The ICAO ESAF/ WACAF Annual Environmental Workshop
and
The EASA 3rd Annual SAF Workshop Under the ICAO - EU ACT-SAF Assistance Project

INTERNATIONAL CIVIL AVIATION ORGANIZATION

Kigali, Rwanda
20-23 April 2026

ICAO

CORSIA Eligible Fuels- CEFs

Presenter: Ms. Blandine Ferrier
ICAO WACAF Office

ICAO

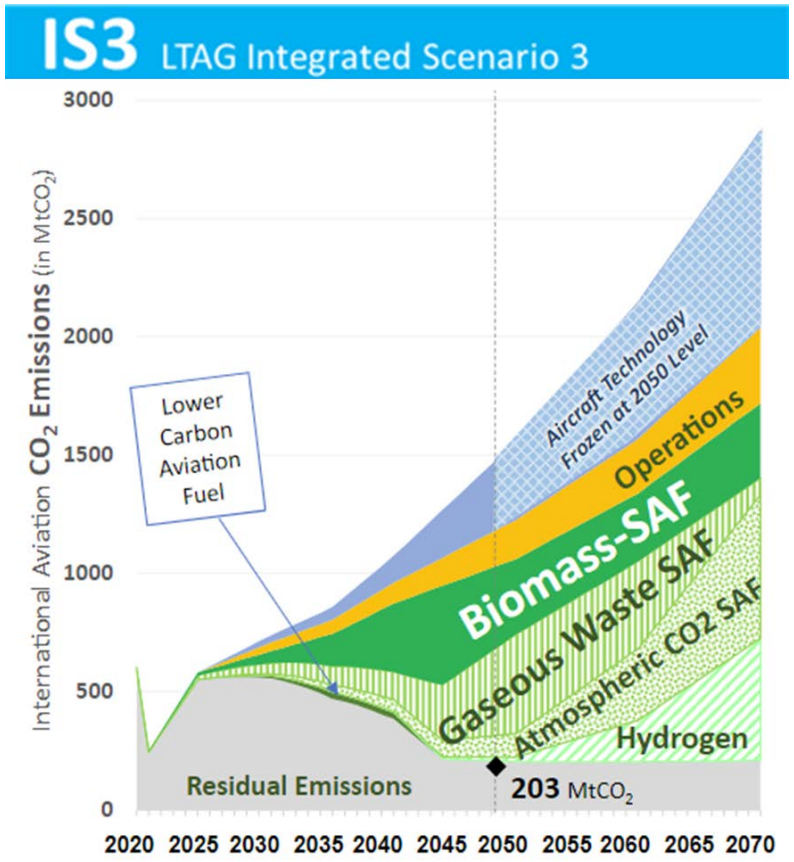
Long-Term Global Aspirational Goal (LTAG)

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**.

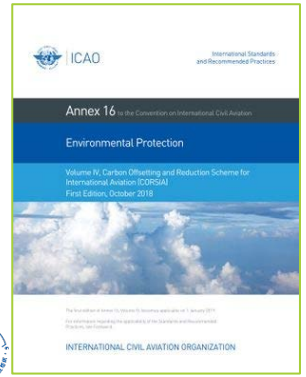
Drop-in fuels have the largest impact driving the overall reductions by 2050….but requires **significant costs and investments**.



SAF basic definitions

What are Sustainable Aviation Fuels (SAF)?

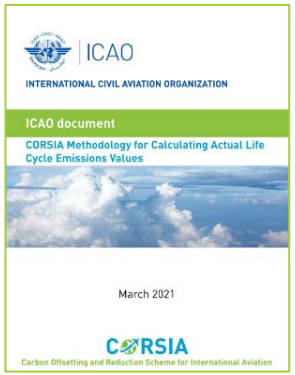
Definition	LCAF definition	Which Sustainability Criteria?	What is a waste?
SAF is defined as a *renewable or waste-derived aviation fuel* that meets CORSIA sustainability criteria. ***reference: Annex 16 Vol IV – CORSIA***	**LCAF** is defined as a *fossil-based aviation fuel* that meets the CORSIA Sustainability Criteria	Sustainability Criteria are defined in the ICAO document ***"CORSIA Sustainability Criteria for CORSIA Eligible Fuels"***	Waste is a feedstock with inelastic supply and no economic value (e.g. municipal solid waste, used cooking oil, waste gases etc.) ***reference:*** **ICAO document *"CORSIA Methodology For Calculating Actual Life Cycle Emissions Values"***



