European and North Atlantic Office

DIRECTORS GENERAL OF CIVIL AVIATION - ICAO EUROPEAN AND NORTH ATLANTIC REGIONS

2024 MEETING (EUR/NAT-DGCA/2024)

(Toulouse, France, 23 April 2024)

Agenda Item 5: Sustainability: timely actions and cooperation to achieve the LTAG

GLOBAL SAF ACCOUNTING FRAMEWORK BASED ON ROBUST CHAIN OF CUSTODY APPROACHES: A MUST-HAVE FOR SUSTAINABLE AVIATION FUEL (SAF) DEPLOYMENT AND ITS COMMERCIAL VIABILITY

(Presented by IATA)

1. Introduction

1.1 It is widely recognized that a global and robust Sustainable Aviation Fuel (SAF) accounting framework, based on trusted chain-of-custody mechanisms, is necessary to support the global aviation industry's goal to reach net-zero carbon emissions by 2050.

1.2 This is also in line with Article 15 of the Conference of Aviation Alternative Fuels (CAAF/3) declaration which mentioned such accounting framework would provide the confidence in the use of such fuels and the claim of their environmental benefits by aeroplane operators, noting that such accounting methodologies could also help support the monitoring of aviation industry progress towards the achievement of the LTAG.

1.3 Considering the urgency of deploying SAF in the most cost and environmentally-efficient manner, it is imperative for ICAO and its Member States to recognize best practices in SAF accounting and reporting already taking place within the industry to provide clarity to materialize a credible SAF transaction subsequently allowing the industry to expedite the scaling up of SAF production.

2. Discussion

Current State of Global SAF Production

2.1 The vast majority of the decarbonization for aviation is expected to be realized by Sustainable Aviation Fuels (SAF) on the 2050 horizon, and until such time that alternative propulsion technologies mature and become scalable for global air transport. However, SAF is currently in very limited supply: in 2023, the production of SAF amounted to less than 0.2% of civil aviation's global jet fuel consumption. [1]

[1] **IATA Global Media Day Presentation on SAF**, December 2023 (Page 7)

2.2 With fuel demand set to rise from 357 Mt in 2023[2] to 500 Mt in 2050, and the mission to replace most of that fuel demand with SAF by 2050, the need for developing SAF production is formidable.

2.3 It is necessary to unite all efforts in the mission to accelerate and maximize the production of SAF. In spite of the strong favourable price signal in the SAF market, as SAF costs 2-5 times more than jet fuel, the scaling up of production still falls short of demand. Unless supply constraints are eased, the price is likely to remain high or increase further, inherently favouring the fossil fuel market.

2.4 Currently, there are only a few SAF boutique producers at select locations and geographies. To facilitate further deployment, it is necessary to provide the frameworks and policies required for the nascent SAF market to mature and operate on market-based principles, where supply and demand is balanced by competitive and transparent pricing, thanks to reduced market fragmentation. One such essential instrument is a SAF accounting system, based on trusted chain-of-custody mechanisms.

