



Session 7: Case study – Government role/support and transition to SAF at the airports

Second Phase of the ICAO Assistance Project with the EU Funding :
“Capacity Building for CO₂ Mitigation from International Aviation

3 to 5 April 2023
Harare, Zimbabwe

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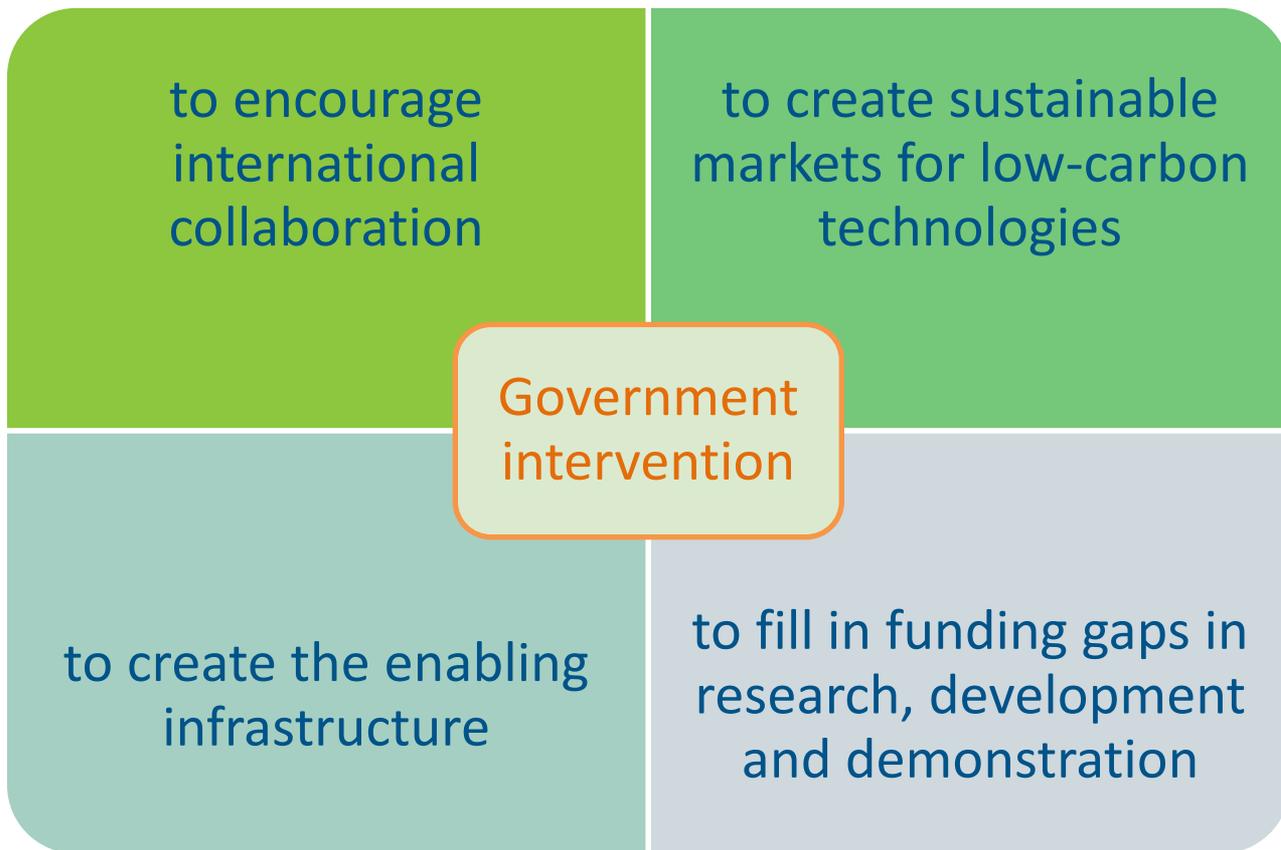


Agenda

1. Practical experiences from States that are developing a policy for SAF
2. ICAO Policies on SAF, and related materials
3. Conclusion



