THE REGULATORY FRAMEWORK FOR S.A.F.

ISA WORKSHOP DEC. 12 2025
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AGENDA

I – Different levels of SAF regulations:

- France
- EU
- ICAO
- Other jurisdictions

II – Combination with existing regulatory schemes

- SAF and EU-ETS
- SAF and CORSIA

KEY REMINDERS

a – Legislation / regulation may be enacted by:

- national lawmakers: gov, parliament
- EU (directives – regulations)
- international institutions → ICAO standards
- IATA → is not a law maker

b – Regulating a new product or concept implies:

- to define that concept as precisely as possible (i.e. answer the question what are SAF?)
- to provide for a corresponding legal regime.

SAF DEFINITION

Def. EU reg. 2023/2405 "ReFuelEU Aviation" → 3 categories

(7) 'sustainable aviation fuels' ('SAF') means aviation fuels that are either:

(a) synthetic aviation fuels; → Non biological origin / produced with low-carbon energy. "Power-to-Liquid / e-fuels"

(b) aviation biofuels; or → Biological origin. Include biofuels (used oils / animal greases) & advanced biofuels.

(c) recycled carbon aviation fuels; → Produced from liquid or solid waste streams of non-renewable origin.

I – DIFFERENT LEVELS OF SAF REGULATION

a – <u>the French level</u>

- 2017 – commitment for green growth: State/Airbus/Total/Safran → 2020 roadmap for SAF foreseeing minimum SAF incorporation to fossil fuels (2 % - 5 %) later reiterated in ReFuelEU reg.
- 2022 – incentive tax for the use of SAF (TIRUERT) = obligation to incorporate SAF to reduce taxation, or to buy renewable energy certificate.

→ Replaced by ReFuelEU mechanisms ; sanctions for breach of ReFuelEU are provided for by Code de l'Environnement art. L. 229-81 s.

I – DIFFERENT LEVELS OF SAF REGULATION

b – the EU level

- 2018 – EU directive 2018/2001 on renewable energies (RED II) amended in 2023 (RED III) and 2024 sets out targets for the production and the use of renewable energies. Is not limited to transport / aviation but also applies to industry in general and construction. Annex IX defines precisely the sources of biofuels and advanced biofuels (referred to by ReFuelEU reg).

- 2023 – ReFuelEU Aviation – regulation n° 2023/2405 – part of the "Fit for 55" legislative package - intermediate step (reduce net CO2 emissions by 55% relative to 1990 level) on the path to EU being carbon neutral in 2050.
In "Fit for 55" also measures on maritime sector (FuelEU maritime regulation).

I – DIFFERENT LEVELS OF SAF REGULATION

b – <u>the EU level</u>

- ReFuelEU regulation is now the main legal instrument regulating SAF.

- It's into force since Jan. 1st 2025.

- It applies within the scope of the 27 State members (but applies also to non-EU operators).

- It's fully binding → breaches are sanctioned by domestic legislation (administrative fines by DGDDI / DGAC).

- No need for domestic transposition measures (self-sufficient legislation).

I – DIFFERENT LEVELS OF SAF REGULATION

b – the EU level

ReFuelEU in a nutshell:

→ impose a progressive increase of SAF use (to be blended in traditional aviation fuels) from 2 % in 2025 to 70 % in 2050.

→ distinguishes between SAF in general (all kind) and synthetic aviation fuels and defines respective share.

→ impose obligations on
a – fuel suppliers
b – airport operators
c - airlines

I – DIFFERENT LEVELS OF SAF REGULATION

b – the EU level

Players in scope of ReFuelEU?

→ Fuel suppliers (def. RED II): *means an entity supplying fuel to the market that is responsible for passing fuel through an excise duty point.*

→ Airports: located on the EU territory AND have passenger traffic > 800 000 pax/y or freight flow > 100 000 t/y → in France 17 airports / 92 % outgoing traffic.

→ Aircraft operators (airlines): operators performing at least 500 commercial passenger air transport flights, or 52 commercial all-cargo air transport flights departing from Union airports.

