



OACI

# ORGANISATION DE L'AVIATION CIVILE INTERNATIONALE

INSTITUTION SPECIALISÉE  
DES NATIONS UNIES





**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 Four Building Blocks

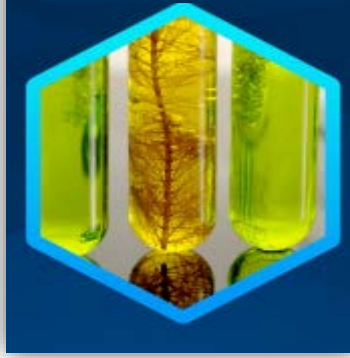


## ICAO Global Framework for SAF, LCAF and other Aviation Cleaner Energies

Policy and Planning



Regulatory Framework



Implementation Support



Financing



- Supports global scale up of aviation cleaner energies – Collective Vision to reduce 5% CO<sub>2</sub> 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

## Building Block 1 – Policy and Planning

### 1. Policy and Planning

- Global aspirational **Vision** to reduce international aviation CO<sub>2</sub> 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**

5. States are encouraged to implement policies in support of the Vision, in a socially, economically and environmentally sustainable manner and in accordance with their special circumstances and respective capabilities.
6. In developing these policies, States are invited to consider the usefulness and benefits of the non-exhaustive and non-prescriptive list of potential policy components contained within the 'toolkit' in paragraph 18 below, noting that ICAO guidance provides further detail on these potential policy components and the guidance does not provide any endorsement of specific policies.
7. In developing and implementing their policies, States are encouraged to recognize:
  - a) the need for, and benefits of, a combination of policies under a coherent and coordinated national plan for the scale-up in production and deployment of SAF, LCAF and other aviation cleaner energies, noting that no one single policy is likely to deliver the best and most efficient outcomes and that the appropriate policy-mix will differ between States due to different national circumstances;
  - b) the need for policies to take into account cost impacts and affordability, and to avoid extraterritorial measures;
  - c) the need for policies to take into account the latest scientific and technological developments;
  - d) the importance of the policy's transparency, certainty and stability, for aircraft operators, feedstock producers, fuel producers, financial institutions and other relevant stakeholders; and
  - e) the need for policies to be applied in accordance with the Chicago Convention and its relevant instruments and any appropriate bilateral and multilateral agreements in place between States, with particular regard for the fundamental principles of non-discrimination, fair and equal opportunity; and the avoidance of market distortion.
8. States are encouraged to work together towards the harmonization of policies, to the extent possible and appropriate to circumstances, across States and regions as a longer-term objective.

# Guidance on the Development of State Action Plans on CO<sub>2</sub> Emissions Reduction Activities (Doc 9988)

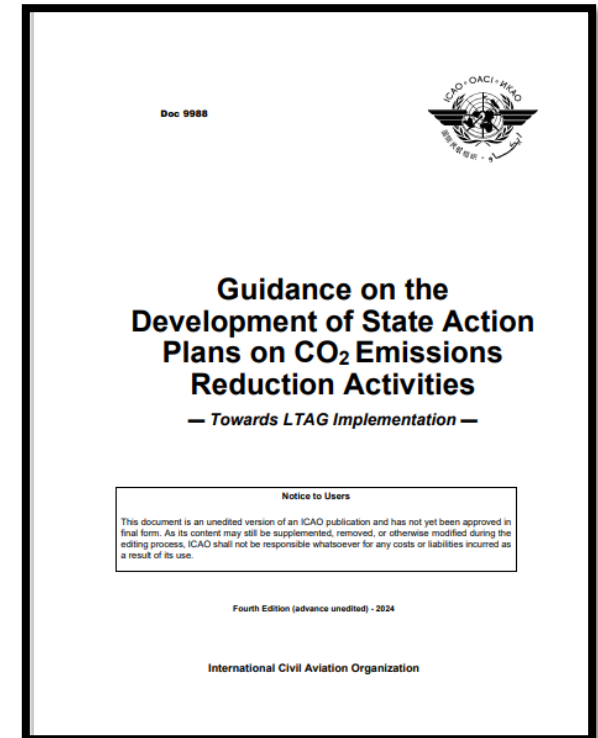
## SAP Guidance update (ICAO Doc. 9988) objectives:

- provide guidance for States to incorporate their long-term emission reduction initiatives
- facilitate the LTAG monitoring with data – quantified SAPs

## • Update :

- **Integration of latest Assembly decisions** and update of sections with the latest information on mitigation measures
- Additional guidance and support for States to incorporate their initiatives in SAPs and contribute to the achievement of collective ICAO global aspirational goals
- **to include respective policies, actions and roadmaps for the development and deployment of Sustainable Aviation Fuels (SAF), Low-Carbon Aviation Fuels (LCAF) and other aviation cleaner energies**
- High-level information on financial instruments for project implementation
- New action plan template, allowing all States **to report quantified data** in a harmonized manner to support the aggregation of information

**Fourth Edition  
now available at  
APER Portal**



# ICAO Guidance on Potential Policies and Coordinated Approaches for the deployment of SAF



- **Developed by CAEP based on studies performed since 2016**
- **A support reference for ICAO States to develop SAF production**
  - Insight on types of policy measures and their impacts
  - Examples of policies used or under preparation
  - Links to additional helpful resources
- **Completes a toolbox of guidance material for ICAO States**
- **Can be used in combination with the ICAO SAF Rules of Thumb**

Publically available on the ICAO website

## Guidance document

[https://www.icao.int/environmental-protection/Pages/saf\\_guidance\\_potential\\_policies.aspx](https://www.icao.int/environmental-protection/Pages/saf_guidance_potential_policies.aspx)

## SAF rules of thumb

[https://www.icao.int/environmental-protection/Pages/SAF\\_RULESOFTHUMB.aspx](https://www.icao.int/environmental-protection/Pages/SAF_RULESOFTHUMB.aspx)

- **Cleaner energy production is limited by a number of barriers**
  - Higher costs
  - Limited feedstock and fuel production infrastructure
  - Perceived financial risks
- **In the presence of such barriers, policy intervention is required to develop cleaner energy production.**
  - In general, a supporting policy framework is in place in those states where cleaner energy production has initiated
- **Constraints and opportunities are specific to each State**
  - Specific climates, agricultural systems, available resources, economic factors, political contexts, regulatory structures, etc.

# Qualitative metrics for assessing policy effectiveness



1 - Flexibility	2 - Certainty	3 - Financial costs and benefits	4 - Price sensitivity to externalities
Can the policy be easily adjusted given evolving circumstances?	Certainty on timeframe, legal conditions and political decisions increase investor interest.	Policies should be assessed on the its costs benefits they deliver, including social ones.	Higher sensitivity, more unintended consequences. Floor/Ceiling prices can reduce volatility
5 - Ease of implementation	6 - Contribution to SAF deployment and GHG reduction	7 - Unintended consequences	8 - Robustness of policy
Administrative, governance and/or procedural complexity can hinder implementation.	Clear criteria on target quantity, sustainability, commercial parameters and timeframe improve results	Mechanisms to identify and mitigate unintended consequences (economic, environmental or social)	Regulating systems to ensure that policy objectives are achieved and procedures have been followed.



# There are multiple policy options to support the development of a SAF market

- The most suitable SAF policies, can **vary for each country** according to their **geographic, economic, social and political characteristics**
- As such, there is not a single path to successful SAF policy implementation. Rather, a considered and customized strategy can be effective.

**ICAO Guidance  
provides details on  
various policy  
options, divided  
into 3 impact areas**



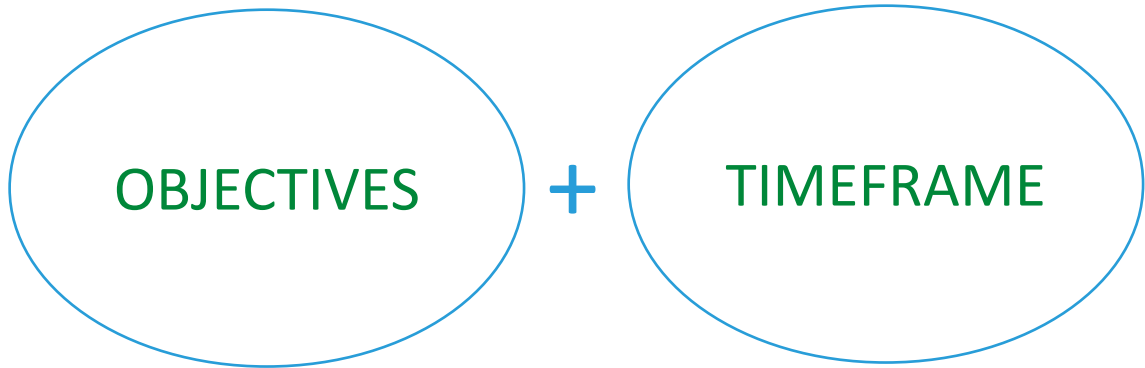
# ICAO Guidance provides details on various policy options, divided into 3 impact areas and 8 categories