Transition to a low-carbon economy  Government intervention essential





- lack of a global agreed-upon target regarding the amount or share of SAF
- implementing SAF follows different overall targets in different States and regions.
 - policies on climate,
 - energy security,
 - agriculture and
 - economy;
- A wide variety of policy instruments and measures are available to reduce GHG emissions





01. Practical experiences from States that are developing a policy for SAF





- Brazil has a long and rich tradition of biofuel production.
 - The first governmental program to foster production dates to the 1970's.
- Today, blending ethanol and biodiesel in fossil fuel is mandatory for ground transportation.
 - 27% blending for gasoline and 10-12% for diesel, respectively.
- Brazil is one of the largest biofuel producers in the world and is widely recognized as a model for sustainable and efficient biofuel production.





- April, 2021 – The Ministry of Mines and Energy instituted the Technical Committee – Fuel for the Future:
 - Multidisciplinary Committee – integrated clean energy policy in Brazil (SAF, maritime and ground transportation)
 - Subcommittees for thematic areas.
- 6 months of intensive work: public consultation, workshops and wide discussion with stakeholders.
- The final conclusion was drafted by the Ministry of Mines and Energy with the support of ANAC in matters related to SAF.





1 MANDATE

ESTABLISH A MANDATE TO REDUCE EMISSIONS FROM THE AIRLINE INDUSTRY

ALLOW ALL TECHNOLOGICAL ROUTES APPROVED BY ASTM AND ANP

ALLOW DIFFERENT SAF LEVELS IN ANY PART OF THE NATIONAL TERRITORY

EXEMPT INTERNATIONAL SEGMENTS OF INTERNATIONAL FLIGHTS, RESPECTING THE RECIPROCALITY OF INTERNATIONAL AIR TRANSPORT AGREEMENTS

PROVIDE FLEXIBILITY TO CNPE

ENABLE AIRPORTS FOR THE USE OF SAF, CONSIDERING AS CRITERIA THE DEVELOPMENT OF SAF PRODUCTION AND LOGISTICS CHAINS, AIRPORT DEMAND AND THE AVAILABILITY OF RAW MATERIAL

ENABLE THE APPLICATION OF "BOOK & CLAIM" FOR SPECIFIC CASES

2 GOALS OF DECARBONIZATION AND CORSIA

ASSIGN CBIO PURCHASE TARGETS TO JETFUEL DISTRIBUTORS

EVALUATE THE POSSIBILITY OF ALIGNING RENOVABIO'S AND CORSIAS' METHODOLOGIES REGARDING SAF

ACCOUNT FOR SAF-ONLY EMISSION REDUCTIONS, WHETHER DOMESTIC OR IMPORTED

3 PROJECT FINANCING AND RD&I

REGULATE ARTICLE 3, I OF LAW N. 14.248/2021 (FEDERAL INCENTIVE)

STRUCTURE SAF FINANCING LINES THROUGH BNDES

EXTEND SAF INCENTIVES TO GREEN DIESEL IN ORDER TO DEVELOP BIOREFINERIES

ESTABLISH GOVERNMENT GUIDELINES FOR PROJECT AND RD&I FUNDING

ASSESS THE STRUCTURING OF A GUARANTEE FUND WITH THE PARTICIPATION OF THE NATIONAL TREASURY FOR INVESTMENT PROJECTS IN SAF

4 TAXATION

CREATE TAX CLASSIFICATION FOR SAF (PURE AND BLENDED)

DEFINE RULES FOR "ICMS" REGARDING SAF (PURE AND BLENDED)

REGULATE ARTICLE 3, II OF LAW N. 14.248/2021 (PIS/COFINS)