I – DIFFERENT LEVELS OF SAF REGULATION

In scope 2024 airports' list

<u>Outermost regions are excluded</u>

FRANCE	
ICAO Code	*Airport Name*
LFKJ	Ajaccio
LFSB	EuroAirport Basel Mulhouse Freiburg
LFKB	Bastia-Poretta
LFOB	Beauvais-Tillé
LFBZ	Biarritz
LFBD	Bordeaux-Merignac
LFKF	Figari-Sud Corse
LFQQ	Lille
LFLL	Lyon
LFML	Marseille Provence
LFMT	Montpellier-Méditerrannée
LFRS	Nantes Atlantique
LFMN	Nice Côte D'Azur
LFPO	Paris Orly
LFPG	Paris Charles de Gaulle
LFST	Strasbourg
LFBO	Toulouse-Blagnac

I – DIFFERENT LEVELS OF SAF REGULATION

In scope 2024 operators' list (part)

FRANCE		
CRCO Identification number	*Operator Name*	*State of the Operator*
186	AIR ALGERIE	ALGERIA
35192	AIR ARABIA MAROC	MOROCCO
29420	AIR AUSTRAL	FRANCE
29815	AIR CAIRO	EGYPT
30304	AIR CARAIBES	FRANCE
10054	AIR CORSICA	FRANCE
227	AIR FRANCE	FRANCE
28019	AIR PINK D.O.O.	SERBIA
45224	AIR SENEGAL	SENEGAL
5633	AIR TRANSAT	CANADA
24094	AIRBUS TRANSPORT	FRANCE
5117	ALL NIPPON AIRWAYS	JAPAN
369	AMERICAN AIRLINES	UNITED STATES
406	ARKIA ISRAEL AL	ISRAEL
27518	ASL AIRLINES	FRANCE
38485	ASTONJET	FRANCE
36972	AZUL LINHAS AEREAS	BRAZIL
29453	CHALAIR AVIATION	FRANCE
39240	CHANNEL ISLANDS JET SERVICES LTD	UNITED KINGDOM
29834	CHINA CARGO AIRLINES	CHINA
12141	CHINA EASTERN	CHINA

I – DIFFERENT LEVELS OF SAF REGULATION

b – the EU level

Obligations under ReFuelEU?

→ Fuel suppliers - *shall ensure that all aviation fuel made available to aircraft operators at each Union airport contains the minimum shares of SAF, including the minimum shares of synthetic aviation fuel in accordance with the values and dates of application set out in Annex I.*

Where an aviation fuel supplier fails to supply the minimum shares set out in Annex I for a given reporting period, it shall at least complement that shortfall in the subsequent reporting period + sanctions

I – DIFFERENT LEVELS OF SAF REGULATION

b – the EU level

Minimum and average shares of SAF and synthetic aviation fuels?

Period 1- 2 % – 2025/2029 - (a) From 1 January 2025, each year a minimum share of 2 % of SAF;

I – DIFFERENT LEVELS OF SAF REGULATION

b – the EU level

Minimum and average shares of SAF and synthetic aviation fuels?

Period 2 – 6 % - 2030 – 2034 – requirement for average and minimum share of synthetic aviation fuels

(b) From 1 January 2030, each year a minimum share of 6 % of SAF, of which:

(i) for the period from 1 January 2030 until 31 December 2031, an average share over the period of 1,2 % of synthetic aviation fuels, of which each year a minimum share of 0,7 % of synthetic aviation fuels;

(ii) for the period from 1 January 2032 until 31 December 2034, an average share over the period of 2,0 % of synthetic aviation fuels, of which each year a minimum share of 1,2 % from 1 January 2032 until 31 December 2033 and of which a minimum share of 2,0 % from 1 January 2034 until 31 December 2034 of synthetic aviation fuels;

I – DIFFERENT LEVELS OF SAF REGULATION

b – the EU level

Minimum and average shares of SAF and synthetic aviation fuels?

