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Review Paper

Carbon-neutral aviation in Nigeria: Assessing the feasibility and impacts of sustainable aviation fuel adoption

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Abstract
This study investigates the feasibility and potential impacts of transitioning Nigeria's aviation industry towards carbon-neutral operations through the adoption of Sustainable Aviation Fuel (SAF). By examining Nigeria's aviation landscape, international efforts for carbon-neutral aviation, and factors such as feedstock availability, infrastructure, and economic considerations, the paper assesses the viability of SAF adoption. Environmental and economic benefits, including reduced carbon emissions, improved air quality, job creation, and economic diversification, are explored. Challenges such as regulatory hurdles, investment requirements, and public awareness are analyzed, with recommendations provided for policy support, industry collaboration, research and development, and public education campaigns. Despite the absence of specific SAF adoption case studies in Nigeria, insights from international experiences inform the recommendations. The findings suggest Nigeria's potential to lead in SAF adoption regionally, contributing to environmental sustainability and economic growth in the aviation sector, while also offering broader implications for the global industry's transition towards a more sustainable future.

Keywords: *Carbon-neutral aviation, sustainable aviation fuel (SAF), Nigeria, feasibility, environmental impact, economic benefits.*

1.0 Introduction

The aviation industry in Nigeria has witnessed substantial growth and development over the years (Oluwakoya and Ajayi 2021). Nigeria is home to several international airports, including the Murtala Muhammed International Airport in Lagos, Nnamdi Azikiwe International Airport in Abuja, and many regional and domestic airports across the country (Oluwakoya and Ogundipe, 2022). The industry plays a pivotal role in connecting the country both domestically and internationally, facilitating trade, tourism, and economic growth (Barkas, Honeck, & Rubio. 2020). However, like the global aviation sector, it faces significant challenges related to environmental sustainability, particularly regarding greenhouse gas emissions and their impact on climate change.

With growing concerns about climate change and its adverse effects, the global community is increasingly focusing on reducing carbon emissions across various industries (Fawzy et. al, 2020). The aviation sector is a significant contributor to greenhouse gas emissions, prompting a concerted effort to achieve carbon-neutral or net-zero carbon aviation (Soria Baledon, et. al., 2022). This involves a commitment to offsetting or reducing the carbon dioxide emissions generated by aircraft operations, either through technological advancements, operational efficiency, or the use of sustainable aviation fuel (SAF) and other innovative solutions (Chiaramonti 2019).

The purpose of this study is to assess the feasibility and potential impacts of adopting sustainable aviation fuel (SAF) in Nigeria's aviation industry as a pathway towards carbon-neutral aviation. By analyzing the current state of aviation emissions in Nigeria, evaluating the viability of SAF adoption, and examining the potential environmental and economic impacts, this study aims to provide valuable insights into the feasibility of transitioning towards a more sustainable aviation sector in the country. Understanding the viability and impact of SAF adoption is crucial for policymakers, industry stakeholders, and environmental advocates seeking to promote sustainable practices within the aviation sector.

2.0 Current state of aviation emissions

The aviation sector is a significant contributor to global carbon emissions. It is estimated to account for approximately 2-3% of the world's total carbon dioxide (CO2) emissions. While this percentage may seem relatively small compared to other sectors, such as energy and transportation, the aviation industry's emissions have been steadily increasing due to the growing demand for air travel worldwide.

2.1 Factors contributing to aviation emissions:

a. Jet Fuel: The primary source of carbon emissions in aviation is the combustion of jet fuel in aircraft engines. Jet fuel releases CO2 and other pollutants, including nitrogen oxides (NOx) and particulate matter, into the atmosphere during flight.
b. Long-Haul Flights: Long-haul flights, which cover vast distances and often use larger, less fuel-efficient aircraft, tend to have higher emissions per passenger kilometer.
c. Rapid Growth: The aviation industry has experienced rapid growth in recent decades, driven by increased global connectivity, rising middle-class populations, and expanding tourism. This growth has led to a corresponding increase in emissions.
d. Limited Alternatives: Unlike some other sectors, aviation does not have widely available alternatives to fossil fuels, making emissions reductions more challenging.