EVALUATE THE FEASIBILITY OF ENCOURAGING THE USE OF RAW MATERIAL FROM FAMILY FARMING

5 QUALITY AND CERTIFICATION

EVERY SAF MUST COMPLY WITH ASTM AND ANP SPECIFICATIONS

CREATE SAF QUALITY MONITORING PROGRAM

CREATE INCENTIVES FOR THE FORMATION OF A NETWORK OF ACCREDITED LABORATORIES

ESTABLISH A PROCESS OF QUALITY AUDITS AND CERTIFICATIONS

6 GOVERNANCE AND OTHER TOPICS

INSERT DEFINITION OF SAF IN LAW NO. 9,478/1997

CREATE SAF EXPORT INCENTIVES

DEBUREAUCRATIZE AND OPTIMIZE ENVIRONMENTAL LICENSING REQUESTS FOR SAF

DEFINE CNPE, ANP AND SAC'S RESPONSIBILITIES REGARDING PUBLIC POLICIES ON SAF





After several months of discussions, with the participation of stakeholders from research centers, the industry (OEMs, airlines, airports, fuel producers, feedstock producers) and government institutions, a comprehensive public policy to foster SAF in Brazil was proposed.

1. It is essential to bind the public policy to emission reductions.
2. It should be technology and feedstock neutral.
3. Holistic approach: coproducts for ground transportation.
4. The mandate is only one of the public policy's tools available – integrated approach.



- Aviation task force was created within the second phase of the national research network **BioFuelNet** Canada (BFN), which targeted strategic areas in research such as SAF and forestry-based fuel production.
- The network looked at the barriers to advanced biofuels production, such as policy and availability of suitable and inexpensive feedstock.
- mandate is to mobilize Canada's agricultural sector to commoditize biomass for bioenergy and bioproducts, to benefit agricultural producers in all regions of Canada, while mitigating and adapting to a changing climate.





✓ Two key initiatives in Japan

- SAF Roadmap and Utilization target in 2030
- Amendment of the Civil Aeronautics Act to promote decarbonisation

The roadmaps for promoting decarbonisation 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



- JCAB established the **Carbon Neutrality Promotion Office** in April, 2022, to reinforce organizational structure dealing with aviation sustainability issues.
- 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.
- Accelerating actions in the roadmaps, JCAB has established public-private councils.

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



1. JCAB believes that it is important to have a bilateral or multilateral relationship with certain states in order to increase the use of SAF among them.
2. In this sense, we are exploring possible relationships around the world to realize our vision with some policy coordination.
3. JCAB welcomes any states or organizations on board, to make this world a better place in light of the NCLB principle.



- Biofuels initiative of the aviation industry was started in 2011, combining the engagement and know-how of airlines, airports, research organizations and companies in the aviation and feedstock industries.
- The objective of the **Aviation Initiative for Renewable Energy** in Germany e.V. (AIREG) is to support the production and use of SAF, with a bio jet target of 10 per cent of the jet fuel consumed domestically by 2025 (AIREG, 2016).



- Germany's federal and state governments, with backing from industry, have agreed a **roadmap** that commits to the development of e-fuels – power-to-liquids (PtL) – for the aviation sector.

*The goal of the roadmap is to create the basis for producing at least **200,000 tons of sustainable e-kerosene annually by 2030** for the German aviation sector.*



- In 2017, France set itself the ambitious objective of achieving carbon neutrality by 2050.
- France's roadmap - climate change mitigation policy: the **National Low-Carbon Strategy**, April 2020
- New French Energy and Climate Strategy for mid 2024 roadmap to achieve carbon neutrality by 2050 & to ensure our adaptation to climate change impacts
- **Roadmap for the deployment of SAF in France published in January 2020**

	2025	2030
Roadmap objectives	2%	5%
Quantity of kerosen uplifted in France (Mt)*	8,2	8,8
Quantity of blended SAF (Mt)	0,16	0,43



Moving toward industrialisation requires collaborative work from the transport, energy and industry sectors

- Mid-February 2023 : high level task force on SAF launched by 3 Ministers
- SAF value-chain stakeholders' consultation on-going
- To identify roadblocks to be removed and to draw adequate measure(s) to be implemented in order to support the development of a SAF production value chain at an industrial level