Impact area: Stimulating Growth of SAF Supply			
1 Government funding for RDD	2 - Targeted incentives and tax relief to expand SAF supply infrastructure	3 - Targeted incentives and tax relief to assist SAF facility operation	4 - Recognition and valorization of SAF environmental benefits
<p>1.1 - Government R&amp;D</p> <p>1.2 - Government demonstration and deployment</p>	<p>2.1 - Capital grants ; 2.2 - Loan guarantee programs</p> <p>2.3 - Eligibility of SAF projects for tax advantaged business status ; 2.4 - Accelerated depreciation/‘bonus’ depreciation</p> <p>2.5 - Business Investment Tax Credit (ITC) for SAF investments 2.6 - Performance-based tax credit</p> <p>2.7 – Bonds / Green Bonds</p>	<p>3.1 Blending incentives: Blender’s Tax Credit</p> <p>3.2 – Production incentives: Producer’s Tax Credit</p> <p>3.3 - Excise tax credit for SAF</p> <p>3.4 - Support for feedstock supply establishment and production</p>	<p>4.1 – Recognize SAF benefits under carbon taxation</p> <p>4.2 - Recognize SAF benefits under cap and-trade systems</p> <p>4.3 - Recognize non-carbon SAF benefits: improvements to air quality</p> <p>4.4 - Recognize non-carbon SAF benefits: reduction in contrails</p>

Impact area: Creating Demand for SAF			Impact area: Enabling SAF Markets
5- Creation of SAF mandates	6 - Update existing policies to incorporate SAF	7 – Demonstrate government leadership	8 - Market enabling activities
<p>5.1 - Mandate renewable energy volume requirements in the fuel supply</p> <p>5.2 - Mandate reduction in carbon intensity of the fuel supply</p>	<p>6.1: Incorporating SAF into existing national policies</p> <p>6.2: Incorporating SAF into existing subnational, regional or local policies</p>	<p>7.1 Policy statement to establish direction</p> <p>7.2: Government commitment to SAF use, carbon neutral air travel</p>	<p>8.1 - Adopt clear and recognized sustainability standards and life cycle GHG emissions methods for certification of feedstock supply and fuel production</p> <p>8.2 - Support development/recognition of systems for environmental attribute ownership and transfer</p> <p>8.3 - Support SAF stakeholder initiatives</p>

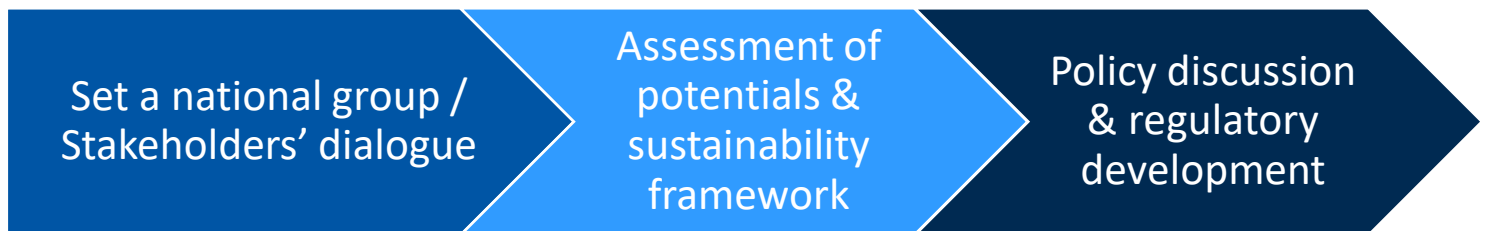
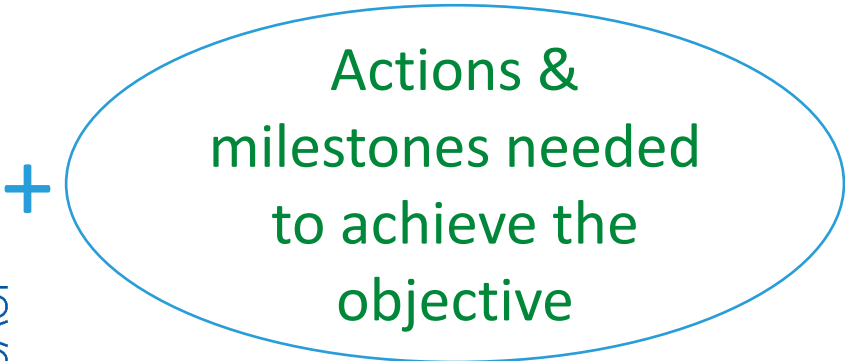
# Elements of a SAF Roadmap



