AIRLINES FOR EUROPE

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FLEXIBILITY MECHANISM & BOOK AND CLAIMING OF SUSTAINABLE AVIATION FUEL

Abstract

This paper sets out A4E and ERA's analysis of the planned flexibility mechanism foreseen by the EU Regulation on ensuring a level playing field for sustainable air transport (ReFuelEU Aviation)[1] as well as guiding principles for SAF book and claim and accounting framework.

A book-and-claim system can support multiple legislative instruments, such as the sustainable aviation fuel (SAF) mandate (ReFuelEU Aviation), the EU's Emission Trading Scheme (EU-ETS), and the Renewable Energy Directive (REDII), by simplifying and streamlining compliance processes[2]. The current patchwork of legislation-specific requirements, ranging from European regulations to national interpretations and implementations of European directives, imposes a significant burden on SAF suppliers and airlines. The flexibility mechanism under ReFuel EU Aviation only reduces the burden of supplying SAF to all airports (until 31.12.2034), while neglecting its interrelation with and impact on other regulatory obligations. In addition to creating

[1] COM(2021) 561 final - 2021/0205 (COD)

[2] For compliance purposes, the geographic scope of existing regulation shall not be changed, i.e., SAF claimed under ReFuelEU Aviation must still be physically supplied to the European market. And fuel that is credited under EU-ETS must also be consumed within geographic scope of the EU-ETS.

coherence and simplifying administration without undermining the legislative objectives, book-and-claim also simplifies environmental claims associated with SAF in voluntary reporting (e.g., GHG Protocol) for fuel producers, suppliers, airlines, and airline customers.

Therefore, A4E & ERA advocate for the introduction of an EU-wide book-and-claim system, which would reach the following objectives:

- Support the ReFuelEU Aviation objectives and prevent undesired effects of the foreseen 'flexibility mechanism'.
- Enable a system for mandatory and voluntary SAF reporting with significantly less administrative effort, in accordance with relevant regulations. New digital tools being developed for fuel reporting could be adapted in this context to provide the basis for this system, by eg. linking the EU Union Database with the ReFuel EU Reporting Tool.
- Improve transparency and ensure verifiability across all Member States, thereby increasing confidence in environmental claims related to SAF.
- Significantly reduce risks of fraud (e.g., double counting) across the system due to a chain of custody based on the use of unique certificates.
- Address possible distortions created by the 10-year transition period during which fuel suppliers are allowed to fulfil their obligations through a mass balance system.
- Improve the affordability of SAF and enable faster SAF growth.

This paper first outlines book-and-claim as a chain of custody option and then applies the concept to facilitate environmental claims related to SAF.

Overview of Chain of Custody Systems

Environmental claims, whether in regulatory or voluntary contexts, typically require supporting evidence. The verification systems associated with these claims are commonly referred to as tracking tools or chain of custody systems. Three different systems are available for use (see Figure 1):

1. With ***Physical Segregation***, SAF can only be claimed by the purchasing airline, which can trace it until it is fuelled into its own aircraft and then considered consumed. This approach, however, requires an independent, separate supply chain distinct from that of conventional jet fuel. From a technical, operational, and safety perspective, this chain of custody is unnecessary and thus expensive. SAF is a drop-in fuel and fully

compatible with existing infrastructure. Creating a separate infrastructure would in fact be not just economically worse, but environmentally as well.

2. With ***Mass-Balance***, fuel is not physically traced all the way to the aircraft. Instead, the infrastructure, jointly used by different suppliers, is considered a 'closed system'. Any supplier or airline introducing SAF may withdraw an equivalent amount of fuel – including the environmental benefits of that SAF – elsewhere, even if it does not involve its original SAF molecules. All stakeholders, including those depositing, withdrawing, and claiming, need to be connected by the same physical infrastructure. A mass-balance system offers economic and environmental advantages but is generally tied to a confined (closed) supply system.

3. A ***Book-and-claim System*** is based on mass-balance, but it is not constrained to a confined supply infrastructure or even national borders. Environmental benefits are separated from the physical SAF and converted into tradable certificates, sometimes referred to as 'book-and-claim units', that are managed and transferred through a central registry. By redeeming certificates, the environmental benefits are linked back to an equivalent volume of physical fuel sold. As a result, even suppliers and airlines without direct access to physical SAF can trade and claim associated environmental benefits. The book-and-claim system provides the greatest possible flexibility for SAF suppliers and airlines, and offers the highest scalability for SAF, while ensuring integrity and avoiding unnecessary logistics, costs, and emissions.

