	Very low • High risk of competition for land with food production – food security	Low • Unlikely to secure adequate feedstock for viable production scale	Very low
Oil crops	HEFA	• Very Low (Uncertain)Lack of suitable area for cultivation, competition with food production • Unknown potential for cultivation of oil seed varieties on marginal lands	Very Low • High risk of competition for land with food production – food security	Very Low (Uncertain) • Low productivity demonstrated on marginal lands to date • Unknown potential of new oil seed varieties	Very low
Agricultural residues (crop, food processing)	FT ATJ	Low • Competing uses for animal feed, energy, and materials applications • Fragmented land holdings and lack of mechanisation will make residue supply aggregation difficult	Medium • Risk of competing with existing energy, materials, and animal feed uses	Low • Feedstock collection cost is likely to be high • Available resource is too little on its own for SAF production facility	Low
Waste oils (used cooking oil, animal fats)	HEFA	Low • Limited availability, but could be input to SAF production	Medium • Risk of competing with existing uses for UCO	Low • Available resource is very small compared with feedstock demand for HEFA process	Low

Exploring Business-Case Opportunities



- Executive Summary
- Section 1: Market Analysis (Scenario and Assumptions)
- Section 2: Techno-economic assessment and results
- Section 3: Financial and Operational Assessment of the project
- Section 4: Risk assessment
- Section 5: Business Implementation recommendations

On-site and On-line Training Activities

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Building knowledge and capacity



Amman, 19 Nov 2024



Santiago, 26 Nov 2024



Accra, 20 May 2024



Harare, 14 Nov 2024

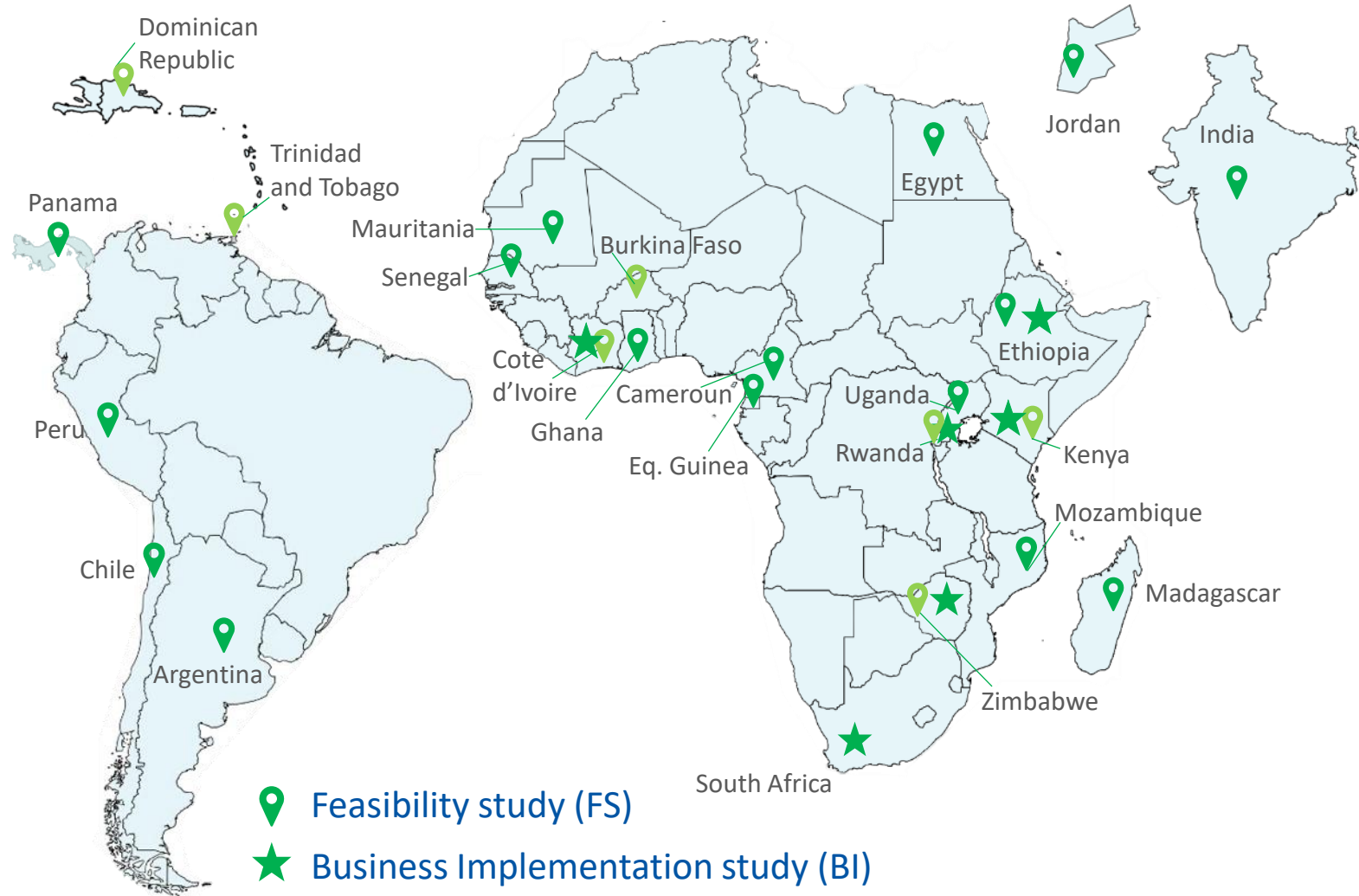


23-24 January'25, New Delhi

Current planning of ICAO ACT-SAF studies

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- **Already completed:** Burkina Faso (FS/EU), Cote d'Ivoire (FS/EU), Dominican Rep. (FS/EU), Kenya (FS/EU), Rwanda (FS/EU), Trinidad and Tobago (FS/EU), Zimbabwe (FS/EU)
- **2024:** Chile (FS/NL), Ethiopia (FS/EU), India (FS/EU), Jordan (FS/NL), South Africa (FS/EU), Zimbabwe (BI/UK).
- **2025 - 2026 :** Argentina (FS/Airbus), Cameroun (FS/EU), Côte d'Ivoire (BI/FR), Egypt (FS/EU), Equatorial Guinea (FS/EU), Ethiopia (BI/FR), Ghana (FS/UK), Kenya (BI/NL), Madagascar (FS/EU), Mauritania (FS/EU), Mozambique (FS/EU), + Panama(FS/Airbus), Peru (FS/Airbus), Rwanda (BI/FR), Senegal (FS/EU), Uganda (FS/UK), + 1 State TBC (FS/NL)



(Map not to scale)

Thank You

