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Which policies exist, and which would be necessary to promote sustainable aviation fuels?

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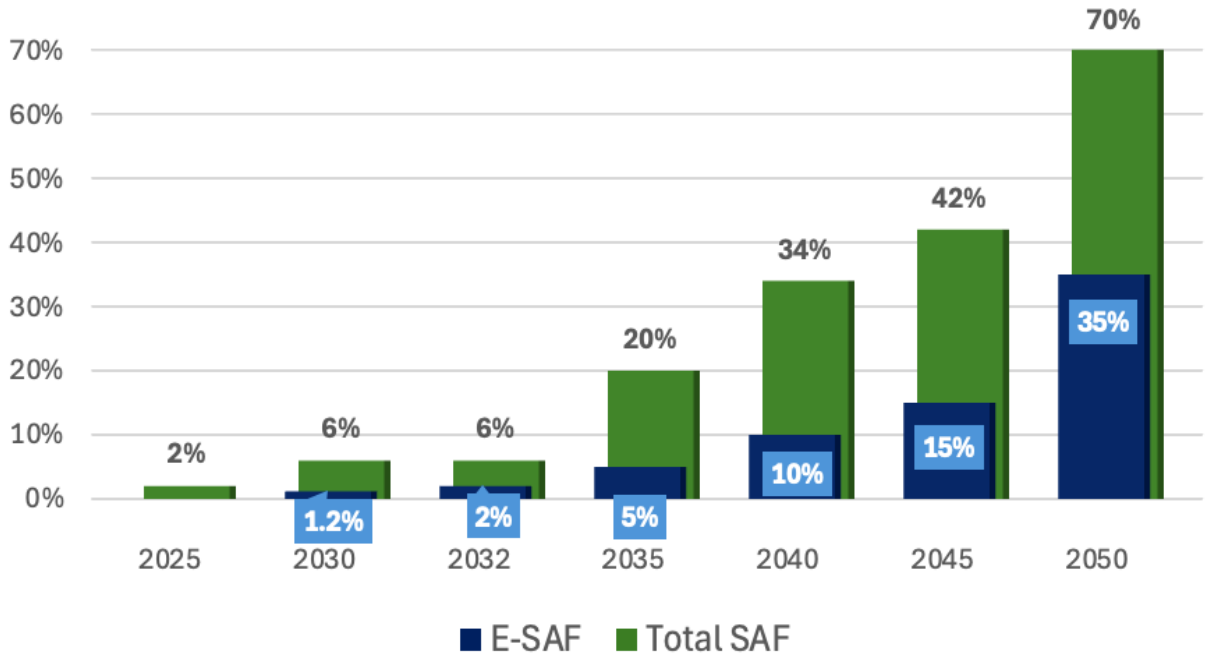
Swiss SAF Regulatory Framework – Overview

- **Revised Swiss CO_2 Act**
  In force since **1 January 2025**; introduces a strong focus on **SAF** for the aviation sector
- **Adoption of EU Regulation 2023/2405 (ReFuelEU Aviation)**
  - Applicable in Switzerland from **1 January 2026**
  - Limited to **Zurich and Geneva** as designated national airports



Source: ReFuel EU Aviation; CO_2 Act Art. 28f

Regulation of aircraft operators, airports & aviation fuel suppliers

Aircraft operators

• **≥90% annual fuel uplift** at Zurich & Geneva (anti-tankering rule) • **Annual reporting** of fuel uplift and SAF use to national and EU authorities • Continued compliance with **Swiss ETS** and **CORSIA**

Airports

• Ensure **SAF-ready infrastructure and operational capacity** • Avoid bottlenecks that could prevent operators from meeting uplift obligations

Aviation fuel suppliers

• **Minimum SAF blending obligation** for fuel supplied at Zurich & Geneva • **Sustainability proof & traceability** (HKN / registry) • **Annual reporting** to national authority