**CAAF/3**  
DUBAI

Global aspirational Vision to reduce international aviation CO<sub>2</sub> emissions by 5% by 2030

**ICAO**  
**LTAG**  
LONG TERM GLOBAL ASPIRATIONAL GOAL FOR INTERNATIONAL AVIATION  
**NET-ZERO 2050**



# Conclusions - Considerations when developing a SAF Roadmap

Collecting context specific data (feedstock, renewable energy sourcing, etc.)

feasibility studies to identify the capacity and propose specific roadmaps to develop local supply chains

Setting a vision for promoting SAF

States' decisions can influence market expectations, set targets, develop long-term strategies, establish national goals for SAF

Developing national SAF roadmaps

develop suitable regulations and incentives to support the scale-up of commercial production facilities and ensure economic viability and competitiveness

Managing risk

different strategies and policy to promote SAF, depending on the States' specific market background and feedstock availability – maximize environmental benefits

Flexible and inclusive policy

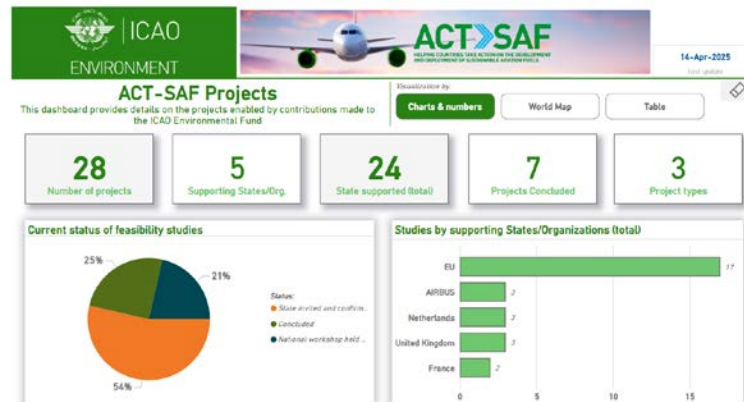
determine if the SAF roadmap should be sector-specific or be a part of a broader national energy strategy

# Additional resources - SAF tracker tools

SAF tracker tools are also available in the ICAO website

Provides updated information on

- SAF offtake agreements from airlines
- SAF production facilities
- Airports offering SAF
- Policies fostering SAF market developments
- Latest news

