ICAO ENVIRONMENT



ICAO ACT-SAF Assistance Programme

ACT-SAF Information Session on Sustainable Aviation Fuels (SAF)

Module I: The ICAO ACT-SAF Programme

ICAO Work on SAF



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
Launch of ACT-SAF

2022 LTAG Agreement **SAF has the greatest potential to reduce CO_2 emissions**



2023 Third Conference on Aviation and Alternative Fuels (CAAF/) **ICAO Global Framework for SAF, LCAF and other Aviation Cleaner Energies**

2023
LTAG Stocktaking

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3

Context

ICAO 41st Assembly Session – Adoption of LTAG



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ICAO ACT-SAF

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

Launched on 1 June 2022

Promoting SAF together

- **Create opportunities for States to develop full potential** in SAF development / deployment
- **Tailored support** for States in various stages of SAF development / deployment
- **Foster knowledge sharing** and recognition of SAF initiatives around the world
- **Facilitate partnerships and cooperation**

www.icao.int/ACT-SAF

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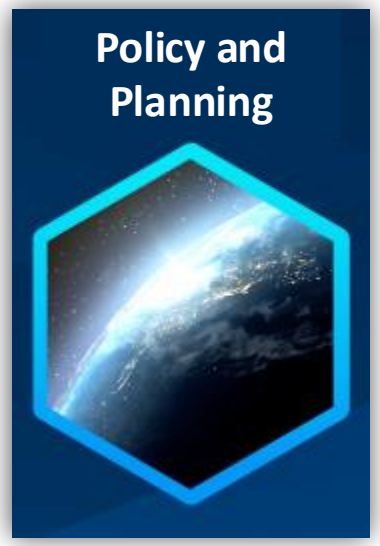
CAAF/3 Dubai

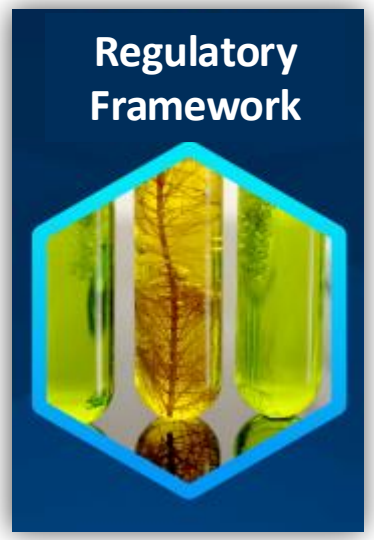
Collective global aspirational Vision to reduce CO2 emissions in international aviation by 5 % by 2030, through aviation cleaner energy use



Each State's special circumstances and respective capability will inform its ability to contribute to the Vision

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







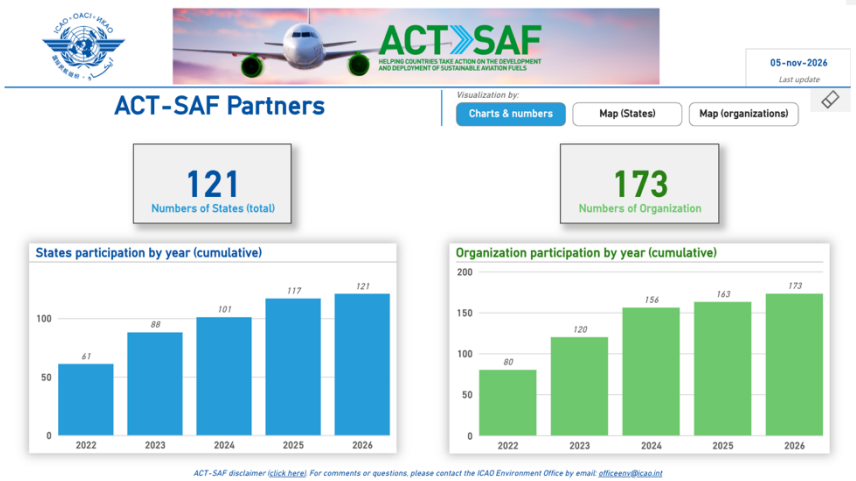


- Supports global scale up of aviation cleaner energies – Collective Vision to reduce 5% CO2 by 2030
- Provides clarity, consistency and predictability to all stakeholders on 1) policy and planning, 2) regulatory framework, 3) implementation support, and 4) financing – 4 Building Blocks
- Monitors the implementation progress on emissions reductions and means of implementation
- Aspiring to have cleaner energy production facilities in all regions by CAAF/4 (no later than 2028)
- To update the Vision at CAAF/4 on the basis of market developments