CORSIA Sustainability Criteria for CORSIA Eligible Fuels**

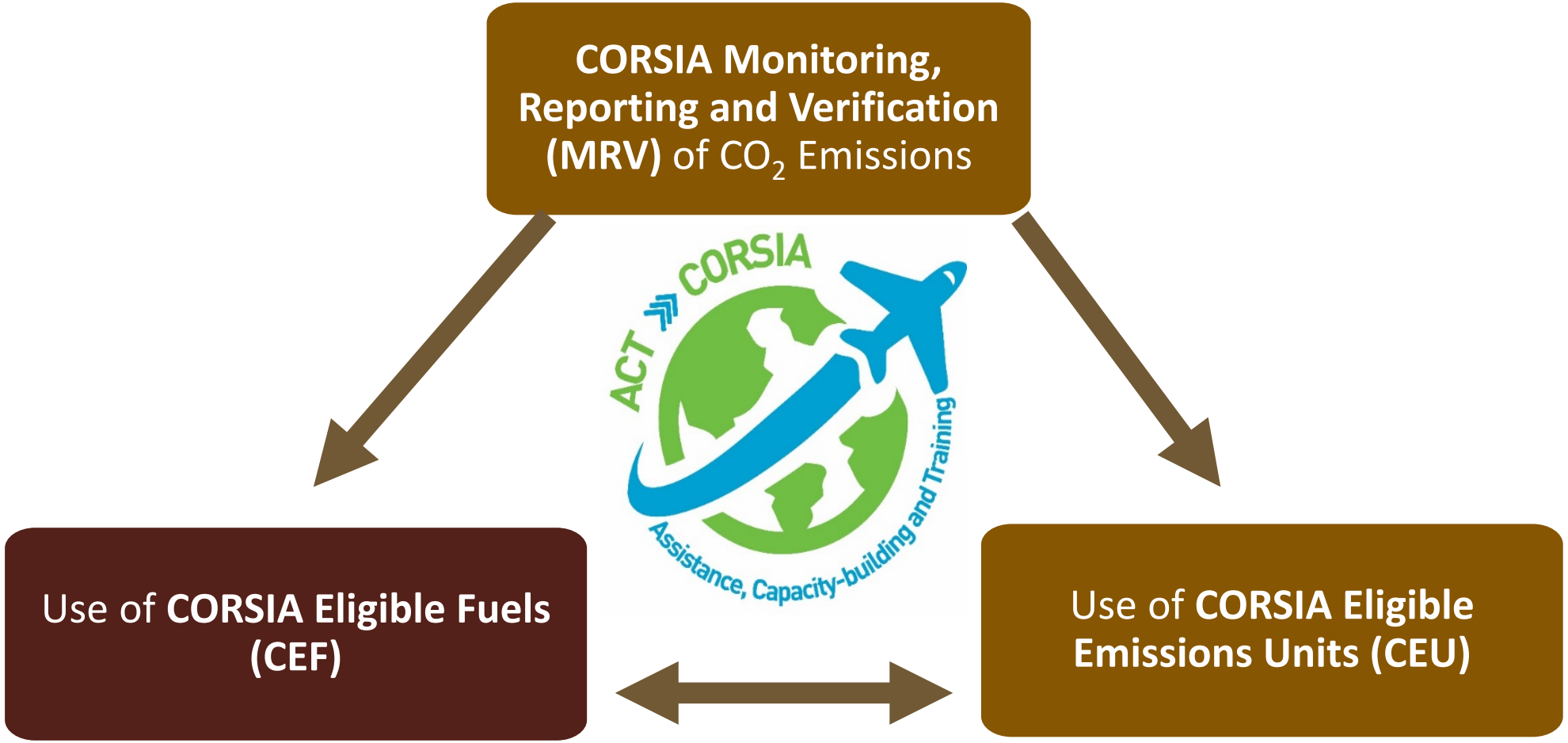
Fourth Edition,

June 2025



All documents available at https://www.icao.int/environmental-protection/CORSIA/Pages/CORSIA-Eligible-Fuels.aspx

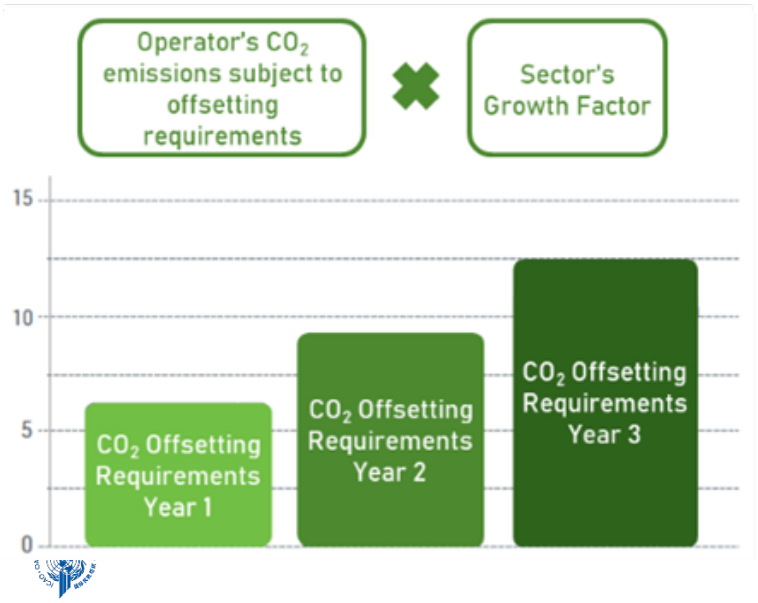
CORSIA Structure



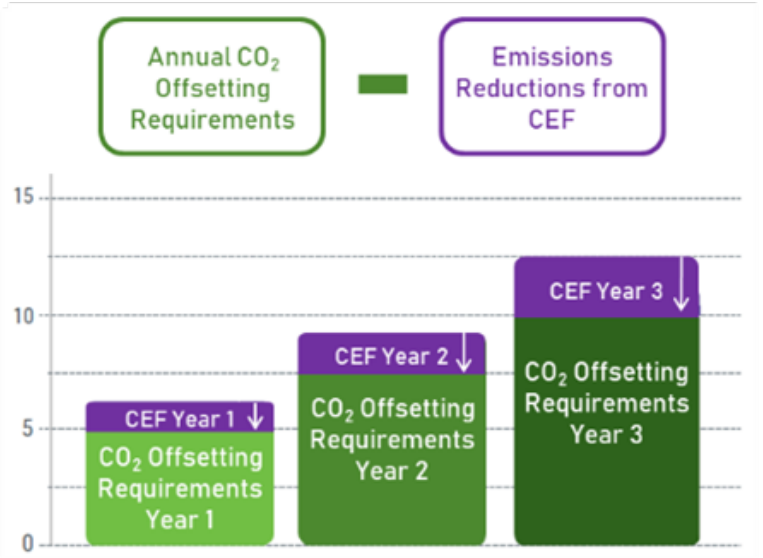
CORSIA offsetting requirements (until 2035) could be met by CEF or CEU

An aeroplane operator can reduce its CORSIA offsetting requirements by claiming emissions reductions from the use of CORSIA Eligible Fuels (CEF)

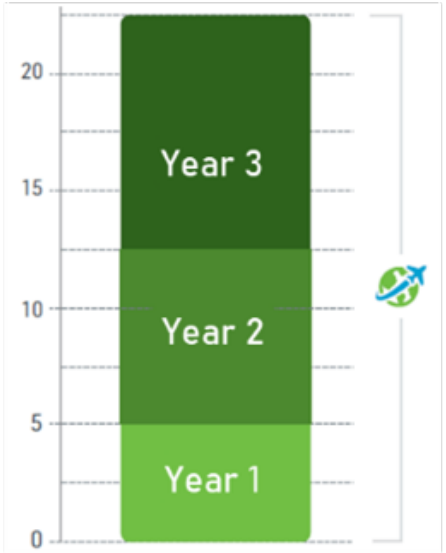
① **CO_2 Offsetting Requirements** calculated by the State for each year



② Emissions reductions claimed from the use of **CORSIA Eligible Fuels (CEF)**



③ **Total Final CO_2 Offsetting Requirements** for a 3-year Compliance Period



ICAO Global Framework for SAF, LCAF and other Aviation Cleaner Energies

- Adopted at the third ICAO Conference on Aviation and Alternative Fuels (CAAF/3) in November 2023