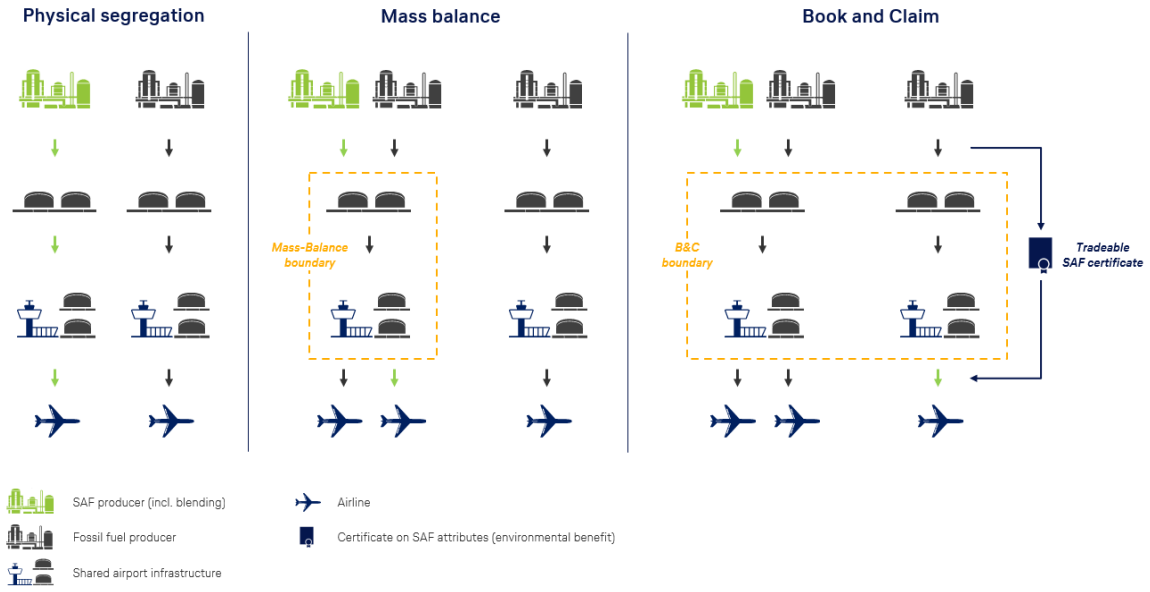

Figure 1: Concepts for chain of custody systems (yellow: illustrative balance boundary).

Book-and-claim systems have significant potential to verify adherence to regulatory obligations effectively and efficiently. They can greatly simplify the compliance processes for authorities in multiple international regimes. Likewise, a book-and-claim chain of custody can simplify CO_2 reporting for airlines and airline customers (e.g., according to the GHG Protocol) and facilitate voluntary SAF procurement beyond legal obligations, e.g., providing certainty that voluntary volumes directly procured by airlines have not been counted into mandates before.

Despite the high degree of flexibility in certificate trading, a book-and-claim system must be carefully designed. Specifically, it is essential to define the stakeholders allowed to participate in certificate trading (the system boundary), the physical boundary of such a system (e.g. SAFs delivered to Europe), and what the certificates represent, e.g., quantity of sustainable fuel (SAF) or an emission reduction (reduced CO_2).

Book-and-claim chain of custodies with tradable certificates already exist in EU legislation, such as Guarantees of Origin (GoO) under the Renewable Energy Directive for biomethane in Germany and Renewable Energy Units (HBE) in the Netherlands. Plans for a central EU registry for pan-EU transfer of bioenergy sustainability certificates (Proof of Sustainability) are already underway. Much of these existing administration infrastructures could be used when expanding the application of book-and-claim to SAF.

SAF Regulation and Voluntary Reporting along the Value Chain

Each legislative instrument and voluntary reporting framework focus on specific aspects and imposes requirements on stakeholders throughout the SAF value chain. A book-and-claim system can support various instruments by simplifying and facilitating compliance processes. The main instruments are described below and illustrated in Figure 2.

