

Sustainability Framework for Sustainable Aviation Fuel (SAF)

Version 2, Adopted September 2023





Table of Contents

| 1 | Recitals and Context | | | | | | |
|---------------------------------|---|----------------------------------|--|---|--|--|--|
| 2 | Emis | Emissions Reduction Threshold4 | | | | | |
| 3 Lifecycle Assessment Approach | | | | | | | |
| | 3.1 | and its by-products as feedstock | 5 | | | | |
| | 3.2 SABA Preferred: Indirect Land Use Change (ILUC) – Land-Use Based Feedstocks | | | | | | |
| | 3.3 SABA Preferred: Displacement Effects – Wastes, Residues and By-products | | | | | | |
| | 3.4 Avoided Emissions and Removals | | | | | | |
| | | 3.4.1 | Municipal solid waste (MSW) feedstocks | 6 | | | |
| | | 3.4.2 | Land-use based feedstocks with soil carbon sequestration | 6 | | | |
| | | 3.4.3 | Carbon capture and sequestration (CCS) and ILUC risk | 7 | | | |
| | | 3.4.4 | Carbon capture and sequestration (CCS) - Crediting negative LCA values | 7 | | | |
| 4 | Susta | ustainability Certifications | | | | | |
| | 4.1 Certification of Power-to-Liquid (PtL) fuels | | | | | | |
| 5 | Ensuring Emission Reduction Impact – the Atmospheric Benefit Principle | | | | | | |
| 6 | Preventing Double Counting | | | | | | |
| 7 | Ensuring Valid Emission Reduction Claims with a Registry10 | | | | | | |
| 8 | Adopting and Updating the Sustainability Framework12 | | | | | | |



1: Recitals and Context

The purpose of the SABA Sustainability Framework for SAF (the "Framework") is to determine the types of SAF that advance SABA's objective of driving production and use of SAF with high environmental integrity. SABA's Sustainability Framework is intended to guide SAF procurement decisions and SAF emissions reduction claims, particularly when made by aviation customers who are not expected to be experts in SAF.

The Framework is based on the International Civil Aviation Organization (ICAO) framework for SAF developed for the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA).¹ In addition to the CORSIA framework, it integrates additional provisions intended to reflect the decarbonization ambitions of SABA's aviation customer members and align with other carbon reduction programs, such as the Science Based Targets Initiative (SBTi).

The additional provisions are described below, grouped into the following categories: (1) Emissions Reduction Threshold; (2) Lifecycle Assessment Approach; (3) Sustainability Certifications; (4) Ensuring Emissions Reduction Impact, (5) Preventing Double Counting, and (6) Ensuring Valid Emission Reduction Claims with a Registry.

The SAF market is new and rapidly evolving. Fuel volumes are low today but projected to rise quickly in the coming years. New SAF technologies are also expected to mature soon, which may offer environmental and economic advantages relative to fuels currently on the market.

Recognizing the dynamic nature of the SAF market, the SABA Framework takes a flexible but rigorous approach to defining high integrity SAF. It establishes a set of **"SABA Eligible"** requirements to ensure that any SAF meeting these requirements represents real and significant environmental benefits relative to fossil-based jet fuel, with carbon reductions that can count towards members' Science Based Targets. At the same time, where appropriate, the Framework describes additional provisions that qualify a fuel as **"SABA Preferred,"** which means the fuel provider has taken additional steps to mitigate risks of Indirect Land Use Change (ILUC) and displacement effects. **All provisions contained in this document should be considered "SABA Eligible" requirements except those clearly marked under the heading "SABA Preferred."**

This distinction between SABA Eligible and SABA Preferred is operationalized in SABA collective procurement processes by requiring that all fuel considered for purchase meet the SABA Eligible requirements. A further evaluation checks if the fuels satisfy the SABA Preferred provisions.

¹ For reference, the methodology developed by ICAO's technical bodies and adopted by ICAO's Council is contained in Annex 16, Volume IV of the Chicago Convention on International Civil Aviation, the SARPs and supporting documents - they are the first and only set of multilaterally agreed methodologies for SAF.

SABA intends to update the Sustainability Framework at least every two years as the market changes, new information about the environmental impact of fuels emerges, and experience with different certification systems and methodologies grows. The SABA Preferred provisions in this version of the Framework may become SABA Eligible requirements in future versions.

