Global Aviation Sustainability Outlook 2026

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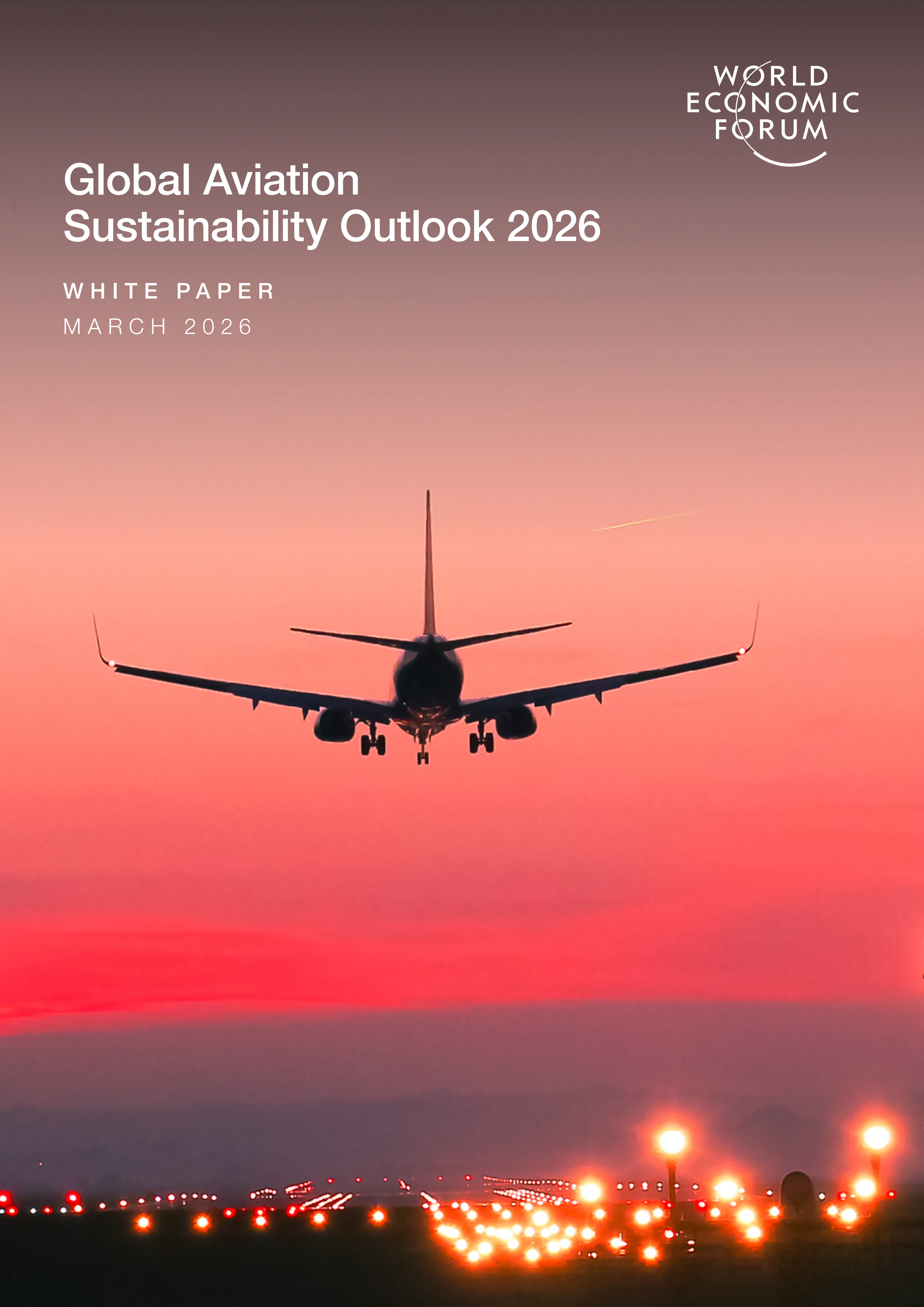

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Foreword by the International Civil Aviation Organization

Juan Carlos Salazar
Secretary General,
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Aviation stands at a decisive moment. With passenger and cargo volumes continuing to rise, the sector must sustain growth while accelerating its transition towards net-zero carbon emissions. In this context, the *Global Aviation Sustainability Outlook 2026* offers a timely and strategic contribution by connecting long-term ambition with practical delivery.

The strength of this report lies in its emphasis on implementation. It underscores that sustainable aviation is not solely a technological challenge, but a system-wide transformation requiring policy coherence, market certainty, infrastructure readiness and sustained public-private collaboration. As climate and economic pressures intensify, structured dialogue across sectors remains essential to maintain progress towards shared climate objectives.

In 2025, ICAO's 42nd Session of the Assembly reaffirmed the sector's collective commitment to the long-term global aspirational goal (LTAG) of net-zero carbon emissions by 2050. The priority now is execution. Achieving this goal will require the rapid scale-up of cleaner aviation energy, major investment in new supply chains, and globally aligned regulatory frameworks that provide confidence to markets and investors. Through the Carbon Offsetting and Reduction Scheme for International Aviation initiative (CORSIA) and its sustainability and life-cycle emissions criteria, ICAO has established a foundation for such international alignment.

It is equally critical to ensure that all regions can participate in this transition. ICAO's Assistance, Capacity-building and Training (ACT) programmes and the Finvest Hub are supporting states in translating commitments into bankable projects, and bridging policy ambition with implementation and finance. In parallel, ICAO is strengthening its work on climate resilience, recognizing that mitigation and adaptation must advance together to safeguard the future of international air transport.

This report reinforces a central reality: the path to net-zero aviation will be shaped not by any single actor, but through coordinated action among governments, industry and finance. By presenting both opportunities and risks associated with the clean energy transition, the *Global Aviation Sustainability Outlook 2026* serves as a practical reference for decision-makers navigating this transformation.

As the window for climate action narrows, ICAO welcomes this contribution from the World Economic Forum and its aviation communities. Through sustained cooperation and clear global frameworks, we can convert ambition into investment and investment into lasting impact for a resilient and sustainable aviation sector.

Foreword by Airports Council International World

Justin Erbacci
Director General,
Airports Council
International (ACI) World

In its latest *Airport Traffic Forecasts 2025-2054*, ACI World predicts global passenger traffic will reach 10.2 billion passengers in 2026 and 18.8 billion by 2045, confirming sustained long-term demand growth and underscoring the role of aviation — and airports in particular — as sources of stability that enable trade, mobility, tourism and global connections.

At the centre of the aviation system, airports are more than physical infrastructure; they serve as economic anchors and community gateways, sustaining supply chains, supporting jobs and maintaining vital links that underpin well-functioning economies and social cohesion, even in times of uncertainty.

In this context, geopolitical shifts, social change, climate impacts and broader uncertainties should not slow progress, but instead serve as a catalyst to reaffirm ambition, accelerate action and embrace the transformations needed to build a resilient, sustainable and innovative aviation sector. Ensuring the sector can grow sustainably is therefore not only an industry priority, but a global economic imperative.

The air transport sector continues to make progress towards net-zero carbon emissions by 2050 and it is important to recognize how much has already been achieved. As this *Global Aviation Sustainability Outlook 2026* demonstrates, airports worldwide are delivering concrete results: expanding sustainable aviation fuel (SAF) distribution, improving energy efficiency, electrifying ground operations, exploring hydrogen projects, strengthening cooperation programmes and increasing participation in the ACI Airport Carbon Accreditation programme, managed by ACI Europe. This progress across airports and the wider aviation ecosystem is real, measurable and deserving of recognition.

With the International Civil Aviation Organization (ICAO) leading the collective ambition of states, these efforts help the sector to remain focused and move decisively forward. Yet the path ahead remains uneven and the challenges are significant. The next five years will be critical in keeping air transport on track for decarbonization.[1] This will require accelerated action and collective effort across the aviation industry and governments, supported by substantial, long-term commitments from the finance and energy sectors.

SAF is central to all decarbonization pathways and must remain a primary focus of action. While the steady growth of the SAF market is encouraging, a much faster scale-up is needed. At the same time, the aviation sector, including airports as energy and infrastructure hubs, will require access to sufficient, reliable, renewable and low-carbon energy to meet growing demand.

These decarbonization efforts must go hand-in-hand with adaptation and resilience, as climate impacts are already increasingly affecting airport infrastructure and operations. Meeting future demand and shaping a next-generation, future-ready aviation sector will require significant, well-coordinated investments to enable long-term, economically sustainable air transport infrastructure.

This report reflects both the urgency of the moment and the opportunity ahead. It rightly underscores the need for pragmatic, actionable strategies and sustained collective delivery. Airports will remain central to this effort, serving as pillars of stability, innovation and coordinated action for the global aviation system and the generations of travellers and communities to come.

Foreword by World Economic Forum and industry leaders

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Lisa Wee
Chief Sustainability Officer, AVEVA

Julian Wentzel
Group Chief Sustainability Officer, HSBC

Aviation's journey towards sustainability is facing strong headwinds in 2026, with a record 9.8 billion passengers expected worldwide this year and the highest volume of cargo ever transported by air in 2025. While this strong growth provides a positive outlook on the overall profitability of the industry, challenges are mounting when it comes to moving the sector towards net zero. From clean technology costs and deployment challenges to disruptions driven by geopolitics, wars, trade tensions, cybercrime and climate change, the world has evolved rapidly and profoundly since a year ago, when the World Economic Forum published its first *Global Aviation Sustainability Outlook*.

Aviation-specific events during 2025 clearly demonstrated how growing and greening the sector are two goals competing among a host of different priorities for executives' attention. The industry is also seeking to double down on safety, increase operational efficiency, navigate air traffic disruptions, improve passenger experience and drive affordability – while at the same time innovating through new business models, frontier technologies, materials and data. As international aviation faces these complementary – and sometimes conflicting – opportunities and risks, it is coming under increasing scrutiny to see whether and how it chooses to advance climate action.

As the sector's journey towards net-zero carbon emissions becomes more turbulent, the flightpath may require some pragmatic course corrections – from leveraging regional dynamics to securing additional policy support. Nevertheless, as leaders of the World Economic Forum's aviation community – driving initiatives such as Airports of Tomorrow, the First Movers Coalition and Green Fuel Forward – we remain committed to advancing sustainable aviation, regionally and globally.

The destination has not changed. The latest Assembly of the International Civil Aviation Organization (ICAO) remained firm in its commitment to net-zero aviation by 2050 and its 2030 vision. To get there, the industry will need to develop and commercialize cleaner fuels, spearhead the transformation of airports into economic, digital and energy hubs, and expand market mechanisms such as book-and-claim. Every actor in the sector will need to play their part in the coming year – including airports, airlines, fuel producers and suppliers, ground handlers, infrastructure companies, financiers, aircraft manufacturers, corporate travellers, innovators, academia and, more than ever, governments.

Where there is fragmentation, we should remind ourselves that aviation is about connectivity. In today's world, bringing people together has never been more important. Scaling-up collaboration across industries and regions remains essential to level the playing field for sustainable investment and ultimately to reduce the cost of the transition to net zero.

There will be upsides along this journey. It is more important than ever to remember that investment in clean aviation means more jobs, better skills, new economic opportunities and greater energy security – topics that continue to gain attention and support across regions.

This can only be achieved if industry and governments continue to work constructively together. During 2026, this collaboration should prioritize the establishment of clear and simple regulations aligned across regions, more transparent fuel supply chains, interoperable book-and-claim mechanisms, greater knowledge-sharing between peers, and better access to affordable clean energy and resources. Along with dedicated financial incentives and better risk management, making progress on these priorities will help unlock the new clean technologies the sector needs, both on the ground and in the air.

With this pragmatic approach, imbued with a spirit of dialogue and collaboration, we look forward to continuing together as a community to accelerate the journey towards aviation sustainability.

Executive summary

Aviation entered 2026 with strong net-zero ambition but growing recognition that delivery requires pragmatic, stable policies and resilient supply chains.

In 2025, the aviation sector maintained its commitment to net-zero carbon emissions despite an increasingly complex operating environment. While ambition and policy attention remained strong, the year highlighted persistent structural challenges related to fuel prices, policy stability, trade dynamics and geopolitical disruption. Progress continued, but unevenly, prompting many in the industry to explore how aspirational targets can be translated into more pragmatic, economically viable and resilient decarbonization pathways.

Sustainable aviation fuel (SAF) remains the cornerstone of aviation's decarbonization strategy. Policy momentum increased across regions in 2025, with mandates kicking off, new incentives and strategic roadmaps aimed at accelerating SAF deployment. Several regions are positioning themselves as future SAF hubs, seeking to capture industrial development and energy security benefits. However, some stakeholders highlighted concerns around the possibility to fulfil mandates post-2030.

This is because, while investment in SAF production expanded, it remains constrained by uncertainty around long-term offtake, price evolution and policy stability. Changes or potential future adjustments to mandates, tax credits, feedstock eligibility and life-cycle emissions methodologies in key markets risk complicating investment decisions. For capital-intensive technologies with long lead times, regulatory predictability remains critical to unlocking private investment and enabling scale.

Biofuel supply chains also proved vulnerable to trade policy shifts, export controls and geopolitical tensions. Disruptions to feedstock flows, particularly used cooking oil, illustrated how trade disputes can rapidly affect SAF availability and pricing. These developments reinforce the need to diversify feedstocks, production pathways and geographies to improve resilience and reduce exposure to external shocks, highlighting the increasingly important links between clean fuels, energy resilience and energy security.

Trade and industrial policy developments last year further shaped the operating environment for aviation. ICAO remained a focal point in bilateral and multilateral negotiations, reflecting the strategic importance of aviation. However, a more complex trade landscape with countries strengthening their domestic manufacturing capacity (including aircraft production, fuels and energy infrastructure) is reshaping competitive dynamics and influencing long-term fleet and infrastructure planning across regions.

Despite these headwinds, 2025 was characterized by sustained industry engagement and willingness to collaborate. Support for cleaner aviation remains strong within industry and governments, and few players expect the sector to retreat from its overarching net-zero ambition at this stage. Instead, attention is shifting towards adjusting the pathway to reflect market realities, prioritize cost-effective solutions and remove practical bottlenecks.

As the sector enters 2026, a more pragmatic approach to sustainability is set to dominate industry discussions. Key priorities include identifying the most cost-effective decarbonization pathways, strengthening energy and supply-chain resilience, improving policy coordination, and leveraging digitalization and artificial intelligence (AI) to enhance efficiency. Converting ambition into delivery will require greater public-private collaboration on these topics, as well as regulatory stability and coordinated action across regions to accelerate progress at scale.

1 Ambitious pragmatism

Progress in sustainable aviation technology and policy brings optimism, but price challenges and regional disparities demand greater pragmatism.

Through 2025 and early 2026, the World Economic Forum has gathered input from more than 100 organizations in its aviation ecosystem to gauge industry progress towards net zero in 2025 and confidence in the sector's continuing decarbonization in 2026. As part of this engagement, the Forum has consulted 40 chief executive officers (CEOs) and senior representatives to help inform this report.

As with the first edition of this report, *Global Aviation Sustainability Outlook 2025*, this 2026 edition presents overarching perspectives captured during industry engagement in Chapter 1, reflections and expectations on technology development in Chapter 2, policy and geopolitical trends in Chapter 3, economic highlights in Chapter 4 and wider industry trends in Chapter 5. For more details on the report's methodology, see Appendix 2.

As a complement to the short-term perspectives presented in this report, this publication also includes a longer-term view on the evolution of the sustainable aviation fuels (SAF) market, written in collaboration with HSBC. This is presented in Appendix 1.

1.1 Overall progress in 2025

Last year's report highlighted "cautious optimism" regarding expectations for progress towards aviation decarbonization in 2025.

The survey carried out during 2025 for this year's report captured perspectives on whether those optimistic expectations were met. Despite headwinds, the results show that the progress achieved was, on average, in line with the initial expectations of industry stakeholders.

Some actors highlighted the steady increase in SAF usage and the development of policy support underpinning it, including commitments to progressive SAF mandates in a multitude of countries and markets. On the other hand, less-satisfied respondents voiced discontentment with SAF's high premiums and slow production growth.

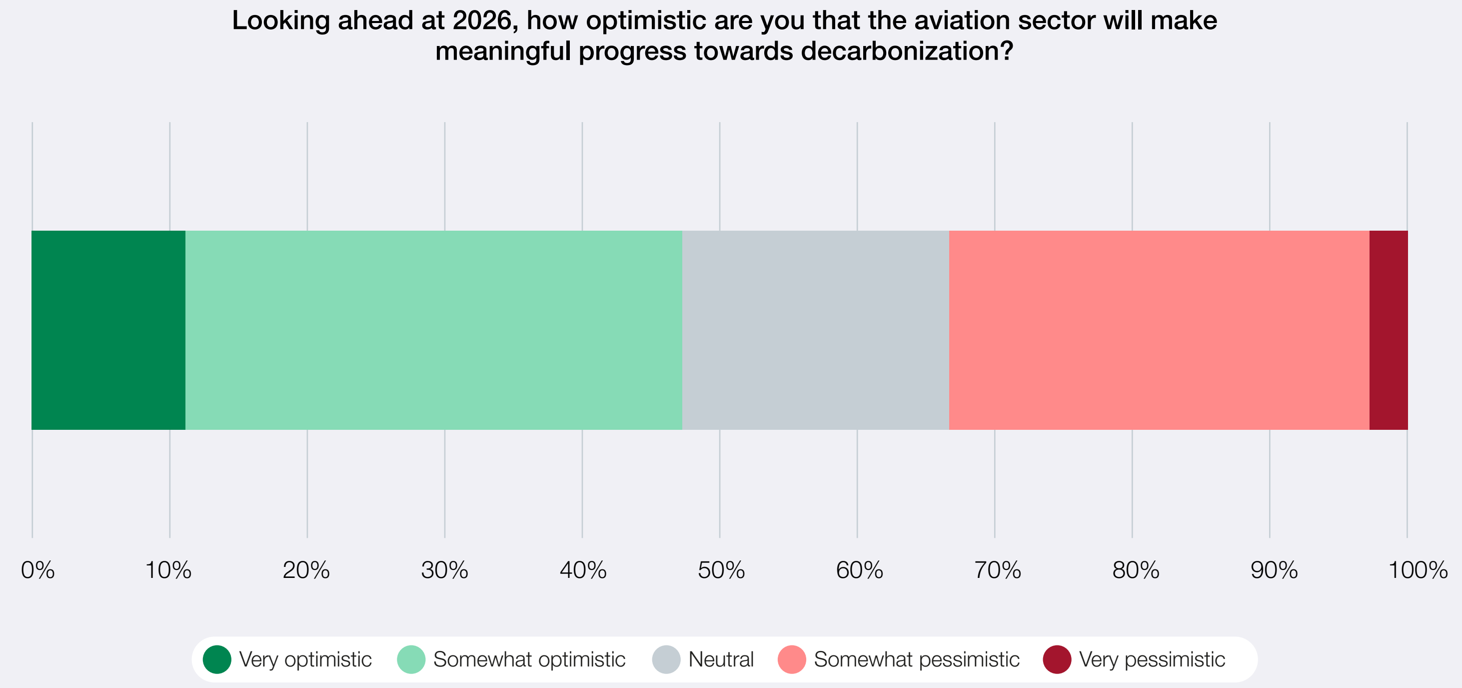
1.2 Expectations for 2026

Nearly half of respondents to the Forum's survey of senior aviation executives expressed optimism that the sector will make meaningful progress towards decarbonization over the next year.

Nearly half of respondents to the Forum's survey of senior aviation executives at the end of 2025 and beginning of 2026 expressed optimism that the aviation sector will make meaningful progress towards decarbonization over the next year. This marks a slight decrease in confidence compared to last year. The same results indicate that around one-third of respondents feel pessimistic about decarbonization's progress this year, with the remainder expressing a neutral view (see Figure 1).

While an optimistic view still prevails among industry leaders, there is an emerging consensus across the stakeholders consulted for this report that a more pragmatic approach to decarbonization is now needed. So, while the targets and ambitions have not budged, the path to achieve them may require modifying to address roadblocks, both decarbonization-specific and systemic. Latest industry analysis validates this "ambitious pragmatism": achieving net-zero aviation by 2050 is still attainable, but the sector needs to pull together to maintain the momentum.[2]

FIGURE 1 | **Global aviation sustainability annual survey – optimism (%)**



Source: World Economic Forum, survey of aviation C-suite executives, December 2025/January 2026.

1.3 Drivers of optimism

> The aviation industry has seen continuous collaboration via ICAO, ensuring that the sector's current climate ambitions and net-zero goals have been maintained without backtracking.

There are several key trends backing an optimistic outlook for progress in decarbonizing aviation during 2026:

Positive policy and market developments

Industry leaders anticipate positive moves in policy and market developments across several regions, especially Asia-Pacific, mainland China and, with some caveats, Europe. In contrast to mounting concerns around the global fragmentation of multilateral cooperation affecting several industries and wider climate change negotiations, the aviation industry has seen continuous collaboration via ICAO, which has ensured that the sector's current climate ambitions and net-zero goals have been maintained without backtracking.

Growing importance of energy security

The increasingly prominent issue of energy security in political agendas is expected to have positive consequences on the development of local and regional markets for SAF, including in the US. This is because governments and supply chains are ramping up diversification efforts in energy procurement, such as through lowering their dependence on oil and fuel imports.

The opportunities of economic growth

This is happening at a time of industry growth, as more and more regions are looking to boost their aviation industries via passenger and cargo volumes, which both reached new records in 2025. Across regions, governments have approved airport expansion plans, as long as they include a greater reliance on SAF and include sustainability in their growth projections.

Confidence in new SAF pathways

Respondents expressed confidence in further technological development, maturity and adoption of a wider array of promising sustainable aviation solutions beyond HEFA,[3] such as carbon removals, waste circularity, and analytical tools powered by artificial intelligence (AI) to quantify and optimize emissions along the entire value chain.

1.4 Challenges ahead

The Forum's survey results have highlighted several headwinds buffeting aviation's decarbonization journey, in large part stemming from wider non-aviation-specific trends.