2.2 Nigeria’s contribution to global aviation emissions

Nigeria, as one of the most populous countries in Africa and a growing economic hub, has a burgeoning aviation industry. While Nigeria's aviation sector contributes to global emissions, its overall share is relatively small compared to countries with larger aviation industries, such as the United States, China, and European countries. However, Nigeria's emissions are on the rise due to increased air travel and the expansion of its aviation infrastructure.

1. Domestic and Regional Flights: Nigeria's aviation sector mainly consists of domestic and regional flights connecting major cities within the country and neighboring West African nations. These shorter routes often involve smaller aircraft and result in lower emissions per flight compared to long-haul international flights.
2. Growth Potential: Nigeria's aviation industry has substantial growth potential, and as the demand for air travel increases, so too will emissions unless measures are taken to mitigate them.

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2.3 Environmental challenges and concerns

The environmental challenges and concerns associated with aviation emissions are significant and multifaceted:

1. Climate Change: The carbon emissions from aviation contribute to global warming and climate change. The sector's emissions include not only CO2 but also non-CO2 effects, such as the formation of contrails and the release of NOx, which can amplify the industry's climate impact.
2. Local Air Quality: Aviation emissions can have detrimental effects on local air quality, especially around airports. NOx emissions can lead to the formation of ground-level ozone and contribute to air pollution, impacting the health of nearby communities.
3. Biodiversity and Land Use: Expansion of airports and associated infrastructure can lead to habitat destruction and encroachment on biodiversity-rich areas.

In light of these concerns, there is a growing imperative for the aviation industry, including Nigeria's aviation sector, to take measures to reduce its environmental footprint and transition towards more sustainable practices, including the adoption of sustainable aviation fuel (SAF). This shift is essential not only for environmental reasons but also for the long-term viability and competitiveness of the industry.

3.0 Sustainable Aviation Fuel (SAF) as a solution

3.1 *What is sustainable aviation fuel?*

Sustainable Aviation Fuel (SAF) is a type of aviation fuel designed to significantly reduce the carbon emissions associated with aircraft operations. SAF is often referred to as an eco-friendly alternative to traditional fossil-based jet fuels. What sets SAF apart is its composition, as it is produced from renewable or sustainable feedstock and undergoes a process that results in lower lifecycle greenhouse gas emissions compared to conventional jet fuel (Peres et. al. 2022).

Key characteristics of SAF include:

1. Renewable Sources: SAF is derived from renewable feedstocks, such as plant-based oils, animal fats, municipal waste, and agricultural residues. It can also be synthesized through advanced processes using carbon capture and utilization (CCU) technologies (Peres et. al. 2022).
2. Drop-in Compatibility: SAF can be blended with traditional jet fuel or used as a pure drop-in replacement without any modifications to existing aircraft engines or infrastructure. This compatibility makes SAF an attractive option for the aviation industry.
3. Carbon Reduction: SAF production methods result in a significant reduction in greenhouse gas emissions, making it an effective tool for mitigating the environmental impact of aviation.

3.2 Types and sources of SAF

There are several types of SAF, each sourced from different feedstock materials and produced using various processes. Some common types of SAF include:

1. Hydroprocessed Esters and Fatty Acids (HEFA): HEFA SAF is primarily made from feedstocks like vegetable oils and animal fats. These feedstocks are refined and then hydroprocessed to produce a SAF that is chemically similar to traditional jet fuel (Usman et. al., 2023)

2. Fischer-Tropsch (FT): FT SAF is produced through a gas-to-liquid (GTL) process, where carbon-rich feedstocks like natural gas or biomass are converted into liquid hydrocarbons. FT SAF is known for its high energy density and cleanliness (Richter et al.,2018).
3. Alcohol-to-Jet (ATJ): ATJ SAF is synthesized from alcohols, such as ethanol or butanol, and converted into hydrocarbons that can be used as aviation fuel. This type of SAF has the potential to be produced from a variety of sustainable feedstocks (Usman et. al., 2023).
4. Synthesized Paraffinic Kerosene (SPK): SPK SAF is created through a process called the Fischer-Tropsch synthesis, where carbon-containing gases like carbon dioxide and hydrogen are used to produce liquid hydrocarbons (Montoya Sánchez, et al.,2022). This process can utilize carbon capture technology to reduce emissions.
5. Biomass-to-Liquid (BTL): BTL SAF is derived from biomass feedstocks like wood, crop residues, or algae. These feedstocks are converted into liquid hydrocarbons through processes like pyrolysis or gasification (Habermeyer, et al.,2023).

