SABA EDUCATION SERIES

Module SAF Basics

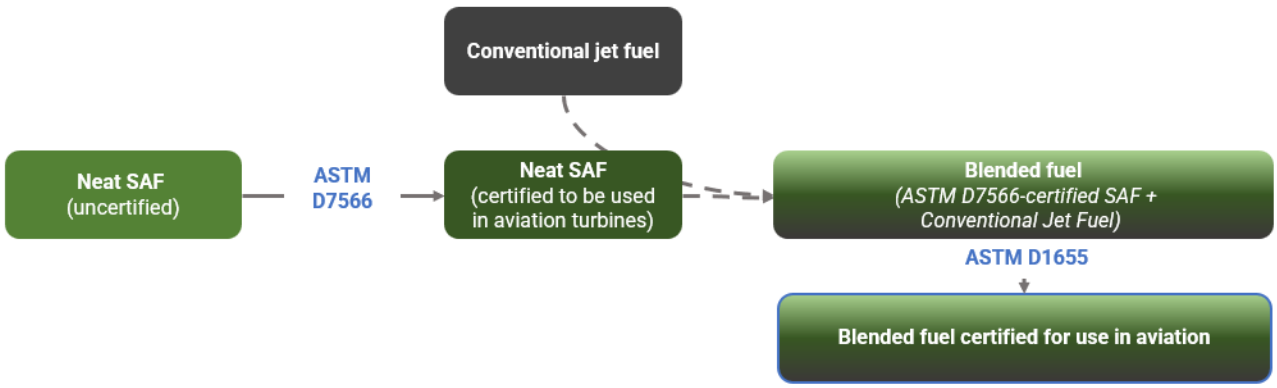
Topic Technical and Sustainability Certification

Introduction

Sustainable aviation fuel (SAF) must meet the same technical and safety standards as conventional jet fuel to be eligible for use as a "drop-in" fuel in existing aircraft engines. The standard regulating the technical certification of SAF is ASTM D7566[1] [1].

After SAF has been blended with conventional jet fuel (currently permitted up to a 50% blend ratio), the blended fuel is recertified by ASTM D1655 [2], which certifies all the world's jet fuel prior to usage.

Exhibit 1: Technical and safety certification of SAF



1 ASTM is an international standards organization that develops and publishes technical standards for a wide range of materials, products, systems, and services. ASTM's standard sets requirements for criteria such as composition, volatility, fluidity, combustion, corrosion, thermal stability, contaminants, and additives1, to ensure that the fuel is compatible when blended.

In addition to technical safety, SAF should also be certified for sustainability in accordance with a credible sustainability standard. Sustainability certification ensures that:

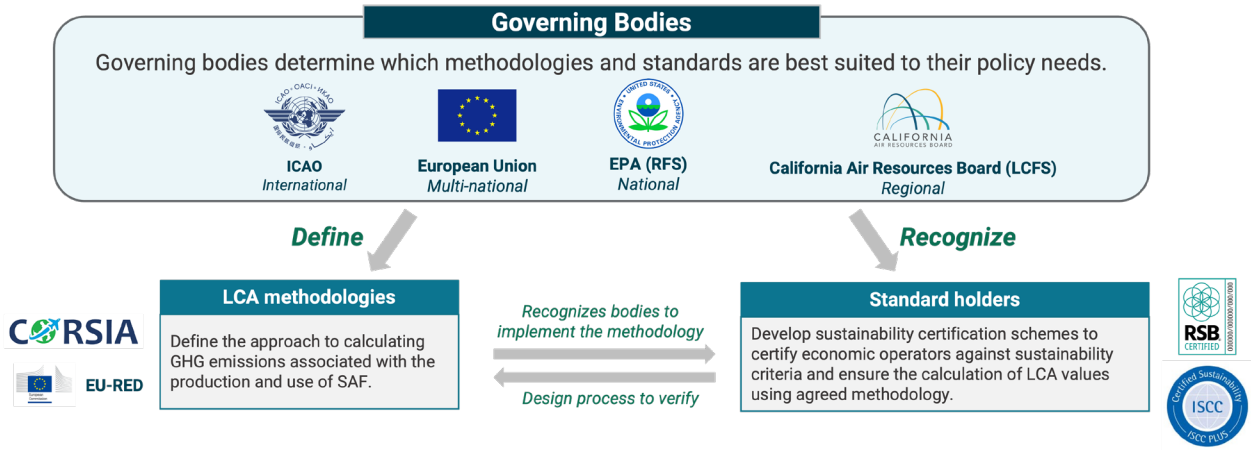
The SAF demonstrates real greenhouse gas emission reductions by validating that the SAF lifecycle assessment (LCA) value accurately and completely reflects all emissions from every step of the SAF supply chain, from the point of feedstock sourcing to combustion in aircraft.

Any negative environmental and social impacts from SAF production, such as deforestation, biodiversity loss, and food insecurity, are avoided or minimized.