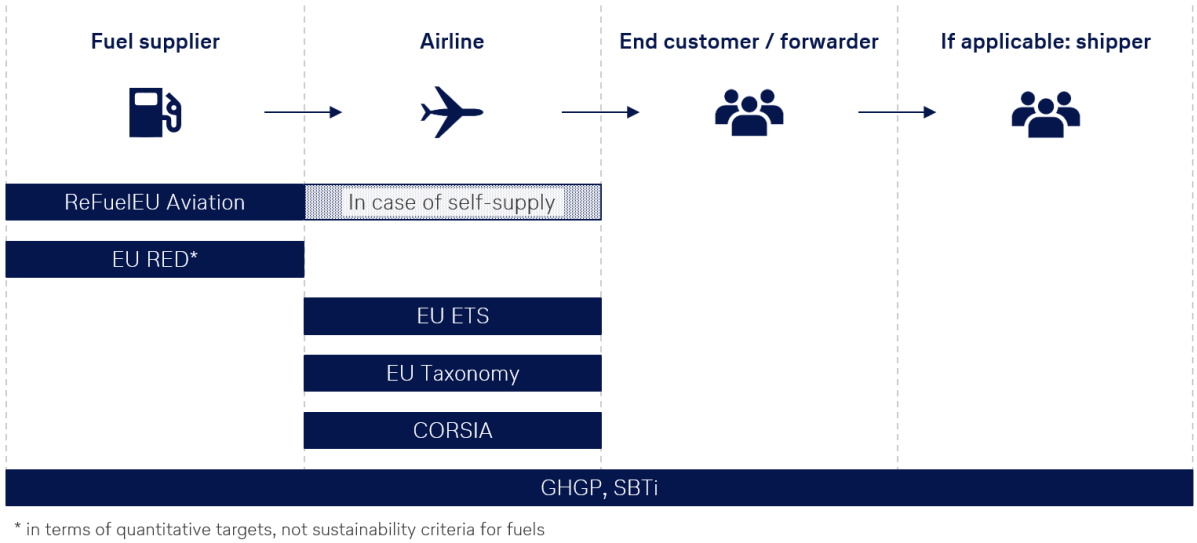

Figure 2: Regulatory and reporting systems affected by book-and-claim.

There are direct (e.g., ReFuel EU Aviation, RED) and indirect (e.g., EU Taxonomy) obligations for SAF supply to aviation:

- **ReFuel EU Aviation**: From 2025 onwards, fuel suppliers are obliged to ensure a defined minimum share of SAF in all jet fuel uplift at Union airports. A flexibility mechanism will allow compliance as a weighted average over all aviation fuel supplied across Union airports – thereby avoiding unnecessary logistics, emissions, and costs. Yet, only as a book-and-claim system the flexibility mechanism will also be a "fairness mechanism" allowing to distribute the cost and environmental benefits across all airlines in the geographic scope[3]. Compliance with the mandate can be verified, for example, by the number of issued certificates (proof of supply) in a central registry.
- **EU Renewable Energy Directive (RED)**: With regards to SAF, the RED has two functions: It defines the sustainability criteria (valid for all sustainable fuel in the EU), and it defines targets for use of renewable energy in transport in EU member states that fuel suppliers must meet (in RED, some states have mandatory targets for aviation). A book-and-claim system could resolve the uncertainties for Member States on SAF supply under their RED obligation, if the system had an interface to national RED inventories.

[3] The flexibility mechanism could result in the situation that only one airport is supplied with SAF and the local airlines are charged all associated cost. With book and claim, the distribution of cost and benefit across all airlines is ensured in a transparent manner.

- **EU Taxonomy:** The EU Taxonomy regulation is a classification framework to guide sustainable investment decisions. As a specific technical screening criterion for airlines, a progressive increase in the use of SAF has been decided upon – going beyond the shares defined in ReFuelEU Aviation. A book-and-claim system can simplify the chain of custody.