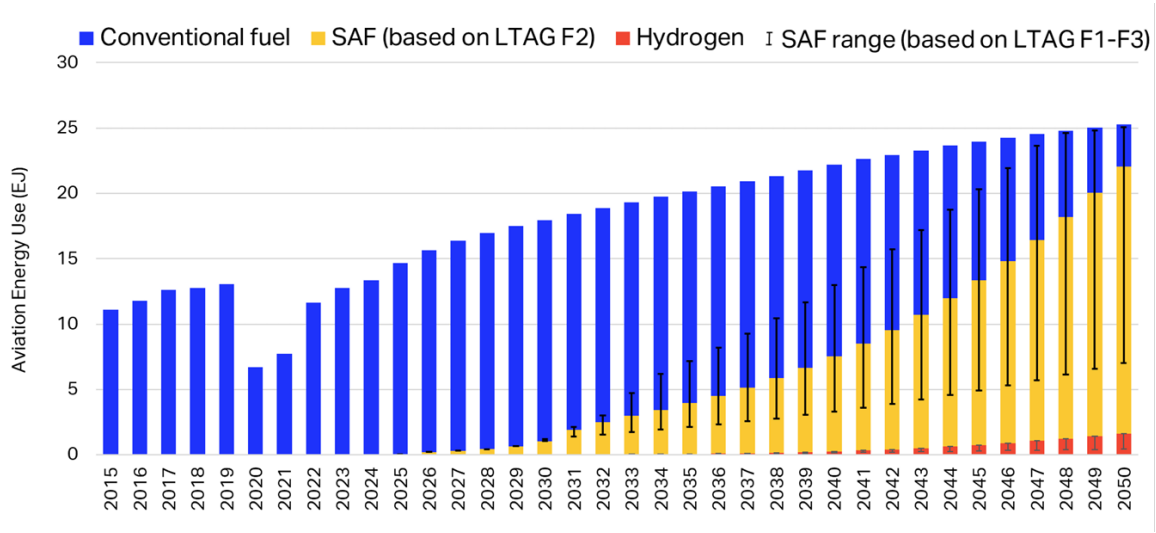

Figure 1: Aviation industry's energy transition to 2050[3]

The Importance of a Global SAF Accounting Framework

2.5 A fit-for-purpose SAF accounting framework would enable airlines to claim the environmental benefits from SAF purchases to meet or reduce their regulatory obligations and fulfil additional commitments. A robust SAF accounting system – or network of interoperable systems – offers the following benefits:

a) Ensures immutable tracking of the environmental attributes, to enable verification.

b) Provides full transparency of the claims made over any specific batch of SAF.

c) Prevents double counting from double issuance, usage, or claiming.

d) Allows stacking of incentives to maximize opportunities to fund SAF's higher prices.

2.6 The utilization of flexible and trusted chain-of-custody mechanisms such as mass balance or book and claim[4], unlocks additional benefits for increased efficiency in SAF production and transport:

a) Enables SAF production where it is most cost and environmentally-efficient.

[2] **IATA Global Outlook for Air Transport, December 2023**
[3] Source: **IATA Net Zero Roadmaps**
[4] As defined by the ISO 22905:2020 – Chain of custody general terminology and models

b) Provides increased demand for production facilities geographically distant from larger airports.

c) Avoids unnecessary transport of SAF and feedstocks, minimizing cost and the associated incremental emissions, enabling efficient deployment.

d) Promotes competition while providing equal access to SAF.

IATA SAF accounting initiatives

2.7 IATA together with a broad range of industry stakeholders are already working to enhance the robustness of global SAF market through introduction of SAF accounting and reporting platforms by IATA. This platform is expected to go live as a minimum viable product (MVP) by Q1 2025. This platform will be operated on a cost-recovery basis to reduce the cost of SAF transactions.

2.8 While it is recognized there will be multiple registries and systems for facilitating SAF transaction in the market and that inter-operability between these systems as well as the ones built by States and policy makers is key in preventing any types of double counting, double claiming and double usage of emissions reduction calculated from the same batch of SAF. IATA together with other SAF accounting platforms actors in the voluntary market is already discussing as a workstream to explore how this can be further materialized. Collaboration with ICAO and its States Members are always welcomed to further enhanced this objective.

2.9 In this process, IATA will also publish its own SAF accounting and reporting methodology to provide guidance for aircraft operators to use a universal, standard industry best practice approach to account and report the emissions reduction from the use of SAF, in order to provide a consistent calculation result for Members and their stakeholders on a well-to-wake (WTW) basis, while complementing the CORSIA methodology developed by ICAO which uses a tank-to-wake (TTW) approach. [5]

2.10 IATA is also working with the sustainability certification schemes body to provide practicle guidance around SAF sustainability certification and streamlining the associated sustainability documentations for aircraft operators to claim emissions reduction from the use of SAF. This is expected to be published by Q2 2024.

Key Considerations for Policymakers

2.11 A SAF accounting framework is a necessary but not sufficient condition for accelerating and maximizing SAF production. It will not deliver all the expected results in any immediate way, as it will remain dependent upon complementary frameworks and policies. Important considerations are included in the recommended principles for SAF accounting frameworks, as presented in **IATA's Policy paper on SAF accounting**.

2.12 The use of a robust and trusted accounting framework for SAF will help **unlock the geographical constraints currently faced by SAF producers**. It would also have a positive impact on local feedstock production capabilities which, in turn, could bring economic benefits to States.

2.13 Following CAAF/3 declaration, ICAO member States are encouraged to recognize and adopt SAF accounting methodologies for international aviation to enable:

a) The claiming of emissions reductions from SAF use towards different regulatory schemes (e.g., CORSIA).

b) The tracking of the sustainability attributes and life-cycle emissions linked to the feedstock across geographies, production pathways, transportation, and use of SAF.

[5] Definitions of emissions scopes are included in the Appendix A of this IP.

c) The different stakeholders to claim a SAF purchase against their specific emissions scopes while avoiding same-scope double claiming of any given batch of fuel.

