



IS YOUR AIRLINE READY FOR SUSTAINABLE AVIATION FUEL CERTIFICATE (SAF_c) MARKETPLACES?

Introduction

Commercial airlines, private/chartered flights, and cargo aircraft, burn up tens of billions of gallons of aviation fuel each year. This makes the aviation sector amongst the more visible contributors to carbon dioxide (CO₂) emissions, a greenhouse gas that accelerates the deleterious impacts of climate change. Various players within the global aviation ecosystem have committed to reducing emissions by 2050 and are taking actions on various fronts to achieve some very ambitious goals. These include redesigning aircraft using lighter materials, using new propulsion and power systems, adopting green manufacturing, etc. Airlines are reducing paper and plastic and focusing on more effective segregation and recycling in their operations.

Moving to Sustainable Aviation Fuel (SAF) is perhaps one of the most important shifts the industry is making towards becoming tangibly greener. IATA estimates that 65% of the emission reductions in the aviation sector could come from SAF. (source: <https://www.iata.org/en/iata-repository/pressroom/fact-sheets/fact-sheet---alternative-fuels/>). Essentially, it involves running aircraft on blended fuels that include fuel derived from non-petroleum bio-feedstocks such as biomass, algae, forestry residues

etc. The feedstocks are chosen to prevent diversion of agricultural production meant for food. In the long-term, hydrogen may emerge as a green fuel for airplanes.

But there are miles to go before all aviation fuels are truly sustainable. The price of SAFs is currently many times that of the ATF obtained from non-renewable sources. This is a major hurdle given the underlying unit economics of the aviation industry. There is also the constraint imposed by current aircraft engines. Most airports lack the infrastructure to handle SAF at scale, and significant retrofitting will be needed. That is why even those airlines that already use SAF, limit it to a maximum of 50% of the blend. With SAF costs expected to reduce significantly in the near future, and aircraft manufacturers committing to produce engines capable of running on 100% SAFs, more players will make the shift, thus improving SAF adoption rates across the industry.

However, just having a supply of SAFs and aircraft capable of flying on them is not enough. It is estimated that almost 450 billion litres of SAF will be needed to achieve Net Zero by 2050. A regulations-driven carrot and stick approach is already in place. Infosys solution is designed to catalyse demand for additional supply of SAF, production scale-up, and provide integrity of SAF Claims.

The SAFc framework can play a critical role in reducing carbon footprint globally

Individual aviation ecosystems use SAFs produced from different feedstocks, each of which has its own environmental attributes. SAFs are currently certified by RSB and the International Sustainability and Carbon Certification (ISCC) system under “mass balance” Sustainability Certification Schemes. SAF certificates (SAFc) convey information about environmental attributes such as carbon intensity and emissions reductions for a given SAF volume compared to conventional jet fuel and are decoupled from the underlying physical fuel volumes. SAFc allows airline operators without physical access to SAF and aviation customers to claim the sustainability benefits of given volume of SAF. Within SAF supply chains, individual facilities are certified.

The aviation industry plays a crucial role in the global economy by facilitating movement of goods and people. The SAFc framework

is expected to play an increasingly important role in enabling organizations outside the aviation sector (customers and business partners) to play a more direct role in reducing aviation emissions. This is to be achieved by allowing organizations willing to share in the higher cost of SAF to claim reductions in SAF emissions- thus furthering their own commitment to reducing carbon footprint.

The SAFc framework will be especially useful for millions of businesses who can use it to reduce their Scope 3 emissions (these refer to emissions arising from assets not owned or controlled by the reporting organization- for example, carbon emissions associated with business travel or shipping cargo by air). The EU has in place the EU Emission Trading System (ETS). The Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) requires airlines and aircraft operators to offset their CO₂ emissions above 2020 levels. For most countries with large aviation sectors, compliance with CORSIA rules will become mandatory from 2027.

An efficient, secure, scalable digital SAFc marketplace will be key to realizing its potential

At a high level, here's how the SAFc process works:

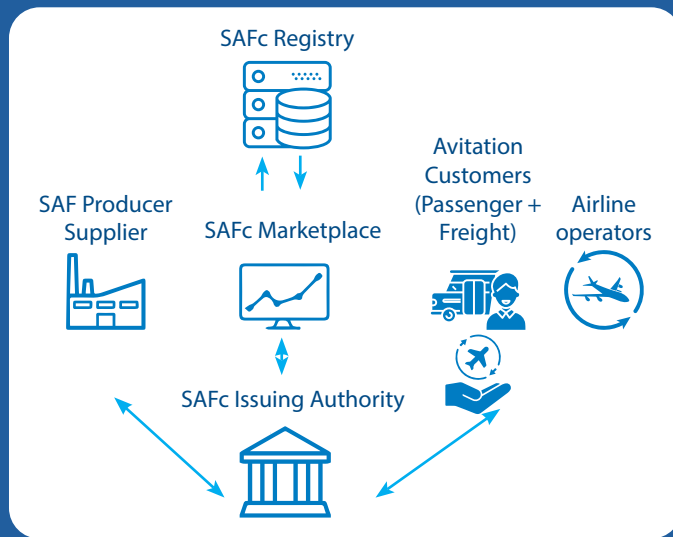
SAF producers and airlines register with a SAF registry. Each batch of SAF produced (after the auditor/inspector authorizes blending) is tested and certified by the issuing agencies. For each batch of fuel, appropriate SAFc (1 SAFc for each MT of SAF) are **issued and transferred to the SAFc registry.** From there, **SAFc tokens are issued to the SAF producer/supplier**, who lists it on the

marketplace at a certain offer price.