Consistency of policy support

Executives consulted for the survey voiced concerns around the consistency of political and government support for the sustainability agenda globally. This factor is not aviation-specific, but rather a broader reckoning that other political priorities, namely defence spending and energy affordability, might pose a challenge to the aviation sector's ability to rely on predictable policy support within and across several jurisdictions.

Growing global economic uncertainty

Related to the prevailing state of geopolitical turbulence is the challenge of competing business priorities amid growing economic uncertainty. In January 2026, the International Monetary Fund (IMF) projected global growth of 3.3% for 2026, with global inflation expected to fall below 4%.[4]

However, despite this relatively positive economic outlook, intractable conflicts and escalating levels of debt require governments to build in fiscal buffers and the private sector to adopt more caution in its investment decisions. This slows the flow of goods, including fuels and feedstocks across markets, and dulls the appetite for the long-term financial and sustainability commitments needed to scale up SAF and other decarbonization technologies.

Choice of technology pathways for aviation decarbonization

Several respondents expressed concern about the pace at which Europe is deploying e-fuels, despite positive policy developments, a number of projects breaking ground and new investment. To maintain progress and avoid delays in reaching interim milestones, executives called on governments and the private sector to cooperate more closely on finding pragmatic solutions and incentives to reduce – as well as share – the risks of developing SAF plants, especially those using more novel technologies.

Achieving sound economics will be key to drive investment in decarbonization projects forward, both for flight and airport operations, particularly amid an uncertain geopolitical environment.

1.5 Industry priorities and trends for 2026

> Multiple SAF mandates and levies with different targets, timelines, monitoring systems and sustainability standards would benefit from greater alignment across regions.

While the aviation sector continues to maintain a positive outlook and high climate ambition, real-world challenges around technology and economics have become more pressing: how can these sometimes opposing forces be reconciled? As industry executives and policy-makers consider their next steps towards more sustainable aviation in 2026, they will face some pragmatic trade-offs.

Focus on developing e-SAF or other pathways?

Based on feedback from the executives consulted for this report, one such decision will be around the prioritization of e-fuels – a technology with considerable long-term potential, but currently more costly and less ready to scale up than the alternatives. While some respondents stressed the need for continued investment in e-SAF related technologies, others suggested prioritizing already available HEFA or crop-based solutions.

SAF mandates show promise, but need to align around common standards

Executives were positive on policy developments across the globe in 2025, including in the US; but the divergent approach introduced by multiple SAF mandates and levies with different targets, timelines, monitoring systems and sustainability standards would benefit from greater alignment across regions. This could be achieved gradually with the introduction of common sustainability standards and labels, the alignment of mandates in selected regions, and greater integration of mandates into the framework of ICAO's Carbon Offsetting Reduction Scheme for International Aviation (CORSIA).

Trading SAF globally could boost affordability, but local production enhances security

As growing numbers of actors are exploring SAF book-and-claim mechanisms and advocating for interoperability and coordination across platforms, it may prove cheaper to produce SAF where resources are available and costs are lower, then export it across regions via a global system. Some governments have started exploring this option. However, given countries' renewed focus on energy security and dominance, there will also be a trade-off to negotiate between sourcing the most affordable SAF and boosting local production capacity, which can unlock economic opportunities.

Hybrid powertrains gain ground over hydrogen

With regard to the use of hydrogen in aviation, executives have been exploring in more detail which on-the-ground airport applications, if any, could benefit from hydrogen and under which circumstances. The practical challenge is to work out where technology or cost present advantages over other powertrains. In the air, a pragmatic recalibration of hydrogen-powered aircraft is already taking place, with the emergence of more cost-competitive, hybrid powertrains that could see greater investment and easier deployment.

Factors determining how optimism can translate into action

Several key factors will determine the industry's choices and direction of travel in the year ahead: the pace of technology and policy development, the intersection of SAF demand and supply, the growth in air travel and cargo both regionally and globally – and the impact of all of this on air fares. Geopolitics and wider market developments beyond aviation will also affect these trends and determine how the optimism with which the sector is entering 2026 can translate to action.

Taking into consideration progress in 2025 and key challenges highlighted by industry, Figure 2 summarizes key priorities and major factors impacting sustainable aviation decisions during 2026. The figure also captures executives' views on whether these areas of focus made positive, stable or negative progress in 2025.

The following chapters examine each of these technology, policy/geopolitical, economic and wider industry trends in greater detail, drawing on survey findings, executive interviews and recent policy and market developments. Together, they highlight how decarbonization progress remains tightly interconnected and impacted by multiple factors, requiring coordinated action across technology, policy and finance to sustain momentum towards aviation's net-zero goals.

FIGURE 2 | **Key areas of focus for aviation sector to advance sustainability in 2026**

Note: CORSIA = Carbon Offsetting and Reduction Scheme for International Aviation – a global ICAO initiative to stabilize net carbon dioxide emissions from international aviation at 2019 levels through carbon offsetting and reduction.

Source: World Economic Forum, survey of aviation C-suite executives, December 2025.

2 Technology trends

SAF availability eased with new HEFA projects coming online, e-fuels and hydrogen need a boost, while AI brings renewed focus on efficiency.

There were notable project developments during 2025 that expanded SAF production capacity. HEFA-based production continued to dominate the technology mix, while the number of e-fuel plants progressing to construction remained low. Project cancellations and technical challenges prompted executives to call on policy-makers to double down on SAF, especially on e-fuel. Nevertheless, there remain diverging views on the benefits and costs that e-fuel brings about, as well as on hydrogen more widely, even if progress continues. Executives interviewed for this report also noted their increasing interest in operational efficiency and in the benefits AI could bring alongside greater digitalization, data collection and transparency.

2.1 SAF availability and scalability

Looking at decarbonization technology first, the development of SAF plants continued to progress, with multiple projects moving to production in 2025 and overall fuel outputs increasing to 1.9 million tonnes (2.4 billion litres). This is equivalent to 0.6% of total jet fuel consumption and twice the amount of SAF produced in the previous year.[5] In addition, new SAF projects were announced, contributing towards a strong pipeline across regions.

United States (US)

The US has been driving this growth. For example:

- LanzaJet's plant in Georgia, US, successfully managed to produce SAF at commercial scale for the first time via the alcohol-to-jet (AtJ) pathway.[6]
- Infinium announced it has taken a final investment decision (FID) on its e-fuel Project Roadrunner facility in Texas, progressing to construction in 2027.[7]
- ENEOS and Mitsubishi Corporation advanced plans to progress the development of their SAF facility (0.3 million tonnes) in Hawaii to the next stage, alongside other projects across regions.[8]

Some US biorefineries, however, continue to produce less SAF than their full capacity, claiming weak market conditions and changes to feedstock policy.[9] Taking into consideration such renewable fuel policy changes and wider market trends, the US Government's Energy Information Administration (EIA) has lowered its forecasts for 2026 and expects production of SAF to plateau in the US, averaging around 40,000 barrels per day, only growing again in 2027.[10,11]

> **As the general partner of the Japan Hydrogen Fund, a global energy transition infrastructure fund, Advantage Partners is supporting Infinium, together with fellow shareholders, to advance as many projects as possible to final investment decision. We have secured multiple binding offtake agreements, helping to translate e-SAF projects into commercial reality. Achieving scale requires the alignment of financing, technology and offtake with supportive policy frameworks, and this is where we are focused on delivering value.**
>
> Richard Folsom, Co-Founder, Advantage Partners

Asia-Pacific

SAF plant expansion continued in Asia-Pacific during 2025. For example:

- Petronas successfully delivered the first SAF to Kuala Lumpur for Malaysian Airlines Group,[12] while continuing the construction of a 0.65 million tonne facility expected to start operations in 2028.[13]

- China's SAF production volumes have been increasing, driven by an anti-dumping regulation introduced by the European Union (EU) that has lowered demand for renewable diesel from China.[14] As of 2025, more than 40 SAF facilities are now operating or under development[15] and an increasing number of plants has been granted certification.[16] China received permits to export nearly 1.2 million tonnes of SAF to other countries,[17] while a new SAF export pilot zone was created in Henan,[18] demonstrating China's willingness to play an increasingly global exporter role.

Europe

Both Europe's SAF production capacity and its pipeline expanded since publication of the Global Aviation Sustainability Outlook 2025. For example:

- In Spain, Moeve continues to progress its SAF plant at La Rabida Energy Park (up to 0.5 million tonnes per year), expected to begin operations in 2026.[19]

- In Italy, Eni began production of SAF in Gela (0.4 million tonnes per year) and announced plans to develop additional HEFA biorefineries across Italy ahead of 2028.[20]

- In the Netherlands, SkyNRG announced it has secured funding for its first large-scale SAF production plant (0.1 million tonnes per year) and has begun construction, with operations expected to commence in 2028.[21]

At the same time, driven by policy, Europe saw momentum for more advanced production pathways beyond HEFA, with over 40 e-fuels plants under development as of 2025. For example:

- In Germany, Ineratec commenced operations at its Era One plant (2,500 tonnes per year) in June 2025.[22]

- In Spain, Moeve and Zaffra partnered to explore the feasibility of e-SAF production.[23]

- In the United Kingdom (UK), more than half the 17 projects selected for a share of £65 million of government grants from the government's latest Advanced Fuels Fund are planning to develop e-fuels,[24] while new plants were also announced in Norway, Finland and the Netherlands.[25,26]

- In France, at least nine e-SAF plants are being developed, showing an increasing focus on power-to-liquid technology to mitigate the continent's limited resource availability and stricter feedstock policies.

> **Our achievement at LanzaJet Freedom Pines Fuels represented a vital step in the continued scaling of sustainable aviation fuel, with our alcohol-to-jet technology now having operated at commercial scale producing ASTM-certified fuel. As the world's first non-oil based, drop-in aviation fuel pathway, fully compatible with existing aircraft, it represents the clear next phase of SAF deployment and complements established HEFA volumes. At a time when governments and industries are confronting energy security pressures and supply chain disruption, diversifying feedstocks and anchoring production regionally has become a strategic imperative. By unlocking this uniquely scalable SAF pathway, we strengthen system resilience, while accelerating aviation's trajectory toward net zero.**
>
> Jimmy Samartzis, Chief Executive Officer and Board Director, LanzaJet

> **The progress of DSL-01, our SAF production plant in the Netherlands, marks an important milestone as we build a global platform for SAF production, alongside developments at Project Wigeon in the United States and Project Skykraft in Sweden. Europe's expanding SAF and e-SAF pipeline shows the industry is moving from ambition to implementation, and scaling now depends on both project delivery and effective policy mechanisms such as the EU's proposed e-SAF double auction to unlock investment and accelerate deployment.**
>
> Maarten van Dijk, Chief Executive Officer & Co-founder, SkyNRG

Concerns around volatile market for SAF and technology choices

This progress means that, while the price of SAF is still a concern, its availability is now perceived by the executives consulted for this report as less of an issue than it was in 2025, at least in the short term. Nevertheless, the pausing, delays or cancellations of SAF projects by various oil and gas majors in Europe and Asia Pacific[27,28,29] are seen by many executives as a set-back that highlights the volatile market environment and the low production margins of SAF facilities, even when more conventional and commercial technologies such as HEFA are employed.

Scepticism also remains about the feasibility of converting the entire pipeline of SAF projects, in particular of e-fuel projects, to operational plants. For HEFA, executives pointed to challenges with feedstock availability and short-term market disruptions that impact prices. While new studies have highlighted that aviation has sufficient resources to reach net zero by 2050,[30] several executives engaged in Forum roundtables identified competition for feedstocks across transport and wider hard-to-abate sectors as an area of concern.

Views on future of e-SAF diverge sharply

For e-SAF, constraints include management of technology risk, access to competitively priced renewable electricity (especially in Europe), and uncertainty around clean hydrogen incentives and costs. These ultimately affect the price competitiveness of power-to-liquids relative to other SAF pathways, and their potential for future cost reductions.

As a result, there have been calls for a more pragmatic approach to scaling-up SAF in the coming years, although with sharply diverging interpretations:

- Some stakeholders argue that the current reliance on e-fuels is unrealistic and are concerned about the aviation industry's ability to fulfil government mandates and targets post-2030, in particular for e-fuels. Hence they advocate a greater reliance on biofuels, suggesting that policy-makers delay sub-mandates for e-fuels and scrap caps on HEFA (currently in place in the EU and UK) that prevent certain feedstocks from being used for biofuels production. In December 2025, the UK government announced a call for evidence to investigate a more flexible approach to crop-based biofuels.[31]
- Other stakeholders, however, encourage investors to double-down on e-fuels. Acknowledging market challenges, several executives interviewed for this report called for additional government support. Practically, this could include performance guarantees for e-fuel plants[32] to reduce the technology risk that e-fuel project developers and engineering contractors currently face, thereby increasing the likelihood of project financing.

As a result of these diverging positions, some executives highlighted concerns around increasing polarization in the e-fuels debate in Europe. Many respondents stressed the need to avoid fragmentation and maintain targets, bringing forward additional incentives to create greater market confidence.

This confidence will be needed to overcome the challenges faced by both established and novel SAF production pathways. Boosting the pipeline of projects and creating the right incentives for more SAF plants, regardless of technology, to achieve final investment decision (FID) are considered priorities for the industry. As SAF mandates ramp up more steeply post-2030, expanding SAF capacity is essential to reduce the risk of SAF demand-supply gaps in the next decade, as highlighted in Appendix 1.

> **The next two years are critical for putting aviation on a genuinely sustainable trajectory. Synthetic aviation fuels will be central to this transition. Europe is now at the crossroads of enabling large-scale e-SAF production, creating a real opportunity to lead global aviation decarbonization. The focus must shift from climate targets to concrete investment — with the full aviation ecosystem aligned behind this effort.**
>
> Tim Boeltken, CEO and Co-Founder, Ineratec

2.2 Infrastructure readiness for SAF along the supply chain

Access to fuel infrastructure

Beyond fuel production, SAF infrastructure readiness both within and outside airports is an emerging area of focus highlighted by executives. Research conducted within the industry for the World Economic Forum's December 2025 report, *Turning Challenge into Opportunity: Supplier Voices from Heavy-Emitting Sectors*, mapped the different options that fuel producers, suppliers and carriers have been taking to manage storage, blending, distribution and quality assurance, along with associated challenges and solutions.

Overall, the number of airports receiving SAF molecules for the first time has increased, especially in North America. Among others, Houston, Newark, Washington DC, Portland and Vancouver airports received their first batches of SAF as part of ongoing collaborations with local airlines, fuel suppliers and logistics providers.[33,34,35]

Nevertheless, physical access to infrastructure and related charges can prove onerous for smaller SAF producers, leading to a number of innovative projects and new investments during 2025 to ease blending challenges. These included plans for the UK's first independent SAF blending facility as part of a wider network of blending hubs, expected to be operational from 2026;[36] and the opening of a first SAF blending terminal at Toowoomba Wellcamp Airport in Australia.[37]

Fuel specifications

With a growing number of players involved and the resulting diversification of supply chains, fuel quality control and safety have come under increasing scrutiny. This prompted the EU's Aviation Safety Agency (EASA) to raise awareness in February 2025 around the risks of out-of-specification jet fuel and list a number of recommendations that should be taken forward as the sector scales up. These recommendations include greater auditing and scrutiny of suppliers, especially new market entrants, increased training and blending away from airports.[38]

As SAF can be used in existing infrastructure – up to 10-50% blends for safety reasons, depending on the production pathway – aircraft and engine manufacturers, fuel suppliers and governments continue to coordinate progress on fuel certification and testing. Their aim is to raise blending limits and ensure a growing number of fuels can be compatible with current pipeline, airport and aircraft infrastructure. Developments in the past year include higher blending thresholds for some SAF production pathways (announced following cross-industry work led by bp)[39] and UK government funding for fuel testing, allocated to several projects in early 2026.[40]

2.3 Access to clean energy and the role of hydrogen for airports and flight operations

Hydrogen's role in the air is recalibrated

Access to reliable, affordable clean energy is increasingly shaping airport decarbonization pathways and the pace at which new aviation fuels beyond SAF are being deployed. In 2025, this dynamic became more visible as expectations around hydrogen aviation were recalibrated, both for aircraft and on-the-ground operations, reflecting a broader industry reassessment of hydrogen's role in aviation decarbonization timelines.

Airbus said the reason for its decision to postpone the development timeline for its hydrogen-powered aircraft[41] was that the hydrogen ecosystem (production, distribution, storage and airport integration) is not yet sufficiently mature to support large-scale aircraft deployment. This assessment aligns with wider industry analysis,[42] which downplays hydrogen's near- to medium-term contribution to aviation's net-zero pathway.

Ground operations continue exploring hydrogen's potential

Nevertheless, airports are continuing to move forward pragmatically on hydrogen, where it could make operational sense. Across Europe, North America and Asia, hydrogen is increasingly being tested and deployed for ground support equipment, airside vehicles, refuelling systems and stationary power applications. For example:

- In Europe, projects involving multiple airports, including initiatives such as OLGA and TULIPS, are advancing hydrogen-enabled ground operations, supported in 2025 by new research and testing capabilities at the UK's Cranfield University.[43]

- In Canada, Montréal-Trudeau and Toronto Pearson airports are building on hydrogen demonstrations initiated in 2024, with expanded trials and infrastructure development continuing into 2025. Edmonton Airport continues to progress on this topic through its Hydrogen Hub.
- In the Asia-Pacific region, Australia's Brisbane Airport[44] and Japan's Kansai International Airport[45] are progressing hydrogen-powered aviation and airport energy applications, with implementation activities accelerating through 2025.

These pilots reflect a growing recognition that hydrogen is not a standalone solution, but a complement to electrification, particularly where high power demand, fast refuelling and operational resilience are critical. From hydrogen baggage tugs and tractors to mobile refuelling units and on-airport hydrogen stations,[46] airports are actively building practical experience and de-risking future infrastructure choices. In November 2025, the Forum published a white paper, *Decarbonizing Aviation Ground Operations: Alternative Bus Technologies*, to support the techno-economic assessment of the different technologies available to power airport buses.

However, the availability of clean electricity and affordable hydrogen remain the top priorities for executives looking to deploy these technologies, with concerns about both the price and the prioritization of electrons and clean fuel molecules across industries, given the emerging competition from data centres and AI.

Overall, challenges such as grid reliability, the volatility of electricity pricing and recent electricity system disruptions have elevated energy resilience to a strategic priority for both governments and companies. Within this context, hydrogen projects are increasingly framed not as symbolic steps towards future aircraft, but as tools to diversify energy supply at airports, enhance flexibility and support uninterrupted operations. While hydrogen aircraft may arrive later than once anticipated, the gradual expansion of hydrogen infrastructure at airports continues to build the foundations of a future multi-energy ecosystem.

> **Hydrogen's role in aviation is shifting from a distant aircraft concept to a near-term enabler of energy resilience and airport ecosystems. From an investment perspective, building hydrogen infrastructure today is more about creating optionality across multiple decarbonization pathways, including e-SAF production and ground operations. What would ultimately unlock scale is not technological hype, but policy clarity, bankable offtake structures and cross-sector collaboration. Hydrogen should therefore be understood as part of a broader multi-energy infrastructure system rather than a standalone solution.**
>
> Richard Folsom, Co-Founder, Advantage Partners

2.4 Developments in aircraft powertrains – hydrogen, hybrid and eVTOL

Hydrogen aircraft and hybrid technologies

Despite the overarching sense of many in the aviation industry that hydrogen will play a limited role in the near future, progress on hydrogen aircraft certification continues, supported by targeted public funding. In 2025, the UK government announced £43 million to accelerate green aviation technologies, including hydrogen propulsion, signalling continued policy support even as deployment timelines evolve.[47]

Constraints around both the availability and affordability of hydrogen and clean energy are shifting the industry's focus towards hybrid aircraft (powered by aviation fuel and batteries) as a more practical near-term option.[48] Airline investments in hybrid regional aircraft reflect a growing interest in transitional solutions that lower emissions while remaining compatible with current energy, infrastructure and certification limits.

Electric vertical take-off and landing

Securing access to expanded electricity supplies will prove vital to facilitate the commercial deployment of electric vertical take-off and landing (eVTOL) aircraft. This technology, which is expected to become commercial within one or two years, could initially target airport shuttles and short-haul urban routes in cities such as Dubai and major US hubs. Last year saw some notable partnership and purchase agreements, including collaborations between Archer Aviation and Saudi Arabia,[49] Serbia[50] and Los Angeles;[51] as well as between Joby Aviation and United Arab Emirates (UAE), Saudi Arabia and Kazakhstan.[52]

Once fully commercialized, eVTOL aircraft could transform local passenger transport, logistics and emergency responses while reducing emissions. Although regulatory hurdles persist across jurisdictions and some stakeholders are questioning the affordability of eVTOL technology, executives consulted for this report confirmed that cross-sector collaboration is accelerating, as governments, industry and regulators converge around shared priorities for certification, infrastructure and airspace integration.

The US is a good example of this convergence, as the government announced a new advanced air mobility national strategy in December 2025 to fast-track deployment of eVTOLs.[53] The strategy aims to promote:

- eVTOL demonstrations by 2027 to investigate the implications for airport infrastructure and kick-start the development of new supply chains in the US.
- eVTOL operations by 2030, in both urban and rural areas.
- Further development by 2035, including more advanced technology and fully autonomous flights.

2.5 Boosting efficiency and sustainability through AI and data

> **Digitally optimized, low-carbon operations are the future of aviation services. Innovation and greater collaboration across the aviation ecosystem will drive meaningful progress in all aspects of sustainability. As technology advances, airports, airlines and aviation services providers have a unique opportunity to redefine ground operations by integrating smarter, safer and more efficient tools into daily operations. Further investment in infrastructure and AI-enabled systems which improve safety, increase efficiency and strengthen real-time decision-making will create a foundation to accelerate sustainability progress. The direction for airport operations is clear: a cleaner, safer and more connected future, built on strong partnerships and a shared commitment to sustainability.**
>
> Hassan El-Houry, Executive Chairman, Menzies Aviation

Google Flights now displays contrail warming risk alongside carbon emissions figures, signalling how data transparency can inform carriers and passengers alike.