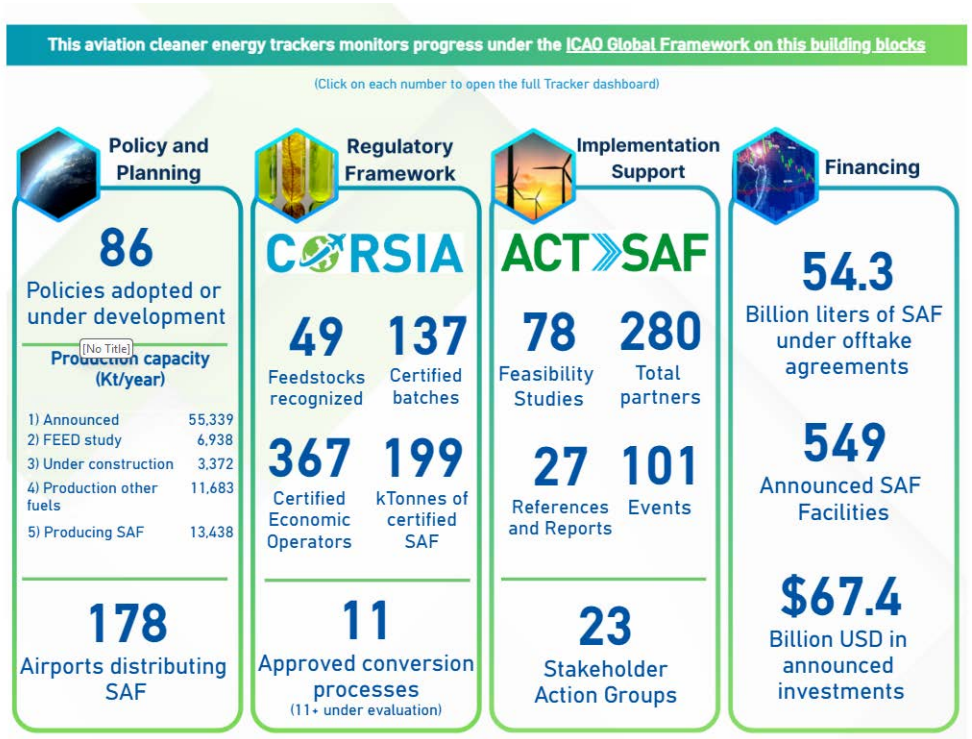
- **Collective Vision** to reduce **5%** CO_2 by **2030** in international aviation using SAF, LCAF and other aviation cleaner energies

- Requires **~23 million tonnes** (Mt) of cleaner energies use by 2030

For more details
A42-WP/28 Appendix B

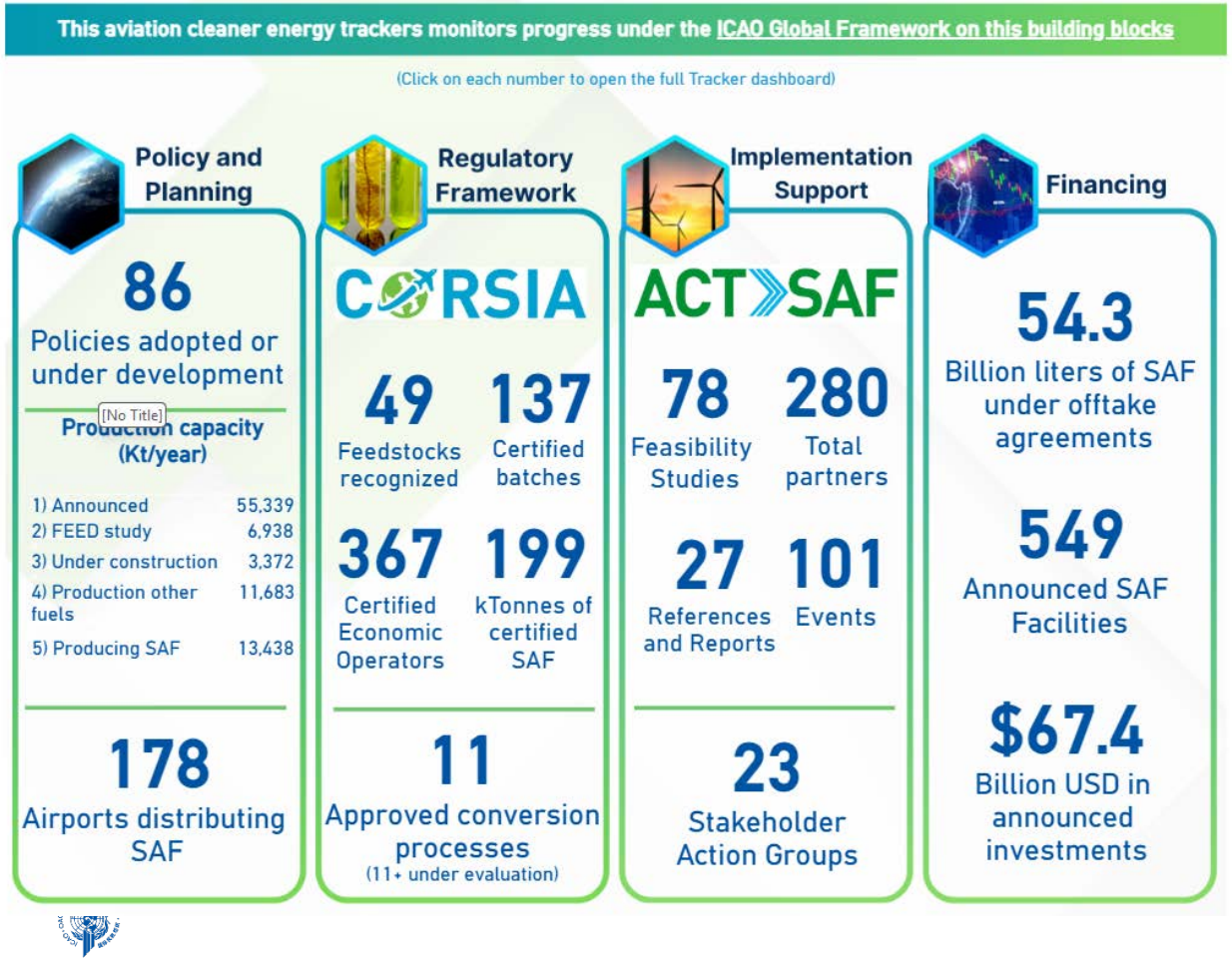
Global Framework is set out through 4 Building Blocks