Lessons learned

- SAF is a challenging cross-sectoral topic to address
- For investments to be made : regulation continuity and harmonisation are paramount, at national / Regional / Global levels
- Enhanced consultation of all stakeholders (from energy to airlines) is key
- Technology neutral approach is important



- Indonesia State Action Plan —→ 2013
- August 2014, the **Aviation Biofuels and Renewable Energy Task Force** was created, composed of four “sub task forces”

formulation of
policy, regulation
and capacity-
building programme

research and
development

Testing and
certification

commercial, risk
analysis and
sustainability

- Ministry of Energy and Mineral Resources established a bio jet fuel mandate at the national level, requiring 2 per cent blending in 2016, 3 per cent by 2020, and 5 per cent by 2025.



- Indonesia's oil producers have shown their commitment to starting production by late 2018, with a production capacity of 257,000 kl/year (ICAO GFAAF, 2017).
- Now, the NEMR Regulation 12/2015 requires the aviation industry to use 2 per cent alternative fuels by 2018, 3 per cent by 2020 and 5 per cent by 2025



- Since 2009, the Ministry of Transportation and Communications foster the development of SAF and coordinating actions towards the establishment of this industry at the national level

The Flight Plan initiative aimed at:

- Leading the national efforts of civil, public, private and research institutions in the development and production of aviation biofuels
- Analysing the legal framework, raw materials availability, refining infrastructure and the economic viability of aviation biofuels
- Integrating the talents of all participating sectors.

Mexican targets supporting the initiative are seeking an aviation biofuels production covering 1% of the national demand in 2015 and 15% in 2020.



The Flight Plan initiative concluded :

- great opportunities for SAF in Mexico, with a strong interest from all stakeholders in participating in the initiative.
- Sustainability appeared as a key, and the main bottlenecks identified were the insufficient production of the required quantities of feedstock and the lack of appropriate legislation and a biorefining infrastructure.
- As an outcome, it is expected that by 2020, with the right funding structure in place, four SAF refineries will be operating, producing 800 megalitre (ML) of SAF per year.
- Additionally, the Flight Plan made it possible for ASA (the single jet fuel supplier in the State) to get involved in the whole SAF supply chain, which allowed the first flights with alternative fuels in Mexico to be carried out



Singapore is exploring initiatives to improve sustainability of airlines operating to, from and through Singapore

Necessary to take multi-pronged ecosystem approach to make SAF viable





- CAAS partnered with Singapore Airlines (SIA), Temasek, CAG, ExxonMobil and Neste to conduct SAF pilot at Changi Airport:
 - First step to validate Changi's supply chain readiness for SAF
 - Understand demand for SAF credits by customers
- SAF was first uplifted onto SIA flight on 7 Jul 2022, via Changi Airport's fuel hydrant system
- Started sale of SAF credits in Jul 2022
 - Allow corporate and individual travelers to reduce carbon footprint



TEMASEK



ExxonMobil

NESTE



- Changi Airport needs to develop a long-term secured supply of SAF to boost the availability and affordability of SAF, to support increased adoption by its airlines
- Developing a roadmap to create a long-term SAF supply in Singapore and the region
 - Build up SAF supply chain, validate regional feedstock to align with global standards and encouraging investments in new SAF pathways
- Singapore is participating in a Southeast Asia (SEA) feedstock study led by Boeing and Roundtable on Sustainable Biomaterials (RSB), alongside other key stakeholders from the aviation, energy, agricultural and financial sectors
 - Identify sustainable SAF feedstock potential in ASEAN countries, key sustainability risks, and opportunities for each feedstock and country
 - Cross-sectoral stakeholder group from across ASEAN involved
 - Study will take into account ICAO's standards and guidance material on CORSIA Eligible Fuels
 - Estimated to take around 15 months, with results in first quarter of 2024





- SAF is a challenging cross-sectoral topic to address
- For investments to be made : regulation continuity and harmonisation are paramount, at national / Regional / Global levels
- Enhanced consultation of all stakeholders (from energy to airlines) is key
- Technology neutral approach is important
- It is essential to bind the public policy to emission reductions.
- Holistic approach: coproducts for ground transportation.
- The mandate is only one of the public policy's tools available – integrated approach.