Airlines bid for SAFc on the marketplace. After automated matching of bids and offers, trades are executed, and after due approval, **SAFc are transferred to the successful bidder.** Airlines that have won SAFcs can use them to submit sustainability claims to the registry. Such claims can be used for Scope 1 emissions (e.g., to offset their own use of conventional ATF) or Scope 3 emissions (e.g., shared use). Once such claims are settled, the **underlying SAFc are retired by the registry.**

Smooth functioning of an SAFc marketplace requires efficient, timely and secure flow of accurate information between various stakeholders.

A SAFc marketplace for the aviation industry will typically bring together multiple players as shown in the diagram below:



Here's how different players can use a blockchain based SAFc marketplace solution:

SAFc issuing authority: Issue SAFc certificates to SAF suppliers.

SAFc suppliers: Sell SAFc to airlines/other buyers.

Airlines: Buy/Sell SAFc to/from other entities (potentially, from outside the aviation sector as well).

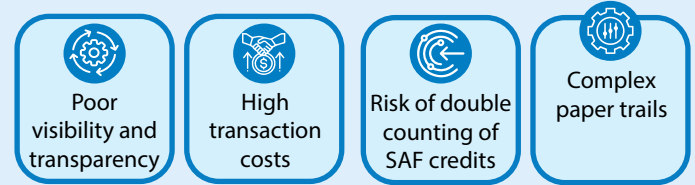
Airline customers: Claim SAFc credits from airlines (this will help corporate customers reduce Scope 3 emissions, while it will help environment-conscious customers be more loyal to the specific airline).

Regulators: Track and verify the issuance, trading, and retirement of SAFc certificates as part of carbon offsetting programs.

As a buyer/seller of SAFc, the blockchain-based approach can deliver the following benefits:

- Single system for all SAFc activities.
- Eliminates risk of double-counting credits, thus making the solution trustworthy.
- A single version of the truth where the data is not owned or controlled by any party.
- Robust governance that allows the governing body to take a holistic, on-demand view of the entire ecosystem.
- Roll-out the solution in SaaS mode, so that you can monetize its use by other stakeholders (who will be attracted by the features and benefits described earlier). Over time, you can also offer value-added services around reporting, compliance, analytics, and risk management. Customers can choose the most relevant bundles, thus expanding your business' revenue potential.
- Enables immutable tracking of the certificates
- Provides complete audit trail of the certificates from the point of issuance to retirement

As of now, there are a limited number of SAF producers globally. Naturally, the demand for SAFc too is limited. Therefore, currently, only a small number of SAFc marketplaces exist. This scenario also means:



COP28 summit held in the UAE in December 2023 saw the launch of a new, independent, not-for-profit SAFc registry designed to connect airlines, freight forwarders, clean fuel producers, and corporate consumers. (source: <https://www.businesstravelnews.com/Transportation/Air/SAF-Certificate-Registry-Launches-at-COP28>). Over time, non-airline businesses too will bid for SAFc and use them to offset their emissions.

We at Infosys believe that blockchain technologies are inherently ideal for building and managing robust, secure, scalable SAFc solutions based on the Book & Claim model. Generating and transmitting SAF credits in the form of Fungible Tokens enhances security by making the SAFc tamper-proof. This real-time approach provides a convenient, transparent, and efficient way for all stakeholders in the SAFc value chain and makes it easy to manage SAFc accounting. It can support multiple SAFc standards. Besides automating issuance, trading, and retirement of SAFc, it can provide perpetual, real-time traceability and audit trails. As the scope of SAFc expands to include other businesses, marketplaces will need to scale quickly- something that blockchain based solutions will easily support. Such solutions also all but eliminate the risk of cyberthreats, thus making it safer for all stakeholders.



The airline industry needs a seamlessly integrated ecosystem to automate the capturing of the flight operational data for capturing the fuel burns considering the actual flight, load and the fuel parameters as a number of variables that impact the operational plans. Infosys Cobalt Airline Cloud (ICAC) addresses such complexity of airline data exchange between the network of systems to ensure the data necessary for SAFc calculation is captured accurately. The ICAC platform is built on composable architecture principles that draw from the overall framework of Infosys Cobalt, a set of services,

solutions, and platforms for enterprises to accelerate their cloud journey for medium to large airline processes and systems. ICAC provides solutions, APIs and re-usable business assets that can be used for improving and optimizing airline operations bringing better customer experience and cost efficiency. The ICAC platform also has additional tools to enhance baggage transfer that can help to reduce flight delay and ground time, optimal ULD utilization to reduce empty ULD transport that can increase fuel burn, Watchtower solution to automate the turnaround operations etc..

To discuss your SAFc needs and explore how we can help or for more information on our blockchain-based SAFc offerings, write to :

TravelPractice@infosys.com

Follow for more updates: [Travel & Hospitality Digital Services and Technology | Infosys](#)

Authors



KUMAR PARAMASIVAM

VP and Global Head - Travel & Hospitality, Professional Services and Enterprise Sustainability, Infosys



K.A. RAGHAVENDRA

VP and Service Offerings Head – Engineering, Enterprise Sustainability and Blockchain – Infosys



ANIL KUMAR BURRA

Lead Consultant – Blockchain Professional, Infosys



For more information, contact askus@infosys.com

Infosys[®]
Navigate your next

© 2024 Infosys Limited, Bengaluru, India. All Rights Reserved. Infosys believes the information in this document is accurate as of its publication date; such information is subject to change without notice. Infosys acknowledges the proprietary rights of other companies to the trademarks, product names and such other intellectual property rights mentioned in this document. Except as expressly permitted, neither this documentation nor any part of it may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, printing, photocopying, recording or otherwise, without the prior permission of Infosys Limited and/ or any named intellectual property rights holders under this document.