Addressing feedstocks: Regulating sustainability

EU

- **Fixed listing** of which biomass feedstocks are considered sustainable or not (RED III Annex IX, Part A/B)
- **Criteria** for sustainable H2 for e-fuels

→ Relatively **rigid** requirements

- Regulating for the ideal situation may not leave space for experimentation, technology development and cost reductions

CORSIA (ICAO)

- SAF feedstocks and pathways assessed in terms of their **lifecycle emissions**
  - Including emissions from induced land use change (ILUC)
  - Further sustainability criteria (environmental and social) also considered

→ **More flexible** approach

- Stronger focus on **actual aim**: reducing emissions
- Higher technological openness
- Direct **incentive** for lower emissions

General challenges to SAF production

- **Costs, costs costs**
  - High production costs → high cost differential to conventional jet fuel
  - High capital costs → limited investment (long-term stability)

- Availability of sustainable and cost-effective **feedstocks**
  - Including robust and cost-effective value chains for waste biomass

- **Competition** with other sectors
  - Biofuels for road transport
  - Renewable power for other uses
  - NET Technologies (e.g. Biochar, Hydrochar)

→Policy needed to alleviate (but can potentially intensify) these challenges!

Costs of different SAF categories

EC Category	Feedstocks	EU RED/ ReFuel	CORSIA	Price (€/t)	Δ fossil (€/t)
Non-advanced Bio-SAF	Palm, soy, rapeseed, virgin oils + petroleum, corn, sugar beet, sugarcane	⊘	✓	2,085	1,146
Advanced aviation biofuels	C_2–C_5 alcohols from biomass, Ethanol, isobutanol, isobutene (biomass) if residues not food crops, algae, UCO, Cat. 1 & 2 animal fats (not virgin oils), lignocellulosic sugars, bagasse, residues (not food crops)	✓	✓	2,987	2,048
Non-fossil low-carbon hydrogen for aviation	Low-carbon power + water	⊘	✓	5,160	4,426
Non-fossil synthetic low-carbon fuels	Biomass residues	✓	✓	6,078	5,139
Renewable hydrogen for aviation	Renewable power + water	✓	✓	7,800	7,066
Renewable fuels of non-biological origin (RFNBO)	Renewable H_2 (electrolysis) + CO_2 (DAC/point)	✓	✓	8,465	7,526

Sources: Union Database for Biofuels; European Commission Note C/2025/2934

Addressing costs: Financial incentives from policy

EU (and Swiss CO2 Act, Art. 28g)

- **Penalty** for non-compliance with quota
  - >2x price differential SAF vs kerosene
  - supplying the shortfall in next period
  - → ok in theory, but what if insufficient supply?

- **Support** for SAF uptake
  - 20 million SAF allowances from the EU ETS to cover price differential; only until 2030
  - Zero emissions and allowance surrendering
  - Strict limits (and penalties) for tankering

- **De-risking** measures
  - Innovation Fund, InvestEU, Horizon
- **Policy review in 2027** → adds uncertainty

CORSIA (ICAO)

- SAF as **alternative to offsets**
  - Cost of SAF vs price of offsets!
  - → incentive too low

Policy Optionen today

Stay strict **or**

- Keep high penalties
- Signaling that 2027 Review is not the end of SAF und e-SAF quotas
- Stronger support for producers
  - Depending on clean electricity, CO_2 delivery, other resources
    - High risk: not available in time
    - Financial **security mechanisms** needed
  - **Purchase guarantees**

Flexibilization of mandates

- Book-and-Claim System (certificate trade)
  - Increases flexibility, decreases cost & CO_2
  - Governance und market design crucial
  - System level: Nationally? Europe? Globally? – Risk of fraud (Wissner & Graichen 2025)
- Instead of e-SAF: Allow kerosene with DACCS (e.g. CDR-Certificates)
  - Risk: Incentives for e-SAF production reduced

Additionally

- Reduce non-CO_2 emissions
- Increase ticket prices

Thank you