Increasing focus on efficiency and AI

Beyond fuels, as industries and societies continue to explore and implement AI, machine learning and automation solutions in a vast range of applications, the aviation sector is leveraging this trend to simultaneously tackle labour, cost and environmental challenges.

Some operators, like Alaska Airlines, already leverage AI-driven flight planning platforms, to optimize routes in real time by accounting for weather, airspace constraints and traffic conditions.[54] Increasingly, airport operators are testing digital twins (virtual replicas relying on sensor data to monitor conditions and provide real-time simulations) to coordinate operations and reduce energy use.[55] Other tried-and-tested high-impact use cases include automated bag loading, AI-powered predictive maintenance and robotic customer assistance.[56]

This advanced "technology stack" bears the potential to revolutionize the airport ecosystem, by re-configuring entire operations in key areas, such as air traffic management (ATM), surface and ground movement operations, ground support equipment (GSE), passenger experience and aircraft maintenance[57] – all dimensions which have been affected by either workforce shortages or safety concerns.

Crucially for decarbonization efforts, AI and advanced sensor tools could exponentially improve analytical capabilities to monitor and predict emissions data, thus empowering the aviation industry to accurately reduce and optimize emissions through operational adjustments.

With opportunities also come challenges, in the form of paramount safety concerns, infrastructure gaps, re-skilling and loss of employment. Overall, given strong momentum in frontier technologies across industries, 2026 is expected to be a year in which further trials, R&D and regulatory discussions will make this topic more relevant than ever for the aviation sector.

Data collection, estimation and usage

Conversations on improving contrail impact estimations and traffic management increasingly emphasise leveraging better data, models and partnerships. Tools such as the Travel Impact Model are advancing methodologies to classify flights by contrail warming potential relative to CO_2 emissions, improving the granularity and accuracy of climate-relevant estimates used at booking and in planning systems.

Google Flights now displays contrail warming risk alongside carbon emissions figures,[58] signalling how data transparency can inform carriers and passengers alike. Such innovations are emerging alongside broader digital collaborations: for example, Lufthansa Group announced a partnership with Amadeus in January 2026 to enhance booking and operational efficiency, which could indirectly support sustainability outcomes by improving planning and reducing inefficiencies.[59] This development reflects a growing recognition that data integration, from climate impact models to operational systems, is key to optimizing traffic management and reducing aviation's climate footprint.

Regulatory initiatives reinforce this shift towards integrated data use. EASA's Flight Emissions Label, developed with EUROCONTROL in January 2026, standardizes operational and fuel life-cycle data to estimate flight carbon emissions.[60] While it currently excludes contrails and other non-CO_2 effects, the required data inputs largely overlap with those needed for upcoming non-CO_2 monitoring frameworks, underscoring the value of building data pipelines today with a future total climate impact perspective.

3 Policy and geopolitical trends

Geopolitics impacted trade in SAF feedstocks and aircraft orders, although international collaboration on aviation and SAF policy support remained strong.

Among the main themes characterizing 2025, geopolitics inevitably made a critical impact on aviation and, in turn, its quest to decarbonize. An increased focus on energy security may have contributed to the acceleration of SAF policy development globally, although governments' willingness to scale up domestic SAF industries resulted in inconsistent approaches to regulation. Meanwhile, industrial policy and tariffs affected feedstock flows and trades across countries.

On a positive note, however, the latest ICAO Assembly saw strong collaboration across states, unlike in other sectors.

Looking ahead, it is likely that global trade will continue to be affected by geopolitical rivalries – especially given that the Forum's *Global Risks Report 2026* tops its list of short-term risks with "geoeconomic competition".[61]

3.1 Energy security could boost fossil-free fuels

Decarbonization efforts may have received an unexpected boost from energy security and self-sufficiency considerations. The IEA found that countries, especially many fuel-importing ones, are increasingly prioritizing energy security and affordability as they lean towards renewable and geographically proximate solutions.[62] Key policy developments in 2025 reinforce this view. For example:

- The EU's Sustainable Transport Investment Plan (see below, section 3.2) states that investing in low-carbon fuels for transportation sectors, including aviation, is "crucial", not only for industrial decarbonization, but also to boost Europe's energy security by reducing its dependence on fossil fuel imports.[63]
- In the US, SAF has been similarly linked to broader energy and industrial strategy. The SAF Grand Challenge launched by the previous administration has been maintained by the current government. This is now explicitly framed by the US Department of Energy as an initiative supporting US energy dominance.[64]

> **With the rising global need for energy security, diversifying fuel sources has become increasingly important. While existing policies are helping to create a global SAF market, SAF supply has been well below 1% of global jet fuel/kerosene consumption in recent years, falling short of expectations and underscoring the need for further policy support to create clear long-term demand signals. At Topsoe, we are fully committed to advancing SAF, including e-SAF, to decarbonize aviation. The technologies and solutions are ready and scalable. Further collaboration across industry, governments and financiers is needed to de-risk, scale and decarbonize.**
>
> Elena Scaltritti, President and Chief Executive Officer, Topsoe

3.2 SAF policy

European SAF policy

Last year proved pivotal as the first SAF mandate policies came into effect, with both the EU and UK requiring aviation fuel suppliers to ensure 2% SAF blending for all flights (domestic and international) departing from EU and UK airports, from January 2025. Switzerland was included in the mandate from January 2026.

While the early-stage implementation of such regulation has boosted demand for SAF, challenges remain on ramping up actual SAF production to meet the mandates, especially for e-SAF. Specific e-SAF sub-targets are expected to be set by UK and EU regulators from 2028 and 2030, respectively, ahead of steeper mandates from 2030 onwards in both regions.

To speed up the development of SAF production in Europe, both the EU and UK have come up with their own incentive schemes, outlined below.

EU incentives for SAF

Through the EU's Sustainable Transport Investment Plan (STIP) announced in November 2025, the bloc aims to mobilize over €2.9 billion by the end of 2027 to support the scaling-up of SAF production, including €500 million for double-sided auctions to fund e-SAF plants, organized by a new e-SAF Early Movers Coalition that brings together Austria, Finland, France, Germany, Luxembourg, the Netherlands, Spain and Portugal. The first auction is planned for 2026, with an intermediary mechanism for double auctions at wider EU level by 2028.

Beyond fiscal incentives, the STIP also opens the door to further policy support, notably by acknowledging the potential extension of EU Emission Trading System (ETS) allowances support for SAF and the assessment of book-and-claim options to further expand the market.

While several executives interviewed for this report expressed confidence in the direction taken by Europe – especially given an increasingly restrictive policy environment in the US (see below) – other respondents questioned the effectiveness of e-SAF policies amid challenging economics, high prices and technology risk. As mentioned in the previous section, some industry actors are either expecting or actively advocating for Europe to backtrack on its e-fuel vision in 2026; meanwhile, multiple stakeholders warned about the need for long-term policy certainty and stressed the importance of sticking to the current ambition and mandate targets, due to concern around the impact of any changes on market and investor confidence.

UK incentives for SAF

In the UK, provisional data from the Department for Transport published in February 2026 confirmed that SAF represented 2.36% of total jet fuel demand during 2025, exceeding the country's 2% target.[65] To provide more support for the SAF market, the UK is expected to implement a new mechanism by the end of 2026, which aims to support SAF investments by stabilizing the revenue of SAF plants. This mechanism is expected to alleviate one of the significant barriers to SAF production scale-up: unlocking investment and access to capital.

Türkiye

In July 2025, Türkiye announced a mandate to reduce the emissions of international flights to and from the country by 5% by 2030, through the use of SAF.[66]

> **Beyond its established role in decarbonizing aviation, power-to-liquid technology is emerging as a powerful lever for energy resilience and defence preparedness. e-SAF cuts reliance on geopolitically exposed and heavily concentrated fossil fuel supply chains. This is a strategic necessity globally — especially in Europe — and requires decisive government leadership, not delay from narrow corporate interests.**
>
> Jan Toschka, CEO, Zaffra

US SAF policy

At a federal level, the 45Z Inflation Reduction Act (IRA) tax credits for SAF have been renewed as part of the One Big Beautiful Bill, but only for fuels produced from US, Mexican and Canadian feedstocks. This is part of a wider US government effort to scale up domestic feedstock and boost the American farming and biofuel industry, contributing to US energy security and "dominance".

Across the clean fuels industry, wider proposals from the Environmental Protection Agency to raise its biofuels mandate to an all-time high in 2026 (65% higher than in 2025) and 2027 (75% higher than in 2025), also contribute to this vision, with these rules expected to be finalized in the first quarter of 2026.[67,68] Final biofuels blending quotas are expected to remain close to the initial proposal, with expectations among industry that penalties for imports of renewable fuels and feedstocks may be reduced, over fears raised by US refiners that this could disrupt fuel markets and raise costs.[69]

SAF incentives extended until 2029

Meanwhile, for SAF, new proposals and guidance released by the US Department of the Treasury and the Internal Revenue Service in February 2026 extend the 45Z tax credits to 31 December 2029, providing a longer window for producers to benefit from the incentives than originally expected.[70] Despite continuation of these incentives, the higher rates of support for SAF (up to $1.75/gallon based on the carbon intensity of the fuel) are now expected to be phased out from this year, to level the playing field with other biofuels for road transport. This means the value of SAF credits will be capped at $1/gallon, like all other fuels. The reduction in support was expected by industry and had already prompted a new bi-partisan bill – the Securing America's Fuels Act introduced in December 2025 – to restore the initial level of credit support.[71]

Additionally, new guidance on how to calculate the life-cycle carbon intensity of alternative fuels no longer considers the impact of indirect land use change (ILUC). Not including ILUC in life-cycle emissions calculations will increase incentives for US-grown feedstocks such as corn and soybeans while the tax credit remains proportional to the carbon intensity of the fuel, but will also reward new feedstocks such as canola oil, which to date has failed to qualify for incentives because of its ILUC impact. These changes seem to favour biofuel pathways, such as ethanol and alcohol-to-jet production, over other waste-based and e-SAF production pathways.

Tax credits for renewables and clean hydrogen face phase-out

Whether power-to-liquids can remain competitive is linked to the IRA's 45V clean hydrogen production tax credit, as well as to the changes in government support for renewable electricity. Federal clean hydrogen tax credits will only remain available for hydrogen production facilities beginning construction before 2028, rather than by 2032 as originally provisioned.

Tax credits for wind and solar energy, however, will be phased out for projects whose construction begins after July 2026. This is likely to make it harder for electrolytic hydrogen developers to secure the competitive clean electricity they need to produce green hydrogen. The renewal of the IRA's 45Q incentives for carbon capture and storage (up to $85 per metric tonne of CO_2 captured and stored) imply that blue hydrogen production could remain an attractive option.

> **Although it's consistent with pro-farmer support that also incentivizes no-till practices, cover crop cultivation, and reductions in nutrient overuse, the U.S. government's choice to eliminate ILUC for SAF is still controversial. From a sustainability standpoint, the policy will create inconsistency with ICAO and EU requirements. However, it could also encourage other regions to incorporate regenerative agriculture practices into their policies, along with the system to verify those actions. Ultimately, the demand from airlines and their corporate customers will determine if SAF producers adopt these new feedstocks.**
>
> Adam Klauber, Chief Sustainability Officer, World Energy

Canadian SAF policy

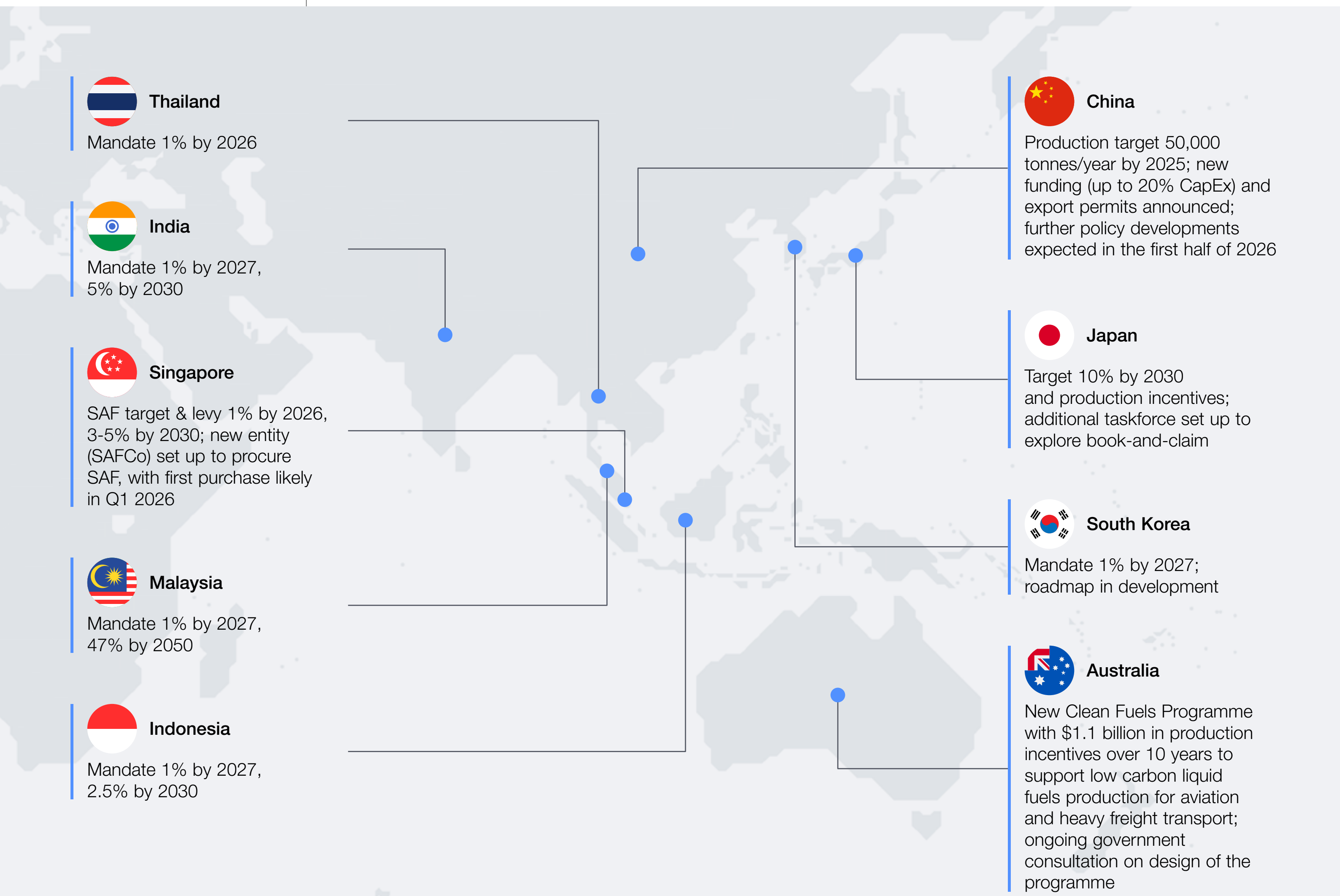
The federal government of Canada continues to advance its plans to scale up biofuels in the country. Clean Fuel Regulations (CFR) are in place for road transport, a new biofuel production incentive kicked off in January 2026[72] and R&D funding has been made available to SAF projects. However, as of February 2026, a national SAF mandate was not in place.

States are complementing federal policy to drive SAF developments. From January 2026, the updated British Columbia Low Carbon Fuels Standard requires a 2% reduction in the carbon intensity of jet fuel, increasing to 10% by 2030. This target has to be fulfilled via SAF.[73] Alberta and Ontario have not yet introduced state-level SAF mandates, although they remain interested in the clean fuels agenda, with incentives for road transport biofuels.[74] Changes to biofuels policy in the US have prompted Canadian state governments such as Ontario to increase regional biofuels targets and introduce stricter rules.[75]

Asia-Pacific SAF policy

Asia-Pacific has seen notable SAF policy developments, with mandates and other types of regulatory and financial incentives now being introduced across most of the region (see Figure 3).

FIGURE 3 **SAF policy developments in Asia-Pacific**



Source: World Economic Forum.

> With European mandates kicking off in 2025, Asian SAF production and feedstocks have significantly contributed to SAF volumes supplied in Europe to date.

China

In October 2025, China's National Development and Reform Commission (NDRC) introduced an up-to-20% capital expenditure subsidy for clean fuels produced using SAF pathways, ammonia, methanol and carbon capture utilization and storage (CCUS). The subsidy's aim is to unlock local green hydrogen production, with experts predicting potential savings of 5-8% in final fuel costs.[76] In the first half of 2026, stakeholders expect China to announce plans for a SAF mandate for domestic flights, which could see rapid growth of the domestic SAF industry and further exacerbate the global trade in used cooking oil.

Combined with the announcement of new export permits for a record 1.2 million tonnes of SAF,[77] China is gearing up to become a leading SAF export market, complementing its already thriving export-orientated fuel feedstock market and supporting the development of its domestic biofuel industry.

Singapore

In Singapore, the government has set a 1% SAF target for 2026, with the goal to raise this target to 3-5% by 2030. To tackle price volatility in the nascent SAF market, a levy will be implemented from October 2026 to pay for centralized procurement of SAF, aggregate demand and provide cost certainty to air transport users. The collected levy will be used to procure the SAF needed to meet the 1% target; companies will be able to use this central procurement platform for voluntary SAF purchases too. The levy is calculated on an origin-destination basis. For instance, economy class passengers will pay S$1.00, S$2.80, S$6.40 and S$10.40 to Bangkok, Tokyo, London and New York respectively. A new body, SAFCo, has also been set up to collect the levy on behalf of the government.[78]

Australia

Similar to the US incentive approach, the Australian government committed to a AU$1.1 billion low-carbon liquid fuels production incentive through its Cleaner Fuels Program, announced in September 2025. The programme will cover clean fuels used in hard-to-abate industries, such as aviation, heavy freight and mining; for example, it will offer grants to domestic producers, including AU$33.5 million under the Sustainable Aviation Fuel Funding initiative. The scheme is expected to be finalized in early 2026, with applications opening mid-2026.[79]

Japan

In April 2025, Japan saw its first commercial SAF plant commence operations, with several other projects in the pipeline. Japan's approach to SAF policy combines fiscal support measures and regulatory policies. The government is offering capital investment support for large-scale SAF facilities under initiatives such as GX Economic Transition Bonds and tax credits for domestic SAF production. On the regulatory side, Japan has set a 10% SAF target by 2030.

In parallel to these efforts, Japan's Ministry of Economy, Trade and Industry (METI) and Civil Aviation Bureau (JCAB) announced the creation of a task force in June 2025 aimed at tackling the high cost of domestically produced SAF, to address the disparity between producers' costs and airlines' ability to pay. This task force is expected to present concrete recommendations and measures, which will support Japan's ambition to replace 10% of conventional jet fuel demand with SAF by 2030.

Other Asia-Pacific regional developments

The Asia-Pacific region's approach to SAF has moved from aspirational goals to legally binding mandates being established in several countries. In addition to the measures above, Thailand recently adopted a 1% mandate by 2026; meanwhile, India, Malaysia, Indonesia and South Korea have all set 1% SAF mandates by 2027, while also establishing their own SAF roadmaps.

Although the development of SAF policy in Asia-Pacific is non-uniform – with some countries opting for mandates, others for incentives and some with roadmaps and legislation still in development – the region has seen significant momentum gathering behind SAF policies over the past year.

With European mandates kicking off in 2025, Asian SAF production and feedstocks have significantly contributed to SAF volumes supplied in Europe to date. In 2024, Europe imported 69% of the feedstocks used for its SAF – with 38% coming from China alone – and also imported 40% of its refined SAF.[80] Growing interest in sustainability and the economic opportunities associated with exporting fuels and feedstocks to Europe have contributed to the spike in measures from policy-makers in Asia-Pacific. However, the increasing prioritization of these feedstocks and fuels for domestic use in Asia-Pacific raises questions around Europe's ability to keep importing such fuels over the long term.

Middle East and Africa

The Middle East offers promising potential for clean fuels to be unlocked by policy measures, while efforts to scale up the development and certification of low-carbon aviation fuels (LCAF) continue. UAE's government has publicly discussed its ongoing work to introduce a SAF mandate,[81] while the Gulf Cooperation Council recently launched a unified Civil Aviation Authority to promote harmonized aviation regulations across states, which could pave the way to better policy integration across the region. Saudi Arabia and Oman are exploring SAF policies, but no final announcements have been made as of February 2026.

No substantial SAF policy developments were seen in Africa in 2025, although momentum kept building. Several governments, including Senegal, continued to explore SAF opportunities as part of ICAO's Assistance, Capacity-building and Training programme (ACT-SAF), which aims to build capabilities in emerging markets. As part of the programme, Côte d'Ivoire completed multiple feasibility studies to explore local SAF production.[81] The private sector is also coming together to advocate for the development of new SAF legislation, as signalled by a policy consensus document signed by several aviation players in Africa in late 2025.[83]

Central and South America

Brazil, along with 23 other countries, launched the "Belém 4x Pledge" at COP30 to scale up low-carbon fuels four times by 2035, compared to 2024 volumes.

In South America, after signing SAF policy into law in 2024, the Brazil Government, along with other committed countries, launched the "Belém 4x Pledge" at COP30 to scale up low-carbon fuels four times by 2035, compared to 2024 volumes.[84] This collaboration highlights Brazil's increasing efforts to raise awareness of the low-carbon fuels agenda internationally, after gaining prominence at the G20 in 2024. Brazil is aiming to maintain collaboration on sustainable aviation and strengthen market opportunities for its domestic biofuels industry at a time of market and feedstock disruptions.