SAF is the most promising near-term option for decarbonizing the aviation sector. But, like all energy technologies, SAF presents tradeoffs that need to be understood and managed. The SABA Framework represents a pragmatic but ambitious approach to identifying the highest integrity SAF available today, while driving the market to continue to innovate towards even higher-quality SAF in the future.

The criteria in this framework apply equally to SAF produced at dedicated SAF production facilities and via co-processing.

2: Emissions Reduction Threshold

Approach: The lifecycle value for SAF – after taking into account any adjustments as required by this Framework – should be at least 60% lower than the lifecycle emissions of fossil jet fuel² as indicated in the SAF's sustainability certification documentation³ (i.e. the Proof of Sustainability).

Rationale: While ICAO requires a 10% minimum emissions reduction for SAF, this is intended as a safeguard to ensure that any emission reduction claim in CORSIA is backed up with real emissions reductions that go beyond the uncertainties associated with the Lifecycle Assessment (LCA) methodology. SABA's goal is **to accelerate the transition to net zero aviation**, **so a higher threshold is appropriate**. The 60% target is technically achievable and directionally aligned with other emissions reduction thresholds, such as those specified in SBTI's target-setting guidance for the aviation sector and the U.S. government's SAF Grand Challenge.

3: Lifecycle Assessment Approach

Approach: SABA will apply ICAO's LCA approach, with additional safeguards to limit the use of avoided emissions towards meeting the 60% reduction threshold, as explained below.

Rationale: A robust LCA approach ensures that all greenhouse gas (GHG) emissions along the SAF supply chain are accounted for from production to final use, including direct emissions (e.g., emissions from operating the refinery where the fuel is produced), and indirect emissions (e.g., emissions from deforestation that occur because feedstock cultivation for energy displaces food and feed crops, resulting in new lands converted to produce food). Indirect Land-Use Change (ILUC) emissions from SAF production are incorporated into ICAO's lifecycle emissions calculation, meaning these emissions effectively act as deficits within the overall carbon intensity value for the fuel. Fuels that clear ICAO's 10% emission reduction threshold must do so net of any ILUC emissions; for SABA, the threshold is 60%, which provides additional protection against ILUC.

² This requirement is to be evaluated using the following formula: (1-(x/y)*100)>=60%, where "x" stands for the LCA value adjusted according to the requirements of this Framework, and "y" stands for the fossil fuel baseline applicable to the SAF

³ Currently, these are the baselines for fossil jet fuel in gCO2e/MJ: a) 89g for CORSIA jet fuel, b) 95g for CORSIA aviation gasoline, c) 90g for RSB Global, d) 94g for EU RED

3.1 Palm oil and its by-products as feedstock

Approach: SAF produced from palm oil or its derivatives, including palm fatty acid distillate (PFAD), is not SABA eligible.

Rationale: The production of palm oil and its by-products involve serious environmental risks for which we have not identified a sufficient solution.

3.2 SABA Preferred: Indirect Land Use Change (ILUC) – Land-Use Based Feedstocks

Preferred Approach: The following requirement does not apply to SABA Eligible fuels and is mandatory only for SABA Preferred fuels produced from land-use based feedstocks. To provide additional protections against ILUC risk, fuel providers should demonstrate via a certification to a CORSIA-eligible sustainability certification scheme (SCS) that SAF produced from land-use based feedstocks is in compliance with ICAO's "Low Land Use Change (LUC) Risk Practices" methodology under ICAO document "CORSIA Methodology for Calculating Actual Life Cycle Emissions Values."

Rationale: While the Framework's 60% GHG reduction threshold provides strong protection against ILUC risk, it does not completely eliminate the risk. ILUC can cause significant negative impacts beyond GHG emissions, such as deforestation, habitat destruction, hunger, malnutrition and food insecurity.