- ICAO is monitoring progress on these building blocks through the **ICAO Cleaner Energy Tracker**



www.icao.int/SAF

Four Building Blocks to Achieve the Vision & LTAG



- 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

CAAF/3 Global Framework – 4 Building Blocks

1. Policy and Planning

- Global aspirational **Vision** to reduce international aviation CO_2 emissions by **5% by 2030**
- Each State's **special circumstances and respective capabilities**
- **CAAF/4** no later than 2028, with a view to update Vision
- **Collaborative effort** across different stakeholders, and encourage **State policies, action plans and roadmaps**
- Implementation **monitored** and periodically **reviewed**

2. Regulatory Framework

- **CORSIA eligibility framework as accepted basis** for SAF, LCAF and other aviation cleaner energies
- Increase the **number of SCS**, additional fuel production **pathways / life-cycle values**
- Parameters for **fuel accounting methodologies**, leveraging on CORSIA MRV system
- **Study of fuel accounting systems** to determine any possible ICAO role

3. Implementation Support

- **Robust, targeted and tailored** capacity -building and implementation support
- **Building on ACT-CORSIA and ACT-SAF programmes**
- Facilitate **partnerships**, and exchange of best practices
- Develop **policy toolkit/guidance** and support **State Action Plans**
- Support **feasibility studies**, **pilot projects**, which may facilitate access to investment
- Support **access to technology**

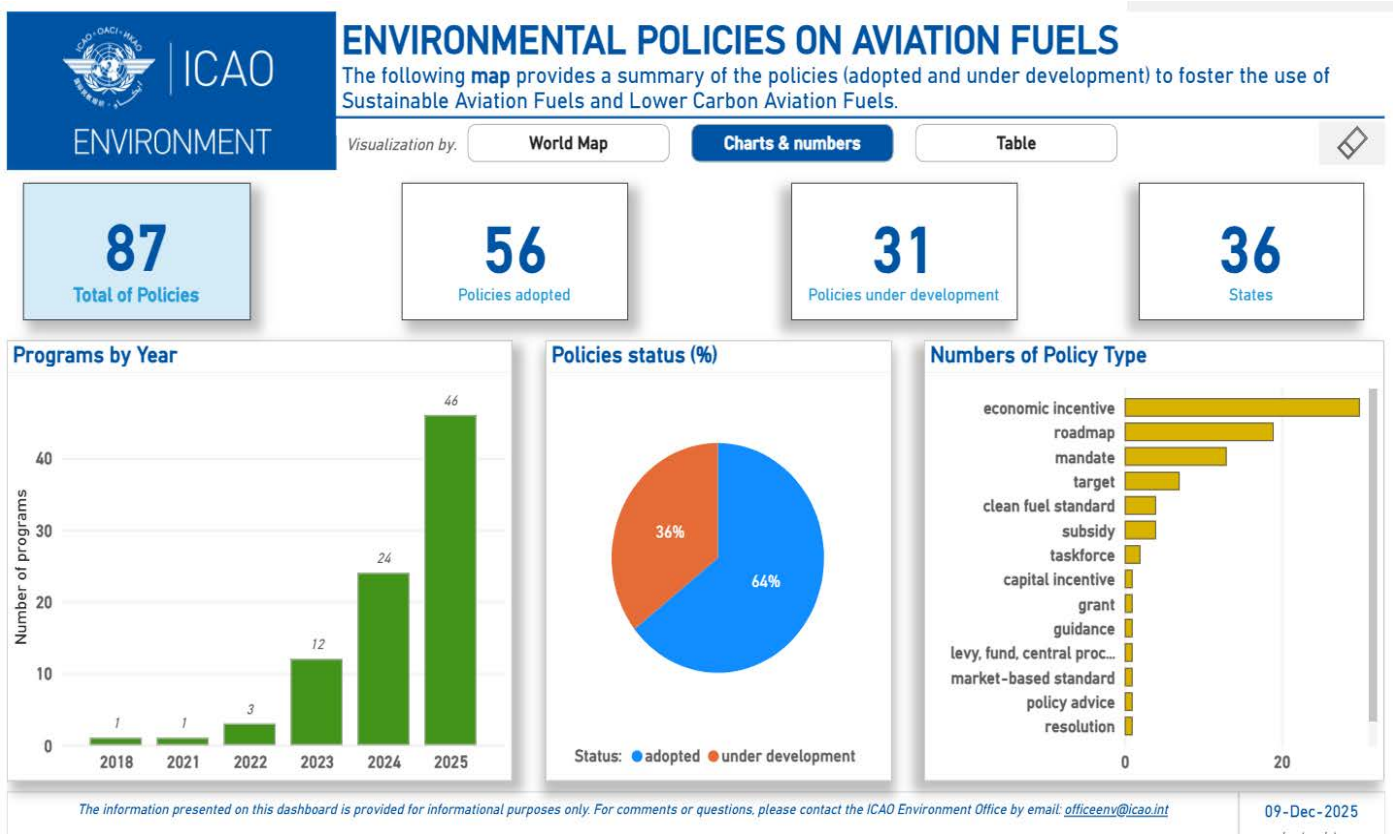
4. Financing

- **Advocacy and outreach** for greater investment in aviation cleaner energy projects, including UN and international financial community
- **Operationalization of ICAO Finvest Hub** to facilitate better access to public fund / private investment
- Expedite work to **consider the establishment of a climate finance initiative or funding mechanism under ICAO**

Building Block 1: Policy and Planning

Policy tracker – **encouraging developments in global policy**

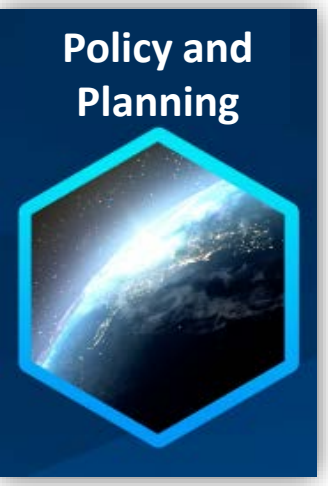
- **56 policies adopted and 31 under development**, including
  - Mandates and blending targets in **Brazil, European Union, India, Switzerland, Republic of Korea, Türkiye, UK**
  - Various **incentive schemes, e.g. USA Inflation Reduction Act, UK revenue certainty scheme, EU subsidies**
  - Various **sub-national policies** being implemented (e.g. States in India and USA, Provinces in Canada)