Underpinned by analysis from the International Energy Agency (IEA), a total of 23 countries signed the Belém pledge, including Chile and Guatemala, as well as Armenia, Canada, India, Italy, Japan and Mozambique. In 2025, Chile continued to refine the regulatory and technical details of its SAF roadmap, introduced in 2024, ahead of the implementation of pilot plants in the country.[85]

ICAO's ACT-SAF programme continues to assist countries in developing their SAF roadmaps and exploring the feasibility of production facilities, including in Argentina, Mexico, Panama and Peru.[86]

Policy alignment and pragmatic support

While SAF policy momentum is building globally, approaches remain fragmented. Europe has reaffirmed its ReFuelEU targets, including the 6% SAF by 2030 mandate, while the US, Asia-Pacific and other regions are pursuing distinct incentive structures, mandates and fuel eligibility and sustainability criteria. This divergence creates complexity for investors, fuel producers and air operators, complicating cross-border fuel supply, compliance planning and long-term investment decisions.

As a result, stakeholders interviewed for this report have highlighted the need for more consistent and aligned international policy. A global SAF mandate has been seen by many as a promising avenue to create a level playing field across regions. Nevertheless, several stakeholders questioned the feasibility of such a mechanism and the timeline for creation and implementation.

In the light of these challenges and to maintain momentum, executives engaged in the Forum's aviation decarbonization discussions have highlighted various complementary, pragmatic actions that industry and governments should be jointly aiming to advance in 2026 (see Box 1).

On top of fostering global synergy among countries in which policy already exists, executives highlighted how international efforts should continue to support policy development across all regions, especially those with great feedstock potential. This could take the form of project implementation assistance and global cooperation projects, and would ensure that the economic and social opportunities the SAF market brings do not remain concentrated in selected markets.

BOX 1 | **Pragmatic actions for the aviation industry and governments to advance in 2026**

- **Identify and align regional policy clusters:** for example EU-UK, or Middle East and Asia-Pacific including China – driven by ambitious countries willing to spearhead regional alliances and collaboration.

- **Harmonize fuel sustainability credentials across geographies:** first, create a single, clear definition of SAF; then introduce sustainability ratings and labels, taking inspiration from other sectors, such as housing and consumer goods/appliances.

- **Integrate national policies and SAF mandates within ICAO's CORSIA**, to leverage and strengthen existing international collaboration, while driving towards a single framework for aviation decarbonization across regions and technologies.

- **Plan long-term policy synergy and certainty post-2035**, to reflect the complexity of moving away from established approaches and the need to maintain stable policy in the short term – this could mean future-proofing existing policy with SAF plants that achieve final investment decision against changes over the lifespan of the investment, and introducing over time more consistent and uniform regulation across regions, to give industry time to adapt and prepare.

Source: Executives engaged in the World Economic Forum's aviation decarbonization initiatives.

3.3 Carbon pricing

As SAF mandates and emissions trading schemes continue to be rolled out, their geographic coverage is, in some cases, limited to flights operating within the boundaries of the country or region introducing such regulation.[87] As a result, 2025 saw increasing focus on the contribution of long-haul international flights to climate change (currently not subject to the EU Emissions Trading System, for instance) and on the options available to address global carbon emissions as well as the potential economic impacts of carbon leakage.[88] Türkiye's introduction of a SAF mandate, complementing EU efforts, has been received positively by European carriers that were concerned about the potential risk of carbon leakage in regions close to the bloc.

Nevertheless, to spread the impact of regulation more evenly across carriers, including those operating from further afield, European aviation industry players have suggested introducing additional measures to preserve a level playing field with non-EU airlines and avoid the risk passengers may fly through hubs or to destination where air tickets are cheaper because SAF is not used. The industry is calling for the introduction of a SAF Border Adjustment Mechanism (SAF-BAM) which would charge international flights departing from the EU but connecting via a non-EU hub, that are not subject to SAF requirements, the same SAF-related costs faced by EU airlines on their entire journey.[89]

Alongside these discussions, in 2026, the EU is expected to undertake a review of its ETS for aviation, with potential plans to expand its scope of application. Currently, the ETS only applies to internal EU flights. Discussions on the inclusion of non-EU flights have been postponed until the end of 2026, through the "stop-the-clock" provision. Given the ETS Directive is up for review by July 2026, the EU is expected to re-assess the feasibility of broadening the ETS to include international EU-departing flights into the carbon pricing system. In addition, EU legislators will assess the potential inclusion of other non-CO_2 greenhouse gas emission sources into the ETS's pricing mechanism.

3.4 Implementation of CORSIA

When ICAO's members adopted CORSIA[90] in 2016, countries committed to carbon-neutral growth in aviation, measured against an interim baseline for the period 2024-2035 that was set at 85% of 2019's emissions. Any emissions over this threshold would have to be offset through low-carbon fuels (including SAF), carbon offsets and carbon credits – as long as these comply with frameworks and environmental criteria set by ICAO to ensure integrity.

In 2025, the ICAO Council conducted its periodic review of CORSIA, assessing its pilot phase (2021-2023) and analysing how carbon emissions could evolve towards 2035, alongside the associated requirements and costs for carbon offsetting. The latest analysis suggests that clean fuels may cover 6-10% of CORSIA's offsetting requirements during its first phase (2024-2026),[91] with carbon credits expected to cover the remainder of the obligation.

To clear CORSIA's bar during the first phase, some market commentaries have highlighted a likely shortage of carbon credits and increasing prices due to high demand from airlines. The cost of credits could exceed $60/tonne of carbon abated after 2030 as a result of limited supply,[92] up from $21/tonne in December 2025. Nevertheless, these prices still compare favourably to SAF – the alternative measure for complying with CORSIA – whose carbon abatement cost can be significantly higher.

As of January 2026, three programmes have issued eligible credits, including Guyana's REDD+ programme, now at its third auction,[93] and clean cooking programmes in Kenya and Malawi approved in early 2026.[94,95] Experts expect this number to grow in 2026, but expansion of supply is contingent on more vocal demand from airlines to demonstrate the sector's needs and attract investment and projects, as well as faster government authorization for projects to be eligible under CORSIA.

As CORSIA scales up, ICAO is confident that implementation of the scheme is on track, especially when it comes to the development of a robust monitoring, reporting and verification system. Some of the stakeholders interviewed for this report were equally positive about the scheme. A notable highlight was ICAO's 42nd Assembly in September 2025, when countries reiterated support for the scheme as the only global market-based mechanism for international aviation, with no objections, demonstrating stronger multilateralism on clean aviation matters compared to other sectors and themes.[96] This factor has contributed to Figure 2's scoring of "Challenges to multilateralism" as "stable".

CORSIA participation continues to expand, reaching 130 states with the addition of Dominica and Viet Nam from January 2026.[97] This is providing confidence in the market in advance of the scheme becoming compulsory in 2027.

3.5 Trade tensions, tariffs and export controls affect aviation supply chains

Aviation and aerospace were not insulated from the global trade disputes that regularly hit the headlines in 2025. Throughout the year, a wide range of tariffs were introduced, amended or revoked, creating uncertainty for manufacturers, airlines and airports alike.

Additional tariffs on aircraft, components and key materials such as aluminium and steel have been reported to affect manufacturing costs, exacerbating existing supply chain disruptions and most likely resulting in higher costs for airlines. These factors will ultimately dampen industry's appetite for additional sustainability charges on top of higher aircraft procurement costs. In addition, supply chain disruptions have caused uncertainty and risked delaying new orders from airlines and ongoing fleet renewal, forcing carriers to fly older, more polluting aircraft for longer.

BOX 2 | Impact of US trade policy on aviation

In 2025, many tariffs were introduced, amended and revoked by the US government, and aviation often played an important and visible role during official talks. Some regional impacts of US trade policy on aviation are outlined below.

Latin America: US trade negotiations with Brazil eventually included a last-minute exemption from the additional tariffs placed on Brazilian products, resulting in a reduced 10% tariff rate for aircraft imports from Brazil to the US.[98]

Middle East: During his 2025 visits to UAE, Qatar and South Korea, President Trump signed a $150+ billion combined deal with local carriers for Boeing planes and General Electric engines.[99,100,101]

Asia-Pacific: Aircraft were part of the trade deal with Japan in September 2025 and aviation was affected by US-China discussions too. In April 2025, several Chinese carriers were reported to have sent back US-made aircraft due to the very high tariff environment between both countries.[102]

After a tariff deal with China was reached in October, imports of US aircraft were expected to rise, given China expects to double its fleet to ~9,700 aircraft in the next 20 years.[103,104] However, China is now spreading aircraft orders across several OEMs[105] including the Commercial Aircraft Corporation of China (COMAC), a state-owned aerospace manufacturer.[106]

Europe & UK: Aviation was one of the sectors exempted by the July 2025 EU-US trade deal. All aircraft, engines, landing gear and spare parts will continue to benefit from zero-for-zero tariffs between the US and EU, building on the Agreement on Trade in Civil Aircraft that was signed in 1979 by over 30 countries. A similar agreement with the UK earlier in 2025 entails zero tariffs on jet engines – important for the UK manufacturing sector, given aircraft are one of the top five British products exported to the US.[107]

3.6 Commodity and feedstock flows

In 2025, for the first time in 20 years, China stopped importing soybeans – which can be used to produce biofuels – from the US entirely.

High feedstock demand and supply chain disruptions

Tariffs and global policy shifts during 2025 have affected the biofuels and agriculture sectors, with implications on the production volumes, prices and trading of feedstocks used for low-carbon fuel production, including SAF. These factors have also had an impact on investments in biofuel production plants, affecting their scalability. Several industry experts interviewed for this report identified high feedstock demand and supply chain disruptions as the main reasons for the higher SAF prices seen in 2025 (see Figure 4).

Last year's *Global Aviation Sustainability Outlook* already referenced the sudden reduction in US imports of used cooking oil from China towards the end of 2024, following China's removal of earlier export credits. Trade negotiations and uncertainty, combined with the updated US biofuels policy, exacerbated this trend throughout 2025, which saw imports of Chinese used cooking oil into the US down 43% in the first seven months.[108] In turn, US agricultural exports to China fell by over 50% in 2025 compared to 2024; for the first time in 20 years, China stopped importing soybeans – which can be used to produce biofuels – from the US entirely.[109]

China shifts soybean imports from US to Latin America

US soybean oil previously shipped to China could see a brighter future in the EU and Indonesia, with limited tariffs agreed as part of their respective trade deals, although the latest production trends still foresee a decline in overall production of US soybeans.[110] This is despite US demand for renewable fuels remaining strong, in particular following the proposal of the Environmental Protection Agency to raise its biofuels mandate to an all-time high in 2026 (up 65% from 2025) and 2027 (up 75% from 2025), as well as the proposed reduction in credits generated from biofuels imported from abroad.[111]

China has turned to Argentina and other Latin American countries to supply soybean and vegetable oils, at a time when domestic biofuels mandates, beyond just aviation, are ramping up.[112] Meanwhile, China has rerouted used cooking oil exports towards European SAF production – not covered by the anti-dumping tariffs introduced by the EU in 2025 on Chinese biodiesel imports.[113] However, used cooking oil production in China during 2025 is expected to have slowed down by 20% compared to 2024.[114]

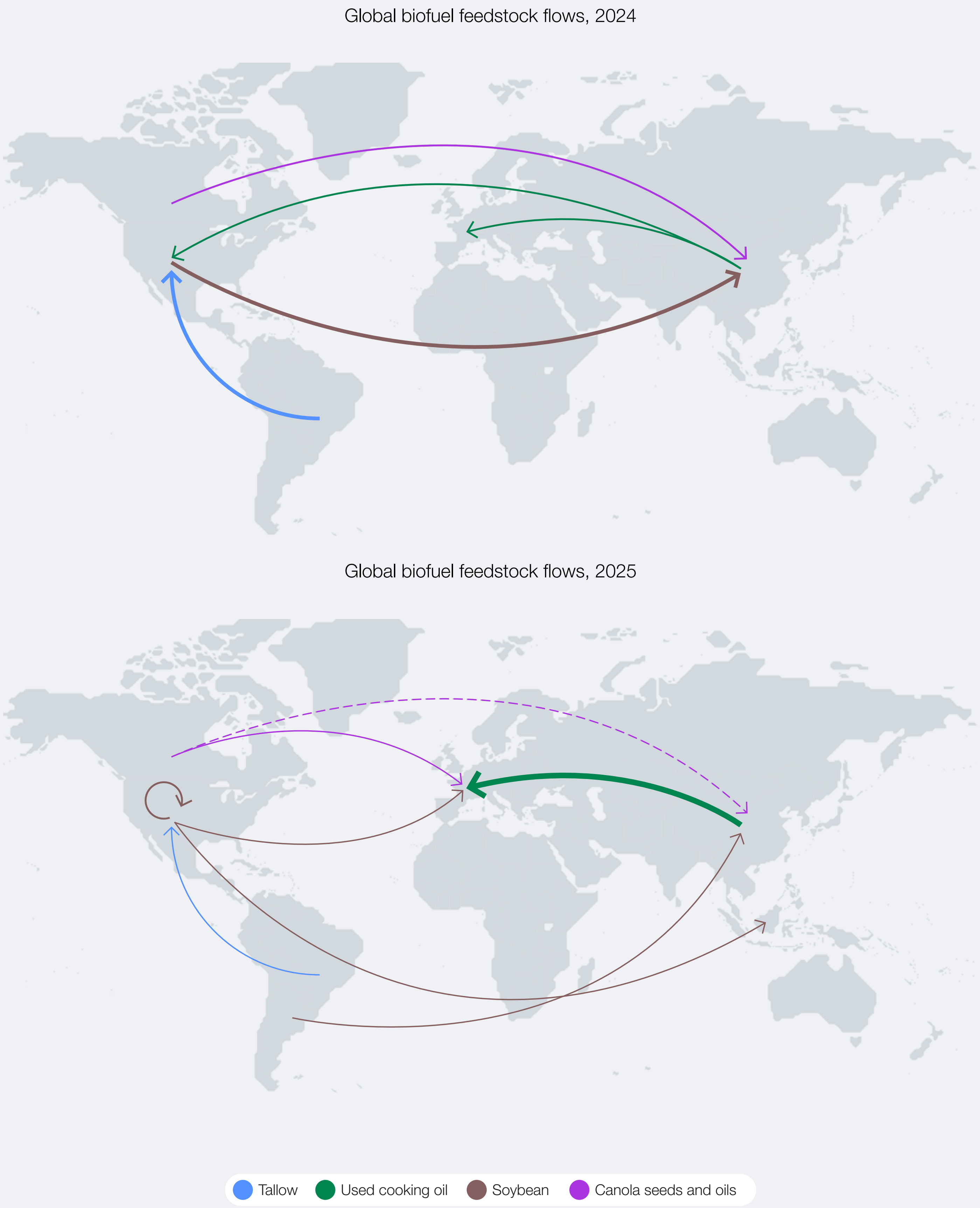
A further development on fuel feedstocks in mid-2025 was Beijing's introduction of 76% preliminary tariffs on canola seeds and 100% on canola oil imported from Canada. Although China had previously imported nearly two-thirds of Canada's total canola seed exports, it introduced new anti-dumping policies to safeguard its domestic market, in response to Canada's 100% tariff on Chinese electric vehicles.[115,116] January 2026's preliminary trade deal between Canada and China is expected to bring a relief to these trends as tariffs on canola seeds have been slashed, but structural vulnerabilities for the Canadian canola industry are expected to persist. SAF can also provide an opportunity for Canada to diversify its customer base. Since Canada cannot export its genetically modified canola seeds to Europe, converting these feedstocks into SAF is expected to become an increasingly appealing option, enabling Canada to create new market opportunities beyond China.[117]

Beef tallow is another feedstock for HEFA-based SAF. Brazil used to sell nearly all its export volumes of beef tallow to the US, including for renewable diesel production; but new US tariffs introduced from August 2025 heavily affected tallow flows. Since then, duty drawback mechanisms available under US regulations seem to allow companies to import tallow and claim back its duty if it is used to produce a fuel that is exported. Hence market commentators expect tallow imports into the US from Brazil to continue, while pivoting towards the production of SAF that could subsequently be exported. Demand from other markets, however, remains unclear due to immature trade channels and longer export routes.[118,119]

Risks rise around access to critical minerals

The broad trend towards greater geoeconomic competition noted at the top of this chapter is compounded by the risk that geopolitical tensions pose to strategic resources. In the aviation context, these resources include critical minerals vital to aircraft manufacturing, such as cobalt, lithium and nickel, along with rare earth elements essential for avionics[120] and other components, namely dysprosium, yttrium, terbium and samarium. The high geographical concentration of mining and processing operations for critical minerals creates significant exposure for supply chains in the event of escalating trade conflicts.

FIGURE 4 | **Global biofuel feedstock flows, 2024-2025**



Note: This figure illustrates global flows for selected clean fuel feedstocks between regions, as affected by tariffs and trade discussions in 2025. The figure is not comprehensive; the thickness of the arrows is not to scale but indicates approximately the volumes of exports.

Source: World Economic Forum.

3.7 Constraints to airspace and military emissions

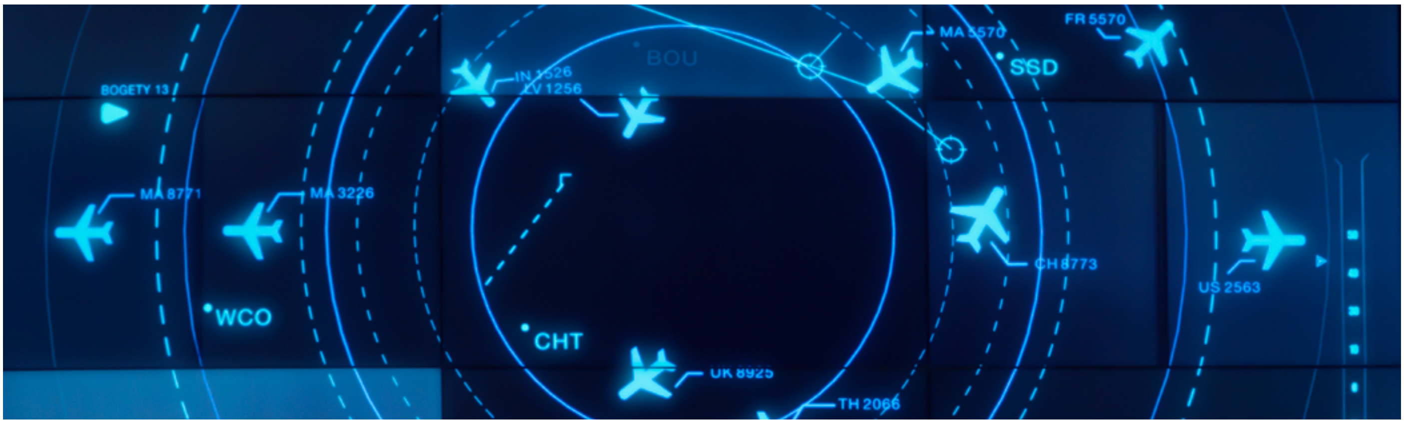
In November 2024, emissions from all military activities were estimated to account for around

5.5%

of global emissions.

The exacerbation of existing tensions and the emergence of new ones, including military interventions, severely affected airspace access and route planning across multiple areas worldwide. While some signs of easing were observed, including the resumption of direct flights between India and China for the first time in five years, other regions remained heavily disrupted, notably Eastern Europe, parts of the Middle East, South Asia, East Africa and South America. The war that broke out in the Middle East in early March 2026 resulted in the cancellation of thousands of flights.

Constrained access to airspace is reshaping competitive dynamics, with some carriers benefitting from routing advantages while others are facing higher costs, longer journey times and ultimately a higher environmental footprint. Should wars and conflicts continue further into 2026, these disruptions will likely continue to affect network planning, operational resilience and long-term investment. Moreover, there is currently a gap in calculating and reporting on emissions from military aviation, which are likely to increase with tensions and conflicts. In November 2024, emissions from all military activities were estimated to account for around 5.5% of global emissions.[121]



3.8 Multilateralism, under strain globally, holds firm in aviation

An overarching effect of geopolitical shifts has been a decline in the perceived effectiveness of multilateral institutions to pursue global policy alignment, especially on the energy transition front. Support for environmental goals and for the cooperation mechanisms that enable climate action has reversed in some jurisdictions, most notably the US. This trend is expected to persist in 2026.

Despite global geopolitical turmoil, however, the aviation sector has demonstrated its resilience in upholding multilateral efforts. For example, ICAO's 42nd Assembly in September 2025 reiterated institutional and stakeholders' commitments to decarbonization measures and objectives, including the sector's Long-Term Aspirational Goal (LTAG) to achieve net-zero carbon emissions by 2050.[122]

Such an outcome is considered remarkable by many stakeholders, particularly when pitted against developments in other hard-to-abate sectors – such as maritime transportation, where the International Maritime Organization (IMO) postponed adoption of its net-zero framework by a year until late 2026.[123] Prominent aviation stakeholders, several governments and Airports Council International World issued a joint statement at COP30 in November that publicly reaffirmed confidence in ICAO's leadership role in building multilateral collaboration. They stressed that ICAO would be best-placed to coordinate international discussions on issues such as aviation taxation, as opposed to the country-led initiatives and levy proposals advanced unilaterally by industry coalitions in 2025.[124]

Meanwhile, global cooperation on climate proved surprisingly resilient during 2025, according to the Forum's *Global Cooperation Barometer 2026*, which found that, despite geopolitical headwinds, climate cooperation grew, stimulated by the increased deployment of clean energy technologies.[125]

So while reaching policy alignment at a global level remains a challenging objective in 2026, regional blocks and industry coalitions in the aviation sector are keeping the spirit of multilateralism alive by advancing decarbonization endeavours under ICAO's framework, while also recognising that collective action in this area fulfils national interests in energy security and economic growth.

4 Economic trends

Economic pressures continue to impact market willingness to pay for decarbonization, although the outlook appears stable.

Many of the executives consulted for this report highlighted growth and economic competitiveness as key priorities, especially considering the significant expansion of the air passenger and cargo markets for 2026 and beyond. Supply chain bottlenecks continued to affect the roll-out of newer, more efficient aircraft.

Within this context, the price premium of SAF remains a concern for both airlines and corporates. Nevertheless, partnerships between stakeholders continued, highlighting the potential of book-and-claim to complement regulation and boost investment in new aviation technology further.