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Structure of ACT-SAF Programme

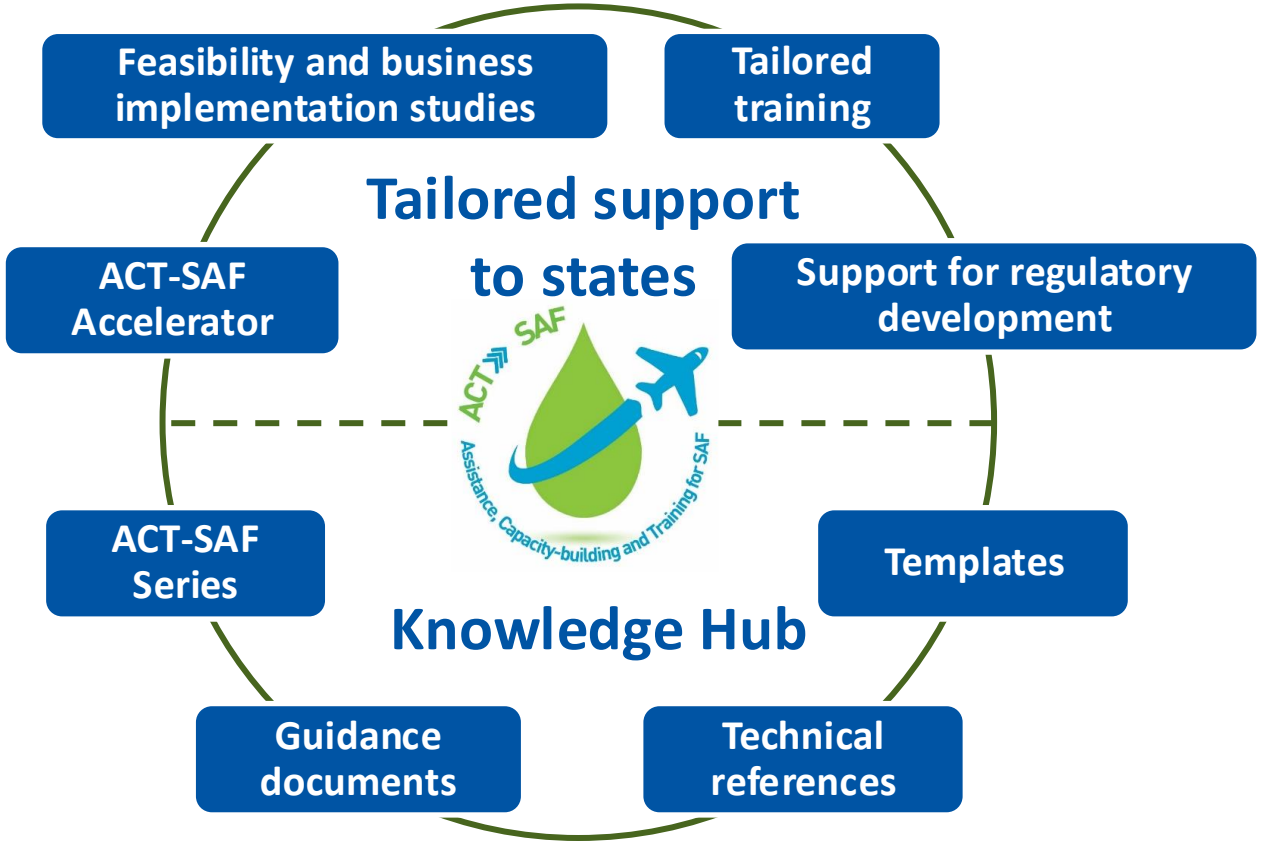
Over 290 ACT-SAF partners



www.icao.int/ACT-SAF/Partners



Two streams, eight elements

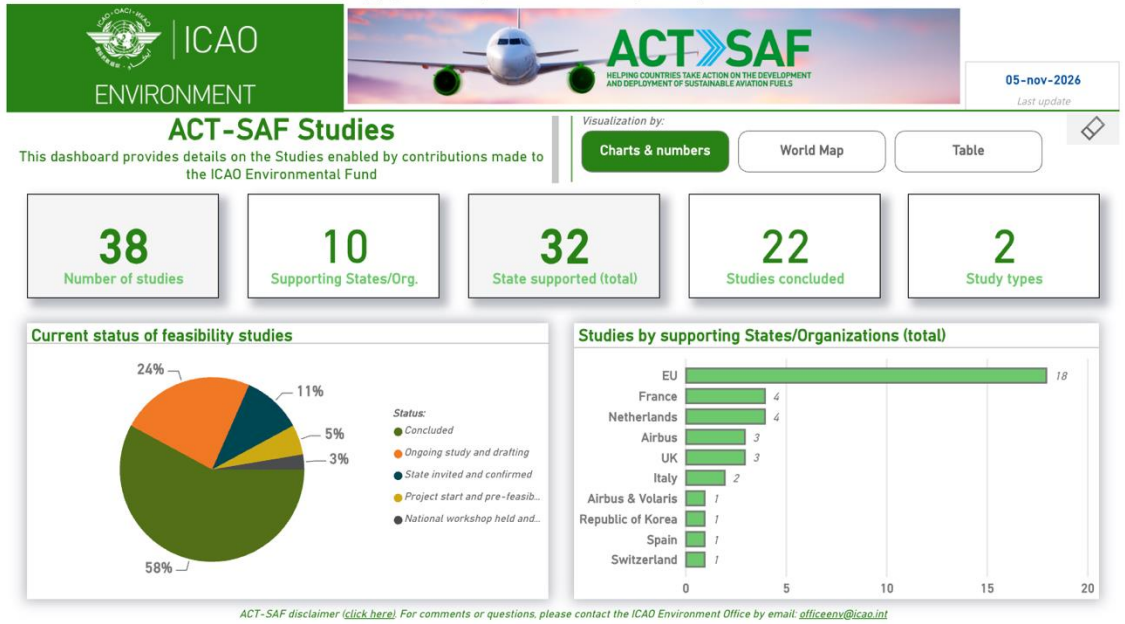


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Overview of ACT-SAF studies and funding

38 ACT-SAF studies (22 concluded / 16 ongoing)