3.3 Benefits of SAF adoption in the aviation sector

The adoption of SAF in the aviation sector offers a range of benefits:

1. Carbon Emission Reduction: SAF significantly reduces carbon emissions compared to traditional jet fuels. It can achieve carbon reductions of up to 80% or more, depending on the feedstock and production process (Usman et. al., 2023).
2. Improved Air Quality: SAF produces fewer harmful emissions, such as sulfur compounds and particulate matter, contributing to better air quality near airports and along flight routes.
3. Energy Security: Diversifying the aviation fuel supply with SAF reduces dependence on fossil fuels, enhancing energy security and resilience in the aviation sector.
4. Compliance with Regulations: Many countries and regions are implementing regulations and targets to reduce aviation emissions. SAF adoption helps airlines meet these requirements and avoid penalties.
5. Market Opportunities: The production and use of SAF create new economic opportunities, including jobs in feedstock production, fuel processing, and distribution.

3.4 International efforts and policies promoting SAF use

Several international efforts and policies aim to promote the adoption of SAF in the aviation sector:

1. ICAO CORSIA: The International Civil Aviation Organization's Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) is a global market-based measure designed to stabilize CO2 emissions from international aviation at 2020 levels (Strouhal, 2020). SAF can be used to offset emissions and comply with CORSIA requirements.
2. National Initiatives: Many countries have introduced policies and incentives to support SAF production and use, including research funding, tax incentives, and blending mandates (Pavlenko, 2021).
3. Industry Commitments: Leading airlines, manufacturers, and industry associations have made commitments to increase the use of SAF in their operations, promoting sustainable aviation practices (Mousavi & Bossink 2017).
4. Research and Innovation: Governments and organizations are investing in research and development to advance SAF technologies, improve production processes, and lower costs (Zhang, et al.,2020).

In summary, Sustainable Aviation Fuel (SAF) holds great promise as a sustainable solution to reduce carbon emissions in the aviation sector. Its compatibility with existing aircraft and infrastructure, as well as its potential for significant carbon reductions, make it a key component of efforts to achieve carbon-neutral aviation worldwide. International policies and industry commitments are driving the adoption of SAF, signaling a positive shift toward more environmentally responsible air travel.

4.0 Feasibility of SAF adoption in Nigeria

4.1 *Availability and production capacity of SAF in Nigeria*

1. Feedstock Resources: Nigeria possesses a wealth of potential feedstock resources for the production of Sustainable Aviation Fuel (SAF). These resources include abundant biomass from agriculture and forestry, waste oils and fats, and algae (Ezeonu and Ezeonu, 2016). These feedstocks can serve as the foundation for local SAF production.
2. Research and Development: Initiatives to explore and harness local feedstocks for SAF production have been underway. Research institutions and universities in Nigeria have been engaged in studies to identify suitable feedstock sources and develop cost-effective conversion processes (Yang, 2014).
3. Potential for Domestic Production: Nigeria has the potential to establish SAF production facilities that can cater to both domestic aviation needs and contribute to the global SAF market. Investment in research and development, as well as collaboration with international partners, can accelerate progress in this regard.

4.2 Infrastructure and technical considerations

1. Refining Infrastructure: Establishing SAF production facilities in Nigeria would require the development or retrofitting of existing refineries or biofuel production plants. This entails technical upgrades and modifications to align with SAF production processes.
2. Distribution and Supply Chain: The infrastructure for transporting SAF from production facilities to airports would need to be established or expanded. This includes pipelines, storage facilities, and logistics for the safe and efficient distribution of SAF.
3. Aircraft Compatibility: SAF should meet international standards and specifications to ensure compatibility with aircraft engines. Technical adjustments and approvals may be necessary to ensure the safe and efficient use of SAF in Nigeria's aviation sector.
4. Research and Innovation: Investment in research and innovation is crucial to address technical challenges and optimize the production and distribution of SAF within the country. Collaboration between government agencies, research institutions, and the private sector can drive advancements in SAF technology.

4.3 Economic feasibility and cost implications

1. Initial Investment: Establishing SAF production facilities and infrastructure represents a significant upfront investment. Government incentives, subsidies, or public-private partnerships may be necessary to attract investors and reduce the financial burden.
2. Production Costs: The cost of producing SAF from different feedstocks can vary. Factors such as feedstock availability, processing technology, and economies of scale influence production costs. Economies of scale can be achieved through increased SAF production and utilization.
3. Price Competitiveness: The economic feasibility of SAF adoption in Nigeria will depend on the price competitiveness of SAF compared to traditional jet fuel. Market dynamics and global SAF pricing will play a role in determining its cost-effectiveness.