4.1 Passenger and cargo trends: uneven growth across regions

ACI World projects global passenger traffic to grow by a further

3.9%

year-on-year in 2026, reaching another new record of ~10.2 billion passengers.

Demand for air travel and air cargo continued to grow during 2025 and into 2026, but it is increasingly uneven by region. This matters for both airport investment decisions and the pace of aviation decarbonization.

Air passenger traffic

In 2025, global airports handled 9.8 billion passengers, representing 3.6% growth year-on-year, according to data from Airports Council International (ACI) World.[126] This marks the completion of the post-pandemic recovery phase and a return to historical growth rates, although with structural differences across regions and markets, impacting the investment and pace of decarbonization activities that airports and airlines are introducing.

In absolute terms, passenger traffic in 2025 remained concentrated in Asia-Pacific (3.6 billion passengers), Europe (2.5 billion passenger) and North America (2.1 billion passengers).[127] Uneven regional growth during 2025 resulted in significant year-on-year expansion in Africa (+9.6%) and the Middle East (+6.9%), both outpacing the global average.

With this growth in mind, the 2025 new airline list included several entrants concentrated in these markets:

– India announced three new carriers: Shankh Air, Air Kerala and Alhind Air, as its domestic market expands.[128]

– Two Israel-linked airlines were launched (TechAir and TUS IL).

– Saudi Arabia announced the debut of three new carriers,[129,130] along with the launch of Riyadh Air.

ACI World projects global passenger traffic to grow by a further 3.9% year-on-year in 2026, reaching another new record of ~10.2 billion passengers. International passengers are expected to be the fastest growing segment, increasing by 4.2% year-on-year. Additional analysis by the International Air Transport Association (IATA) predicts Asia-Pacific to lead this growth (+7.3%), with North America lagging behind (+1.5%). System-wide passenger load factors are expected to reach a record high of 83.8% in 2026,[131] mainly due to aircraft shortages which have constrained airlines' capacity.

These developments signal competitive expansion in regions already pursuing hub strategies. Airport development plans reinforce this trajectory. As an example, the Middle East is engaged in a multi-billion-dollar airport development programme through to 2035, including expansion at Dubai World Central and King Salman International Airport in Riyadh.

North America, by contrast, is experiencing slower aviation momentum. In Q3 2025, it was the only region to record a decline in passenger traffic (-0.9%). This reflects weaker US domestic demand, a contraction in Canada-US transborder travel, as well as operational and labour constraints, such as staff shortages, that have weighed down performance at major hubs. Against this backdrop, airline passenger traffic is projected to grow by just 1.5% in 2026 after near-stagnation in 2025.

This regional divergence also underpins a different passenger mix emerging: in faster-growing regions, younger demographics and expanding middle classes are expected to drive strong demand for affordable and first-time flyers, while more mature markets continue to sustain higher shares of premium and business traffic, with more stable demand patterns. These behavioural differences are reflected in long-term passenger forecasts and will continue to drive the ongoing rebound of premium class travel across major markets.[132]

The economics around air passenger traffic affect not only infrastructure and capacity investment decisions, but also the feasibility and sequencing of decarbonization efforts. Where demand is more sensitive to price increases, the willingness and ability to pay a green premium (e.g. for SAF blends, carbon charges or higher fares linked to decarbonization) may be weaker, even as traffic grows faster. Aligning traffic growth with climate goals will require region-tailored approaches, so that fast-growing markets are not locked into high-emissions pathways simply because passengers and carriers cannot absorb higher near-term green costs.

Beyond the impact of the rising costs of decarbonization on passengers, the reality of an expanding aviation market continues to fuel industry, civil society and academic debate on the feasibility of growing and decarbonizing aviation simultaneously.[133] In the UK, plans to reduce emissions via SAF investment have contributed to the government's approval for expansion plans at London's Heathrow and Gatwick airports, announced in 2025.[134]

As the sector grows, stakeholders expect an increased focus on technology and efficiency gains, as well as air traffic modernization and slot reforms. For example, a UK government report published in December 2025 highlighted the potential for near-term carbon savings through operational "quick wins", noting that CO_2 emissions per passenger in 2019 were already around 22% lower than in 1990, despite strong traffic growth. A pipeline of operational interventions across aircraft operations, airspace management and airport processes could deliver further reductions.[135] In parallel, United Airlines' investment in blended wing body aircraft is expected to reduce fuel burn per passenger mile by 50%.[136] Together, these developments illustrate how economic conditions, capacity constraints and technological choices are increasingly shaping the context in which aviation decarbonization decisions are made.

Air cargo demand

Air cargo ended 2025 on a strong note despite ongoing trade volatility. In November 2025, cargo demand grew 5.5% year-on-year, with international volumes up 6.9%. Capacity increased by 4.7% year-on-year,[137] helping to support stable yields. As with passenger traffic, growth remained uneven across regions, with strong demand in emerging markets and growth in some Middle East countries offsetting weaker performance in the Americas, where volumes continued to adjust to the new US tariff regime.

Cargo growth has been shaped by trade re-routing, evolving e-commerce rules and changes in customs regimes, leading to more concentrated flows along specific corridors. While global goods trade grew by around 2% year-on-year[138] and manufacturing activity strengthened towards the end of 2025, higher jet fuel prices and geopolitical uncertainty added cost pressures across the value chain. For airports, this means that overall cargo volumes remain resilient, but growth is uneven and increasingly concentrated at selected hubs, complicating revenue planning and capacity allocation amid elevated policy uncertainty. In many cases, recent disruptions have resulted in lasting shifts in cargo routing and hub roles rather than temporary dislocation.

From a sustainability perspective, uneven cargo growth concentrates emissions and operational pressures at specific airports, reinforcing the need for greater efficiency, optimized capacity use and cleaner ground and flight operations. This concentration also creates an opportunity to develop "green corridors", where coordinated actions across airports, ports, airlines, integrators and fuel suppliers can accelerate the deployment of low-carbon solutions along key trade routes. Executives interviewed for this report predicted that an emerging area for collaboration and discussion in 2026 will be the development of interconnected airport-port fuel infrastructure, which offers the potential to establish clean fuel corridors across transport modes, and to facilitate the development of green logistics offerings and more integrated, sustainable cargo and passenger propositions.

Major integrators are beginning to respond: DHL and FedEx have announced large SAF commitments,[139] aiming to ensure that at least 30% of their jet fuel use is SAF by 2030 at key cargo hubs. In parallel, cross-modal initiatives such as the Rotterdam-Singapore Green Corridor[140] illustrate how ports and airports can collaborate on shared clean fuel infrastructure,[141] including hydrogen and biofuels for both aviation and shipping. These initiatives show how leading cargo operators are seeking to decouple growth from emissions.

Executives predicted that an emerging area for collaboration and discussion in 2026 will be the development of interconnected airport-port fuel infrastructure.

However, differences in shippers' willingness to pay for greener logistics mean that broader industry coordination, policy support and scaled-up SAF supply will be critical to ensure that cargo market resilience aligns with aviation's climate objectives.

During 2026, air cargo demand is expected to grow by around 2.6%, with volumes reaching 71.6 million tonnes and revenues of approximately $158 billion. Yields are forecast to remain broadly stable and still well above pre-pandemic levels, reflecting the sector's continued role in moving high-value, time-sensitive goods.

Factors affecting passenger and cargo outcomes

Across both passenger and cargo markets, geopolitical tensions, trade policy fragmentation, economic volatility and capacity constraints, stemming from aircraft delivery delays, supply chain bottlenecks and shifts in airline capacity deployment are expected to remain defining features of the aviation operating environment. These factors continue to shape traffic outcomes unevenly across regions and market segments, influencing risk profiles, investment horizons and network strategies. While they introduce greater uncertainty into short- and medium-term planning, they do not undermine the long-term growth outlook. Instead, they reinforce the importance of resilience planning, flexible capacity strategies and diversified traffic portfolios as airports and airlines navigate growth alongside decarbonization objectives.

4.2 Aircraft and engine manufacturing bottlenecks

Aircraft and engine manufacturing constraints continued to affect fleet renewal in 2025 and airlines' ability to cope with increasing demand. While production performance at major original equipment manufacturers (OEMs) showed signs of stabilization, bottlenecks across engines, components and supplier capacity continued to slow down new aircraft deployment and slow progress towards decarbonization.

In 2025, Airbus delivered just under 800 commercial aircraft, meeting its revised annual target, while Boeing recorded 600 deliveries,[142] its highest level since 2018. In terms of gross orders, Boeing recorded 1,175, enough to surpass Airbus (1,000) for the year (see Figure 5). These improvements marked an important step forward, yet both manufacturers acknowledged that output remained constrained by supply-chain fragilities, quality controls and workforce challenges.

COMAC, China's state-owned aircraft manufacturer, has collected 1,000 orders to date,[143] mostly from China Eastern, Air China and China Southern Airlines. During 2025, the company also faced supply-chain bottlenecks, exacerbated by reliance on foreign-sourced engines. Nevertheless, the manufacturer's large order book and state support underscore its potential to gradually increase production and begin carving out a niche in regional markets.

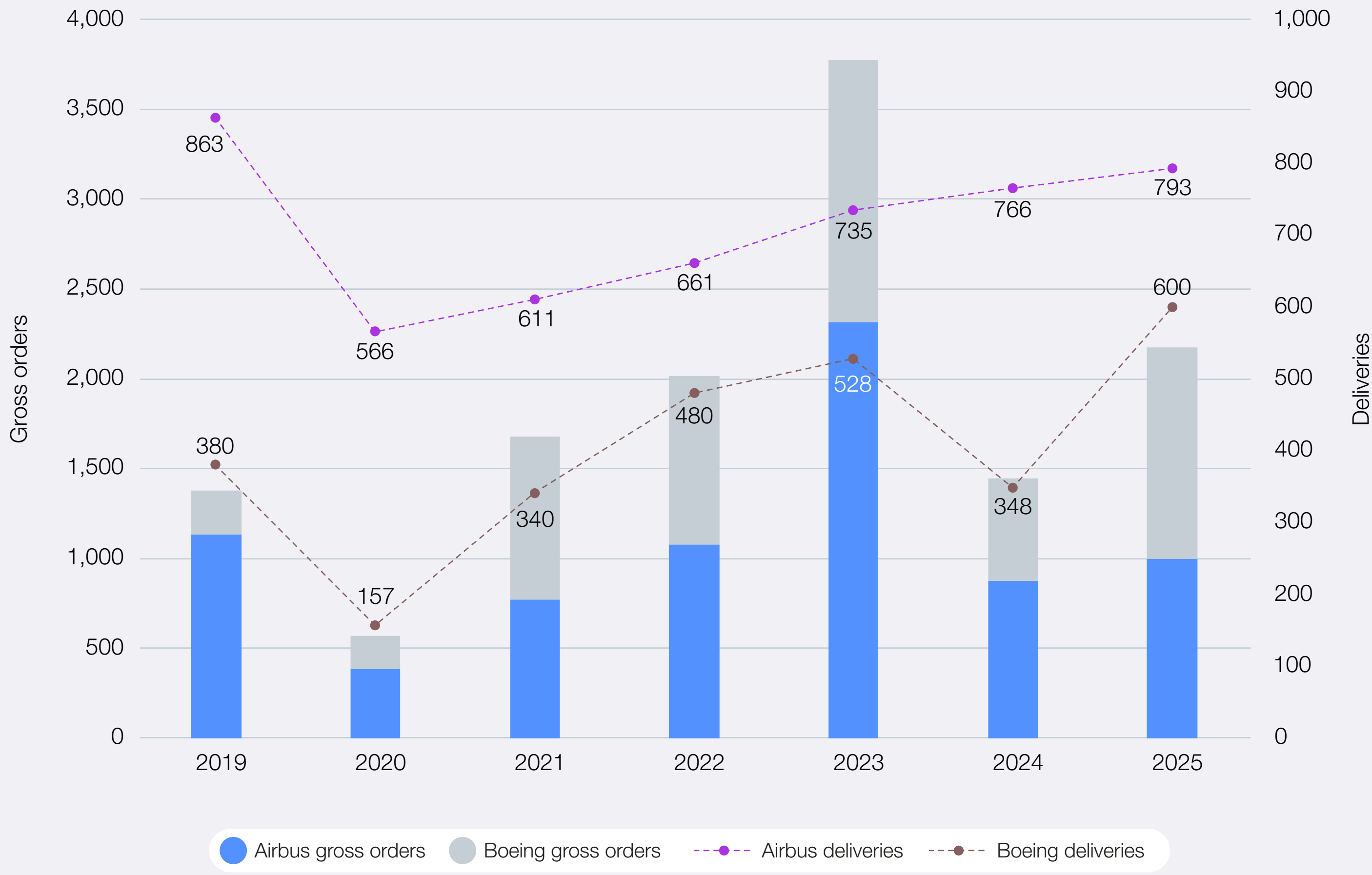
Engine availability emerged as the most important bottleneck, with sustainability implications extending well beyond production lines. Shortages of engines and spare parts led to delivery delays, aircraft groundings and operational disruptions,[146] highlighting a severe imbalance between airframe production and engine readiness. Similar pressures were reported for some carriers that had to retire very young aircraft to use parts for other fleets.[147]

These disruptions have had direct consequences for emissions reduction efforts. Delays in introducing new-generation aircraft have forced airlines to keep older, less fuel-efficient planes in service for longer, increasing fuel use, maintenance costs and emissions. At the same time, industry analysts and aircraft lessors highlight growing inefficiencies in capital use, as airlines are paying for aircraft they cannot fully deploy.

During 2025, supply chain challenges extended beyond engines to avionics, fuselage sections and interiors, further constraining production ramp-ups. The continued mismatch between aircraft demand and manufacturing throughput has reinforced near-term sustainability risks.

At the same time, investment in future aerospace technologies accelerated. Japan's one trillion-yen aerospace strategy fund aims to support next-generation propulsion, hydrogen technologies and advanced manufacturing,[148] while experimental programmes (e.g. Boom Supersonic's XB-1 demonstrator, which broke the sound barrier using SAF-compatible design principles)[149] highlight longer-term innovation pathways. However, these initiatives are unlikely to ease manufacturing bottlenecks in the near term. At the same time, although supersonic flight is gaining interest among some US airlines[150] (with Boom Supersonic holding up to 130 optional orders), many commentators have raised concerns about the potential fuel consumption. These concerns centre on the sustainability of supersonic operations and the risk that they could further strain already limited supplies of SAF.

FIGURE 5 | **Overview of gross orders and deliveries for Airbus and Boeing (2019-2025)**



Source: Airbus and Boeing.

4.3 SAF affordability and price

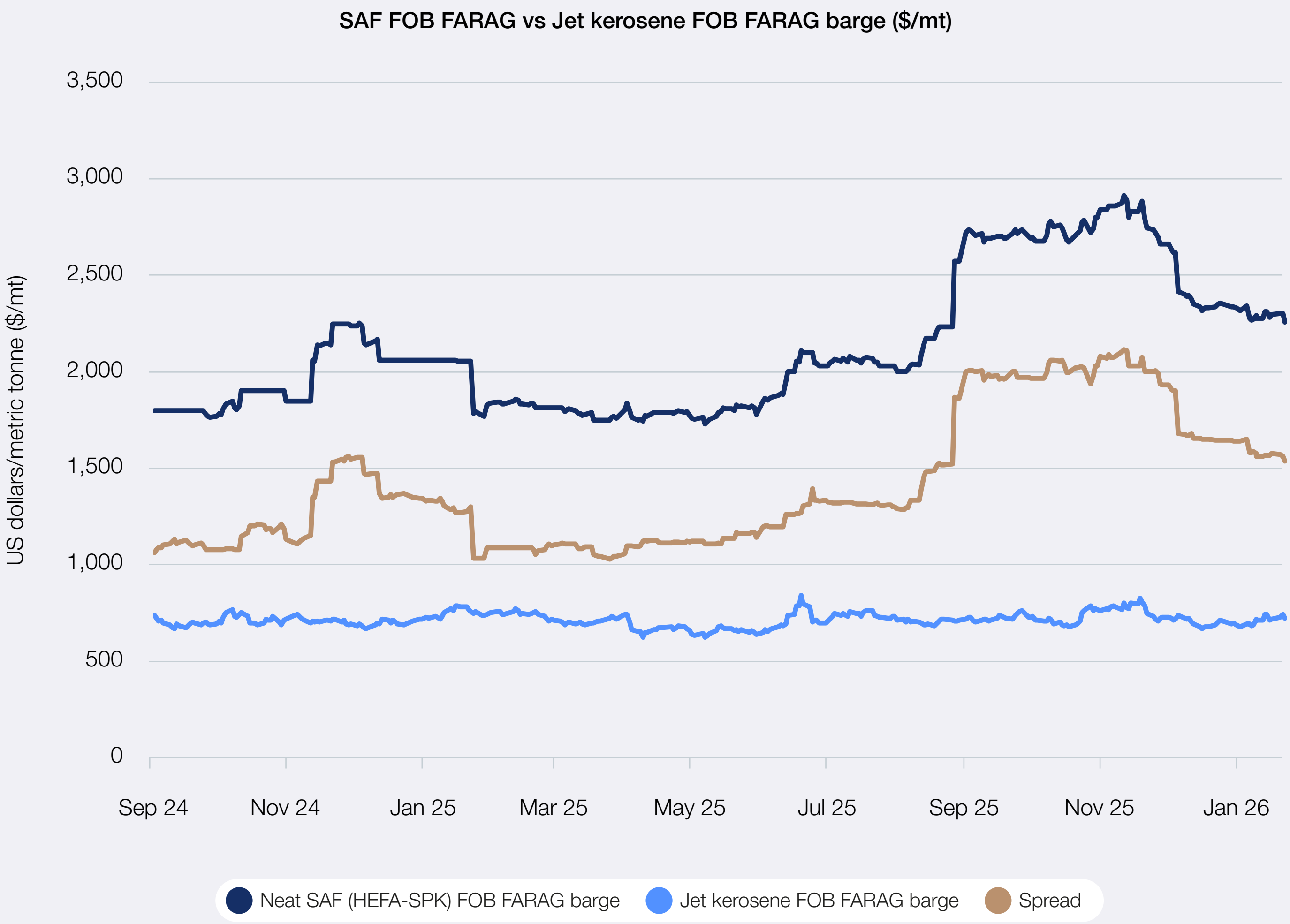
Several executives consulted for this report stressed the need for aviation to remain affordable, especially in the markets that are growing fastest, and highlighted their concern that the cost of decarbonization could stifle demand. From one angle, this highlights once more the trade-offs between growth, cost and carbon emissions. From another angle, it may explain the active industry debate and diverging positions on SAF prices that unfolded in 2025.

In last year's edition of this report, stakeholders had already identified SAF availability and price as key challenges for 2025. The increase in SAF production capacity discussed in Chapter 2 has not, however, correlated with lower market prices and therefore requires further analysis in this 2026 edition.

SAF prices spiked in 2025

The latest SAF prices assessed by Platts, part of S&P Global Energy, show overall increases in the last six months of 2025, but with regional diversity and regular fluctuations (see Figures 6, 7 and 8). In Europe, SAF prices achieved two-year highs, approaching $3,000/metric tonne towards the end of 2025 – a premium of over $2,000/metric tonne over conventional jet fuel.[151] This compares to an average price of around €2,250/metric tonne in Europe in 2024.[152] In Asia-Pacific, similar price hikes have been seen, although peaks reached lower highs than in Europe. In the US, SAF prices remained lower, as a result of tax incentives, with California proving to be the most competitive region for SAF procurement.

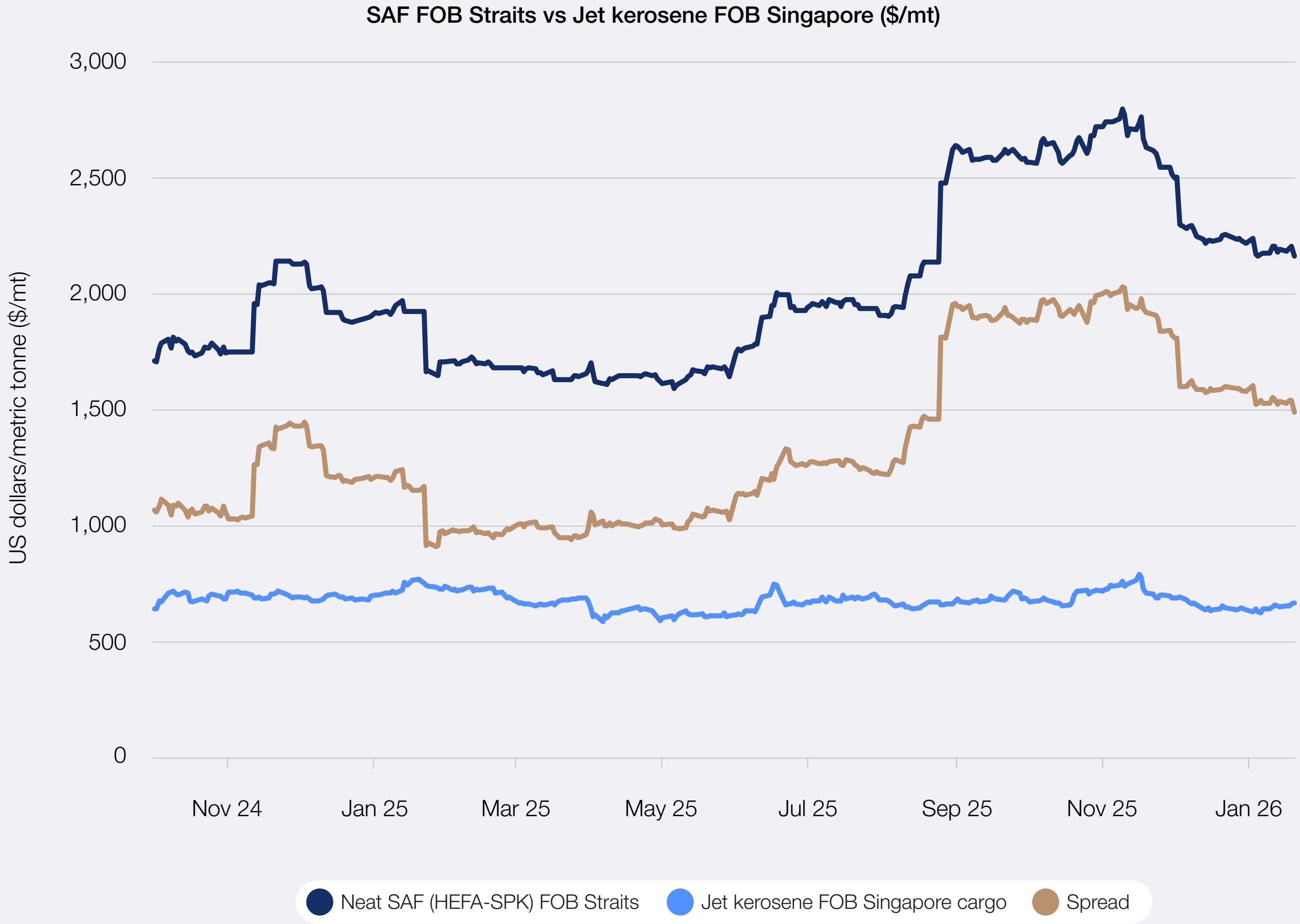
FIGURE 6 **SAF vs jet kerosene prices, Europe ($/mt)[1]**



Notes: The graph shows the price comparison, measured in US dollars per metric tonne ($/mt), between neat SAF – HEFA-SPK (HEFA synthetic paraffinic kerosene) – and conventional jet fuel (kerosene), delivered onto a barge at the port of origin (FOB or free on board) in the FARAG region (Flushing, Amsterdam, Rotterdam, Antwerp, Ghent). "Spread" = difference between prices for neat SAF and jet kerosene, also known as the "green premium".