- 10 supporting states/organizations (**France, Italy, Netherlands, Republic of Korea, Switzerland, Spain, United Kingdom, EU, Airbus and Volaris**)
- 1 co-funded study **(Angola/Italy)**
- **Austria and Côte d'Ivoire** contributed towards other activities





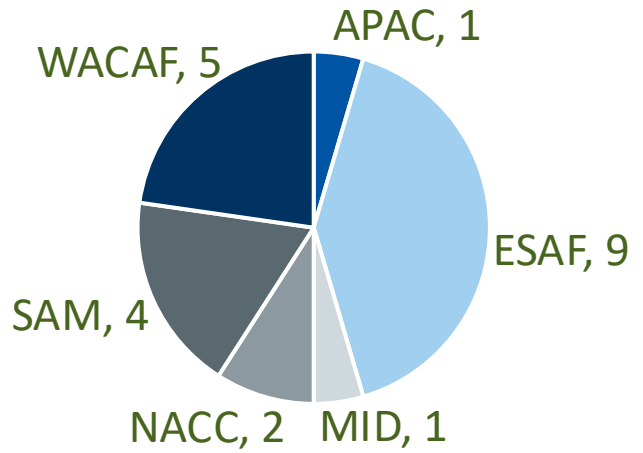
www.icao.int/ACT-SAF/Studies

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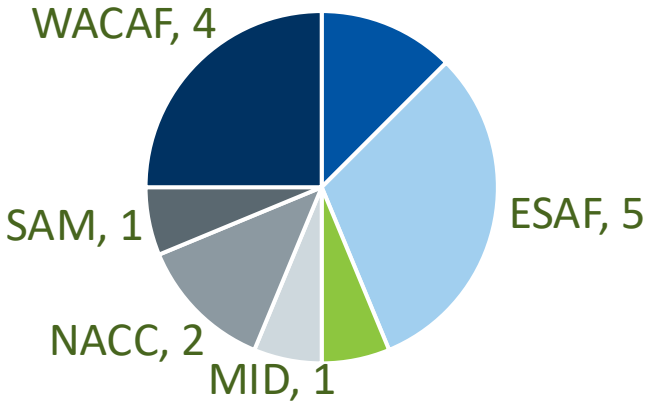
38 ICAO studies - continued