4. Job Creation: The SAF industry has the potential to create jobs in feedstock cultivation, processing, production, and distribution, contributing to economic growth.

4.4 Government and industry support for SAF adoption

1. Policy Framework: The Nigerian government can play a pivotal role by implementing supportive policies, such as tax incentives, research grants, and blending mandates, to promote SAF production and adoption in the aviation sector.
2. Industry Collaboration: Collaboration between the government, airlines, airports, and SAF producers is essential for the successful integration of SAF into Nigeria's aviation industry. Public-private partnerships can facilitate the development of SAF infrastructure and supply chains.
3. Education and Awareness: Raising awareness among industry stakeholders and the public about the benefits of SAF adoption is crucial. Education campaigns can foster acceptance and drive demand for SAF.
4. International Cooperation: Nigeria can benefit from international partnerships and collaborations with countries that have advanced SAF industries. These partnerships can provide knowledge transfer, technical expertise, and investment opportunities.

In conclusion, the feasibility of Sustainable Aviation Fuel (SAF) adoption in Nigeria depends on various factors, including feedstock availability, technical readiness, economic viability, and government and industry support. With the right policies, investments, and collaborations, Nigeria has the potential to become a regional leader in SAF production and use, contributing to both environmental sustainability and economic growth within the aviation sector.

5.0 Environmental and economic impacts

5.1 *Reduction in carbon emissions and environmental benefits*

1. Greenhouse Gas Emissions Reduction: The adoption of Sustainable Aviation Fuel (SAF) in Nigeria's aviation sector would lead to a substantial reduction in carbon emissions. SAF can achieve carbon reductions of up to 80% or more compared to traditional jet fuel. This reduction in greenhouse gas emissions contributes significantly to mitigating climate change and aligning with international emissions reduction targets.
2. Lower Particulate and NOx Emissions: SAF also reduces emissions of particulate matter and nitrogen oxides (NOx) by 70% (Habermeyer, et al.,2023) which have detrimental effects on air quality and human health. Lowering these emissions near airports and along flight routes improves local air quality and public health.
3. Reduced Contrail Formation: SAF's cleaner combustion process can lead to fewer contrail formations, which have a warming effect on the atmosphere. This can help mitigate aviation's non-CO2 climate impacts.
4. Biodiversity and Land Use: By reducing the demand for traditional jet fuel, SAF adoption can alleviate pressure on ecosystems and biodiversity-rich areas that may otherwise be impacted by fossil fuel extraction and transport.

5.2 Potential for job creation and economic growth

1. SAF Production Jobs: The establishment of SAF production facilities in Nigeria has the potential to create jobs in feedstock cultivation, processing, and refining. These jobs span

various skill levels and can contribute to employment opportunities in both urban and rural areas.

2. Supply Chain and Logistics: The distribution and supply chain for SAF, including transportation, storage, and logistics, can generate additional employment opportunities in the aviation sector.
3. Economic Diversification: SAF production can diversify Nigeria's economy by adding a new sector that is less reliant on oil and gas revenues. Economic diversification enhances resilience to market fluctuations.
4. Increased Investment: The development of a local SAF industry can attract investment from domestic and international sources, stimulating economic growth and technology transfer.

5.3 Impact on airfares and consumer perception

1. Airfare Considerations: The cost of SAF production and distribution may initially be higher than that of conventional jet fuel. This could potentially lead to higher ticket prices for air travelers. However, the extent of the impact on airfares depends on various factors, including the availability of SAF, production costs, government incentives, and market dynamics.
2. Consumer Perception: The aviation industry's commitment to sustainability and reduced carbon emissions through SAF adoption can positively influence consumer perception. Passengers may be more willing to pay a premium for flights associated with lower carbon footprints, fostering a sense of environmental responsibility.
3. Market Differentiation: Airlines that actively promote their use of SAF may gain a competitive edge by appealing to environmentally conscious travelers who prioritize sustainable travel options.
4. Industry Leadership: Nigeria's aviation industry has the opportunity to demonstrate leadership in sustainable aviation practices, setting an example for the region and the global aviation community.