Source: S&P Global Energy Platts, 2026.

FIGURE 7 | **SAF vs jet kerosene prices, Singapore ($/mt)**

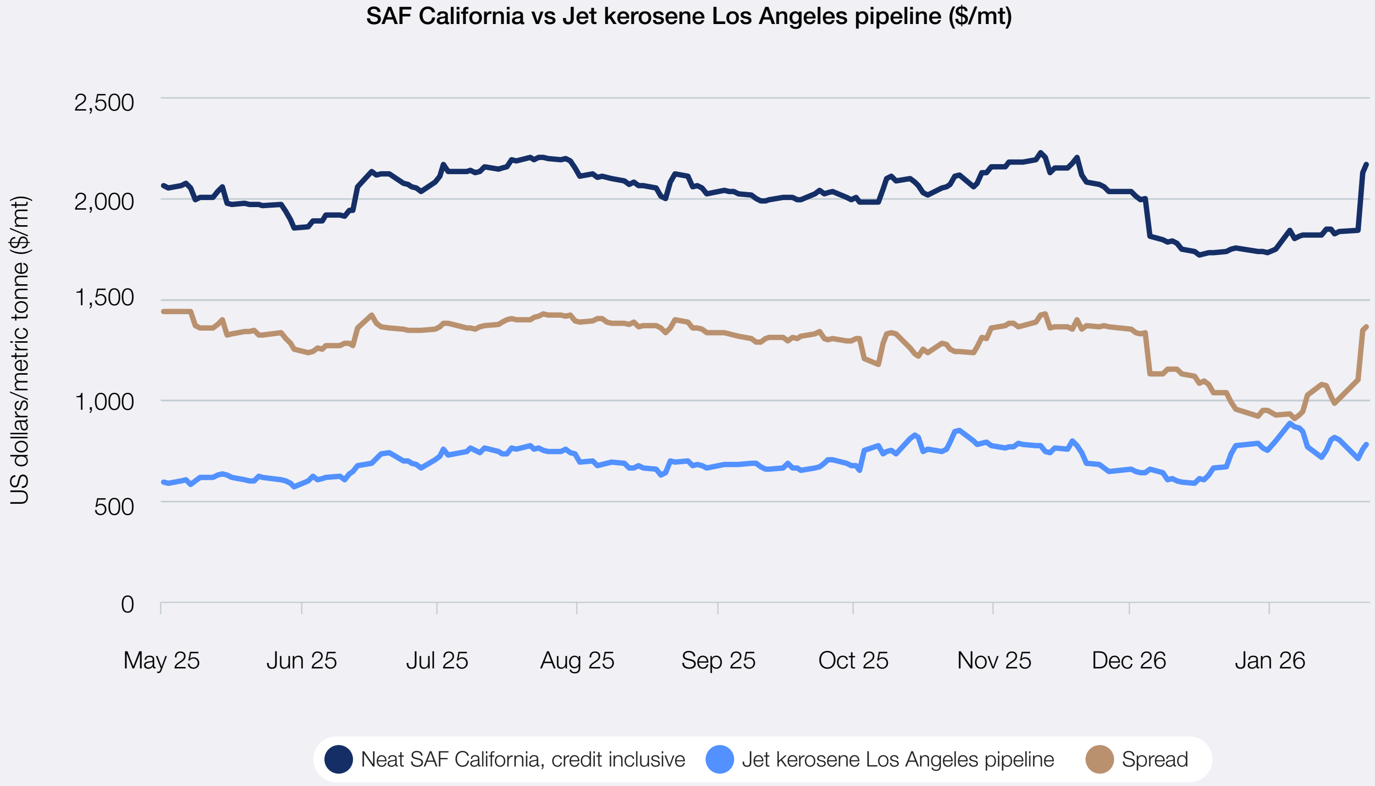


Notes: The graph shows the price comparison, measured in US dollars per metric tonne ($/mt), between neat SAF – HEFA-SPK (HEFA synthetic paraffinic kerosene) – produced in the Straits (Singapore/Malacca Strait region) and conventional jet fuel (kerosene) at the port of origin (FOB or free on board) in Singapore. "Spread" = difference between prices for neat SAF and jet kerosene, also known as the "green premium".

Source: S&P Global Energy Platts, 2026.

> **Pricing in the first half of 2025 seemed to suggest that a mandate doesn't automatically create demand, especially if buyers are already covered in the marketplace and enforcement uncertainties remain.**
>
> Vera Blei, Head of Platts at S&P Global Energy

FIGURE 8 | **SAF vs jet kerosene prices, California ($/mt)**



Notes: The graph shows the price comparison, measured in US dollars per metric tonne ($/mt), between neat SAF – HEFA-SPK (HEFA synthetic paraffinic kerosene) – delivered in California, US by railcar or barge, and conventional jet fuel (kerosene) delivered by pipeline in Los Angeles, California. "Spread" = difference between prices for neat SAF and jet kerosene, also known as the "green premium". "Credit inclusive" means that the graph takes into consideration tax incentives provided by the Low Carbon Fuels Standard (LCFS).

Source: S&P Global Energy Platts, 2026.

Stakeholders interviewed for this report and wider industry position papers provide diverging views on the potential causes behind SAF's increasing market prices in late 2025. IATA claimed that suppliers subject to mandates introduced "compliance fees" that artificially inflated prices.[153] Others attributed these price hikes to feedstock constraints and trade disruptions. In addition, as deadlines to meet 2025 mandate targets loomed in the second part of the year and some European refineries underwent maintenance, SAF prices climbed due to higher demand.

According to S&P Global Energy Platts, it is likely that a combination of all these factors, alongside supply-demand dynamics, have contributed to SAF price volatility. US policy uncertainty around 45Z credits after the new US government took over, as well as the launch of European SAF mandates, likely resulted in weaker market conditions in the first half of the year, exacerbated by lower-than-usual jet fuel prices caused by tariff debates.

Data from S&P Global Energy Platts shows a clear decrease in SAF prices during January and February 2026 and some commentators expect prices to continue easing during 2026.[154] Reasons for the price drop include lower demand and greater SAF availability, including from China after the release of new export permits.

Nevertheless, price volatility remains and many stakeholders forecast uncertainty well into the current year. This is one of the challenges often raised by SAF offtakers, especially corporate buyers, who struggle to navigate future prices as part of their negotiations.

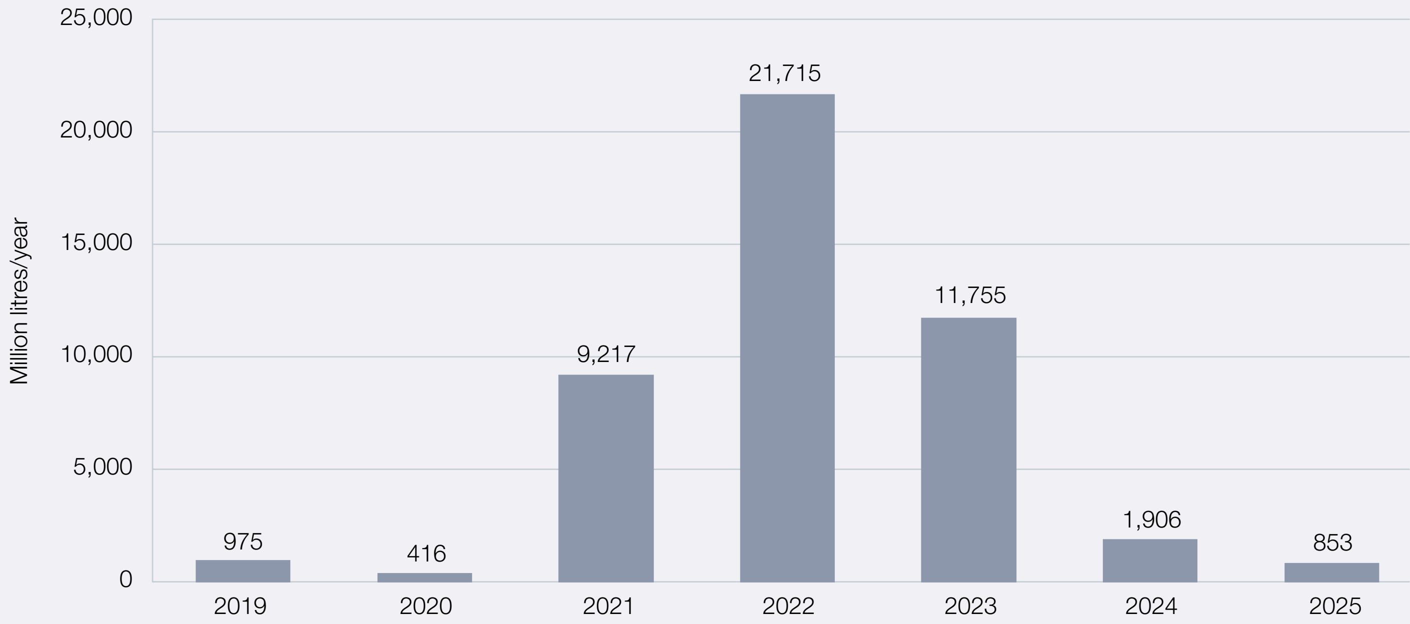
4.4 SAF partnerships, offtakes and voluntary demand

Airlines' offtakes and use of SAF

Data from ICAO's online tracker of SAF offtake agreements shows a reduction in the number of SAF offtakes between airlines and fuel suppliers in 2025, accelerating the trend reported in the *Global Aviation Sustainability Outlook 2025* (see Figure 9). Some stakeholders view this as a recognition of weakening SAF demand, highlighting the need for mandates to cement demand.

Nevertheless, ICAO's data should be interpreted cautiously: the tracker does not differentiate between volumes of SAF contracted for compliance with policy and those purchased on a voluntary basis, and offtake agreements are usually multi-year and would not therefore require re-signing on an annual basis. In addition, the date of fuel delivery may not coincide with the date of the contract, as some airlines have contracted-out fuel volumes ahead of mandates starting in 2025, and not all partnerships may have been announced publicly.

FIGURE 9 **Announced SAF offtake, between airlines and fuel suppliers, 2019-2025 (million litres)**



Note: This data shows SAF offtake agreements between airlines and fuel suppliers, but not between corporates and suppliers.

Source: ICAO tracker.

Asia-Pacific shows growing uptake of SAF

Asia-Pacific stands out as a region in which demand has been evolving positively, signalling a change from last year when the *Global Aviation Sustainability Outlook* identified Asia-Pacific, the Middle East and Latin America as laggards in the uptake of SAF offtakes. Feedback gathered for this 2026 edition highlights growing SAF offtakes and usage in the region, which has seen new partnerships emerge. For example:

- More regular SAF usage has been seen in Korea[155] and Australia.[156]
- Japan's All Nippon Airways has expanded the use of SAF to its domestic flights.[157]
- Eight Thai carriers have signed an MoU with the Civil Aviation Authority of Thailand to promote SAF adoption in the country, collaborating on procurement planning, reporting standards and verification, with a possible voluntary carbon surcharge mechanism for international flights.[158]
- In Viet Nam, PTT Oil signed an agreement with VietJet for regular SAF use to start in 2026.[159]

> **Corporate commitments to purchase SAF continue to play a critical role in helping scale the industry. By procuring SAF for your travel program today, your organization is providing bankable demand for this important technology, which helps to continue investment flow into the sector and, in turn, future-proof economic growth and connectivity.**
>
> Paul Abbott, Chief Executive Officer, Amex GBT

> **The role of tech and industry in driving decarbonization has never been clearer. By investing in sustainable fuels today, we are demonstrating how climate ambition must be matched by concrete action. Through concerted action like AVEVA's investment in SAF book-and-claim, industries can scale new technologies, minimize life-cycle emissions and set a higher standard for responsible growth.**
>
> Caspar Herzberg, Chief Executive Officer, AVEVA

Corporate offtakes and partnerships

Last year saw growing interest in SAF book-and-claim mechanisms, with increasing emphasis on the role companies can play to decarbonize their business travel by purchasing SAF certificates, while supporting plant scaling-up and fuel production.

SAF certificates and book-and-claim

Many airlines and air cargo carriers have book-and-claim travel programmes through which they sell SAF certificates to businesses flying with them or purchasing goods flown on their aircraft, to reduce emissions associated with air travel – typically counted under companies' Scope 3 emissions. Bilateral interviews have highlighted how the expansion of these corporate travel programmes is a top priority for airlines and carriers. However, the proportion of businesses buying SAF certificates to offset business travel emissions is currently extremely small.

Similarly, fuel producers have reported they are monitoring the book-and-claim landscape to review the feasibility of introducing new business models for corporate customers. Some governments have indicated they are exploring book-and-claim mechanisms, both to facilitate compliance with mandates and to overcome potential feedstock availability and cost constraints in some regions.

Selected industry trials are taking place, such as the collaboration between Mizuho, ENEOS and other players, that completed its first phase in Summer 2025 with a test purchase of Scope 3 certificates.[160] Intermediaries and facilitators acting between supply and demand have emerged as one-stop-shops for businesses, trying to capitalize on the fragmented landscape caused by the multiple players now selling, buying and re-selling SAF certificates.

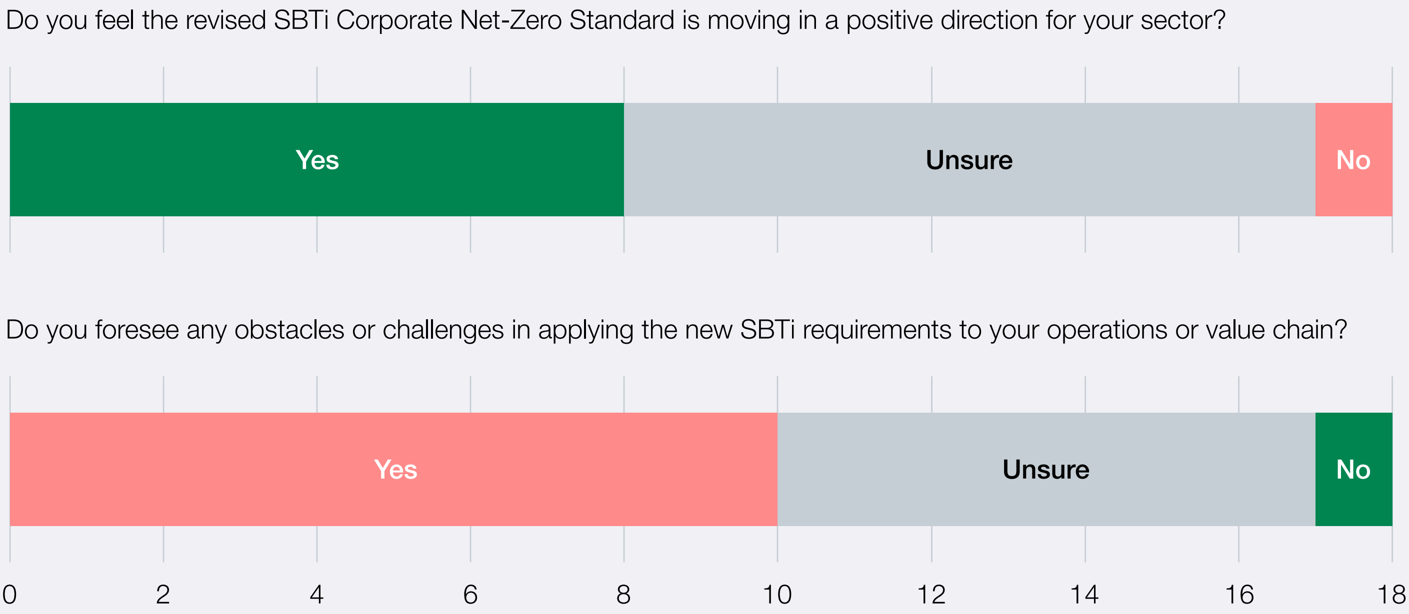
Challenges facing book-and-claim and SBTi compliance

Despite increasing interest in book-and-claim from multiple stakeholders, and stable voluntary demand from corporates for SAF throughout 2025 even in today's geopolitical context, recognition of book-and-claim as a legitimate mechanism that companies can use to meet their targets under the Science Based Targets initiative (SBTi) remains uncertain. This most likely contributes to the limited corporate demand for such mechanisms.

In 2025, SBTi launched two consultations on the revised version 2.0 of its *Corporate Net-Zero Standard*, which opened the pathway for SAF certificates to be allowed as an indirect mitigation measure under certain criteria and circumstances. The industry has broadly welcomed this development, but confidence in the outcome continues to be moderated by significant uncertainty and divergence of views.

A survey conducted by the World Economic Forum in December 2025 with 18 First Movers Coalition members and partners to gauge their views on the SBTi's second consultation showed that fewer than half of respondents felt the revised *Corporate Net-Zero Standard* is moving in a positive direction, with additional concerns mounting around the challenges of implementing the standard (see Figure 10).

FIGURE 10 | **Industry perspectives on version 2.0 of SBTi's *Corporate Net-Zero Standard***



Source: World Economic Forum survey of 18 First Movers Coalition members and partners active in the transport sector, December 2025.

Respondents noted that the new SBTi requirements are becoming increasingly complex and difficult to operationalize, with limited criteria set out at this stage that would clarify the circumstances under which SAF certificates could be claimed. These issues are expected to be addressed by an update to the Greenhouse Gas Protocol's Land Sector and Removals Guidance, planned for the first quarter of 2026. Even so, the uncertainties surrounding SBTi's standards, including their timing and implications for Scopes 1, 2 and 3 accounting, are likely to continue to influence corporates' decision-making processes well into 2026. On the positive side, some executives have highlighted that the current SBTi guidelines remain in place until further notice and these do recognise book-and-claim.

As book-and-claim schemes attempt to take off in 2026, aviation executives interviewed for this report emphasised the need to navigate increasingly complex interactions between mandatory and voluntary markets, particularly in markets that are expected to operationalize new policies, such as Singapore, and markets where mandates are already in place, like the EU. To reduce the risk that fuels could be accounted for under multiple book-and-claim systems, and to boost credibility, industry stakeholders have highlighted that more work is needed to foster interoperable and transparent book-and-claim platforms as a priority. However, opinions are divided on where the responsibility for coordinated action should sit.