2.14 CAAF/3 declaration already recognizes the importance of such accounting framework. Further work through CAEP and industry partners is required and need to be expedited in providing greater clarity to how such accounting framework and mechanism could facilitate an effective SAF deployment and scaling-up in the most cost and environmentally-efficient manner.

3. Action by the Meeting

3.1 The meeting is invited to note the contents of this paper.

The following Appendix is provided with this information paper:

APPENDIX A: Relevant information on SAF accounting

APPENDIX A — RELEVANT INFORMATION ON SAF ACCOUNTING

(paragraph 2.9 refers)

SAF accounting framework under CORSIA

The provisions in CORSIA Standard and Recommended Practices (SARPs) recognize that jet fuel and SAF are not segregated at airports but are instead typically co-mingled. CORSIA eligible fuels (CEF) can be mingled in fuel pipelines, storage terminals, and in airport storage systems, all upstream from its use in aircraft. The CEF purchased by a particular airline may not be physically used in its aircraft, and it will not be feasible to determine the specific CEF content at the point of uplift in an aircraft, given the nature of the upstream supply chain. Claims of emissions reductions from the use of CEF by airlines are hence based on mass of CEF according to purchasing and blending records[6]. Furthermore, according to ICAO Doc 9501 - Environmental Technical Manual, Volume IV, the CEF can be produced and uplifted anywhere in the world, as long as they satisfy CORSIA reporting requirements in accordance with the CORSIA SARPs[7].

Promoting competition in the global SAF market

As long as SAF supply remains restricted, only airlines operating at the few airports fortunate enough to benefit from such supply will be able to purchase SAF. This will slow the energy transition for the aviation industry while also potentially creating market distortions since market access to SAF is not granted equally to all airlines in the world.

A SAF accounting framework enables separation of the environmental attributes of the SAF purchased from the physical delivery of that SAF. This would allow any airline in the world to engage in SAF purchases, irrespective of the supply, or lack thereof, in that airline's operating location. In this manner, all airlines would have equal access to one global market for SAF, and while this is optimal for all kinds of markets, it is essential in a supply-constrained market where airlines are subjected to decarbonization obligations. All airlines must have equal opportunity to meet such obligations, and all airlines must have equal opportunity to realize the airline industry's commitment to achieving net-zero CO2 emissions reductions by 2050.

While CORSIA SARPs already allow airlines to claim emissions reduction from the use of SAF via purchase and blending records, the lack of broad recognition from policy makers of such systems limits the airlines' ability to conduct their claims in a consistent and harmonized manner. Additional requirements from voluntary schemes may also prevent corporate customers from contributing to the unlocking of further investments and financing that is much needed to increase SAF production. Explicit recognition from policy makers of airlines' ability to stack the environmental attributes from the use of SAF would help to address this.

"Stacking" of incentives versus double counting: different scopes of emissions

Stakeholders in the aviation value chain may be subject to multiple regulations or commitments affecting the same emissions. For instance, a batch of SAF sold in the US could benefit from production incentives claimed by the producer; the airline may decide to use the environmental attributes to reduce their CORSIA obligation (scope 1, direct); and a corporate customer could include the associated emissions reduction in their annual reports (scope 3, indirect).

The framework defined by the Greenhouse Gas Protocol (GHGP) allows for multiple claims under different scopes, and SAF accounting frameworks must support such stacking of claims by different stakeholders

[6] As defined by the ISO 22905:2020 – Chain of custody general terminology and models

[7] Note 1, Clause 2.2.4 of ICAO CORSIA SARPs, Annex 16 Vol IV, Part II, Monitoring of CORSIA eligible fuels claims

pertaining to the same batch of SAF. The GHGP[8] considers that accounting for the same emissions under different scopes does not constitute double counting, and instead regards it a common and expected practice.

Enabling SAF production in developing aviation markets

The investment proposition for investors and SAF production entrepreneurs is currently at the very early stages of innovation and technological development. It is a stage where all the risks are shouldered by the investors, and the dominant future technology is still unknown. Many measures can be taken to improve the investment proposition and spread the risk-taking more broadly. Nevertheless, a fundamental element in assessing the potential success of any such investment is the estimated market size and the access to that market. Similarly, the location of raw material inputs in the production process and access to such inputs will be a determining factor in investment decisions.