In addition to these obligations, airlines can voluntarily procure SAF. Airlines can decide to claim their SAF (from obligations or voluntary procurement) in EU ETS or CORSIA to reduce the corresponding duties:

- **EU Emission Trading Scheme (EU ETS):** Airlines must procure emission allowances for CO_2 emissions on intra-EU flights. Emissions from SAF combustion are exempt. Airlines can report their SAF use to ETS emission authorities to reduce the number of required allowances.
- **CORSIA:** The Carbon Offsetting and Reduction Scheme in International Aviation is the global offsetting framework on international flights established by the International Civil Aviation Organization (ICAO). It aims to offset emissions (or reduce emissions through SAF) exceeding a defined baseline. Emissions from SAF combustion are exempt (proportional to the SAF's lifecycle reduction) if airlines report them.

To be successful, the book-and-claim system must be compatible with these existing frameworks. The core requirements for the book-and-claim system can be described as follows.

Success Factors

A book-and-claim system needs a central registry as the primary database to ensure integrity. It should distinguish between SAF supply to meet obligations and additional voluntary SAF procurement (i.e., direct purchases by airlines). As a guideline for any SAF-related regulation it is essential that the functionalities of the central registry reflect and preserve the geographic scopes, obligations, responsibilities, and all obligated parties of the existing legislation in that it applies in a non-discriminatory manner to all EU and non-EU operators active in the EU market.

- **In obligations**, a specified volume of SAF must be supplied to the market by fuel suppliers. In a book-and-claim system, the proof of supply to the market is equivalent to the issuance of certificates. Obligation certificates should only be traded and

redeemed by suppliers within the geographic scope as specified in the corresponding regulation.

- **In voluntary supply**, airlines and suppliers make separate and individual arrangements for the procurement and supply of SAF.

Consequently, the book-and-claim should:

- **Remain limited to Europe:** The book-and-claim system must be limited to SAFs that are physically delivered to European airports, to align with existing regulations, and must meet the relevant sustainability and feedstock eligibility standards (ReFuel EU or RED depending on the obligation).
- **Maintain existing legal bases:** The legal bases of existing obligations, in particular ReFuelEU Aviation, must be protected. This means that airlines must not be obligated to purchase certificates, as to do so would shift the obligation of ReFuelEU Aviation to the airline. The obligation should rest on the fuel supplier to demonstrate compliance through sufficient obligated certificates. However, airlines should be allowed to evidence their SAF purchase by providing appropriate evidence e.g. from the registry system.
- **Protect the integrity of the ETS and CORSIA:** Significant safeguards would need to be in place to ensure that the system does not lead to unequal treatment for operators on equal routes. If either obligated or voluntary SAF is intended to be claimed in EU ETS or CORSIA, this has to be specified upon redemption and must respect the scope of existing regulations – e.g. SAF receiving an ETS benefit must not be used on a route outside of the ETS scope. Where the route of the SAF cannot be demonstrated, an alternative methodology not based on physical tracing should be used to protect the integrity of the ETS. Conversely, the system should explore the possibility of earmark SAF bought via Book and Claim for specific routes whilst respecting the above-mentioned principles.

In any case, airlines and other stakeholders in the aviation value chain must be able to claim the associated environmental benefits according to the GHG Protocol and SBTi – regardless of whether the fuel was subject to obligations or voluntary purchases. The central registry serves as the database for verification of all SAF supplied in Europe including its environmental properties. This reduces administrative effort, while still preserving transparency and verifiability. For this purpose, it must be able to distinguish between volumes coming from regulatory obligations or voluntary procurement. Still, it must be tracked in which schemes the SAF has been claimed (e.g., the ETS). Lastly, each certificate would need to document the sustainability properties as listed on the Proof of

Sustainability (e.g., carbon intensity, feedstock, sustainability certification) of the SAF batch it represents.

In addition to the parties described, other aviation stakeholders are increasingly interested in reporting emission reductions from SAF. This includes for example, airports and leasing companies, both of which report in different categories of Scope 3 (e.g., Category 13: Downstream leased assets). A book-and-claim system can also simplify facilitation in these cases. For example, a registry excerpt about purchased/supplied SAF could be issued for each airline to determine the SAF share of the total fuel consumption. This ratio could then be applied to fuel consumption linked to the assets of the respective stakeholders and provided as their excerpt, allowing for transparent emissions reporting.