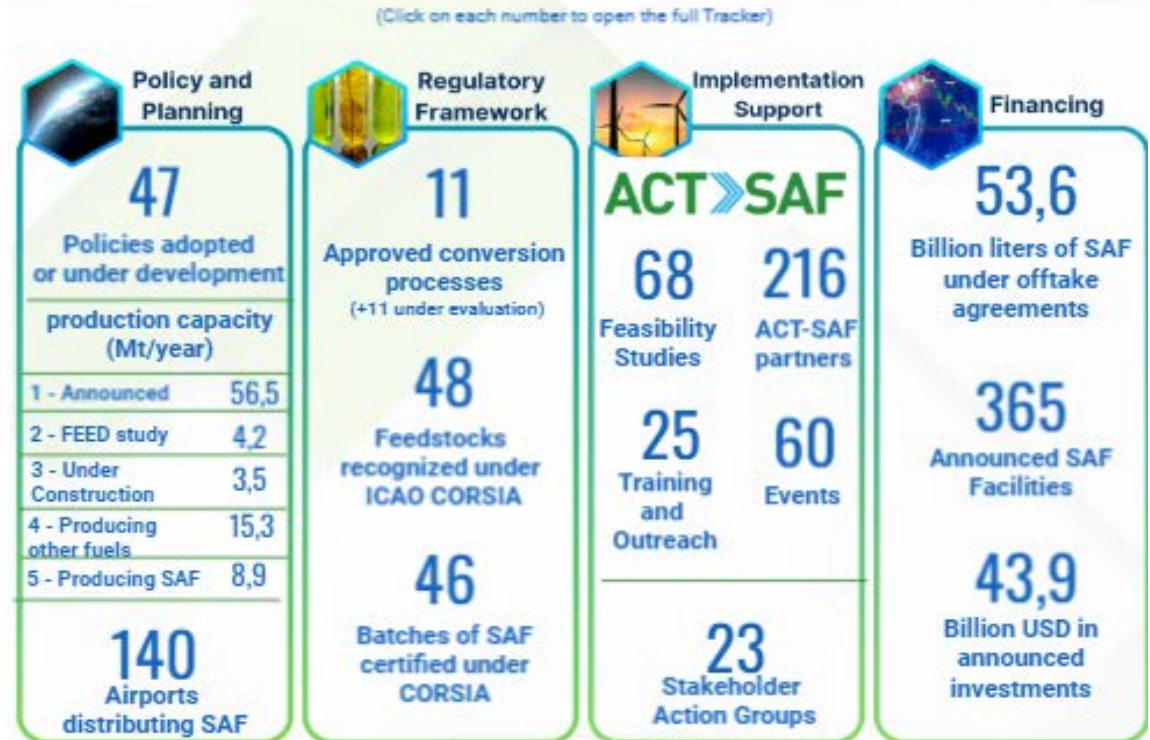


## ICAO Cleaner Energy Tracker Tools (click for details)

ICAO adopted a Vision to reduce CO<sub>2</sub> 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 (according to the LTAG report data).

This aviation cleaner energy trackers monitors progress under the ICAO Global Framework on its four building blocks



### Latest news (click for details)

Date	Link
3 mars 2025	<a href="#">UK government plans to fund SAF revenue mechanism through a levy on fuel suppliers</a>
3 mars 2025	<a href="#">Industry on track to meet EU targets for sustainable aviation fuel share</a>
26 févr. 2025	<a href="#">First SAF deal in Saudi Arabia</a>
26 févr. 2025	<a href="#">Financing Sustainable Aviation Fuels: Case Studies and Implications for Investment</a>
25 févr. 2025	<a href="#">Mato Grosso do Sul (Brazil) advances in sustainable aviation fuel production</a>
25 févr. 2025	<a href="#">EASA publishes briefing note on SAF prices in the European Union</a>

# *Examples from States*

## ✓ Stimulate SAF supply →

Financing grant competitions for SAF production (USA, France)

ICAO ENVIRONMENT **IRA SAF and Clean Technology Grant Program** ACT>>SAF

Support projects to rapidly scale-up domestic SAF production

**IRA FAST Grant Program**

- \$40007
- \$245 million competitive grant program
- Specifies consideration criteria and eligible entities
- FAST Meeting – Dec. 14, 2022

Text - H.R.5376 - 117th Congress (2021-2022): Inflation Reduction Act of 2022 | [Congress.gov](https://www.congress.gov) | [Library of Congress](https://www.libraryofcongress.gov)

MINISTÈRE CHARGÉ DES TRANSPORTS dgac

2. French endeavour for SAF

**2- Focus on French endeavour for SAF**

Mid-2020 launched a **Call for Expression of Interest** to assess stakeholders' interest and needs

July 2021: **calls for proposal** to support the development of a French SAF production sector :

- 200 million € for pilot/demonstrator construction or engineering studies
- Closed in September 2022 – 5 winning projects to date

Concrete application via a mandatory incorporation mandate :

- January 2022: **blending mandate of 1%** implemented
- Mid-2022 : launch of a working group to address the **industrialization phase** at government level
- December 2022 : study on **PtL fuels potential** in France