Period 3- 20 % 2035/2040

(c) From 1 January 2035, each year a minimum share of 20 % of SAF, of which a minimum share of 5 % of synthetic aviation fuels;

Period 4- 34 % 2040/2045

(d) From 1 January 2040, each year a minimum share of 34 % of SAF, of which a minimum share of 10 % of synthetic aviation fuels;

Period 5 - 42 % 2045/2050

(e) From 1 January 2045, each year a minimum share of 42 % of SAF, of which a minimum share of 15 % of synthetic aviation fuels;

Period 6- 70 % 2050 +

(f) From 1 January 2050, each year a minimum share of 70 % of SAF, of which a minimum share of 35 % of synthetic aviation fuels.

I – DIFFERENT LEVELS OF SAF REGULATION

b – the EU level

Obligations under ReFuelEU?

→ Aircraft operators (airlines) – the anti-fuel "tankering" rule.

Fuel "tankering" is a practice whereby an aircraft carries more fuel than required for its flight in order to reduce or avoid refuelling at the destination airport.

Ex – Turkish Airlines flies IST-TLS and uplift at IST fuel for both legs, avoiding refuelling in TLS where ReFuelEU minimum shares apply…

ReFluelEU apply to all fuel uplifted by aircraft operators at Union airports, for both intra-EU and extra-EU flights, conducted by both EU and non-EU aircraft operators

I – DIFFERENT LEVELS OF SAF REGULATION

b – the EU level

Obligations under ReFuelEU?

→ Aircraft operators (airlines) – obligation to use SAF applies to all flights departing from EU, whatever the nationality of the airline → based on the anti-fuel "tankering" rule:

Art 5 - *The yearly quantity of aviation fuel uplifted by a given aircraft operator at a given Union airport shall be at least 90 % of the yearly aviation fuel required.*

Yearly aviation fuel required means the amount of aviation fuel referred to as 'trip fuel' and 'taxi fuel' in Annex IV to Commission Regulation (EU) No 965/2012 (14) that is necessary to operate all the flights covered by this Regulation operated by an aircraft operator, departing from a given Union airport, over the course of a reporting period;

I – DIFFERENT LEVELS OF SAF REGULATION

b – the EU level

Obligations under ReFuelEU?

→ Aircraft operators (airlines) – the anti-fuel "tankering" rule

- Ex: CDG to JFK operated by Delta – fuel needed is 50t → at least 40t have to be uplifted in Paris with SAF blended share.

- the threshold 90 % is assessed on a yearly basis.

- possible derogations for safety reasons (necessary to uplift more fuel at dept outside EU) or due to specific reasons (SAF not available in remote airports / much more expensive in certain airports) → applies to short flights only + derogations have to be cleared by authority

I – DIFFERENT LEVELS OF SAF REGULATION

b – the EU level

Obligations under ReFuelEU?

→ Aircraft operators (airlines) – the anti-fuel "tankering" rule

- sanctions: non-compliant airlines will pay fines: 2 to 5 times the price of aviation fuel ton x quantity of SAF not uplifted.

Previous example: if Delta uplifts only 20 tons instead of 40 tons:

/ min fine: 20t x 2 x 735€ = 29 400 €

/ max fine: 20t x 5 X 735€ = 73 500 €

I – DIFFERENT LEVELS OF SAF REGULATION

b – the EU level

Obligations under ReFuelEU?

→ Airports: *shall take all necessary measures to facilitate the access of aircraft operators to aviation fuels containing minimum shares of SAF in accordance with this Regulation.*

→ Airports below the threshold 800 000 passengers ? Do not fall under ReFluelEU → LCC may operate from Carcassonne or Tarbes to circumvent obligations.

I – DIFFERENT LEVELS OF SAF REGULATION

c – the ICAO level

Reminder: ICAO groups 193 States under the Chicago convention on civil aviation → establishes mandatory standards (SARPs) in 19 annexes.

- No mandate for the use of SAF under ICAO legislation.

- ICAO promotes SAF and has created number of working groups / initiatives.