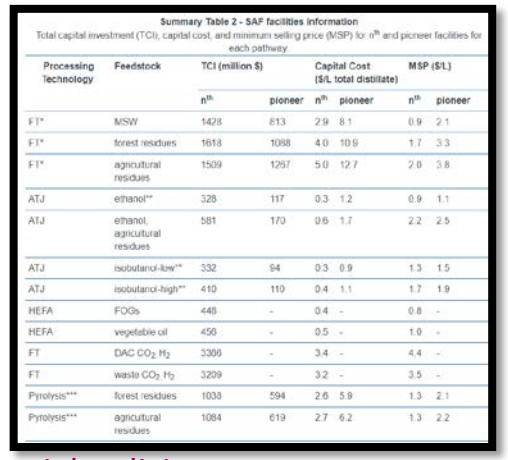
https://www.icao.int/SAF/saf-policies

Building Block 1: Policy and Planning

ICAO Toolbox of guidance material for States



- **Guidance on SAF policies**
- **ICAO SAF Rules of Thumb** - order of magnitude estimations on SAF costs, investment needs and production potential
- **Materials updated since A42 with the latest information**



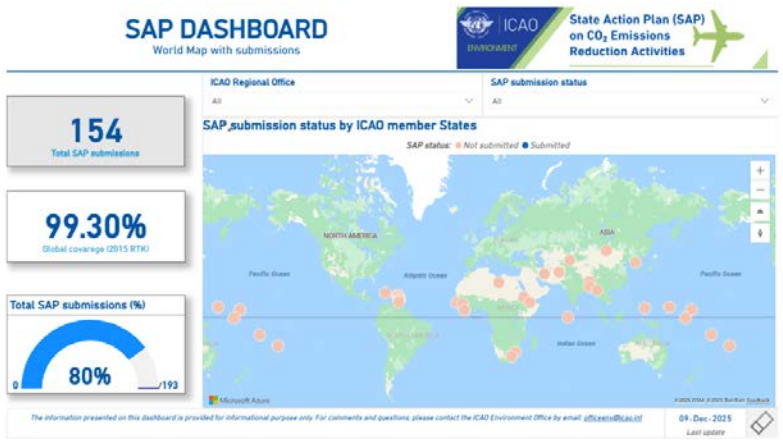
Summary Table 2 - SAF facilities information

Total capital investment (TCI), capital cost, and minimum selling price (MSP) for nth and pioneer facilities for each pathway

Processing Technology	Feedstock	TCI (million $)		Capital Cost ($/L total distillate)		MSP ($/L)	
		nth	pioneer	nth	pioneer	nth	pioneer
FT*	MSW	1428	813	2.9	8.1	0.9	2.1
FT*	forest residues	1618	1088	4.0	10.9	1.7	3.3
FT*	agricultural residues	1509	1257	5.0	12.7	2.0	3.8
ATJ	ethanol**	328	117	0.3	1.2	0.9	1.1
ATJ	ethanol, agricultural residues	581	170	0.6	1.7	2.2	2.5
ATJ	isobutanol-low**	332	94	0.3	0.9	1.3	1.5
ATJ	isobutanol-high**	410	110	0.4	1.1	1.7	1.9
HEFA	FOGs	448	-	0.4	-	0.8	-
HEFA	vegetable oil	456	-	0.5	-	1.0	-
FT	DAC CO_2, H_2	3366	-	3.4	-	4.4	-
FT	waste CO_2, H_2	3209	-	3.2	-	3.5	-
Pyrolysis***	forest residues	1038	594	2.6	5.9	1.3	2.1
Pyrolysis***	agricultural residues	1084	619	2.7	6.2	1.3	2.2

https://www.icao.int/SAF/saf-guidance-potential-policies
https://www.icao.int/SAF/saf-rules-of-thumb

ICAO State Action Plans



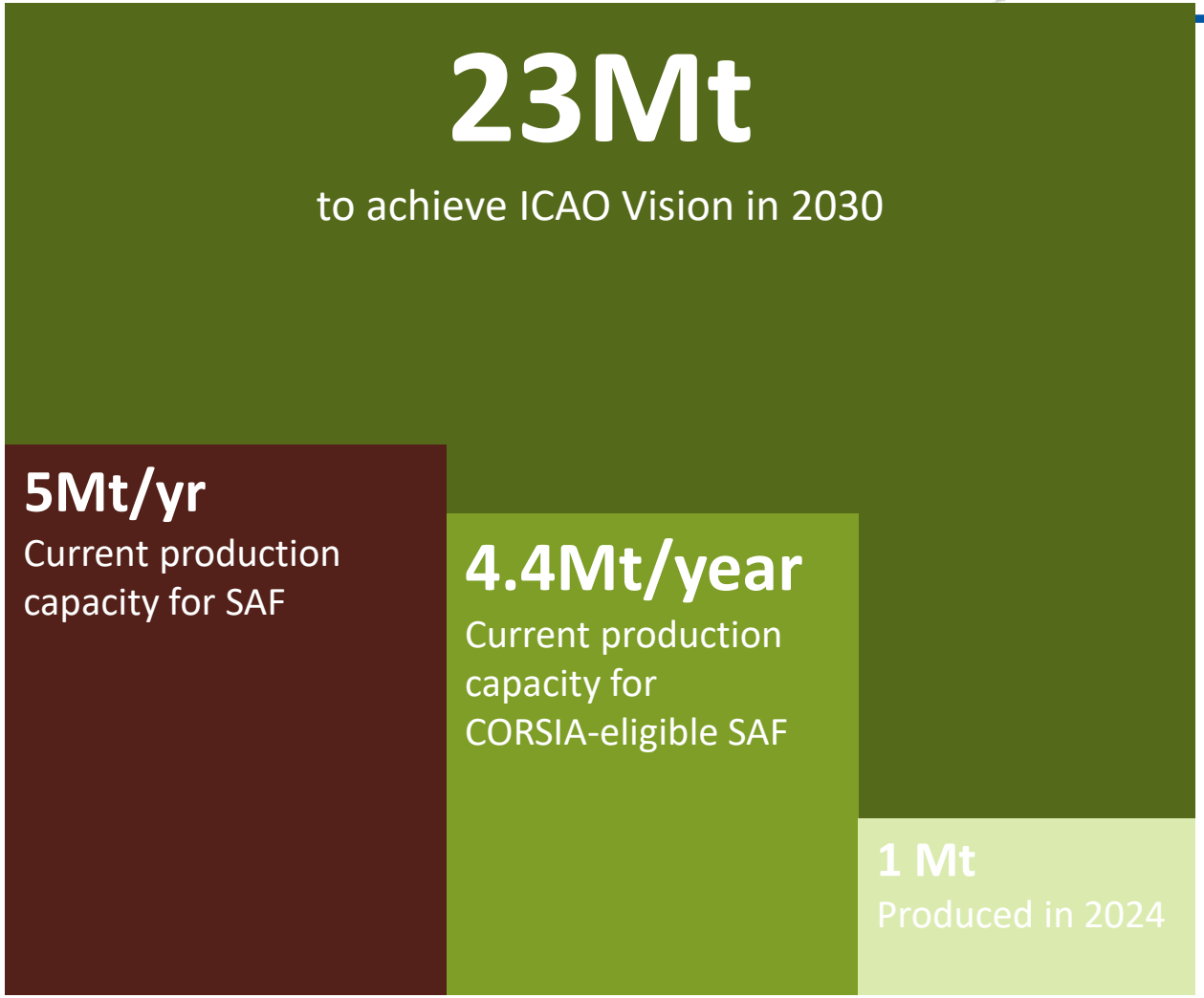
154 States Submitted action plans, Representing 99.3% of global RTK