	SAF feasibility studies	SAF business implementation studies
Completed	**18** Argentina, **Burkina Faso**, Chile, **Côte d'Ivoire, Dominican Republic, Ethiopia, Ghana, India**, Jordan, **Kenya, Mozambique,** Panama, Peru, **Rwanda, Senegal, Trinidad & Tobago**, Uganda, Zimbabwe	**4** Côte d'Ivoire, Kenya, Rwanda, Zimbabwe
Under development	**12** Algeria, Angola, **Cameroon**, Costa Rica, **Egypt**, **Eq. Guinea**, **Madagascar**, **Mauritania**, Mexico, Namibia, Thailand, Viet Nam	**4** Chile, Ethiopia, **Nigeria**, **South Africa**

Completed: 22



Under development: 16



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Latest Developments: Financing



- **~75 Billion dollars** announced on SAF facilities
- 55 billion liters of SAF under offtake agreements **(+260% since 2022)**
- ICAO LTAG will require up **to 3.2 trillion USD in investments** - financing needs to accelerate to enable planned SAF facilities



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

FINVEST HUB

https://www.icao.int/finvest

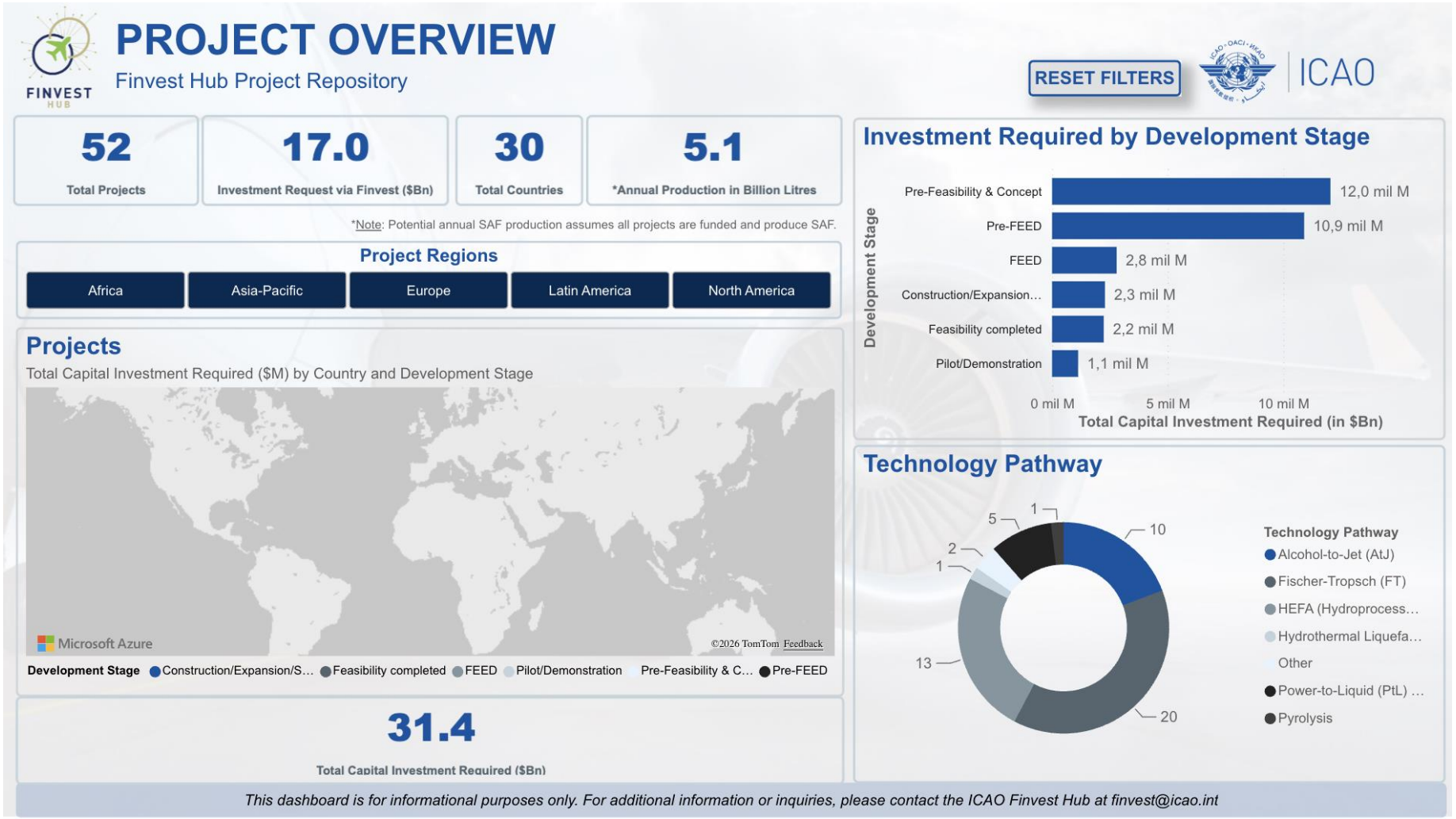
- **ICAO Finvest Hub is now launched -** Facilitate funding for projects contributing to the decarbonization of international aviation
- **CORSIA certification - pre-requisite for Finvest**

