

SUSTAINABLE AVIATION FUEL IN LATIN AMERICA

*As the aviation market moves towards a more sustainable future and fuel source, Brazil and other Latin American countries are likely to serve as key production locations for SAF due to their unique natural endowments and existing experience with bio-fuels. While challenges will exist in taking projects on the drawing board through the construction and financing cycle the opportunities for Latin America are clear. By **CHRIS TAUFATOFUA**, partner, **ALAN J ALEXANDER**, partner, **AFZAAL ABIDI**, associate, and **RUAIRI MCGILL**, associate, **VINSON & ELKINS**.*

The aviation industry is a cornerstone of the global economy, accounting for more than 35% of trade volume by value, and with passenger numbers rebounding sharply post-Covid, serves as a primary method of migration. Flight numbers are expected to grow at an annual growth rate above 8% until 2030, intensifying the impact of an already energy and emission intensive sector. While making progress in its pursuit of decarbonisation through the introduction of more efficient engines and composite building materials, the aviation industry requires a significant overhaul to meet its self-imposed net-zero emissions target by 2050.

Although emissions have been reduced on a per passenger and per tonne basis, the increase in flights means that aviation contributes between 2% and 3% of CO₂ emissions annually, with its effects particularly perceptible given that emissions are released in the stratosphere where their impact is more pronounced. Unlike other target areas for decarbonisation, in the short-to-medium term, the aviation industry is having to look beyond battery solutions given their limited energy intensity.

Current front-runners in alternative propulsion methods and fuels include sustainable aviation fuel (SAF) and hydrogen cells, and Latin America, given its abundance of agricultural land available for repurposing and its mature bio-fuel production, blending and distribution experience, is emerging as a key player. Despite being an area ripe with opportunity, financiers and project sponsors will need to be mindful of bio-fuel specific considerations alongside environmental credibility and certification.

SAF AS THE SOLUTION

The International Air Transport Association expects SAF to contribute about 70% of the industry's reduction in emissions. SAF blends sustainably produced fuels with conventional aviation fuel (CAF) to reduce its carbon intensity, and to ensure the final fuel meets high combustion requirements, as SAF, as currently produced, requires blending to ensure a complete combustion chain profile. SAF is produced from biomass, agricultural residues, or renewable energy and carbon methanation.

SAF has the key advantage of not requiring significant modifications to existing engines or distribution networks, and is a drop-in replacement, which aids both upfront capital expenditure requirements and its roll-out speed. Projections suggest that Latin America will be responsible for the production of more than 15% of SAF by 2030, an oversized proportion compared with its production of CAF given its ability to leverage its arable land stock and its existing mature bio-fuel market. Other key producing markets are likely to include North America.

The SAF market, while still nascent and with SAF based fuels only accounting for less than 0.5% of aviation fuel consumed, is expected to grow from a US\$1.25bn market in 2020 to over US\$15bn by 2030. Significant scale-up and investment will be required across the entire supply chain for supply to meet expected demand levels.

SAF market's development has been accelerated by partnerships between airlines, aircraft manufacturers and SAF producers, advancements in production technology and methods, and the emergence of innovative financing and pricing models to support SAF adoption such as the Carbon Offsetting Reduction Scheme for International Aviation (CORSA), a market-based mechanism for airlines to offset their carbon emissions by investing in and purchasing SAF. Additionally, regulatory measures, as further discussed below, and emission reduction targets are driving demand for SAF among airlines despite the price premium SAF currently commands over CAF.

SAF had a price differential of 223% in 2022, which continues to drop¹. The EU is currently targeting SAF blend targets for fuel supplied to flights starting at 2% in 2025, increasing to 6% in 2030 and up to 70% by 2050, both driving demand and providing a clear and predictable regulatory framework allowing producers and users to make long-term investment and procurement decisions.

LATIN AMERICA AS A KEY PRODUCER

As the SAF market matures, and technological innovation gathers pace, production methods will include the processing of waste fats, oils and bio-feedstock, and eventually will incorporate the use of renewable energy to produce green hydrogen that will then be combined with CO₂ to make methane or a synthetic hydrocarbon.

The production of SAF at the scale required to meet decarbonisation targets will require significant biomass, agricultural residues or waste oils as its feedstock. Latin America, and Brazil in particular, are well-positioned to be significant producers given their ability to leverage sizeable existing agricultural land, and government initiatives and mandates already encouraging and incentivising the use of other bio-fuels in the domestic market (as discussed below), which will allow for a pivot of production to SAF efficiently.