Many of the current and potential future feedstocks likely to be important in SAF production will probably be predominantly located in areas which represent a limited share of global aviation traffic. It would go counter to the objective of decarbonization to have the global SAF market rely on sourcing of inputs from distant locations for production in areas with greater air transport density. Instead, it is important to give feedstock-rich areas access to the global aviation market, while freeing those locations from local demand constraints.

A SAF accounting framework aligned with the CORSIA SARPs would give all SAF producers access to global airline demand for SAF, making the case for new SAF production capacity much more attractive in markets where local SAF demand would not otherwise justify the necessary investments. Ultimately, this would open the SAF market to global competition, drive innovation, reduce market fragmentation, and ensure competitive prices.

Fuel accounting based on trusted Chain-of-Custody (CoC) mechanisms

Fuel supply chains may be configured differently. Consequently, different CoC approaches exist that seek to ensure accurate accounting in each case. CoC relates to the process by which inputs and outputs, as well as associated information are transferred, monitored, and controlled at each step in the relevant supply chain.

The 3 most used CoC models are:

- **Physical segregation:** materials or products originate from a single source and their specified characteristics are maintained separately from any other throughout the supply chain. This is the case when SAF is supplied to the end users via a dedicated infrastructure, as has been seen in specific SAF demonstration flights.

- **Mass balance:** this is the tracking of SAF inputs at each stage of the aviation fuel distribution network, requiring documentation checks of the amount of SAF at every junction. This is commonly used when SAF is blended late in the supply chain, notably at existing fuel facilities which are shared by multiple fuel suppliers at airports.

- **Book and claim:** enables the decoupling of SAF's environmental attributes from the physical molecules upstream in the supply chain, and does not require physical uptake of any portion of the SAF by the buyer, as long as the product's use by other airlines can be proven.

[8] **Corporate Accounting and Reporting Standard**, Chapter 4

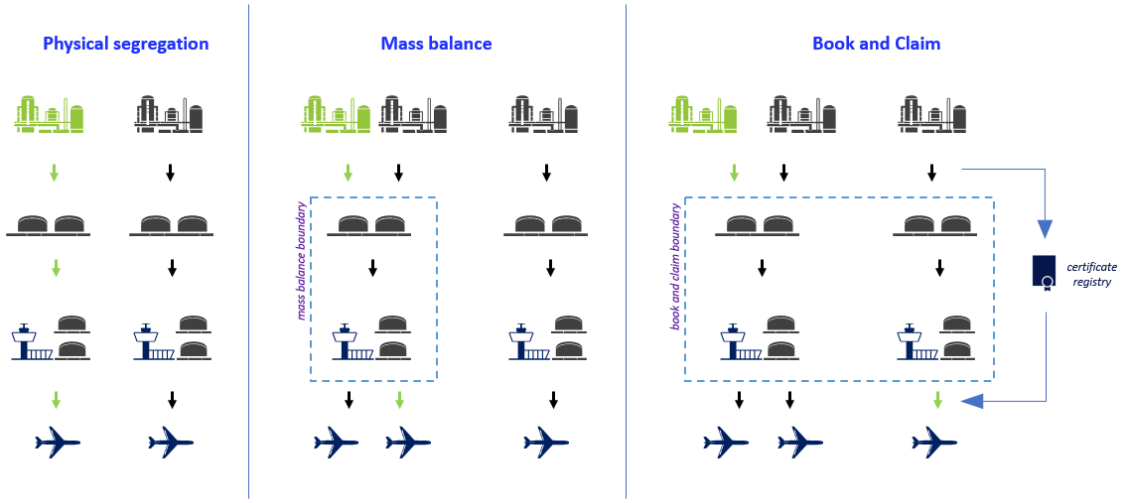

Figure 2: Illustration of chain of custody models used for aviation fuel accounting

SAF scopes of emissions

There are multiple important concepts under SAF scopes of emissions and is summarized in the following:

- **Greenhouse Gas Protocol (GHGPemissions scopes:**
    - **Scope 1:** Combustion emission from assets that are directly owned or controlled by the reporting company, e.g., the release of CO2 from the combustion of fossil fuels.
    - **Scope 2:** Indirect emissions from the production and distribution of electricity, heat, and steam purchased by the reporting company, e.g., emissions from use of electricity for airlines A premises
    - **Scope 3:** All indirect emissions not reported under scope 2. Emissions that are a consequence of the activities of a reporting company but that occur from sources not owned or controlled by the company, e.g., emissions that occur in the upstream or downstream value chain, further subdivided in 15 categories of activities (refer Figure 2 and Table 1).