Information enable to monitor progress towards LTAG

https://www.icao.int/environmental-protection/state-action-plans-and-assistance

Are we on track?

- **5% Vision requires ~23 Mt of cleaner energy use in international aviation by 2030**
- In 2024
  - ~1 million tonnes of SAF produced **(doubling every year since 2022)**
  - Certified as CORSIA eligible fuels – 0.2 million tonnes
- New ICAO Projections show Vision is possible, **but requires**:
  - Increased policy for technology evolution
  - More widespread use of waste gas for SAF production
  - More widespread electrification of ground vehicles



SAF production capacity is higher than actual production→
Cost barrier; need for capacity-building

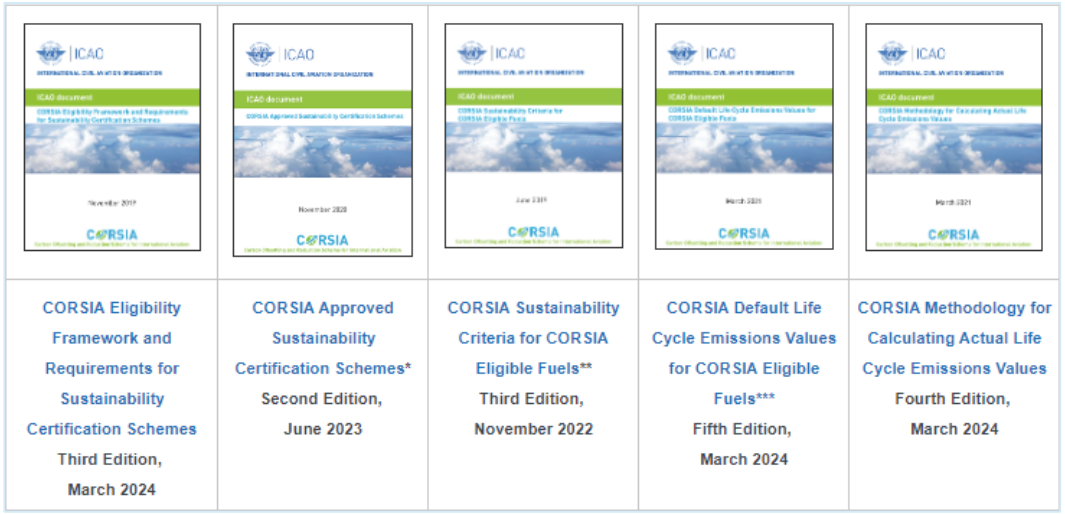
Building Block 2: Regulatory Framework

CORSIA environmental standards for fuels

Recognized as the accepted basis for fuels used in international aviation

June/2025, the Council approved updates to the CORSIA standards on fuels

- **Agnostic methodologies**
- **49 types of feedstocks** currently recognized
- Open process for consideration of **new feedstocks**
- **New feedstocks -** beef tallow, poultry fat, lard fat, mixed animals fat, non-standard coconut, wheat starch slurry and cobs
- Monitoring, Reporting, and Verification system (MRV) in place, including a **CORSIA Central Registry**



CORSIA Eligibility Framework and Requirements for Sustainability Certification Schemes Third Edition, March 2024	CORSIA Approved Sustainability Certification Schemes* Second Edition, June 2023	CORSIA Sustainability Criteria for CORSIA Eligible Fuels** Third Edition, November 2022	CORSIA Default Life Cycle Emissions Values for CORSIA Eligible Fuels*** Fifth Edition, March 2024	CORSIA Methodology for Calculating Actual Life Cycle Emissions Values Fourth Edition, March 2024

https://www.icao.int/CORSIA/corsia-eligible-fuels

ICAO continues to update standards to include the most recent technologies on fuel production

Building Block 2 How can CEF be produced today ?