Direction générale de l'Aviation civile  
Direction du transport aérien

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# Policy examples

✓ Stimulate SAF supply →

Tax credits on SAF (USA, France)

ICAO ENVIRONMENT Inflation Reduction Act (IRA) - Production support through 2027 ACT>>SAF

**IRA Tax Credits**

**SAF Tax Credit** §13203 - 2023-2024

- Achieves 50% lifecycle GHG reduction
- \$1.25 with additional up to \$1.75 for additional lifecycle emissions reduction

**Production Credit** §13704 - 2025-2027

- Lifecycle GHG <50kg CO2e/MMBTU (Jet Baseline = 94kg CO2e/MMBTU)
- Enhanced value for SAF up to \$1.75 for 100% reduction

[Text - H.R.5376 - 117th Congress \(2021-2022\): Inflation Reduction Act of 2022 | Congress.gov | Library of Congress](#)

MINISTÈRE CHARGÉ DES TRANSPORTS dgac 2. French endeavour for SAF

### 2- Focus on French endeavour for SAF

**TIRUERT : an existing tax instrument**

- Incentive mechanism to encourage the blending of biofuels in diesel and gasoline, and now kerosene
- Set-up via the **budget law** & update annually
- To evolve over the coming years to match our SAF roadmap objectives

**Principles**

- Separate annual objective per type of fuel (non fungible)
- SAF blending mandate set at **1% since 2022** (in energy)
- Tax level of **168 € / hectolitres** (at present)

**Recent development**

- Mandate level raised to 1,5% in 2024
- **Upgrade of the biofuel management platform** developed by the French Energy Ministry

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For details – ACT-SAF Series #12 Training – <https://www.icao.int/environmental-protection/Pages/ACT-SAF-Series.aspx>



✓ Stimulate SAF demand →

SAF blending/use mandates in energy content or CO<sub>2</sub> emissions reductions (EU, Brazil, UK)

ICAO ENVIRONMENT **ACT>>SAF**

### ReFuelEU Aviation legislative proposal Design\*

**Ramp-up: binding minimum SAF shares in aviation fuel supplied in the EU:**

Total shares in the fuel mix (in %)	2025	2030	2035	2040	2045	2050
Sustainable Aviation Fuels (SAF) target	2	5	20	32	38	63
Synthetic aviation fuels <i>sub-target</i>	-	0.7	5	8	11	28

**Eligible SAF:**

Sustainability framework of the Renewable Energy Directive

- Sustainable biofuels produced from waste and residues
- Synthetic aviation fuels produced from renewable sources

\* Subject to possible changes as a result of the legislative process.

ICAO ENVIRONMENT **ACT>>SAF**

### Latest news

#### New policy – UK SAF mandate

- The mandate will start in 2025 at 2% of total UK jet fuel demand, increase on a linear basis to 10% in 2030 and then to 22% in 2040.
- From 2040, the obligation will remain at 22% until there is greater certainty regarding SAF supply.
- Supported by a detailed cost-benefit analysis
- <https://www.gov.uk/government/speeches/aviation-fuel-plan>

**Supporting the transition to Jet Zero: creating the UK SAF mandate**

PDF, 1.99 MB, 137 pages

This file may not be suitable for users of assistive technology.

▶ [Request an accessible format.](#)

**UK SAF mandate: final stage cost benefit analysis**

PDF, 982 KB, 87 pages

This file may not be suitable for users of assistive technology.

▶ [Request an accessible format.](#)

**UK SAF mandate: final stage cost benefit analysis dataset**

ODS, 266 KB

This file is in an [OpenDocument](#) format

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For details – ACT-SAF Series #12 Training – <https://www.icao.int/environmental-protection/Pages/ACT-SAF-Series.aspx>



✓ Stimulate SAF demand →

SAF blending/use mandates in energy content or CO<sub>2</sub> emissions reductions (EU, Brazil, UK)

The slide is titled "Public Policy for SAF" and "ACT-SAF". It features a grid of policy options under the heading "1. MANDATE". A callout box points to the "MANDATE" heading.