- Regulatory SAF framework is embedded in CORSIA programme, where the use of SAF reduces the offsetting obligations of aircraft operators (see *infra part 2*)

I – DIFFERENT LEVELS OF SAF REGULATION

d – <u>SAF in others jurisdiction?</u>

→ The "UK SAF mandate"

- Classifies SAF in 3 main categories.
- Creates obligations on fuel suppliers only.
- Mandate: 2% (2025) → 10 % (2030) → 22 % (2040) / will remain at that level "*until there is greater certainty regarding SAF supply*" (UK gov.)
- Synthetic SAF (power-to-liquid fuels PtL): 0.2% of total jet fuel demand and will increase to 0.5% by 2030 and 3.5% in 2040.

- Main differences with ReFuelEU? Does not create obligation on operators.

I – DIFFERENT LEVELS OF SAF REGULATION

d – <u>SAF in others jurisdiction?</u>

→ The US SAF policy relies both on the Inflation Reduction Act (Biden administration), federal investments, and state initiatives.

- US tend to favour biomass fuels crop-based such as corn / sugarcane.

- Significantly different approach:
  - incentives for the use of SAF instead of creating obligations on parties,
  - loans
  - subsidies
  - tax credit

→ New Trump adm. rolls back IRA measures as part of deregulatory environmental agenda, dismantlement is not total.

I – DIFFERENT LEVELS OF SAF REGULATION

d – SAF in others jurisdiction?

→ Other countries plan to implement SAF production targets (China) or blend-use mandates (Japan)

→ Ambition almost never exceed 1% or 2% at horizon 2030…

→ Australia / NZ have no significant SAF policy…

I – DIFFERENT LEVELS OF SAF REGULATION

Source: Carbon Target June 2025

Approved/confirmed**		
Brazil	Mandate	1% GHG reduction in 2027, 3% by 2030, 10% by 2037 (domestic flights)
Singapore	Target	1% by 2026, 3-5% by 2030 non-binding target
Proposed***		
Japan	Mandate	10% by 2030 with 50% GHG savings
Malaysia	Mandate	1% by 2027, 47% by 2050
Turkey	Mandate	1% in 2025, 5% by 2030 (international flights)
Indonesia	Mandate	1% by 2027, 2.5% by 2030, 50% by 2060
India	Target	1% in 2027, 2% in 2028, 5% in 2030 non-binding target (international flights)
South Korea	Mandate	1% by 2027 (international flights)
Preliminary or informal target****		
China	Target/Mandate	50,000 tonnes SAF by 2025; industry stakeholders are anticipating a mandate of 5% by 2030
Chile	Target	50% by 2050 non-binding target
Australia	Target	≥10% by 2030 non-binding target
Thailand	Target	1% by 2026, 1-2% by 2030, 8% by 2036 non-binding target
UAE	Target	1% by 2031 voluntary target

II – COMBINATION WITH EXISTING SCHEMES

a – SAF and EU-ETS

- In a nutshell, EU-ETS is a cap-and-trade system applying solely to intra-EEA flights.
- It's based on the allocation of a yearly definite number of CO2 quotas to operators (1quota = 1t CO2).
- If the operator has surplus quotas, it may either use them the following year, or resell them to other emitters,
- If it has not enough quotas to cover its actual emissions, it has to purchase quotas from other emitters or on the market. But the circulation of quotas is limited because their number is capped.

- concretely, every year the operator declares its CO2 emissions and has to surrender the corresponding quotas. If it has not enough quota to return, shall buy or will pay a fine.

II – COMBINATION WITH EXISTING SCHEMES

a – <u>SAF and EU-ETS</u>

- since 2012, SAF used in the EU-ETS perimeter benefit from a zero-emission factor → quotas do not have to be surrendered. In short, the use of SAF reduces the obligation to surrender allocated quotas.

- EU implements incentives since 2024 → 20 million free allowances representing 1,5 bn€ will be available to operators using SAF in the period 2024-2030.