CORSIA

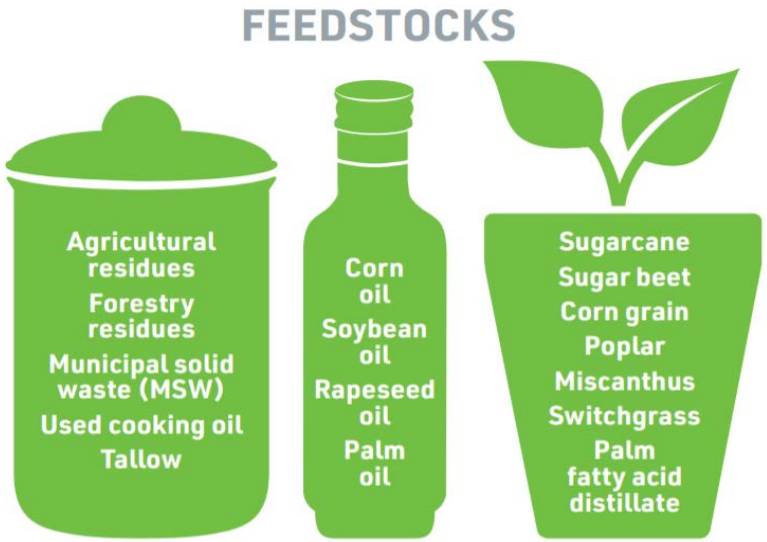
57 Feedstocks recognized

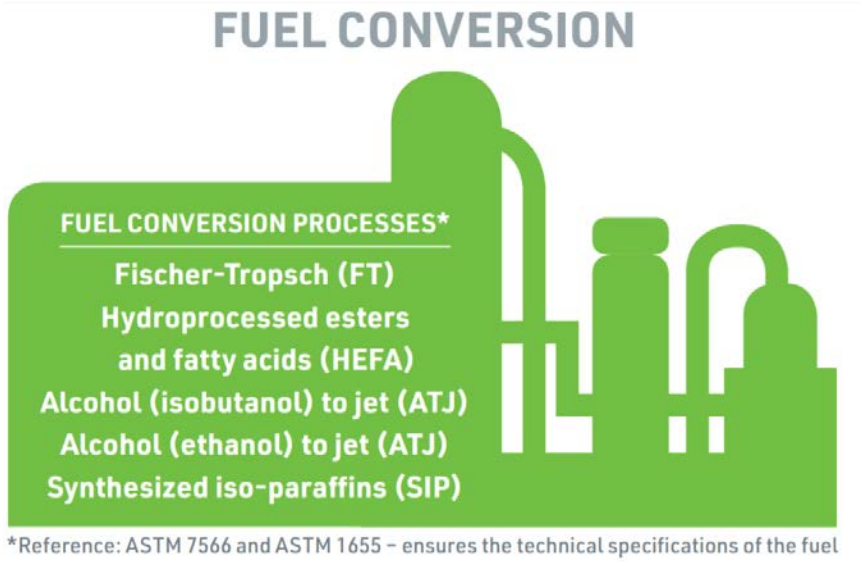
137 Certified batches

367 Certified Economic Operators

199 kTonnes of certified SAF

11 Approved conversion processes (11+ under evaluation)





- More feedstocks and conversion processes will become available as the industry evolves.
- Up-to-date information is available on the ICAO website

https://www.icao.int/environmental-protection/Pages/SAF_Feedstocks.aspx
https://www.icao.int/environmental-protection/GFAAF/Pages/Conversion-processes.aspx

Sustainability criteria and Life Cycle Emission Values of CEF

Sustainability Criteria was approved by the ICAO Council, in the context of consideration of SAFs and LCAFs under CORSIA.

14 Sustainability Themes

1. Greenhouse Gases (GHG)
2. Carbon stock
3. GHG reduction permanence
4. Water
5. Soil
6. Air
7. Conservation
8. Waste and Chemicals
9. Seismic and Vibrational Impacts (only for LCAF)
10. Human and labour rights
11. Land use rights and land use
12. Water use rights
13. Local and social development
14. Food security

Life Cycle Emission Values of CEF

with CORSIA as the Globally Harmonized Framework

Default Life Cycle Emissions Value

ICAO document **'CORSIA Default Life Cycle Emissions Values for CORSIA Eligible Fuels'** provides **default life cycle emissions values** for CEFs, as a function of the feedstock, conversion process, and production region of the SAF.

Actual Life Cycle Emissions Value

ICAO document '**CORSIA Methodology for Calculating Actual Life Cycle Emissions Value**s' provides guidance for **fuel producers to determine the actual life cycle emissions** values for CEFs and, when supported by robust data, to claim values lower than the default ones.

CORSIA Eligible Fuels (CEFs)

CORSIA eligible fuel (CEF) is CORSIA sustainable aviation fuel (SAF) or CORSIA lower carbon aviation fuel (LCAF), which an operator may use to reduce its offsetting requirements.

CEF needs to be certified based on the **CORSIA Sustainability Criteria**, including **its life-cycle emissions values**, by an approved Sustainability Certification Scheme (SCS).

ICAO-approved "Sustainability Certification Schemes (SCS) are verifying compliance with CORSIA standards.

3 approved SCSs as of 2025.