While SAF will contribute to emission reductions, there are concerns that the repurposing of existing arable land used for food, or the deforestation of land that operates as a natural carbon sink in order to grow feedstock for SAF, may limit the actual environmental benefit. With an estimated 40 million hectares of land with high agricultural aptitude that may be repurposed or rehabilitated, Brazil is particularly well placed to be the forerunner in the development, production and utilisation of SAF without the need for greenfield sites to be used.

The repurposing of previously degraded land through the re-introduction of native plants that are less water-intensive than the cash crops currently grown, improves the green credentials of SAF across the value chain. Brazil is an attractive destination for SAF production given its mature and developed aviation industry, its consistent track record of utilising blended fuels in its energy mix², a robust refining and energy industry well equipped with blending and distribution, and an experienced and sophisticated development bank³.

DEVELOPMENT AND FINANCING

Given the infancy of the SAF market the level of growth required to meet expected demand will require significant investment, with estimates ranging between US\$1trn and US\$1.5trn. The market is expected to be primarily funded by multi-source, limited recourse project financing. Although interest in the SAF financing market remains intrinsically linked to SAF's environmental benefits, and the potential for the reallocation of emission liability, there is growing investment appetite for SAF as a standalone investment opportunity⁴. Potential financiers have highlighted certifying green credentials and risks of regulatory changes as causes of uncertainty. Where potential producers are considering debt as a means of financing their production of SAF the following are key considerations within the context of the Latin American market:

- *Feedstock supply and project-on-project risk* – SAF production will be reliant on bio-organic feedstock supplies and potential producers will need to remain vigilant in ensuring the security of their supply, both with respect to quantity and quality. Given the significant repurposing of land required for SAF production, project sponsors will need to consider how their feedstock agreements line up with any project-on-project risks that exist further up the supply chain. As with many project financings, there is a risk that a SAF facility reaches completion (and therefore its debt becomes serviceable) before either the raw agricultural produce is ready, or the feedstock processing facility (if required) has come online.

Financiers are likely to require that offtake agreements do not commit producers to commence supplying customers or allow customers to terminate if delivery of SAF is delayed due to project-on-project risks. This is particularly pronounced for a SAF production facility where the quantity

or quality of feedstock may be affected by variables outside the project company's control, such as weather. In the context of Latin America, issues with land repurposing and soil enhancement where previous monocropping has deteriorated, the conditions should be investigated and protections and contingency options considered.

- *Offtake arrangements* - Given the significant upfront capital expenditure required, and the current price premium charged, the bankability of an SAF project is likely to be heavily influenced by the strength of the offtake agreement with respect to omitted volumes, payment obligations – with financiers likely to prefer a take-or-pay arrangement – and the creditworthiness of the offtaker⁵. Given the significant fluctuations of the currencies of key Latin America countries, we might see financiers requiring that key agreements are denominated in the same currency as the debt facility.

- *Reliability of certification and of regulations* – SAF producers and users are grappling with how to define, measure and verify the carbon intensity and sustainability of aviation fuels, with uncertainty on a changing regulatory landscape (regionally and globally) cited as a concern of investors as numerous standards may apply. As the market develops, and the percentage of SAF included in the fuel mix used by aircraft increases, financiers are likely to seek comfort over a project's ability to pivot production methods or blends. SAF producers will also need to grapple with potential reputational risks for their projects as the entire value chain of SAF, from plant to plane will, like other biomass products, come under scrutiny as to the “macro” benefit they are providing.

- *Technology risk* – Given the developing market for SAF, numerous production methods and processes are still under development, with Brazil serving as an incubator, including for projects such as BioQAV which aims to produce hydroprocessed esters and fatty acids (a form of SAF) from used cooking oil. The level of progress being made represents a risk as first movers may feel penalised as new and more economical technologies become available after production facilities are completed⁶. Project sponsors should ensure robust protections and best practice sharing provisions are included in any proprietary technology licences they acquire and under any operation and maintenance agreements. ■

FOOTNOTES

1 – The applicability of SAF towards CORSIA, and thus reducing (or removing) the requirement for airlines to purchase carbon abatement products will allow SAF to become cost-competitive with CAF even with the cost premium

2 – Brazil mandated a minimum of 14% ratio of bio-fuel to diesel as of March 2024

3 – See Brasil Development Bank's climate fund that has been established to incentivise investment in clean energy investments

4 – See the recent Air Transport Action Group survey on SAF Financing

5 – Airlines, generally, are not typically investment-grade creditors and this, if SAF is to be sold directly to users, may result in financiers requiring additional protections in offtake agreements

6 - This is also likely to be a concern of initial offtake customers, which may be reluctant to enter into agreements that have a fixed price that may come down as technological progress is made