02. ICAO Policies on SAF, and related materials





ICAO has international policies applicable to SAF

CORSA	2050 ICAO Vision for Sustainable Aviation Fuels	Long term Aspirational goal (LTAG)
<ul style="list-style-type: none">An aeroplane operator can reduce its CORSIA offsetting requirements through the use of CORSIA Eligible Fuels (CEF)Includes international approaches for sustainability and life cycle assessment of fuels	<p>Calls for a significant proportion of SAF use by 2050, and a level-playing field with other sectors</p> <p>To be reviewed in CAAF/3 (2023)</p>	<p>Largest aviation CO₂ emissions reductions to come from fuel-related measures</p> <p>LTAG agreement (A41-21) includes aspects related to policy planning, regulatory framework, implementation support, and financing</p>



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



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 State

Guidance document

https://www.icao.int/environmental-protection/Pages/saf_guidance_potential_policies.aspx



What defines an effective SAF policy? (1/2)

Three key themes influence policy effectiveness:

1. **Feasibility:** practicable and easy to implement
2. **Effectiveness:** successful in producing a desired result
3. **Practicality:** the policy targets the outcome rather than a theory or set of ideas



What defines an effective SAF policy? (2/2)

To be effective, SAF policies/programmes should be

- **Stable**, predictable and consistent in implementation
- Be of a **sufficient duration** to reflect project development timelines
- Be “**stackable**” with other incentives – i.e., allowing credit to be received from multiple reinforcing incentives at the same time is helpful
- Be **technology-neutral**
- Link **incentives to performance**
- Allow access to a **compliance credit market** to mediate prices between renewable fuels and fossil fuels by ascribing a compliance value
- Recognize **needs of pre-revenue companies** through clear access to non-dilutive capital via grants and loans.
- **Ambitious** to support aviation decarbonisation and **drive further innovation**
- Ideally, be national in **scope** to allow innovation and project development where it can be accomplished most effectively
- Designed with **broad political support** to avoid sudden policy reversals.
- **Customized** to the specific circumstances of the State



Guidance provides details on 28 types of 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 o expand SAF supply infrastructure	3 - Targeted incentives and tax relief to assist SAF facility operation	4 - Recognition and valorization of SAF environmental benefits
1.1 - Government R&D 1.2 - Government demonstration and deployment	2.1 - Capital grants ; 2.2 - Loan guarantee programs 2.3 - Eligibility of SAF projects for tax advantaged business status ; 2.4 - Accelerated depreciation/‘bonus’ depreciation 2.5 - Business Investment Tax Credit (ITC) for SAF investments 2.6 - Performance-based tax credit 2.7 – Bonds / Green Bonds	3.1 Blending incentives: Blender’s Tax Credit 3.2 – Production incentives: Producer’s Tax Credit 3.3 - Excise tax credit for SAF 3.4 - Support for feedstock supply establishment and production	4.1 – Recognize SAF benefits under carbon taxation 4.2 - Recognize SAF benefits under cap and-trade systems 4.3 - Recognize non-carbon SAF benefits: improvements to air quality 4.4 - Recognize non-carbon SAF benefits: reduction in contrails

Impact area: Creating Demand for SAF

5- Creation of SAF mandates	6 - Update existing policies to incorporate SAF	7 – Demonstrate government leadership
5.1 - Mandate renewable energy volume requirements in the fuel supply 5.2 - Mandate reduction in carbon intensity of the fuel supply	6.1: Incorporating SAF into existing national policies 6.2: Incorporating SAF into existing subnational, regional or local policies	7.1 Policy statement to establish direction 7.2: Government commitment to SAF use, carbon neutral air travel

Impact area: Enabling SAF Markets

8 - Market enabling activities
8.1 - Adopt clear and recognized sustainability standards and life cycle GHG emissions methods for certification of feedstock supply and fuel production 8.2 - Support development/recognition of systems for environmental attribute ownership and transfer 8.3 - Support SAF stakeholder initiatives