ESTABLISH A MANDATE TO REDUCE EMISSIONS FROM THE AIRLINE INDUSTRY	ALLOW ALL TECHNOLOGICAL ROUTES APPROVED BY ACTR AND ASP	ALLOW DIFFERENT SAF LEVELS IN ANY PART OF THE NATIONAL TERRITORY	CHIEFT INTERNATIONAL AGREEMENTS OF INTERNATIONAL FLIGHTS, RESPECTING THE SOVEREIGNTY OF NATIONAL SOVEREIGN AIR TRANSPORT AGREEMENTS
PROVIDE FLEXIBILITY TO OPE	ISSUE MANDATES FOR THE USE OF SAF, CONSIDERING AS CRITERIA THE DEVELOPMENT OF SAF PRODUCTION AND LOGISTICS CHAINS, AIRPORTS, AIRCRAFT AND THE AVAILABILITY OF SAF MATERIALS	ENABLE THE APPLICATION OF "BOOK & CLAIM" FOR SPECIFIC CASES	

**COMBUSTÍVEL DO FUTURO**

- No blending mandate or tax incentives – limited budget
- Alternative: a mandate of CO<sub>2</sub> emissions reduction (in %) by the use of SAF
  - Applied to airlines (thus not on SAF distribution).
  - Fosters competition for the use of the best technology available and the most efficient SAF


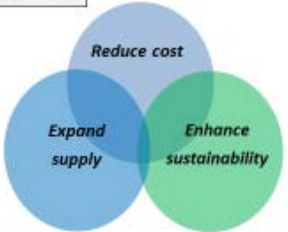


## ✓ Stimulate SAF demand →

Defining SAF aspirational targets (Japan 10% SAF by 2030, USA 3 Billion gallons of SAF by 2030)

ICAO ENVIRONMENT U.S. SAF Grand Challenge ACT>>SAF

- Agreement by the Departments of Transportation, Energy and Agriculture
- Achieve 3 billion gallons of domestic SAF production in 2030 and put U.S. on trajectory to 35 billion gallons per year by 2050
- At least a 50% reduction in life cycle greenhouse gas emissions, as compared to conventional jet fuel
- Multi-agency roadmap to focus federal actions to support industry scale-up

ICAO ENVIRONMENT Public-Private Councils ACT>>SAF

- In Mar21, JCAB established “Study Group on CO2 Reduction in the Aircraft Operation Sector” which consists of air-carriers, academic experts etc.
- The study group established roadmaps for promotion of decarbonisation in aviation operation sector.

*<Target > Replacing 10% of the fuel consumption by Japanese airlines with SAF in 2030*

- Accelerating actions in the roadmaps, JCAB has established public-private councils.

### Private-Public Councils for promotion of SAF deployment

- Purpose**
- ✓ Coordination of demand (airlines) and supply (oil companies) to facilitate the development and production of domestic SAF
  - ✓ Construction of future supply chain including imported SAF
- Key actions**
- ✓ Coordinating of demand and supply of SAF
  - ✓ Demonstration of imported neat SAF refueling in Japan
  - ✓ Assistance of ICAO CEF certification
- Member**
- ✓ Private sector: Air-carriers, Airport company, Oil company, etc.
  - ✓ Public sector: MAFF, METI, MLIT, MOE, NEDO(observer)



Vice-minister of MLIT, Mr. Nakayama at the 1<sup>st</sup> council



## ✓ Enable SAF markets implementation



Design of a national SAF roadmap (UAE, Japan)

ICAO ENVIRONMENT UAE SAF Roadmap ACT>>SAF

### 2022-2050: Key strategic points



National Sustainable Aviation Fuel Roadmap of the United Arab Emirates  
2022-2050