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Latest Developments: Financing

Details on projects submitted to Finvest hub now available on a dashboard

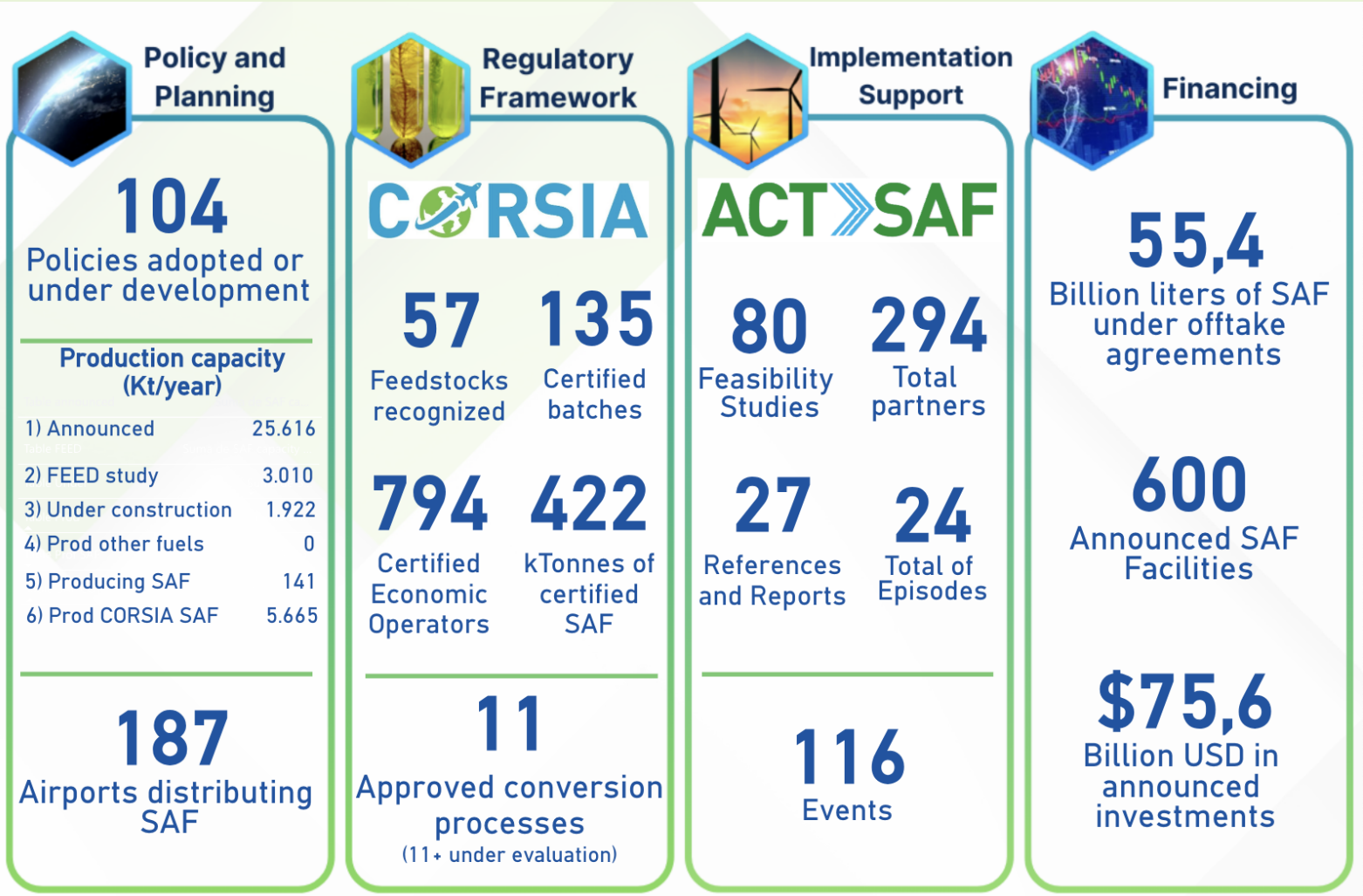
https://www.icao.int/finvest/saf



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ICAO Cleaner Energy Tracker Tools

- **ICAO Cleaner Energy Tracker Tools**
  - Layout to reflect four building blocks of the Global Framework
  - SAF-related indicators in airports distributing SAF, policies adopted/under development, SAF volumes/offtake agreements, approved conversion processes, etc.
  - **Specific indicators on CORSIA – feedstocks, certified batches**



https://www.icao.int/icao-cleaner-energy-tracker-tools

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SAF-related guidance

Resources for States and stakeholders available in ICAO web

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

- Developed by ICAO CAEP based on various studies since 2016
- Updated in March 2023



SAF studies templates

- feasibility study template/guide (July 2023)