3.3 SABA Preferred: Displacement Effects – Wastes, Residues and By-products

Preferred Approach: The following requirement does not apply to SABA Eligible fuels and is mandatory only for SABA Preferred fuels produced from feedstocks designated as wastes, residues and by-products under ICAO CORSIA. Fuel providers should demonstrate compliance with ICAO's zero ILUC designations and quantify displacement emissions other than those caused by ILUC, by:

- a. When displacement may pose an ILUC risk, undertaking an audit to demonstrate that the feedstock or product satisfies the criteria and compliance indicators in the RSB Low ILUC Risk Biomass Module (RSB-STD-04-001),⁴ the ISCC CORSIA Guidance Document: Low Land Use Change (LUC) Risk Certification,⁵ or an equivalent standard from another CORSIA-eligible SCS, when available; or
- b. For wastes, residues and by-products with displacement emissions other than ILUC, estimating displacement emission risk level per the methodology for Displacement Emissions under RSB's Standard for Advanced Biofuels to show low ILUC risk and to quantify displacement GHG emissions.⁶ Resulting displacement emissions should be added to the lifecycle value of the SAF.

Rationale: Displacement Effects occur when SAF production draws feedstocks away from some pre-existing application, which can trigger the production or use of substitute materials with negative carbon and/or other environmental and social impacts. For example, increased demand for edible tallow for SAF may divert it from other uses, such as cooking oil or animal feed. In these cases, the resulting gap may then be filled with virgin vegetable oil, resulting, *inter alia*, in ILUC emissions. Another example could involve the use of forest residue for

⁴ https://rsb.org/wp-content/uploads/2020/06/RSB-STD-04-001-ver-0.3-RSB-Low-iLUC-Criteria-Indicators.pdf

⁵ https://www.iscc-system.org/wp-content/uploads/2022/05/ISCC_CORSIA_Guidance_for_low_LUC_risk_certification_v1.1.pdf

⁶ Not all displacements result in displacement emissions, e.g., when the displacement occurs in a sector that is covered under a cap-and-trade system.

SAF that was previously used to power an electric generating unit (EGU). If natural gas is used as a substitute fuel in the EGU, this could result in an increase in GHG emissions, i.e. displacement emissions. Under ICAO CORSIA, wastes, residues and by-products are designated with a zero ILUC value, and displacement emissions other than ILUC are not considered. Since displacement effects can have a significant impact on the emissions reduction claims, fuel providers should minimize ILUC risk and quantify displacement emissions other than those caused by ILUC through the approaches outlined above.

3.4 Avoided Emissions and Removals

Approach: Only avoided emissions and removals that occur within the SAF value chain will count toward the SAF lifecycle carbon intensity value, consistent with SBTi's guidance. Elaboration on a few common cases is provided in 3.4.1 and 3.4.2 below.

Rationale: Under ICAO's CORSIA, LCA values may include avoided emissions and removals from activities associated with SAF production even when they are not part of the SAF. This approach is accepted under ICAO because aircraft operators can comply using either offsets (avoided emissions are offset project types) or emissions reductions from SAF. SABA's mission, however, is to drive in-sector decarbonization of aviation, so it is important that SABA's approach drives uptake of SAF based on the emission reductions embodied in the fuel itself. This general approach is aligned with SBTi.

3.4.1 Municipal solid waste (MSW) feedstocks

Approach: *This section applies to Municipal solid waste (MSW) feedstocks.* Landfill emissions credits (LECs) and Recycling Emissions Credits (RECs) are considered outside the SAF value chain and will therefore not count toward the fuel's carbon intensity value.

Rationale: When MSW is used for SAF production, aluminum cans are diverted from landfill in the process. They can then be recycled and used in other industries instead of new aluminum, leading to avoided emissions. Under ICAO's CORSIA, this process would generate a "Recycling Emissions Credit" and fuel producers could subtract the corresponding emissions reductions from the lifecycle value of the SAF. The fact that another industry can use the recycled aluminum is an associated benefit of SAF production, but that process is not part of the SAF supply chain. This means those avoided emissions do not represent a direct reduction in aviation emissions and would not count towards a Science Based Target.

3.4.2 Land-use based feedstocks with soil carbon sequestration

Approach: This section applies to feedstocks with land management practices in which soil carbon sequestration is accounted. Soil carbon sequestration emission savings will not count toward the LCA value if the GHG calculation method used actual rather than default LCA values.

Rationale: There is debate over whether soil carbon sequestration occurs within or outside the SAF value chain. SABA has decided against counting these toward SAF carbon intensity values in the calculation of actual LCA emissions given this debate *as well as* significant additional concerns regarding permanence, leakage, and inconsistent methodologies for crediting soil carbon sequestration.