ISCC

ISCC International Sustainability & Carbon Certification

RSB

RSB Roundtable on Sustainable Biomaterials

Class NK

New SCS Approved in 2024

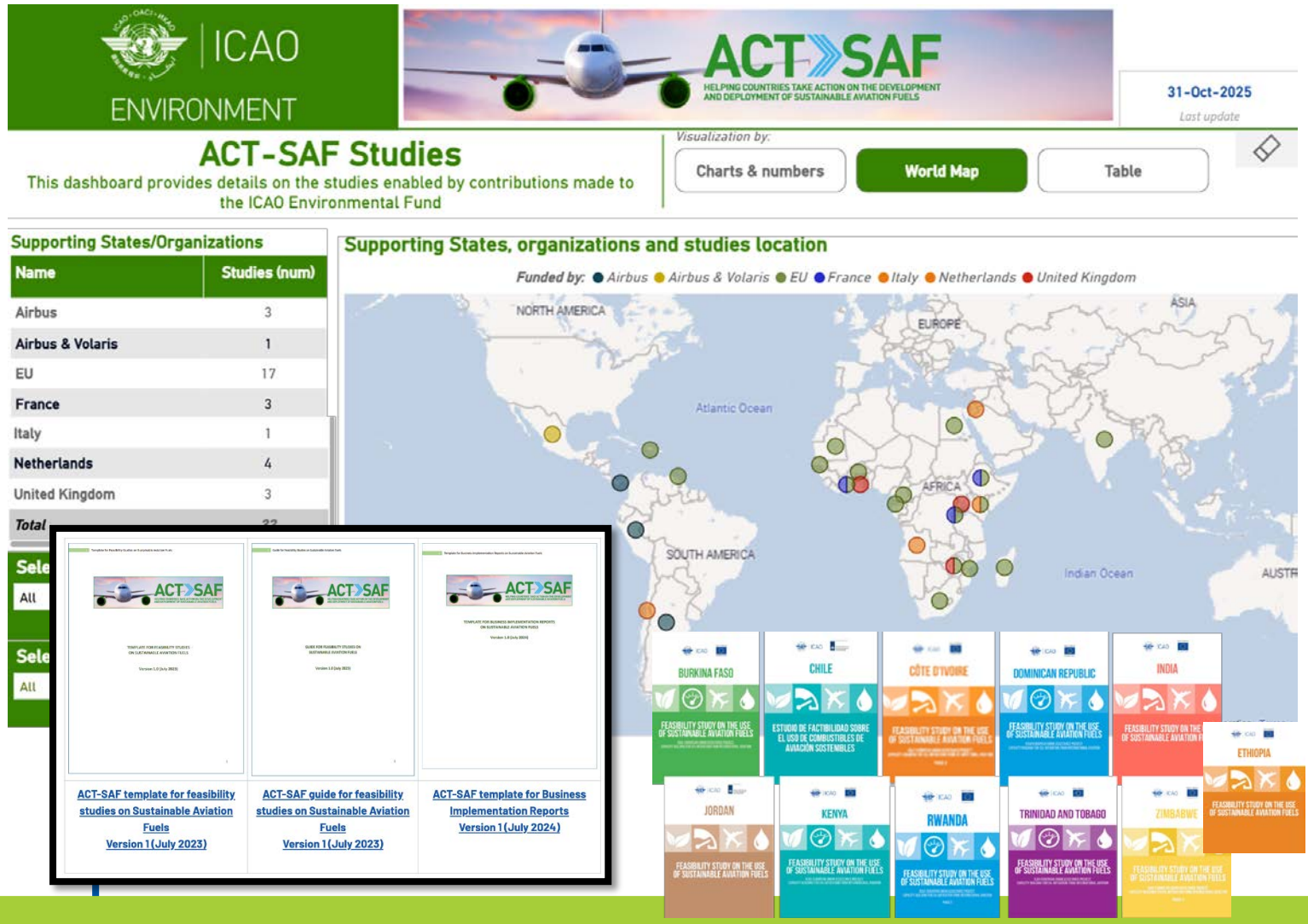
ClassNK CHARTING THE FUTURE

- SCSs currently only approved to certify CORSIA SAF.
- Evaluation is ongoing for one LCAF certification scheme

All documents available at https://www.icao.int/environmental-protection/CORSIA/Pages/CORSIA-Eligible-Fuels.aspx

Building Block 3: Implementation Support

ACT-SAF



>280 ACT-SAF partners

20 training sessions concluded

32 SAF feasibility studies now

50 studies by 2028

ACT-SAF Knowledge Hub
Collects all materials to facilitate SAF capacity-building

ACT-SAF Accelerator
Supports analysis of life cycle values for new fuel sources and pathways under CORSIA

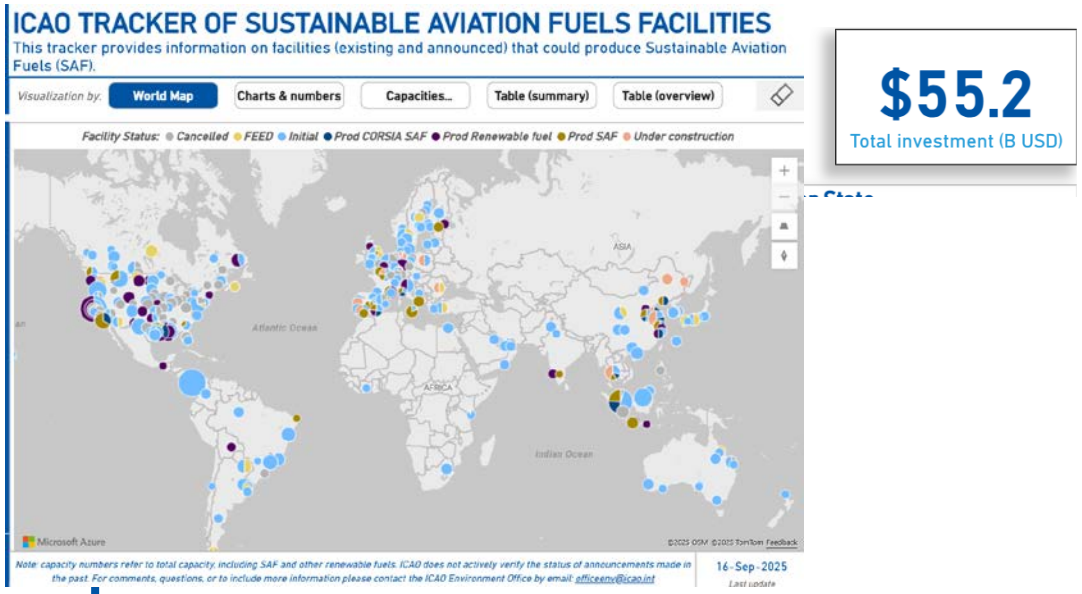
Building Block 4: Financing

Investments are being announced in SAF development

- **55 Billion dollars** announced on SAF facilities
- 54 billion liters of SAF under offtake agreements **(+260% since A41)**
- ICAO LTAG will require up **to 3.2 trillion USD in investments** - financing needs to accelerate to enable planned SAF facilities
- **ICAO Finvest Hub is now launched -** Facilitate funding for projects contributing to the decarbonization of international aviation
- Launch of the Finvest@ETAF portal by ICAO and IRENA in September 2025

FINVEST HUB

https://www.icao.int/finvest



https://www.icao.int/SAF/saf-offtake-agreements

ICAO Finvest Hub

ICAO

ACT-SAF

1 Development of Feasibility Studies

2 Development of Business Cases

- Templates
- Feasibility studies
- Business cases
- ICAO Tracking tools

States & stakeholders

Project Proposals

3 Development of Project Proposals

ICAO

ICAO to support project proposal development *for States and stakeholders, including proposals based on* ***ACT-SAF feasibility studies and business cases → SHAPE SAF***

ICAO

Finvest Hub

4 Submission of Project Proposals

5 Matchmaking Projects with Financing Opportunities

6 Financial Offer Negotiation and Agreement

Project Implementation (construction, production, etc.)

FINVEST HUB

ICAO to ensure the technical requirements (e.g. ICAO sustainability criteria) *in the project proposals, and to* ***monitor the progress*** *of implementation*

Thank You

ICAO