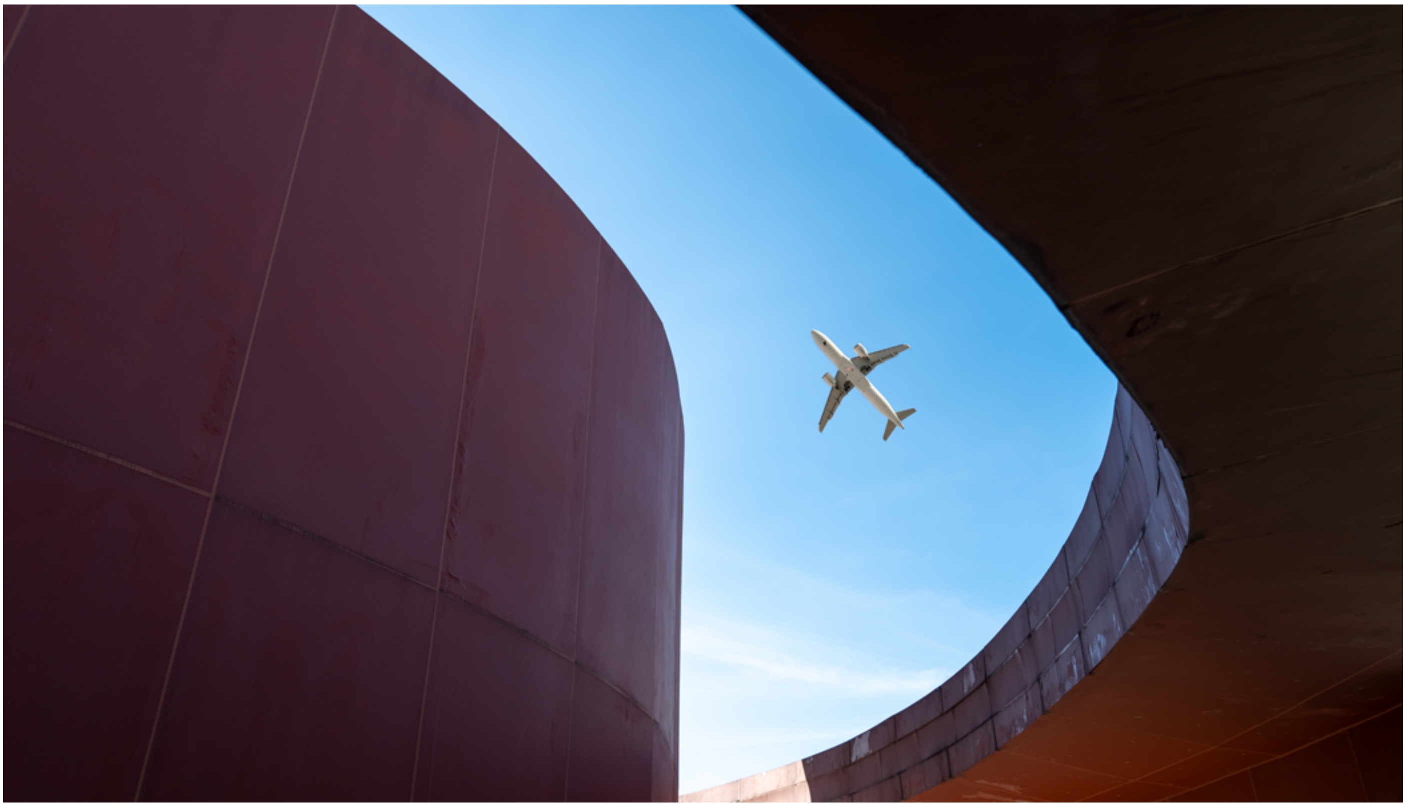
Additional challenges preventing the growth of book-and-claim include complex corporate governance and SAF procurement processes for corporates, which, unlike airlines, are not used to procuring fuel; these challenges are exacerbated by unclear future SAF market prices that affect negotiations and pricing structures. While these hurdles are hampering the uptake of SAF by new players, more experienced corporates that have purchased SAF in the past are also facing more complex, sophisticated demands, such as the need to account for SAF against specific flights or airlines.

Navigating these difficult processes requires further guidance and peer learning from companies that have already taken up SAF offtakes. To this end, in May 2025, the World Economic Forum in collaboration with GenZero launched Green Fuel Forward in Singapore. This initiative aims to widen the pool of businesses interested in SAF certificates, by building awareness of the avenues available to purchase SAF, and their sustainability, procurement, accounting and reporting implications. Several players, such as Amex GBT, Shell, OMV, LanzaJet, Sumitomo Mitsui Banking Corporation (SMBC), Temasek, BOC Aviation, Microsoft, SkyNRG and multiple airlines active in Asia-Pacific are involved.

> Asia-Pacific will be key to the next wave of aviation growth, so getting SAF to scale here is a global priority for sustainable aviation. Learning how carbon credit revenues can channel financing towards underlying decarbonization projects, we believe that SAF credits can similarly drive catalytic financing towards SAF development by reducing the green premium, encouraging investments in supply and scaling adoption. Over time, this will make SAF a more mature and less costly solution. Green Fuel Forward brings airlines and corporates together to raise the level of understanding about SAF and encourage the demand for SAF credits. Coupled with innovative policy solutions like Singapore's SAF levy, this has the potential to accelerate aviation decarbonization through faster adoption of SAF.
>
> Frederick Teo, Chief Executive Officer, GenZero

Progress in 2025 despite headwinds

Despite challenges, 2025 saw progress and innovative collaborations being established across industry. For example, Microsoft signed a five-year deal for 39,000 tonnes of SAF,[161] while Airbus launched a new collaboration with OMV. Member companies of the Aviation sector of the Forum's First Movers Coalition (FMC) are making progress towards their target of replacing at least 5% of their conventional jet fuel demand with SAF.[162] For example, Autodesk[163] and AVEVA[164] procured SAF for the first time in 2025; PwC signed a new partnership with Iberia to reduce CO_2 emissions for business travel by 10-30% by 2030;[165] and Amex GBT widened the pool of suppliers providing SAF to its blockchain-based book-and-claim platform, Avelia, through a new collaboration with Moeve.



> Decarbonizing aviation is an environmental imperative and an innovation opportunity, but it requires collaboration. Autodesk supports ambitious carbon-reduction pathways, is aligning with the World Economic Forum's First Movers Coalition, and is partnering with Twelve to invest in power-to-liquid e-SAF—where early demand is key to scaling and cost reduction.
>
> Joe Speicher, Chief Sustainability Officer, Autodesk

Key collaboration trends in 2025

Increasing interest in collective procurement:

- In May, the Sustainable Aviation Buyers Alliance launched SAFc Connect, a new platform to connect buyers and sellers of SAF certificates.[166]
- In October, 10 companies launched a partnership comprising global airlines and corporate partners to acquire 20,000 tonnes of SAF via book-and-claim.[167]

Greater collaboration between cargo players:

- DHL announced several offtake agreement partnerships, including:
  - 240,000 tonnes of SAF over three years to use at Los Angeles International Airport, produced by Phillips 66.[168]
  - 2,400 tonnes of SAF supplied by Cathay Pacific for flights from Seoul, Tokyo and Singapore.[169]
  - A renewed collaboration with Air France-KLM Martinair Cargo to develop book-and-claim solutions for air freight.[170]
- FedEx collaborated with World Fuel Services to supply 15,000 tonnes of SAF at major hubs including Dallas-Fort Worth and New York JFK, delivered as a minimum 30% blend.[171]
- These developments build on earlier SAF use at Los Angeles, Chicago-O'Hare and Miami, underscoring how airport-based partnerships are helping increase SAF uptake in air cargo operations.

Equity investment in SAF from airlines:

- In September, the oneworld alliance and Breakthrough Energy Ventures launched a $150 million fund to commercialize SAF technologies.[172]
- In October, Cathay Pacific and Airbus announced a joint investment agreement of up to $70 million to accelerate SAF production in Asia.[173]

4.5 Fuel refining activity, oil markets and overall implications

Market consolidation could reflect an uncertain outlook for conventional fuel refining activity – especially in Europe, where refining capacity is expected to shrink by up to

30%

over the next 10 years.

Airlines and corporates have not been the only stakeholders looking into SAF prices and competitiveness. Mergers of fuel players and acquisitions accelerated during 2025 and early 2026, particularly in Europe. Among the latest announcements, Moeve and Galp have been exploring a non-binding agreement to combine refining and retail activities, with a focus on mobility, low-carbon fuels and transformation of existing assets into integrated multi-energy hubs,[174] while VARO Energy completed the acquisition of Preem, achieving a combined capacity of 1.3 million tonnes of renewable fuel production per year – the second-largest in Europe and one of the top six in the world.[175]

Market commentators expect such transactions to strengthen players' ability to scale up clean fuel production, including co-processed fuel,[176] SAF and green hydrogen for aviation, while leveraging wider and more integrated infrastructure and distribution networks. This market consolidation could also reflect an uncertain outlook for conventional fuel refining activity – especially in Europe, where refining capacity is expected to shrink by up to 30% over the next 10 years, because of more volatile margins as well as the increasing share of alternative energies.[177]

The global picture remains uncertain. Some analysts expect refining capacity to reduce further, despite growing oil demand.[178] Others predict growth in overall refining volumes, especially in the Middle East, China and India,[179] as well as globally on the back of geopolitical shifts that have seen renewed interest in fossil fuels.

According to the IEA, the past year demonstrated that geopolitical instability could co-exist with subdued oil prices, reflecting a large surplus of supply over demand.[180] However, possible escalations of inter-state conflict in 2026 could propel prices on an exponential upwards trajectory, widening the spread between conventional jet fuel and SAF, as well as affecting airlines' fuel-hedging strategies.

Changes in refining activities and oil trends have prompted The Hague Centre for Strategic Studies to investigate the implications on European fuel readiness, vulnerability and resilience, as well as the opportunities that a multi-fuel future can bring to the defence industry.[181] Ongoing tensions and conflicts suggest that sustainability (and therefore any increased use of SAF and new fuels by defence actors) remains a lower priority for the military than it was in the past. However, trials and exploration of sustainable aviation technology by the military – spearheaded by the Royal Air Force in the UK in the last couple of years[182] – are expected to continue, presenting governments with an opportunity to strengthen their role as bankable offtakers of SAF.

5 Wider industry trends

Increasingly frequent climate, workforce, grid and cyber disruptions highlight urgency to advance resilience planning and risk mitigation.

From more frequent and severe weather events to new types of physical and digital disruptions affecting airports, trends during 2025 highlighted the urgency for executives to ramp up resilience planning alongside decarbonization. Aviation operations were disrupted by – among other events – hurricanes, intense solar radiation, drones, cyberattacks and electrical infrastructure failures. Workforce constraints and disputes further interrupted the flow of passengers and goods, with protracted impacts on end-users lasting often weeks or months.

5.1 Climate resilience of airport infrastructure amid extreme weather events

Recent climate events have reinforced the value of preparedness and rapid emergency response.

Extreme weather events in 2025 and early 2026 have elevated climate resilience as a sustainability risk in its own right for aviation. Flooding, storms, heatwaves and energy disruptions are already affecting airlines, airport operations and infrastructure, with direct implications for safety, connectivity, insurance costs and long-term investment planning. As climate impacts intensify alongside other natural phenomena – such as the solar storm that grounded all Airbus A320s in November 2025[183] – resilience is becoming essential to safeguard continuity of air travel and minimize the economic and societal disruption associated with climate shocks.

While infrastructure resilience remains critical, 2025 has seen growing recognition that operational resilience is equally decisive. Airports are not only exposed through runways, terminals or power systems,[184] but also through tightly coupled operational processes that can amplify disruption. Increasingly common "once-in-a-century" extreme weather events can generate cascading impacts across the aviation system, from severe heat reducing operating hours to heavy floods on access roads that constrain passenger flows.

Preparedness pays off

Recent climate events have reinforced the value of preparedness and rapid emergency response, as illustrated by airports that successfully maintained continuity during major weather disruptions. Examples include:

- Hong Kong Airport's efficient handling of the major travel disruptions caused by Typhoon Ragasa in September 2025 (see Box 3).[185]
- The temporary suspension of flights at Marseille Provence Airport in July 2025, due to nearby wildfires.[186]
- Significant flooding around the Texas border in spring 2025, where regional airports mitigated operational impacts through rapid response and continuity planning.[187]

Climate risks differ from airport to airport and cannot be fully avoided, but their impacts can be reduced. Airports need to assess the potential disruptions that may occur in their region and their vulnerabilities, so to invest in measures that allow a quick and effective response when extreme weather occurs. Today, many airports still lack clear, detailed data and common ways to measure climate risk,[188] which makes it harder to plan investments and increases uncertainty for insurers and investors.

BOX 3 Operational resilience at Hong Kong International Airport

Hong Kong International Airport demonstrated the growing importance of operational resilience when Typhoon Ragasa caused major regional travel disruptions in September 2025. Despite extreme weather conditions, the airport maintained continuity by safely handling around 600 flights through proactive planning, real-time data sharing and close coordination across airlines, air traffic control and ground services. This experience highlights how preparedness and rapid response can significantly reduce disruption even during severe climate events.

In anticipation of the storm's impact, major carriers including Cathay Pacific and other Hong Kong-based airlines strategically relocated a significant portion of their fleets, with roughly 80% of aircraft flown to alternative airports across Asia, Europe and Australia,[189] both to protect assets and to position them for a rapid return once conditions improved. This experience highlights how preparedness and agile coordination between the airport and airline partners can significantly reduce disruption even during severe climate events.

5.2 Workforce instability presents ongoing challenges

Executives agreed that embedding sustainability in every aspect of a company's culture and decision-making would contribute to both operational excellence and staff retention.

Labour availability and relations emerged as significant challenges in 2025. Government shutdowns, pay disputes and staffing shortages led to widespread flight cancellations and delays across multiple regions, including North America, Europe and Asia. Most notably, the US government shutdown in November 2025 resulted in flight caps at major airports, resulting in thousands of flights being cancelled or delayed.[190]

In Canada, negotiations over staff pay for 10,000 cabin crew resulted in significant flight cancellations and government intervention.[191] In some instances, these disruptions coincided with heightened safety scrutiny, further compounding operational challenges. Rostering issues and apparent pilot shortages in India in December 2025 also caused the cancellation of thousands of flights, at a time of increased scrutiny over safety and in a market in great expansion.[192]

While the nature of these issues might be temporary, workforce instability appears to present a longer-term challenge that will continue to affect operational reliability and strategic planning across the aviation ecosystem in 2026. During his speech to ICAO's 42nd Assembly, the US Secretary of Transport lamented that the US has "a nationwide shortage of air traffic controllers".[193] Looking ahead, challenges with pilot and air traffic controller shortages could be compounded by the incoming advent of eVTOLs and other such advanced air mobility (AAM) solutions, which will increase labour demand and congestion in the skies.

Beyond pilots, the wider workforce is one of the enablers of the energy transition in the aviation sector. Executives consulted for this report agreed on the imperative to embed sustainability in every aspect of a company's culture and its strategic and operational decision-making. This cultural shift would contribute to both operational excellence and staff retention. It could be brought about by up-skilling and re-skilling workers for digital and sustainability competences, improving data availability and educating employees on how to maximize the benefits of lower emissions operations.

5.3 Operational disruptions from cyber-attacks and digital system failures

Last year, there were 10 major cyberattacks targeting the aviation industry.[194] These attacks, combined with digital system failures, emerged as a key operational risk for aviation, disrupting airport operations and underscoring the sector's growing vulnerability as it becomes increasingly digitized.

A major ransomware incident targeting a critical airline technology provider's check-in and boarding systems caused cascading disruptions at key European airports (including London Heathrow, Brussels and Berlin) in September 2025,[195] forcing a revert to manual processes that led to significant delays, flight cancellations and passenger backlogs.

This incident highlighted how tightly interconnected digital systems, third-party dependencies and legacy infrastructure can create single points of failure that have continent-wide operational impacts. It demonstrated that even short system outages can affect airport operations, passenger processing, baggage handling and scheduling.

The rising frequency of cyber-related events has prompted airports, operators and regulators to elevate cyber resilience as a priority risk area. As geopolitical tensions rise and the digital footprint of aviation expands, cybersecurity is increasingly competing for attention and resources with sustainability initiatives. In this context, operational disruptions from cyber-attacks not only have immediate economic and service implications but also pose barriers to long-term sustainability goals by diverting investments, complicating planning and undermining confidence in digital transformation.

These risks are increasingly intertwined with other forms of disruption such as drone sightings[196] and system outages and illustrate how digital vulnerabilities can quickly escalate into complex, multi-faceted operational crises.

5.4 Energy system outages and grid reliability risks

Energy system disruptions in 2025 had measurable operational impacts on aviation, reinforcing concerns around grid reliability as airports accelerate electrification. The Iberian Peninsula power outage in April 2025 affected major airports in Spain and Portugal, disrupting flight operations, passenger processing and ground services as electricity supply imbalances cascaded across critical infrastructure.[197,198] While backup generation enabled partial continuity, most airports are designed for short-duration outages, leaving them exposed during prolonged grid failures, particularly as electricity demand grows.

Similar vulnerabilities were evident in the electricity substation fire near London Heathrow in March 2025,[199] which resulted in the cancellation or diversion of hundreds of flights and disruption to hundreds of thousands of passengers, underscoring how single-point failures in external energy infrastructure can rapidly propagate through aviation networks.

From a sustainability perspective, these incidents highlight a growing tension: electrification accelerates decarbonization, but without parallel investment in energy infrastructure, it can expose airports to greater operational risk through increased dependence on outdated grid systems. Internally, the electrification of ground operations, terminal systems and digital infrastructure can add significant load to ageing assets that were not designed for higher and more variable electricity demand, reinforcing the need for targeted investment and grid upgrades. Externally, exposure to state-level power outages reflects the importance of non-centralized energy solutions (e.g. onsite renewable generation, storage and back-up systems) and the need to recognize airports as critical infrastructure, comparable to other essential public services.

During 2026, airports and policy-makers will need to increasingly embed energy resilience into sustainability strategies and policy frameworks, prioritizing diversified supply, onsite generation where possible, storage and closer coordination with energy providers.

Conclusion

To maintain optimism, public-private sector collaboration in 2026 should focus on pragmatic avenues to address net-zero aviation's challenges.

What stands out from 2025 is the aviation industry's positive attitude and willingness to advance the sector's transition to net zero, despite financial challenges and geopolitical disruptions affecting passenger and cargo trends, as well as organizational priorities across the fuel and aviation supply chains.

Sustained growth, new SAF project developments and the roll-out of supportive policy globally continue to demonstrate political support. This has been essential to maintain international collaboration despite geopolitical headwinds.

Feedback from the World Economic Forum's aviation community members suggests that, at this stage, a recalibration of aviation's overarching net-zero ambitions is not expected, as support within countries and industry remains strong. While the destination remains unchanged, many executives expect the pathway to undergo adjustments to reflect market challenges and remove bottlenecks.

Hence a more pragmatic approach to sustainability will continue to dominate industry discussions during 2026 and beyond, especially in light of longer-term SAF technology production challenges. Pressing questions abound. How can a renewed focus on energy security help unlock decarbonization? Which decarbonization scenarios can deliver the best opportunities for growth across the aviation industry, from airports to fuel supply chains? How can policy be aligned globally, or at least regionally? How can the clean electricity needs of aviation be met – for airports and fuels? What is the role of AI?

Ideas and practical solutions to these questions have already been emerging in 2025, with new collaborations and partnerships developing across the globe and progress in selected areas, as reported in this white paper. Nevertheless, greater public-private collaboration is vital to drive a more pragmatic way forward that can maintain the sector's latent momentum towards net zero and harness the willingness of stakeholders to work together towards a more sustainable future for the sector.

In 2026, the World Economic Forum will continue to offer a platform for constructive dialogue across all the areas covered in this report. The aim is to find more tangible answers to the open questions above and advance collaboration among airports, airlines, fuel producers and suppliers, infrastructure providers, financiers, academia, NGOs and governments.

From more in-depth discussions on book-and-claim mechanisms for SAF in Asia-Pacific to the industry gathering at the Farnborough International Airshow, the Forum's activities in 2026 will continue to combine evidence-based analysis with thought-provoking views to accelerate the aviation sustainability conversation at a critical time for international collaboration and multilateralism.

Appendix 1
A longer-term look at SAF demand

Action is needed now to help ensure future SAF availability matches demand as mandates ramp up beyond 2030, and to accelerate the flow of private capital that can enable SAF growth.

As set out in Chapter 2, global sustainable aviation fuel (SAF) production expanded in 2025 and many executives interviewed for this report are optimistic about the availability of SAF to meet mandates in the run-up to 2030. High-level market assessments show similar trends. The Forum's report *Financing Sustainable Aviation Fuels: Case Studies and Implications for Investment*, published in February 2025, predicted that SAF demand globally would surpass 17 million tonnes in 2030, when factoring in both mandates and voluntary SAF commitments from airlines.

Beyond 2030, both SAF demand and supply are more uncertain. Few governments have set mandates to 2040 or 2050, and where this is the case, targets ramp up steeply. In addition, several airlines remain committed to achieving net-zero aviation by 2050 through cleaner fuels, but few have announced voluntary SAF ambitions beyond 2030. Future SAF expansion will depend on demand, incentives, technology development, feedstock availability as well as wider market conditions, as set out in the previous chapters of this report.

If demand grows fast but supply cannot keep up with it, additional SAF production capacity will be needed. On the contrary, weaker demand may affect offtake certainty, and in turn the willingness of existing and prospective SAF project developers to maintain and expand the current project pipeline. The uncertain interaction between supply and demand post-2030 has prompted further investigation on future trends.

This chapter, written in collaboration with HSBC*, presents three plausible SAF demand scenarios up to 2040, based on the evolution of policy as affected by the trends set out in this report. These scenarios are compared with project pipeline estimates to draw key reflections on next steps for investors and governments.

For a more detailed methodology of the assumptions and data analysis in this Appendix, click here.

* HSBC contributed Appendix 1. However, the views and recommendations in this appendix are conceptual in nature and should not be construed as HSBC making any funding, investment or participation commitments in relation to the recommendations included therein.

