RESEARCH ANALYSIS: BILATERAL COOPERATION OPPORTUNITIES BETWEEN BRAZIL AND SWEDEN IN SUSTAINABLE AVIATION FUEL

Mini-biography

Jorge Willian Ferreira Gonçalves holds a B.A. in International Relations from the Federal University of Goiás (UFG). His research focuses on the decarbonization of the aerospace sector, specifically the strategic development of SAF. In 2023, his comparative study on Australian and New Zealander SAF policies was awarded “Best Research in Humanities” by the UFG University Council.

The growing international synergy to mitigate aviation emissions over the last decade, particularly through the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) established by the International Civil Aviation Organization (ICAO), underscores the strategic role of diplomacy in the aviation sector. In the next year, the mandatory phase of CORSIA will enter into force, during which all airlines within Member States will implement ICAO’s basket of measures to reduce carbon emissions. In this context, Sustainable Aviation Fuel (SAF) has emerged as both a critical technological solution and a geopolitical tool.

Brazil and Sweden stand out among nations with defined SAF mandates, sharing a distinguished history of aerospace cooperation that can be leveraged for SAF development. Since 2013, Brazilian and Swedish companies have collaborated on the FX-2 Program to renew the Brazilian Air Force (FAB) fighter fleet. Representing the major export agreement in Swedish history and one of the major defense contracts in South America, the collaboration culminated in March 2026 with the first F-39 Gripen E/F entirely produced in Brazil, the only country authorized by Saab to do so.

This established ecosystem, bolstered by recent legislative advances, creates a fertile ground for new bilateral opportunities. In 2017, the Swedish parliament established the Obligation Reduction Act (2017:1201) to reduce carbon emissions from land transport modes, including the aviation sector in 2021. This law was created within the framework of the Climate Act (2017:720) and comprises the efforts of the nation to reduce its emissions. Conversely, in 2024, the Brazilian executive branch approved the Sustainable Aviation Fuel National Program (ProBioQAV) to reduce the aviation sector emissions, one of the axes of the legislation known as the Future of the Fuel Law (14.993/2024), focusing on promoting the development of sustainable fuels for all transport modes.

While both nations promote SAF, their regulatory focuses differ: the Brazilian mandate targets direct emission reductions through SAF volume, while the Swedish model focuses on reducing the carbon intensity of the fuel pool. This differentiation reflects their unique national challenges, in which those countries face emission reduction and their environmental footprint. However, the overcoming of climate change requires multilevel player efforts, leveraging their expertise to expand production capacity and meet their respective decarbonization targets in the next decade. Exemplifying how energy and aerospace cooperation can transcend technical outcomes.

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The research, in this sense, was conducted to comprehend how Swedish and Brazilian industries can work closely to promote, develop, and use SAF in both countries. The central hypothesis was that enhanced collaboration could accelerate technological advancements, positioning these countries as global leaders in aviation's energy transition. The main objective, instead of direct comparisons, was to assess how public policies, regulatory frameworks, and best practices from both nations contribute to strategic alignment and international cooperation, combining distinct yet convergent capabilities.

Research Methodology and Findings

The study employed a case study methodology to analyze legislative progress and climate policy frameworks in both nations. The dataset included official government documents and ICAO and civil aviation regulatory bodies' resolutions from both countries, as well as the International Air Transport Association's (IATA) reports. The mapping of SAF projects and industrial initiatives was guided by press releases, fact sheets, and other public domain documents produced by key stakeholders, such as Embraer and Saab, the other main airspace players, and the respective Ministries of Foreign Affairs.

The research identified 16 flight tests using diverse SAF blends between 2010 and 2025 in both countries and 36 SAF-related initiatives, most launched following the establishment of national mandates, creating an internal demand for aviation biofuels and for academic understanding of feasibility. However, a significant gap remains between current production capacity and the targets set for the next years. In Sweden, feedstock availability is the primary hurdle, leading to increased interest in electro-fuels (e-SAF). Nonetheless, the European energy crisis and shifting of international policies in Russia and the United States can directly impact the projects' feasibility. The Brazilian case presents the opposite circumstance. As one of the main players in SAF on the American continent, Brazil possesses immense productive capacity linked to the amount of feedstock available in the country. However, productive capacity is significantly impacted and underutilized due to the low technological maturity and the high complexity of the industrial infrastructure.

These complementary challenges create a perfect opening for cooperation, since Brazil's abundant biomass can feed the advanced technological solutions developed by Sweden. By merging these capabilities, both nations can reduce the operational and logistical costs that currently hinder SAF global adoption. The lessons learned from the Gripen program can serve as a blueprint for academia-industry synergy, adapting the projects to their socio-economic realities and national productive capacity.

To meet Brazil's 2037 and Sweden's 2045 targets, new bilateral projects must be ratified in the coming years, promoting long-term initiatives to further cooperation beyond the government mandates. Strengthening ties between stakeholders like Saab and Embraer, as well as Petrobras, Preem, and Swedish Biofuels, is essential to focusing on innovative biofuel solutions. Since climate change and the challenge to overcome aviation

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emissions require a complex and global effort as fast as it is effective, comprehending new pathways and partners is inherent to this global question.

The full version of the research entitled “The Energy Diplomacy for the Sustainable Aviation Fuel (SAF) compared between Brazil and Sweden” is available at the institutional repository of the International Relations course of the Federal University of Goiás (UFG), Brazil.

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