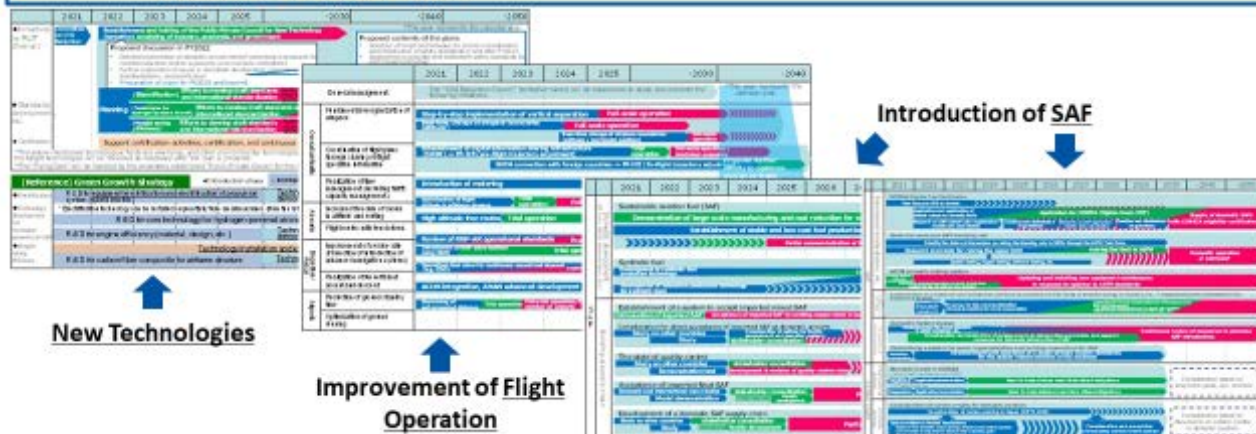


**5 Sustainable Aviation Fuel (SAF) principles** are highlighted with the intent to accelerate the decarbonization of the UAE's aviation sector and transform it into a **regional hub for low carbon aviation fuels**

- Principle 1:** Establishing the ambition
- Principle 2:** Accelerating SAF Technology Deployment and Innovation
- Principle 3:** Developing the National Regulatory Environment for SAF
- Principle 4:** Building Local Capacity to Boost In-Country Value
- Principle 5:** Leading International Collaboration

ICAO ENVIRONMENT SAF Roadmap and Utilization target in 2030 ACT>>SAF

- The roadmaps for promoting decarbonization in aircraft operation sector were established in 2021 and are shared among public/private parties in Japan.
- Two quantitative targets for decarbonization were established within roadmaps.
  - SAF:** Replacing 10% of the fuel consumption by Japanese airlines with SAF in 2030
  - Operational improvement:** Reducing CO2 emissions by about 10% through future efforts of improvement of flight operations by renovating air navigation services



**New Technologies** (indicated by an upward arrow)

**Improvement of Flight Operation** (indicated by an upward arrow)

**Introduction of SAF** (indicated by two downward arrows)



## ✓ Enable SAF markets implementation



Industry engagement (UAE, Japan “Act for Sky”, Singapore “Buyers club for SAF”)

ICAO ENVIRONMENT Participants ACT-SAF

The UAE SAF Committee

Emirates, Etihad Airways, DUBAI AIRPORTS, HSBC, BEEAH, ADNOC, bp, Shell, BOEING, SAFRAN, IATA, Khalifa University, Masdar

Knowledge Partner ICF

ICAO ENVIRONMENT Private Initiative for SAF - Act for Sky - ACT-SAF

- Establishment of “Act For Sky”  
On 2 March 2022, a voluntary organisation, “ACT FOR SKY”, was launched with JGC HD, Revo INTL, ANA and JAL as lead companies, with the aim of promoting and expanding domestic SAF.
- What is Act For Sky
- Member companies: 24 (as of February 2023)

**CONCEPT**

ACT FOR SKY is an all-Japan initiative aiming to achieve carbon-neutral skies through the promotion and expansion of sustainable aviation fuel (SAF). We will create a movement that crosses the boundaries of the companies directly involved in domestic SAF and the companies and organizations required to build the supply chain. In order to realise the commercialisation, diffusion and expansion of domestic SAF.

ICAO ENVIRONMENT Corporate Buyers' Club for SAF ACT-SAF

- Studying the feasibility and design of a corporate buyers' club to encourage early adopters to take collective action, to aggregate SAF demand and provide stronger demand signals for SAF production and scale-up
  - Tap on business travelers and air cargo users and encourage them to become first movers
  - Potential of collaborating with regional partners to expand the buyers' club to the broader ASEAN region
- As the buyers' club would be the first of its kind in Singapore, need careful assessment of its commercial viability and operating model
- Plan to commence study in second quarter of 2023, which will take around 3 months



For details – ACT-SAF Series #12 Training – <https://www.icao.int/environmental-protection/Pages/ACT-SAF-Series.aspx>



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Merci!