- SAF business implementation template (July 2024)





SAF-related guides under ICAO-UNDP-GEF project

- Sustainable Aviation Fuels Guide
- Renewable Energy for Aviation
- Financing aviation emissions reductions





SAF Rules of Thumb

- Order of magnitude estimations related to SAF costs, investment needs, and production potential
- Developed by CAEP experts

Summary Table 1 - Feedstock Information

Technology, feedstock type and price, yield, total annual distillate scale, annual SAF production for both n^{th} and pioneer facilities.

Processing Technology	Feedstock	Yield (ton distillate/ton feedstock)	Feedstock Price	Total Capacity (million L/year)		SAF production (million L/yearr)	
				n^{th}	pioneer	n^{th}	pioneer
FT*	MSW	0.31	$30/ton	500	100	200	40
FT*	forest residues	0.18	$125/ton	400	100	160	40
FT*	agricultural residues	0.14	$110/ton	300	100	120	40
ATJ	ethanol	0.60	$0.41/L	1000	100	700	70
ATJ	isobutanol-low	0.75	$0.89/L	1000	100	700	70
ATJ	isobutanol-high	0.75	$1.20/L	1000	100	700	70

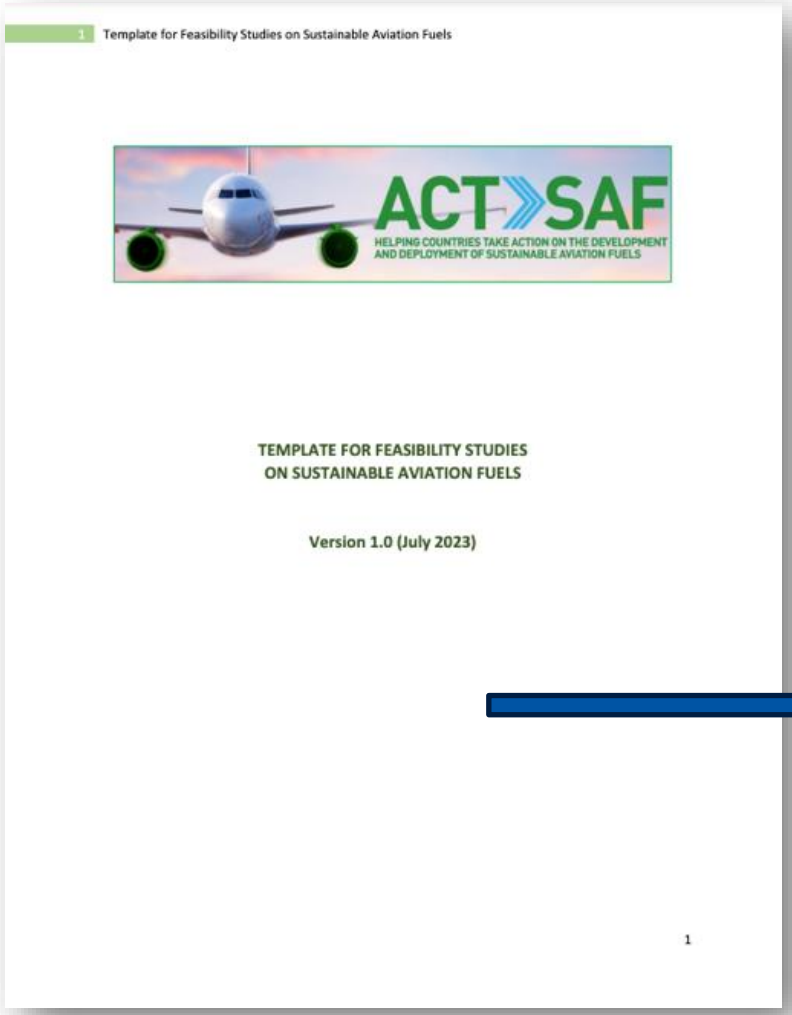
Summary Table 2 - SAF facilities information