3.4.3 Carbon capture and sequestration (CCS) and ILUC risk

Approach: This section applies to SAF production involving carbon captured at a processing unit in the supply chain processing SAF raw materials and products⁷ and sequestration of the captured CO_2 in a viable geological formation. In such cases, the CCS and resulting emission reductions can be considered part of the SAF supply chain, and therefore counted toward the LCA value up to a point (see Section 3.4.4). However, fuel providers employing CCS must demonstrate that their feedstock is not associated with notable ILUC risk by complying with at least one of the following:

- a. Achieve SABA's 60% emission reduction threshold without CCS reductions included in the LCA value, *or to*
- b. Demonstrate that the feedstock used for SAF production carries a 0 default CORSIA ILUC value (i.e., qualify as a waste, residue, or byproduct feedstock per CORSIA), **or**
- c. Have a certification from a CORSIA-approved SCS that attests to compliance with criteria to demonstrate that a feedstock or product is at minimal risk of causing indirect land use change. Currently, the RSB Low ILUC Risk Biomass Module and the ISCC Low LUC risk certifications satisfy this requirement.

Rationale: As described in Section 3 (ii), SABA's 60% emissions reduction threshold is set as an additional safeguard against, and effective cap on, ILUC risk associated with SAF production. ILUC risk may include negative environmental impacts, such as habitat destruction and increased food insecurity, beyond the ILUC emissions themselves. Due to the significant impact that CCS can have on the LCA, processes using feedstocks with high ILUC values could achieve an LCA that achieves the SABA threshold despite not being able to do so in the absence of CCS. Since CCS does not compensate for other environmental and social risks related to ILUC, SABA requires fuel producers using CCS to comply with at least one of the measures in 3.4.3 (i) to ensure that their SAF is not associated with meaningful ILUC risk.

3.4.4 Carbon capture and sequestration (CCS) - Crediting negative LCA values

Approach: This section applies to SAF demonstrating negative LCA values. Negative LCA values can result from in-sector removals, specifically carbon captured at a processing unit in the supply chain processing SAF raw materials and products, that exceed all other GHG emissions associated with the SAF lifecycle. To maintain alignment with SBTi, however, the lowest SABA-eligible LCA value is 0.

Rationale: SBTi does not allow claiming below-zero LCA values towards the achievement of sciencebased targets (SBT) validated under SBTi. SABA seeks to maintain alignment with SBTi in order to support its member companies in achieving their SBTs.

⁷ Limiting eligible carbon capture to carbon captured at a processing unit in the supply chain processing SAF raw materials and products is the approach taken by CORSIA-approved SCSs to date.

4: Sustainability Certifications

Approach: For SAF to be SABA Eligible, it must be certified by a CORSIA-approved SCS (sustainability certification scheme) that attests to compliance with requirements consistent with the full set of sustainability criteria approved by the ICAO Council,⁸ which includes appropriate certifications across all economic operators. RSB and ISCC were deemed CORSIA eligible SCSs. Certifications offered by these entities that would qualify SAF for any feedstock as SABA Eligible include: RSB CORSIA and ISCC CORSIA. SAF made from (a) non-land use based feedstock, or (b) feedstocks categorized as "waste, residues or byproducts" by CORSIA may also use RSB Global, RSB EU, ISCC Plus and ISCC EU. If SAF is not made from "waste, residues, or byproducts" and is certified by RSB Global, RSB EU, ISCC Plus or ISCC EU, it must also achieve RSB Low ILUC Risk Biomass Module and the ISCC Low LUC risk certifications certification in order to be SABA eligible.

Rationale: The sustainability criteria approved by the ICAO Council⁹ include provisions for: greenhouse gases, carbon stock, water, soil, air, conservation, waste and chemicals, human and labor rights, land use rights and land use, water use rights, local and social development, and food security. SABA believes it is important and practical for SAF to meet this criteria.

4.1 Certification of Power-to-Liquid (PtL) fuels

Approach: This section clarifies certification options for power-to-liquid SAF (e.g., e-fuels) producers. PtL producers must receive RSB Global (RSB Standard for Advanced Fuels) or ISCC PLUS certification, the only CORSIA-approved SCS holders today with certifiable PtL methodologies. ¹⁰ SABA will review and seek to include additional certifications for SABA eligibility for PtL producers as they become available. In addition, at this time, CO₂ from any source (e.g., biogenic, non-biogenic, direct air capture) is treated equally with respect to LCA calculation.