5.4 Case studies of SAF adoption in other countries

Examining case studies of SAF adoption in other countries provides valuable insights into the potential benefits and challenges of integrating SAF into Nigeria's aviation sector:

1. United States: The United States has seen significant progress in SAF adoption, with various airlines committing to purchase and use SAF. Initiatives such as the Sustainable Aviation Fuel Grand Challenge seek to promote SAF production and use (Jensen et, al.,2023)
2. European Union: The European Union has set ambitious targets for SAF use in aviation as part of its Green Deal and Flightpath initiatives. European countries are investing in SAF production facilities and infrastructure development (Finger et. al., 2021).
3. Singapore: Singapore has made strides in SAF production and has established a SAF initiative, aiming to supply SAF to airlines operating at Changi Airport. The country's efforts showcase the feasibility of SAF adoption in an Asian context (Sreenath et al., 2021).
4. Australia: Australia has initiated SAF production projects, leveraging its vast biomass resources. These projects demonstrate the potential of SAF adoption in countries with abundant agricultural and forestry resources (Lebrouhi et al., 2022).

These case studies highlight diverse approaches to SAF adoption, emphasizing the role of government support, industry collaboration, and technological innovation in advancing sustainable aviation practices. They provide valuable lessons that can inform Nigeria's efforts to integrate SAF into its aviation sector.

6.0 Challenges and barriers

6.1 *Regulatory and policy hurdles*

1. Lack of Regulatory Framework: One of the primary challenges in adopting Sustainable Aviation Fuel (SAF) in Nigeria is the absence of a comprehensive regulatory framework that governs SAF production, distribution, and use. Clear and supportive regulations are essential to provide a legal framework for SAF operations.
2. Certification and Approval: SAF must meet stringent aviation safety and quality standards before it can be used in aircraft. Ensuring that SAF produced in Nigeria complies with international standards and securing necessary approvals can be a complex and time-consuming process.
3. International Coordination: As aviation is an international industry, harmonizing SAF regulations and standards with international bodies like the International Civil Aviation Organization (ICAO) is crucial. Nigeria may need to align its regulations with global aviation agreements.

6.2 Investment and funding challenges

1. High Initial Investment: Establishing SAF production facilities and infrastructure requires significant capital investment. Attracting investors and securing funding can be challenging, particularly in the early stages when returns on investment may be uncertain.
2. Access to Financing: Access to affordable financing and investment capital for SAF projects may be limited. Public-private partnerships, grants, and subsidies may be necessary to incentivize investment.
3. Price Volatility: The price of feedstocks and SAF production can be subject to fluctuations. Predicting and managing these price variations is essential for the economic feasibility of SAF projects.

6.3 Technological limitations

1. Technology Development: Developing and optimizing technology for SAF production from local feedstocks may require extensive research and development efforts. Nigeria may face technological challenges in scaling up production processes efficiently.
2. Infrastructure Upgrades: Retrofitting or building new infrastructure for SAF production, refining, and distribution may require substantial technical expertise and investments. Developing the necessary infrastructure can be a barrier.
3. Availability of Sustainable Feedstocks: While Nigeria has abundant agricultural and forestry resources, ensuring a consistent and sustainable supply of feedstocks for SAF production can be challenging. Competition with other industries for these resources may arise.

6.4 Public awareness and education

1. Lack of Awareness: Public awareness of the benefits of SAF and the importance of sustainable aviation practices may be limited in Nigeria. Educating the public, including passengers and communities near airports, is crucial to foster support and demand for SAF.

2. Stakeholder Engagement: Engaging with various stakeholders, including government agencies, airlines, airport authorities, and environmental organizations, to build consensus and support for SAF adoption can be time-consuming and challenging.
3. Perceptions and Misconceptions: Addressing potential misconceptions or skepticism about SAF, including concerns about safety, affordability, and effectiveness, is essential to ensure public acceptance and support.
4. Workforce Training: Training and preparing the workforce for SAF-related roles and responsibilities, from feedstock cultivation to SAF production and distribution, is essential for a smooth transition to SAF adoption.