Apart from the aviation value chain, governments and authorities are interested in counting emission reductions from SAF into their national emission inventories and towards international climate commitments. As far as possible, established rules from cross-border CO_2 accounting in existing book-and-claim systems (e.g., for biomethane) should be applied[4]. In the absence of these rules, the location of the redemption must also be recorded by the registry and included in an additional excerpt for the national emission inventories.

Proposed Design

Figure 3 illustrates the design of a book-and-claim system based on a single registry. To address both the SAF obligations and the voluntary purchases, there must be two different types of certificates, each with its own system boundary:

[4] National RED II implementation in Germany.

Figure 3: Design of the proposed SAF book-and-claim system (yellow: balance boundary).

For SAF supplied to meet obligations, the system boundary only comprises fuel producers and suppliers. They exchange 'obligation certificates' that can only be issued, traded, and redeemed by SAF producers and SAF suppliers. However, within the registry, the fuel supplier must allocate their redemptions to specific airlines based on the agreed commercial arrangements.

For SAF supplied for voluntary procurement, the system boundary comprises fuel producers, suppliers, and airlines that exchange 'voluntary certificates'. While suppliers must not count voluntary certificates against any SAF obligation, they can issue, trade, and redeem these certificates (on behalf of airline customers). Airlines can only procure and redeem these certificates. In the registry, SAF from redeemed voluntary certificates must be allocated to customers.

In both cases, the environmental claims are linked to the stakeholder-specific excerpts from the registry. Airlines, airline customers, other aviation stakeholders, and national authorities each receive individual excerpts from the registry. The excerpt is the list of all certificates redeemed in a defined period. In its simplest form, a SAF certificate represents one unit of neat SAF and its environmental properties according to the Proof

of Sustainability ('sustainability certificate'). However, it should also include additional information such as:

- SAF mass, volume, and energy content
- Sustainability Certification
- Energy source, feedstock(s), and production process
- Location of Production / Import
- Date of Commissioning
- Date and Country of Issue, Unique identification number
- Type of certificate (obligation certificate or voluntary certificate)
- Financial incentives drawn (e.g., (tax) credits, support schemes, etc.)

Latest on redemption of the certificate (in order to be included in the registry excerpt) it must be reported whether SAF is intended to be claimed in EU-ETS or CORSIA. Issue of the certificate should occur in the first tax warehouse after blending or import (or equivalent location where aviation fuel is registered with the tax authority).

Recommendations

A book-and-claim system has the potential to significantly streamline the regulatory and voluntary reporting and verification processes related to SAF, reducing administrative burdens, and mitigating unnecessary logistics, including associated emissions and costs, while enhancing their objectives of accelerating decarbonization. If smartly designed, it can simultaneously meet the requirements of policy instruments as well as voluntary reporting frameworks. A key success factor lies in carefully defining system boundaries (i.e., no change of the geographic scope or defined responsibilities). As long as the tradeable book-and-claim certificates represent a unit of SAF, smooth harmonization with existing regulations and industry standards for environmental accounting can be ensured.

These certificates should encompass all the environmental characteristics detailed on the sustainability certificate of the SAF (*Proof of Sustainability*), such as precise emission factors. This preserves the incentive for producers to continuously improve their fuels. Moreover, the certificates should contain information as to whether the SAF benefits from support mechanisms or subsidies, as this could have implications for environmental claims (e.g., double counting, additionality).

Furthermore, existing book-and-claim infrastructure that has already received approval from EU authorities, such as biomethane registries for Guarantees of Origin in

accordance with RED, could serve as a blueprint or even a platform for integrating SAF book-and-claim. The Union Database (UDB), EU-wide harmonized registry for environmental properties of bioenergy, should be assessed in this context.

Implementing a well-designed book-and-claim system is a promising approach to simplify SAF reporting and compliance, while encouraging SAF scale-up, higher environmental performance, and lower costs. Leveraging existing infrastructure and ensuring transparency in environmental claims will be key to its success.

It is important to demonstrate that the EU is a frontrunner in terms of SAF-related regulation. This book-and-claim system imposes the opportunity to define a robust and widely applicable system which fits member state needs and enables efficient and reliable reporting for all international (EU and non-EU) stakeholders operating in and from Europe.

From this perspective, it is recommended to periodically review the process to further optimize its functioning and reporting procedures.