Rationale: SABA requires certification by a CORSIA-approved SCS. Though other PtL LCA methodologies are under development by CORSIA and national governments, the above noted standards are the only ones available today. New certifications will also be accepted when and if they are recognized. With respect to CO_2 sources, SABA will not assign a bias toward any CO_2 sources given the nascent stage of the PtL market. Future revisions of the Framework will consider whether to include a phase-out for non-biogenic, industrial CO_2 .

⁸ https://www.icao.int/Newsroom/Pages/ICAO-Council-approves-CORSIA-Sustainability-Criteria-for-sustainable-aviation-fuels.aspx

⁹ https://www.icao.int/about-icao/Council/Pages/council.aspx

¹⁰ The RSB EU RED and ISCC EU certifications are pending recognition by the European Commission for compliance with the criteria set out in the renewed Renewable Energy Directive (REDII) for renewable fuels of non-biological origin (RFNBOs). SABA will allow use of these certifications as they are recognized.

5: Ensuring Emission Reduction Impact – the Atmospheric Benefit Principle

Approach: Emission reductions from SAF being claimed for use toward voluntary climate targets will need to generate emissions reductions beyond those already incentivized by compliance obligations, creating an atmospheric benefit. Due in part to the rapidly evolving regulatory landscape, it is beyond the scope of this document to provide a comprehensive inventory of all SAF compliance obligations and their interplay with SABA's Atmospheric Benefit Principle. SABA's Atmospheric Benefit Evaluation Tool [visit flysaba.org/resources] will be made available to SAF providers and purchasers to assess compatibility with the Atmospheric Benefit Principle when issuing voluntary SAF certificates. We offer a few representative examples below.

Rationale: SABA's mission is to accelerate the path to net zero air transport by driving investment in high integrity SAF. Some jurisdictions already have regulations in place to reduce emissions and/or incentivize alternative fuel use. Emission reductions from SAF being claimed for use toward voluntary climate targets will need to generate emissions reductions beyond those already incentivized by compliance obligations. This ensures they create an atmospheric benefit, meaning they generate an emissions reduction that would not have otherwise occurred.

Examples:

a. Emission reductions from SAF may not also be used by an air transport provider to meet a regulatory emission reduction obligation when a particular air transport customer is claiming reductions toward a voluntary climate target. Example below.

Air transport providers face emissions reduction obligations under CORSIA, which can be met through either the use of SAF or purchase of offsets.

If an air transport customer were to purchase SAF certificates derived from SAF also used to meet an air transport provider's CORSIA obligation, the customer would effectively be buying carbon reductions that were already required by CORSIA. This would not result in net carbon reductions.

b. Emission reductions from SAF will only be used to meet a low carbon fuel standard (or similar) with an opt-in for aviation in a jurisdiction that has a regulatory GHG emission reduction obligation. Example below.

California's LCFS policy features a declining cap on statewide transportation fuels with tradeable credits used as compliance mechanisms. The LCFS exists alongside a statewide cap on emissions that includes the transportation sector. SAF can "opt in" to the LCFS system, meaning the fuel can generate LCFS credits, but does not face compliance obligations.

The sale of these SAF-derived credits into the system creates headroom within the LCFS cap that other fuels producers could, in principle, legally fill with increased emissions. The statewide emissions cap, however, creates a separate backstop that the transport sector must then meet through additional emissions reduction.

Importantly, in California, LCFS credits cannot be sold into the cap-and-trade system. As a result, the SAF purchase results in net emissions reductions even when LCFS credits are claimed for the same fuel.

c. Emission reductions from SAF that has been or will be used to meet a SAF use mandate will not also be sold to an aviation customer for voluntary emissions reduction claims. Example below.

The ReFuelEU Aviation initiative, once adopted, will establish EU-wide SAF blending mandates. Any emission reductions associated with SAF used to comply with ReFuelEU could not be sold to air transport customers for use in their voluntary GHG claims because the SAF production and its associated emissions reductions are already required by law.