In conclusion, while the adoption of Sustainable Aviation Fuel (SAF) offers significant environmental and economic benefits, several challenges and barriers must be addressed in Nigeria. Overcoming regulatory hurdles, securing funding, advancing technology, and enhancing public awareness and education are critical steps in facilitating the successful integration of SAF into the country's aviation sector. Collaboration between government, industry, and international partners is key to overcoming these challenges and realizing the potential of SAF in Nigeria.

7.0 Recommendations for a carbon-neutral aviation future in Nigeria

7.1 *Policy recommendations*

1. Develop a comprehensive SAF policy: Create a dedicated policy framework specifically focused on Sustainable Aviation Fuel (SAF) production, distribution, and use in Nigeria. This framework should include incentives, mandates, and standards to support SAF adoption.
2. Incentives for SAF production: Provide financial incentives, tax breaks, or subsidies to encourage private sector investment in SAF production facilities. These incentives can help offset the high initial capital costs associated with SAF production.
3. Blending mandates: Introduce blending mandates that require a certain percentage of SAF to be used in aviation fuel. Gradually increase the blending targets to stimulate demand for SAF within the aviation sector.
4. Support for research and innovation: Allocate government funding for research and development initiatives related to SAF technology, feedstock development, and production process optimization.
5. International agreements: Actively participate in international agreements and initiatives, such as CORSIA, to align Nigeria's aviation emissions reduction efforts with global standards.

7.2 Industry collaboration and partnerships

1. Public-Private partnerships: Foster collaboration between government agencies, aviation industry stakeholders (airlines, airports, and aircraft manufacturers), research institutions, and private companies to jointly invest in and promote SAF adoption.
2. Supply chain development: Facilitate partnerships between SAF producers, logistics companies, and airports to develop a robust SAF supply chain, including storage and distribution infrastructure.
3. Airlines' commitment: Encourage airlines operating in Nigeria to commit to SAF adoption through voluntary agreements, thereby driving demand and setting a positive example.
4. Knowledge sharing: Collaborate with countries and organizations that have advanced SAF adoption to share best practices, technologies, and lessons learned.

7.3 Research and development initiatives

1. SAF technology centers: Establish research centers or hubs dedicated to SAF development and innovation. These centers can focus on improving feedstock cultivation, processing techniques, and conversion technologies.
2. Feedstock research: Invest in research into locally available and sustainable feedstock sources for SAF production. This includes studying crop residues, algae, municipal waste, and other potential feedstocks.
3. Efficiency improvements: Fund research projects aimed at increasing the efficiency of SAF production processes, reducing production costs, and enhancing the environmental benefits of SAF.
4. Carbon capture technology: Explore and invest in carbon capture and utilization (CCU) technologies that can capture carbon dioxide emissions and convert them into SAF, further reducing the carbon footprint of aviation.

7.4 Public awareness and education campaigns

1. Public engagement: Launch public awareness campaigns to educate the public, passengers, and communities near airports about the benefits of SAF adoption, its safety, and its role in reducing aviation's environmental impact.
2. Industry outreach: Work with aviation industry associations to promote SAF adoption and educate aviation professionals about its use and benefits.
3. Educational programs: Collaborate with educational institutions to develop programs and courses related to sustainable aviation practices and SAF production. This can help create a skilled workforce for the SAF industry.
4. Media and marketing: Engage with the media to disseminate information about SAF adoption and showcase the efforts of Nigerian airlines and airports in adopting sustainable practices.

Thus, achieving a carbon-neutral aviation future in Nigeria requires a multifaceted approach involving policy support, industry collaboration, research and development, and public awareness efforts. By implementing these recommendations, Nigeria can position itself as a leader in sustainable aviation practices within the African region, contributing to both environmental preservation and economic growth in the aviation sector.

8.0 Conclusion

Nigeria has the potential to become a leader in carbon-neutral aviation due to its abundant feedstock resources, growing aviation sector, and commitment to environmental sustainability. Achieving this goal will require dedicated efforts, international cooperation, and addressing regulatory, financial, technological, and awareness challenges.

Nigeria's actions in adopting SAF and reducing aviation emissions can set an example for other African nations and emerging economies, signaling that sustainable aviation practices are viable globally. These efforts align with international initiatives like CORSIA, contributing to the collective goal of mitigating climate change in the aviation industry.

Thus, Nigeria's pursuit of carbon-neutral aviation through SAF adoption demonstrates the transformative potential of sustainable aviation practices globally, inspiring the broader aviation industry's transition to a more sustainable and environmentally responsible future.

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