Total capital investment (TCI), capital cost, and minimum selling price (MSP) for n^{th} and pioneer facilities for each pathway.

Processing Technology	Feedstock	TCI (million $)		Capital Cost ($/L total distillate)		MSP ($/L)	
		n^{th}	pioneer	n^{th}	pioneer	n^{th}	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	1267	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

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SAF Feasibility Studies

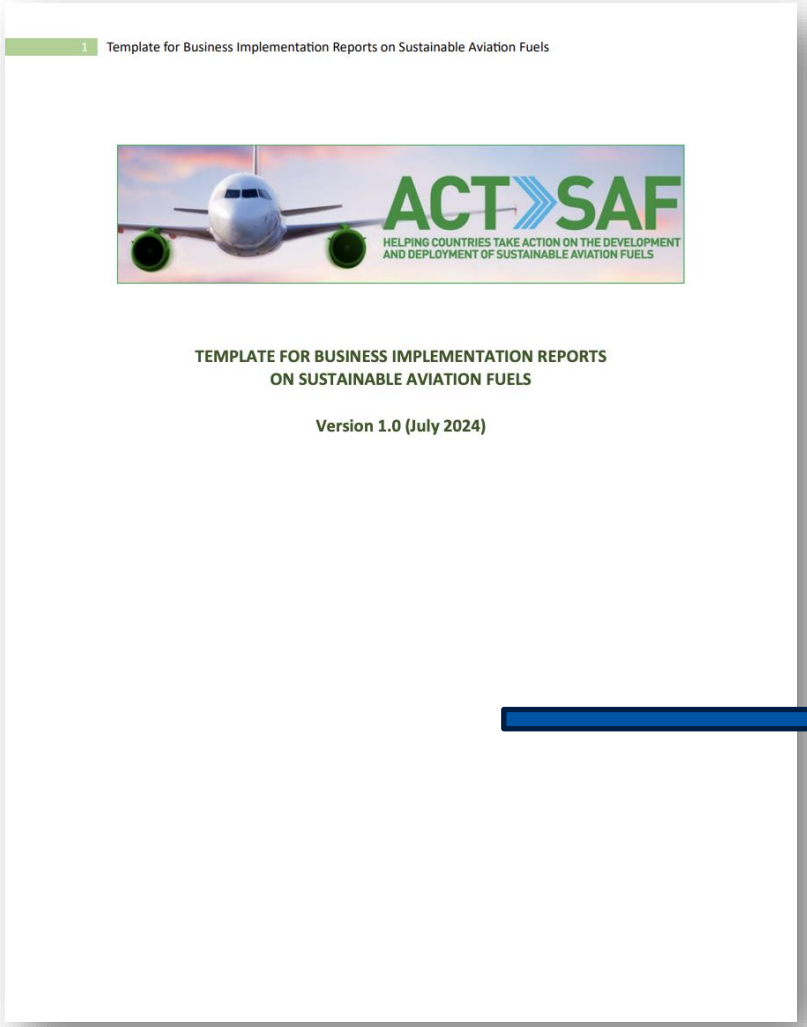


Feasibility Study according to ICAO Template

- 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

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SAF Business Implementation Studies



Feasibility Study according to ICAO Template

- 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

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QUESTIONS?

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