II – COMBINATION WITH EXISTING SCHEMES

a – SAF and EU-ETS

Aircraft operators and their ETS allowance allocations for the use of sustainable aviation fuels in 2024

ETS ID	AIRCRAFT OPERATOR NAME	ETS ALLOWANCES
20514	AEGEAN AIRLINES	8,899
132	AER LINGUS	60,126
3456	AIR ALSIE	2,967
23085	AIR BALTIC CORPORATION	162
10054	AIR CORSICA	2,498
227	AIR FRANCE	254,418
22380	AIR NOSTRUM	2,693
308	AIRBUS SAS	511
24094	AIRBUS TRANSPORT	63,011
27518	ASL AIRLINES	491
27011	ASL AIRLINES BELGIUM	92

II – COMBINATION WITH EXISTING SCHEMES

b – SAF and CORSIA

- in a nutshell, CORSIA is the ICAO net-zero regulatory framework. It is not fully developed but is into force today.

- CORSIA imposes to aircraft operators to compensate their international flights CO2 emissions exceeding a 2019 baseline, by purchasing eligible emissions units (EEU / carbon credit).

- the use of "CORSIA eligible fuels" reduces the operators' offsetting obligations.

- eligible fuels are both

CORSIA lower carbon aviation fuel. A fossil-based aviation fuel that meets the CORSIA Sustainability Criteria under this Volume.

CORSIA sustainable aviation fuel. A renewable or waste-derived aviation fuel that meets the CORSIA Sustainability Criteria under this Volume.

II – COMBINATION WITH EXISTING SCHEMES

b – SAF and CORSIA

3.2 CO_2 offsetting requirements

3.2.1 The State shall calculate, for each of the aeroplane operators attributed to it, the amount of CO_2 emissions required to be offset in a given year from 1 January 2021 to 31 December 2023 prior to consideration of the CORSIA eligible fuels, as follows:

II – COMBINATION WITH EXISTING SCHEMES

b – SAF and CORSIA

3.3 Emissions reductions from the use of CORSIA eligible fuels

3.3.1 The aeroplane operator that intends to claim for emissions reductions from the use of CORSIA eligible fuels in a given year shall compute emissions reductions as follows:

$$ER_y = FCF * \left[\sum_f MS_{f,y} * \left(1 - \frac{L_{CEF}}{LC}\right)\right]$$

where:

ER_y	=	Emissions reductions from the use of CORSIA eligible fuels in the given year *y* (in tonnes);
FCF	=	Fuel conversion factor, equal to 3.16 kg CO_2/kg fuel for Jet-A fuel, Jet-A1 fuel, TS-1 fuel, or No. 3 Jet fuel and 3.10 kg CO_2/kg fuel for AvGas or Jet-B fuel;
$MS_{f,y}$	=	Total mass of a neat CORSIA eligible fuel claimed in the given year *y* (in tonnes), as described and reported in Field 14.b in Table A5-1 from Appendix 5;
L_{CEF}	=	Life cycle emissions value for a CORSIA eligible fuel (in gCO_2e/MJ); and
LC	=	Baseline life cycle emissions values for aviation fuel, equal to 89 gCO_2e/MJ for Jet-A fuel, Jet-A1 fuel, Jet-B fuel, TS-1 fuel, or No. 3 Jet fuel and equal to 95 gCO_2e/MJ for AvGas.

Note 1.— The ratio $\left(1 - \frac{L_{CEF}}{LC}\right)$ *is also referred to as the emissions reduction factor (*ERF_f*) of a CORSIA eligible fuel.*

Offsetting requirement reduction depends on the life cycle emission value of a definite eligible fuel.

Life Cycle Assessment (LCA) is provided by ICAO docs either by default or by given methodology.

KEY-TAKEAWAY

I – No unified regulatory framework at ICAO level.

II – The SAF regulatory landscape is relatively fragmented and complex → challenging to navigate in different set of rule for global airlines.

III – EU and UK mandates are way more ambitious than others jurisdiction.

→ Long way to go…