Sustainability Certification Systems

While several governing bodies have set rules related to SAF, the International Civil Aviation Organization (ICAO), which is the governing body for international aviation, was first to define a methodology to calculate the LCA of SAF and recognize specific Sustainability Certification Systems (SCSs) for use in its Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA). SCSs set standards and auditing protocols that enable the certification of SAF producers against CORSIA or another governing body's sustainability criteria and ensure the calculation of LCA values is done correctly using those governing bodies' prescribed methodologies. ICAO has approved two standard holders for use in CORSIA: the Roundtable on Sustainable Biomaterials (RSB) and The International Sustainability and Carbon Certification (ISCC).

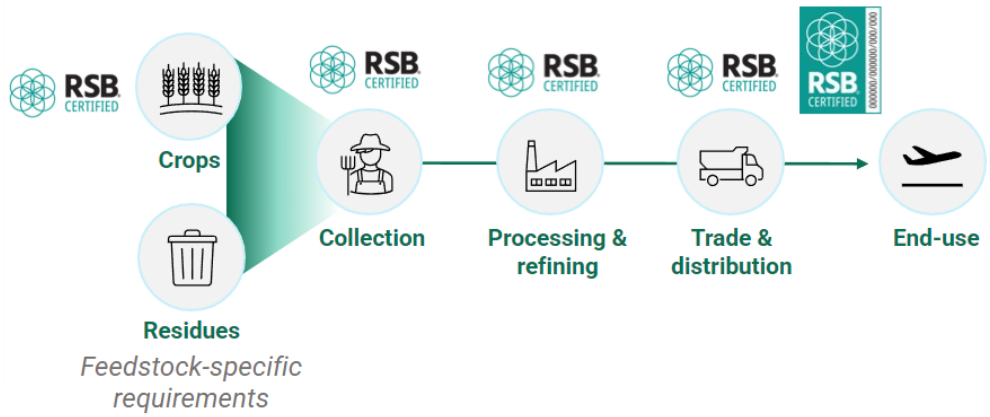
Exhibit 2: The ecosystem of operators that ensure sustainability certification for SAF



In addition to their RSB-CORSIA and ISCC-CORSIA certifications, which adhere to the sustainability standard set by ICAO, RSB and ISCC have additional sustainability certification schemes (e.g., ISCC Plus, RSB Global, among others) that can also certify SAF for sustainability.

The diagram below shows the holistic approach to sustainability certification by SCSs as exemplified by RSB's approach.

Exhibit 3: The entire supply chain must be certified for the final SAF to carry the RSB Claim



Building a High-Integrity SAF Market with Sustainability Certification

In addition to vetting the accuracy of the SAF LCA, sustainability certification reduces the risk that SAF production may lead to unintended environmental damage.

One such risk related to the use of land-use based feedstocks for SAF production is indirect land-use change (ILUC). ILUC may occur when the growth of biofuel feedstocks takes place on arable land, displacing existing or future food production. This can lead to the conversion of natural lands to compensate for the food production lost in favor of biofuel feedstock growth and result in increased GHG emissions, as well as other unintended environmental consequences, from food insecurity to habitat and biodiversity loss.

Sustainability standards (like the one developed by ICAO) include provisions to reduce ILUC and other risks. For example, ILUC emissions from SAF production are incorporated within ICAO's LCA methodology such that ILUC emissions act as deficits within the overall LCA value.

In addition, RSB and ISCC require audits on several sustainability criteria to ensure that the fuel was produced using sustainable practices. For example, to certify fuels as CORSIA eligible, RSB and ISCC require auditors to ensure checks against the following twelve sustainability criteria defined by ICAO:

1. **Greenhouse gases**: SAF should generate lower carbon emissions on a life cycle basis
2. **Carbon stock**: SAF should not be made from biomass obtained from land with high carbon stock
3. **Water**: Production of SAF should maintain or enhance water quality and availability
4. **Soil**: Production of SAF should maintain or enhance soil health
5. **Air**: Production of SAF should minimize negative effects on air quality
6. **Conservation**: Production of SAF should maintain biodiversity, conservation value, and ecosystem services
7. **Waste and chemicals**: Production of SAF should promote responsible management of waste and use of materials

8. **Human and labor rights**: Production of SAF should respect human and labor rights
9. **Land use rights and land use**: Production of SAF should respect land rights and land use rights including indigenous and / or customary rights
10. **Water use rights**: Production of SAF should respect prior formal or customary water use rights
11. **Local and social development**: Production of SAF should contribute to social and economic development in regions of poverty
12. **Food security**: Production of SAF should promote food security in food insecure regions

Sustainability certification by a reputable SCS provides safeguards against potential environmental damage resulting from SAF production and is therefore instrumental to ensuring the environmental integrity of SAF.

SOURCES

1. IATA Sustainable Aviation Fuel: Technical Certification
2. ASTM D1655 Standard Specification for Aviation Turbine Fuels
3. RSB.org