Tracker of Policies adopted or under development to foster SAF development

Date	State	Policy Title	Policy Description	Status	Source
13 fevr. 2023	United States	Invest in Illinois Act	This legislation in Illinois provides a tax credit of \$1.50 per gallon for SAF used by aircraft in the state. For the SAF to qualify for the credit, it must reduce carbon emissions by at least 50% throughout its life. The credit applies to all SAF used in Illinois, regardless of where it is produced. However, credits for SAF used before June 1, 2023, must come from renewable sources such as biomass, waste streams, renewable energy, or gaseous carbon oxides. The tax credit will be available until January 1, 2033.	adopted	https://www.sustainable-aviation.com
16 nov. 2022	India		SAF mandate blending under consideration	under development	https://www.committed-partnership.com
18 oct. 2022	Japan		The Japanese government is seeking public comments on a draft policy to promote decarbonization in the aviation industry. The policy, in part, would require flights to be carbon neutral by 2050 and require airlines to use sustainable aviation fuel (SAF).	under development	https://bigpictureaviation.com
3 oct. 2022	China	China Civil Aviation Green Development Policy and Action	Target of 50k tons of SAF use by 2025 SAF performance testing, airworthiness certification, exploration of new paths for its development.	adopted	http://www.caa.gov.cn/xxwfb/202210/15425.html
16 août 2022	United States	Inflation Reduction Act (SAF blenders tax credit)	The bill provides a \$1.25 per-gallon credit for each gallon of SAF sold as part of a qualified fuel mixture, including that it has a demonstrated lifecycle greenhouse gas (GHG) reduction of at least 50 percent compared to conventional jet fuel. The credit, available for two years beginning January 1, increases up to \$1.75 per gallon on a sliding scale based on the percentage of lifecycle GHG emissions reduced beyond 50 percent. Beginning in 2025, SAF would be eligible for credits up to \$1.75 per gallon under a new Clean Fuel Production Credit (CFPP). That credit is set to expire at the end of 2027.	adopted	https://www.aviation2025.com
19 jui. 2022	United Kingdom	Jet Zero Strategy	Increasing support for sustainable aviation fuels (SAF), by creating secure and growing UK SAF demand through a SAF mandate that will require at least 10% of jet fuel to be made from sustainable sources by 2030 and kickstarting a domestic SAF production industry by 2025.	adopted	https://www.sets-out-strategy.gov.uk

Environmental Policies on Aviation Fuels

The following map and table provides a summary of the policies (adopted and under development) to foster the use of Sustainable Aviation Fuels and Lower Carbon Aviation Fuels.

- COUNTRY
- DATE
- STATUS
- POLICY TITLE
- LATEST LINK
- POLICY TYPE
- POLICY DESCRIPTION

Map Satellite

Greenland, Iceland, Sweden, Finland, Norway, United Kingdom, Poland, Ukraine, Kazakhstan, Mongolia, Russia, Turkey, Iraq, Iran, Afghanistan, Pakistan, China, South Korea, Japan, Thailand, India, Indonesia, Papua New Guinea, Australia, New Zealand, South Africa, Madagascar, Botswana, Namibia, Angola, Tanzania, Kenya, Ethiopia, Sudan, Chad, Niger, Mali, Nigeria, South Arabia, Egypt, Libya, Algeria, Venezuela, Colombia, Peru, Bolivia, Brazil, Chile, Argentina, Mexico, United States, Canada.

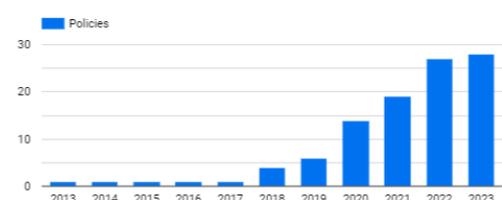
South Atlantic Ocean, Indian Ocean, North Pacific Ocean, North Atlantic Ocean, South Pacific Ocean.

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Status ● under development ● adopted





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THANK YOU