6: Preventing Double Counting

Approach: Both air transport providers as well as their relevant customers are able to claim emission reductions for SAF towards their respective climate goals. In order to prevent double claiming by customers, however, when reporting publicly or bilaterally, the providers should distinguish between:

- a. SAF and associated emissions reductions that have been supported by and will be claimed by a particular customer or group of customers
- b. SAF and associated emissions reductions that can be claimed by all customers

Rationale: Accounting rules help ensure the integrity of emissions reduction claims. This includes the avoidance of double counting and within it, double claiming. There is double claiming when the same emissions reductions from the use of SAF are claimed twice towards the same emissions category under GHG Protocol guidance.

7: Ensuring Valid Emission Reduction Claims with a Registry

Approach: All SAF certificates must be registered in the SAFc Registry or a registry recognized by a CORSIA-approved SCS. For details on how the criteria defined in this Framework are operationalized in the context of an independently governed SAF certificate registry, please refer to the draft Sustainable Aviation Fuel Certificate Rulebook (subject to further revision) available here: https://rmi.org/saba/safc-registry/.

Rationale: SABA's mission to drive the growth of a high-integrity SAF market necessitates transparency and standardization related to the use of SAF certificates. Environmental attribute registries support emission reduction claims made by SAFc buyers and incentivize fuel providers to demonstrate environmental integrity via certification.

Table 1. Crosswalk of SABA sustainability framework requirements as compared to CORSIA and SBTi requirements.

| | CORSIA | SBTi | SABA Eligible | SABA Preferred | |
|--|---|----------------------------------|--|---|--|
| LCA Methodology | | Certification evaluates core LCA | + ILUC (CORSIA's LCA approach | | |
| GHG Reduction Threshold | 10% on an LCA basis | | 60% on an LCA basis | | |
| ILUC for Crop-Based Feedstocks | Addressed through 10% GHG reduction threshold | | Addressed through 60% | GHG reduction threshold ICAO Low LUC Risk Practices | |
| Displacement for Waste-Based Feedstocks | | | | Demonstrate low or no displacement | |
| Atmospheric Benefit | | | SAF purchases must drive add regulato | litional CO ₂ reductions beyond bry mandates | |
| Avoided Emissions & Removals | | No out-of-se | ctor avoided emissions or remo Carbon capture and storage Soil carbon seques | vals counted counted in LCA, above zero tration not counted | |
| | Co-processing allowed as a production pathway | | | | |
| Other | | | Palm oil and derivates not a | allowed as a feedstock type | |
| | | | Registry us | se required | |

This table intends to compare SABA's sustainability framework criteria with those of two other commonly recognized schemes – CORSIA and SBTi. Here, boxes are highlighted in blue to indicate where CORSIA and SBTi requirements are directly leveraged, boxes in green are unique to the SABA sustainability framework, and boxes in grey are unique to the SABA preferred definition. Note that in the SAFc Registry, SABA preferred and SABA eligible definitions have distinct unit types, and all other fuels that do not meet these thresholds but are certified to a RSB or ISCC sustainability certification scheme are defined as "SCS eligible".

8: Adopting and Updating the Sustainability Framework

The Framework has been adopted according to the following process:

- A draft of this Framework was published for consultation by SABA Members and external stakeholders for 30 calendar days. Participants in the consultation submitted observations or recommendations in writing to the SABA Secretariat.
- b. After considering the relevance and appropriateness of the observations and recommendations, the SABA Management Team submitted the revised Sustainability Framework to the SABA Customers Advisory Board for adoption.
- c. The SABA Customers Advisory Board adopted the Framework by consensus on November 4, 2022.
- d. The SABA Customers Advisory Board further adopted revisions to the Framework by consensus on August 7, 2023.
- e. This version of the Framework will be applicable from the date of publication onwards.

The SABA Management Team will continuously monitor developments concerning SAF and will propose updates to the Framework as needed.

At least every two years, the SABA Management Team will conduct a review of the Framework, with a view towards raising ambition over time. The review will - *inter alia* - examine whether the Framework's provisions are effective and whether there is a need for any updates based on developments in the market (such as new technology) and improvements in the relevant science. The SABA Management Team will take care to consider and propose revisions in a manner that is cognizant of existing commercial agreements based on earlier versions of the Framework, e.g. through use of grandfathering provisions if and where appropriate.

Future versions of the framework will be adopted based on the SABA governance rules in place at that time.