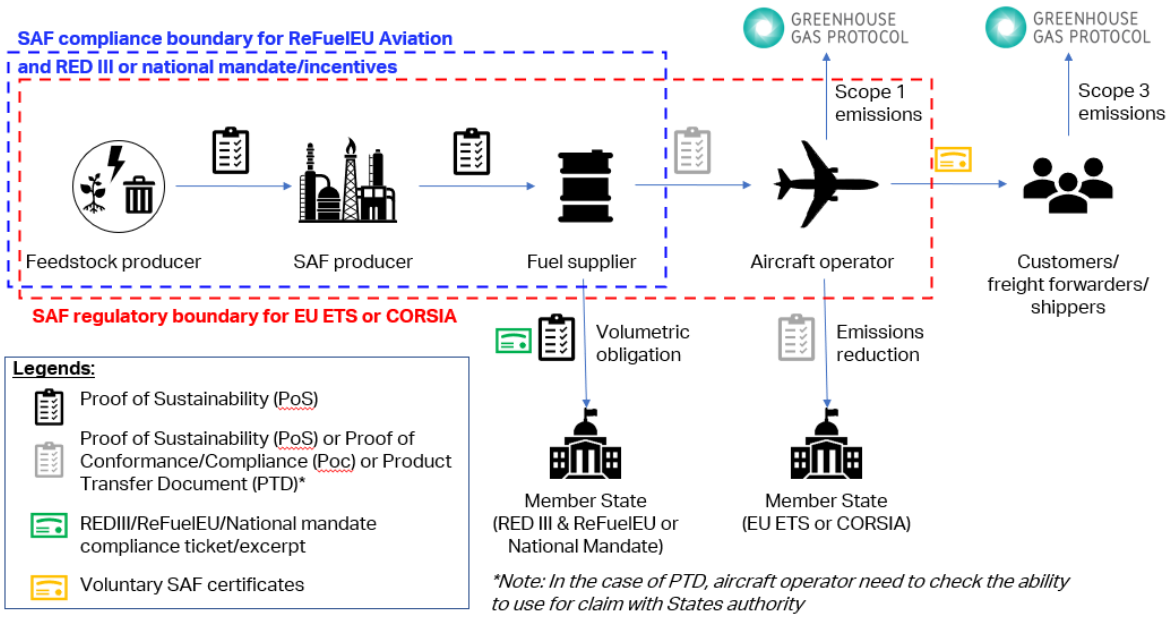

Figure 3: simplified model layout of SAF accounting and reporting across its value chain

- **Well-to-tank (WTT) emissions:** the emissions from the production and supply of the fuel, encompasses emissions from feedstock sourcing, processing, and transport to fuel production and distribution.

- **Tank-to-wake (TTW) emissions:** the origin of the carbon content of the fuel and/or in the emissions from the combustion of the fuel.

- **Well-to-wake (WTW) emissions:** complete lifecycle reflected in the assessment throughout the value chain, i.e., WTW is equivalent to the sum of WTT and TTW emissions.

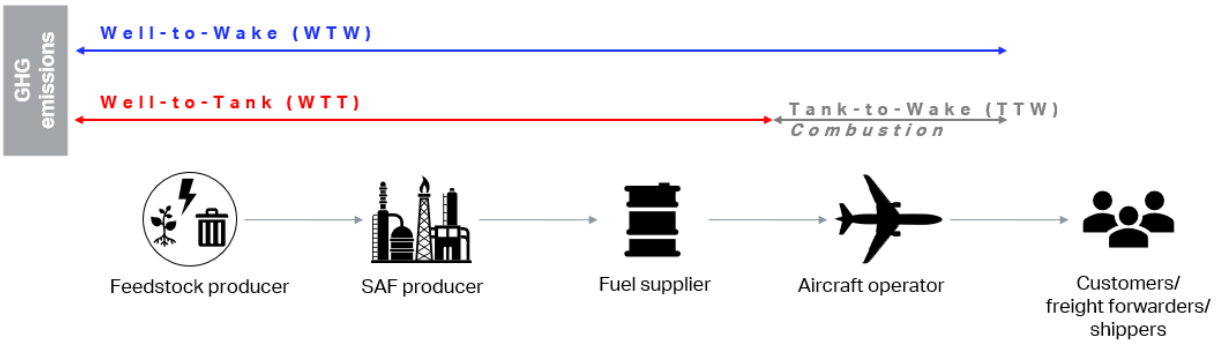

Figure 4: Illustrative diagram of an indiative well-to-wake emissions for SAF

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