Future SAF demand scenarios

As of February 2026, the European Union (EU) and at least 16 other countries had announced a number of SAF policies, ranging from full blending mandates to production targets or more speculative ambition statements. These countries can be grouped according to their likely enforcement of SAF targets post-2030 (see Figure 11). The criteria for these groupings include progress with regulatory design and legislation, the definition of enforcement mechanisms and historical precedent:

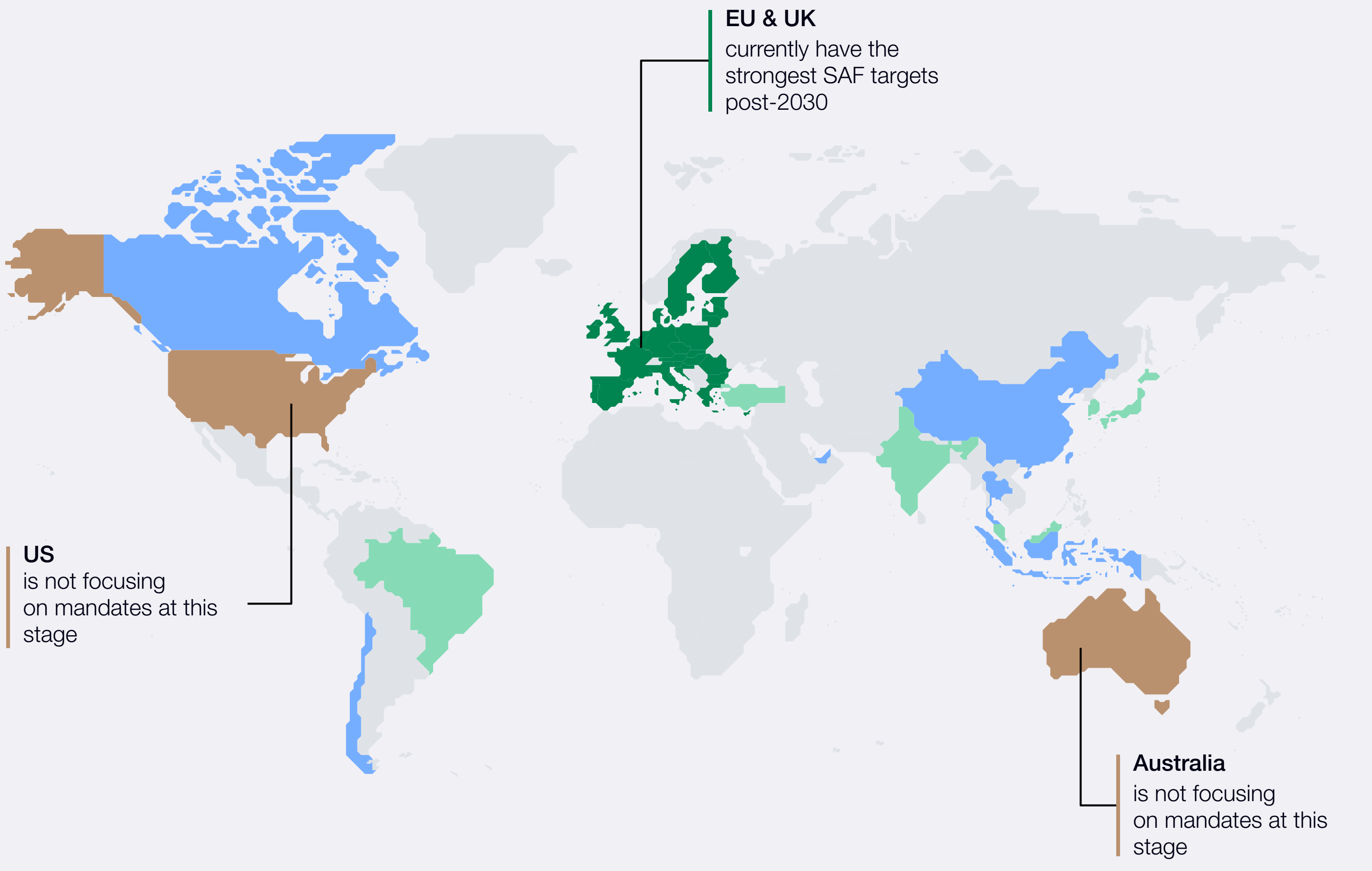
- **Highly likely targets:** EU's 27 member states, United Kingdom. These are countries where long-term targets are enshrined in legislation.

- **Likely targets:** Brazil, India, Japan, Malaysia, Singapore, South Korea, Turkey. Governments of these countries have set ambitious SAF targets and reiterated their willingness to scale up SAF and wider biofuels industries as priorities. Legislation is newer and targets tend not to extend beyond 2030.

- **Possible targets:** Canada, China, Chile, Indonesia, Thailand, United Arab Emirates. These countries have introduced or are likely to introduce preliminary SAF strategies, incentives and roadmaps, but have not yet set long-term ambitions.

- **Speculative targets:** Australia, United States. These countries favour tax credits and incentives rather than mandates at this stage.

FIGURE 11 **Country groupings based on likely enforcement of SAF targets post-2030**



Note: The 16 countries assessed (as noted in the figure above) and the EU have stated targets or ambitions to blend SAF with jet fuel between 2025 and 2050. These countries are divided into four groups in the map, based on an assessment of the likelihood that governments will ensure that airlines flying out of their country will comply.

Source: HSBC analysis for *Global Aviation Sustainability Outlook*.

Market conditions, as potentially affected by the factors discussed in this report, will determine the likelihood that mandates (where already in place) will remain unaltered post-2030 and the rate at which targets will ratchet up over time. To calculate the associated global SAF demand that could be underpinned by future policy, the country groupings in Figure 11 have been used to construct the following three hypothetical scenarios for 2040 (see below and Table 1):

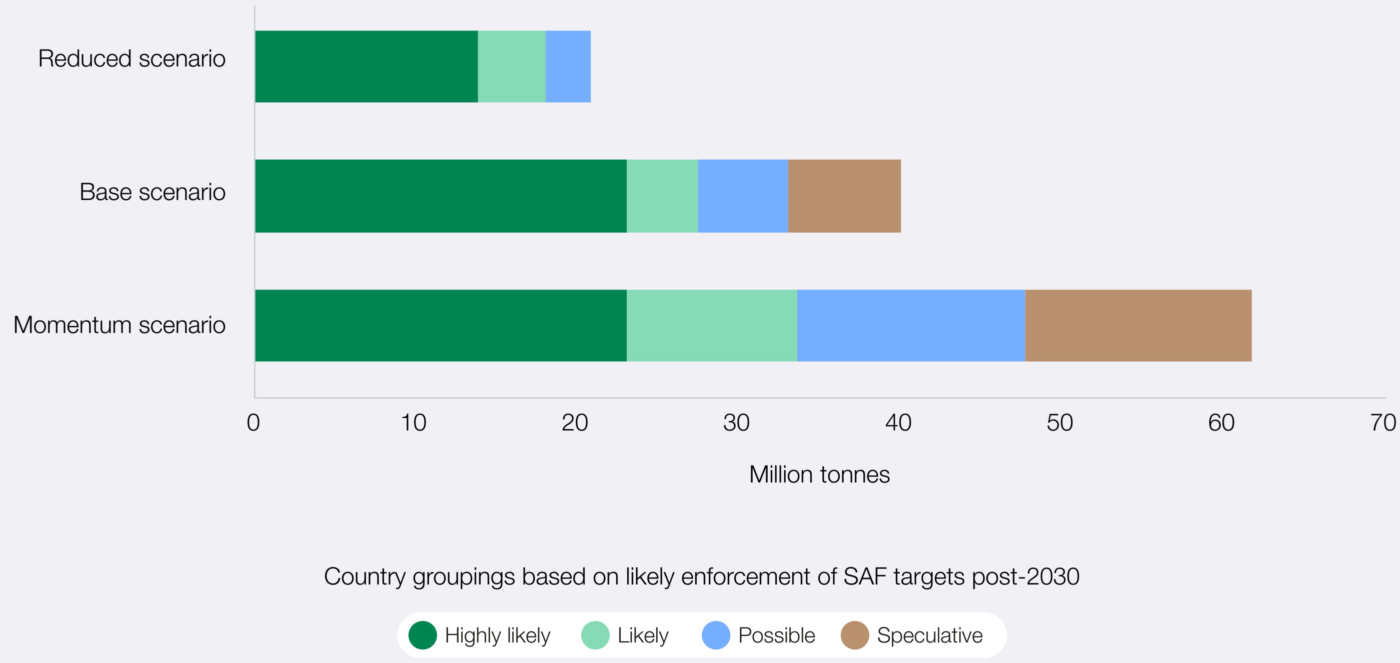
- **Reduced scenario:** Some rollback of policy or postponement of targets. This may be equivalent to ~21 million tonnes of SAF demand in 2040, approximately 6% of the potential jet fuel demand in that year.
- **Base scenario:** All current targets or stated ambitions are maintained through to 2040, with no material increase beyond those already announced. This scenario underpins global SAF demand of ~40 million tonnes by 2040.
- **Momentum scenario:** Continuation of mandates beyond 2030, including gradual expansion of SAF blending requirements in jurisdictions where policy has only been confirmed up to 2030. This could correspond to ~62 million tonnes of SAF demand by 2040, or 19% of total jet fuel demand.

TABLE 1 **2040 SAF scenarios and assumptions on policy evolution**

	Country grouping			
	Highly likely	Likely	Possible	Speculative
Reduced scenario:	Targets are kept flat after 2030-2035	Targets are kept flat after 2030-2035	The most recent target is halved	No targets
Base scenario:	All current targets or ambition remain in place	All current targets or ambition remain in place	All current targets or ambition remain in place	2030 targets are halved
Momentum scenario:	All current targets remain in place	All current targets remain in place	All current targets remain and these are assumed to increase incrementally by 1 percentage point per year, if no targets beyond 2030 have been set yet	2030 targets only

The assumptions across each scenario are summarized in Table 1, while the SAF demand volumes entailed by each scenario are set out in Figure 12. A full breakdown of the SAF blend percentage of each country can be found in Table 3 below.

FIGURE 12 **Potential total SAF demand in 2040 across three scenarios (million tonnes)**



Sources: HSBC analysis for Global Aviation Sustainability Outlook, S&P Global Energy, Carbon Direct.[200]

Current SAF project pipeline

Taking into consideration projects which are already operational today, as well as those under construction or in various phases of development, BloombergNEF (BNEF) estimates the current SAF project pipeline to surpass 43 million tonnes of annual production capacity.* HEFA projects make up the majority of this pipeline.[201]

However, not all SAF plants that have been announced will be able to achieve final investment decision (FID) and progress to construction and operation. By assessing a range of factors – including feedstock procurement strategies, progress on regulatory compliance and permitting, construction status, and financing and offtake agreements of individual refineries – BNEF expects that roughly half of this pipeline (22.9 million tonnes) may become operational, referred to below as "BNEF's realistic case".[202]

For comparison, SkyNRG expects a pipeline of around 18 million tonnes,[203] while IATA forecasts around 20 million tonnes of SAF capacity by 2030. Approximately one-third of this SAF production capacity is expected to be in the US, with Asia-Pacific and Europe expected to have similar capacities.[204] The European Union Aviation Safety Agency (EASA) estimates the EU will reach a production capacity of 3.6 million tonnes by 2030.[205]

Table 2 compares the potential SAF demand across scenarios in 2040 with the current projected SAF pipeline. Figure 13 shows how demand compares with the current projected SAF pipeline capacity, broken down by project status and technology.

This comparison shows that only if the entire current SAF production pipeline were to become operational would there be enough capacity to meet demand in the base scenario by 2040. However, under BNEF's more realistic case noted above, the current pipeline would be sufficient to meet SAF demand only under a reduced ambition scenario; however, under the base scenario, the realistic pipeline could meet just half of SAF demand expected by 2040, while under the momentum scenario it could meet more than one-third of anticipated demand.

This demand-supply pipeline comparison highlights that additional SAF production capacity will most likely need to become operational to produce sufficient SAF to meet demand by 2040.

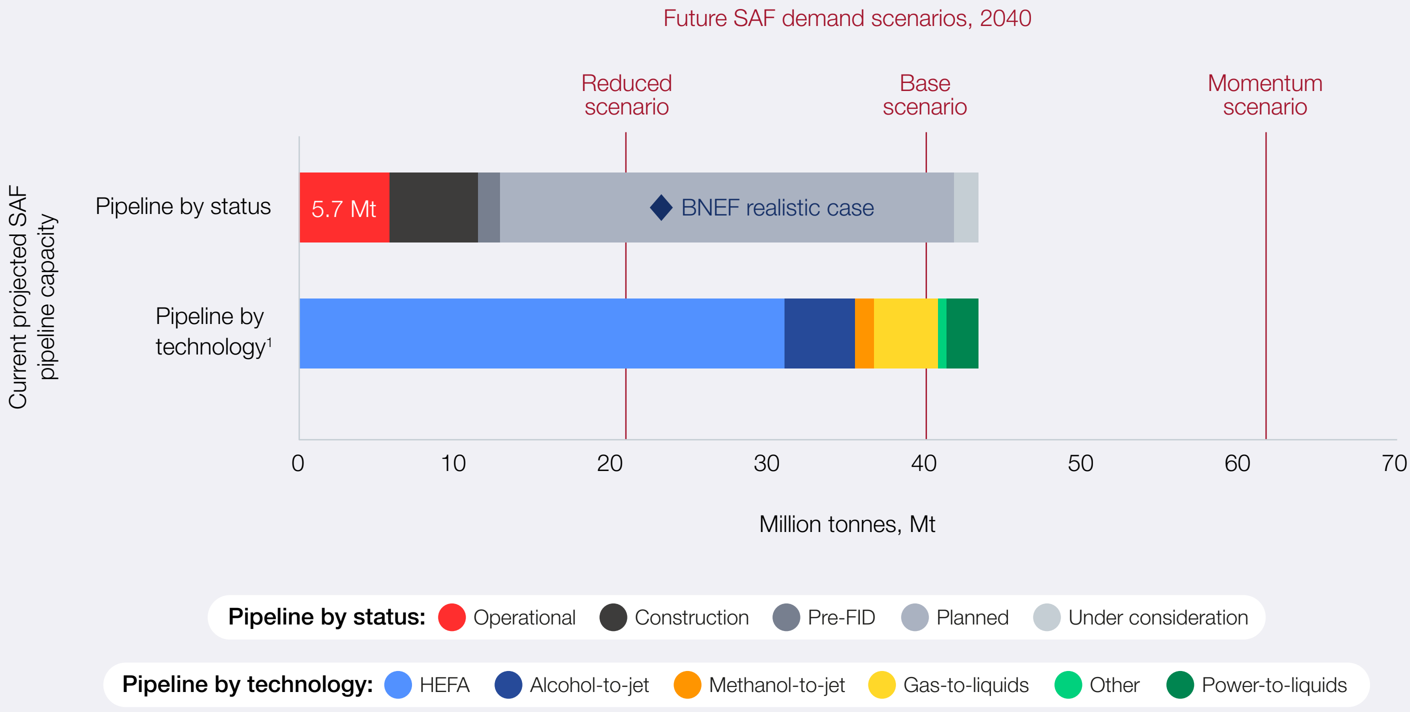
* The global SAF production pipeline reflects a point-in-time snapshot of all known projects at the time of this analysis, rather than an expected commissioning date of these facilities. The 43 million tonnes figure represents aggregated announced nameplate capacity across operational, under-construction and development stage projects.

TABLE 2 **Comparison between potential SAF demand in 2040 and current projected SAF pipeline capacity, by scenario (million tonnes/Mt)**

Demand scenarios	SAF demand in 2040 (Mt)	SAF supply – current projected SAF pipeline capacity (Mt/year)	
		If all current pipeline projects become operational	If ~half pipeline projects become operational (BNEF's realistic case)
Reduced	20.76	43.29	22.85
Base	39.96		
Momentum	61.66		

Sources: BloombergNEF (BNEF).

FIGURE 13 **Potential SAF demand scenarios in 2040 vs. current projected SAF pipeline capacity, by status and technology**



Note: 1. Bar chart shows proportions of different SAF technologies in the current project pipeline. Under the "realistic case" predicted by BNEF – in which roughly half of this pipeline (22.9 Mt) may become operational – the technology breakdown may not be scaled back proportionately, both because of HEFA-scalability constraints due to used cooking oil availability and because non-HEFA pathways face bigger technology deployment challenges.

Sources: HSBC analysis for Global Aviation Sustainability Outlook and BNEF.

Technology considerations

The existing SAF pipeline is dominated by HEFA. If all the projects in the pipeline were to progress to construction and operation, HEFA capacity could reach ~30 million tonnes soon after 2030. However, estimates of the future supply of used cooking oil (UCO) – a key feedstock for HEFA – suggest that this production pathway may face constraints. A bottom-up calculation based on UCO availability and collection rates suggests that production of just 8.6 million tonnes per year of HEFA by 2040 would be more realistic.[206]

Constraints on UCO could arise from various factors. For example, geographic concentration of UCO in selected markets can affect feedstock flows and, consequently, the ability of projects to secure the inputs needed for SAF production (see Chapter 3.6). In addition, competition with renewable diesel production can divert UCO supply away from the aviation industry and reduce the pipeline further.

This future tightening of UCO supply and its impact on the growth of HEFA, plus volatile market conditions increase the urgency for additional, technologically diverse SAF plants to meet potential demand by 2040. Improvement in UCO collection and rapid diversification by SAF producers into other feedstocks, where allowed by regulation, could ease some of the constraints. However, the production of SAF from alternative waste or byproduct inputs will require the commercial expansion of more expensive alcohol-to-jet (AtJ) and gasification Fischer-Tropsch (GFT) fuel pathways. Feedstock restrictions in selected regions may also need to evolve to recognise the need for a greater pool of raw materials where the impact on emissions and land use are positive.

To overcome such feedstock constraints, there is widespread acceptance in industry that investment in power-to-liquid (PtL) fuels will need to complement other technologies. Yet only the EU and UK have, so far, set out explicit mandate sub-targets for e-fuels – and even those targets are increasingly being questioned by some as unrealistic (see Chapters 1.4 and 2.1). In reality, greater e-fuel capacity will be needed to boost the SAF pipeline and fill the supply gaps that HEFA pathways may not be able to provide.

Implications for future SAF plant development and investment

This analysis identifies potential SAF demand scenarios in 2040 and shows that the current SAF project pipeline is unlikely to be sufficient to supply either base or momentum scenarios, unless production capacity is boosted further. To meet mandates, additional investment is needed today, including in e-fuels. Only in the case of weaker demand (reduced scenario) might there be enough fuel volumes to meet likely mandates.

Policy stability is essential

For all scenarios, policy stability and long-term certainty on targets are essential to create the right investment environment. Any softening of government mandates and targets would reduce confidence in the sector and could affect investors' perception of the feasibility and bankability of SAF plants. This could potentially exacerbate the risk that more SAF projects cannot secure the funding needed to progress to construction, reducing the likelihood of meeting even the demand that lower mandates would imply.

Investment needs

As a result, boosting SAF capacity across technologies, especially e-fuels, must be prioritized to help ensure mandates can be met beyond 2030. This will come at a cost. The capital required to build the entire current SAF project pipeline is significant, even before accounting for the additional capacity required to fulfil higher fuel demand under the momentum scenario.

Considering the 37.6 million tonnes of production capacity under development as of February 2026 but not yet operational,[207] and applying greenfield capital intensity assumptions from the Forum's 2025 *Financing Sustainable Aviation Fuels* report, the sector could require around $120 billion of capital to translate this pipeline into operational capacity.[208]

To reduce capital investment costs and speed up construction timelines, some HEFA plants may be able to leverage the conversion of existing oil refineries and infrastructure, although feedstock costs are expected to remain volatile.

While greater reliance on non-HEFA pathways, including e-fuels, will be needed, this will come at a premium, given the higher cost of producing SAF via power-to-liquid, gasification-Fischer-Tropsch and alcohol-to-jet pathways compared to HEFA. This highlights an increasingly important trade-off between SAF market growth and affordability, especially in emerging aviation markets, that is resulting in calls for pragmatism and extra policy support.

Role of governments and financiers

Governments and investors play a key role in supporting the conversion of a greater number of pipeline projects into operational capacity as well as funding new, additional plants.

Governments can create appropriate risk management mechanisms to help reduce the technology risk of projects. Hence beyond mandates, which are needed to drive demand, policy should increasingly prioritize risk allocation and mitigation measures that can reduce the technology burden currently borne by SAF project developers and their contractors. At the same time, governments can introduce mechanisms to help stabilize the revenues of prospective SAF plants to make projects more bankable. This is particularly needed for non-HEFA SAF production pathways, whose technology risk is higher.

When designing policy, governments should be pragmatic about acknowledging the different levels of technology risk and challenges faced by different SAF production pathways.

This means that non-HEFA pathways, in particular e-fuels, would need bespoke policy support to overcome technology-specific challenges. However, such bespoke policy support should not come at the expense of other production pathways, given the aim should be to help ensure that a wide range of different SAF technologies remain potentially viable. This in turn enables governments to maintain a technology-neutral approach that is key to driving the most cost-effective SAF production pathways forward. Such an approach can help reduce the price premium of SAF on passengers and businesses, with a potential positive impact on their willingness to pay and the translation of this into stronger voluntary demand.

Such a policy approach is particularly needed in markets with higher SAF mandates and e-fuel quotas (e.g. EU, UK and where governments aim to fulfil their targets through domestic production). This analysis has not looked into the geographic breakdown of SAF production capacity, but policy-makers need to consider how much SAF can realistically be produced domestically and the availability of imports, to assess which trade-offs between energy security and cost may be needed.

Designing industrial policy that makes investment in SAF more attractive to developers and investors is essential to attract private capital towards aviation. This would level the playing field with other technologies and sectors, as investment in sustainable fuel plants currently looks riskier, despite SAF benefitting from a largely policy-driven global and growing market. Financial institutions should work with governments to set out clear investment criteria that policy would need to favour.

At the same time, investors should come together as a community to reduce and spread risks, including through partnerships across financial institutions as well as across the industry, with airlines, airports and SAF project developers. Financiers could also consider introducing streamlined and standardized processes to report the capital provided for sustainable aviation investments. This would help governments track how quickly the gap in the $120+ billion funding needed to scale SAF production to 2040 is being reduced; as well as highlighting any additional interventions that could further accelerate capital deployment.

Methodology for Appendix 1: A longer-term look at SAF demand

Scope

This Appendix estimates potential SAF demand scenarios in 2040 by translating national blending targets into volumetric fuel demand and comparing this to the currently announced production capacity. The assessment covers the 16 countries that have stated SAF targets or ambitions between 2025 and 2050, plus the European Union's ReFuelEU Aviation target.

The analysis excludes airline-specific SAF commitments, corporate commitments or demand for SAF driven by CORSIA. It does not consider the announcement of future mandates, nor does it consider countries which have not yet introduced a mandate, unless evidence suggests policy is under development.

As a result, there is uncertainty to all SAF demand scenarios presented here. The purpose is to show the scale of demand implied by current policy frameworks and not to forecast outcomes in 2040.

Aviation and jet fuel demand assumptions in 2040

SAF demand is calculated as a share of total jet fuel demand. Aviation demand growth reflects the expectation that continued post-pandemic increases in passenger kilometres will be driven by rising global wealth.

SAF blending targets across markets

Announced country blending targets reflect the proportion of jet fuel expected or mandated to come from non-fossil-based fuels, or planned SAF plant capacity targets as a percentage of total jet fuel consumption when there are only supply targets in place (as in the US).

Not all announced targets are the same. They can be mandatory or voluntary, enshrined in law or simply proposed. They do not carry the same likelihood of implementation; some of them apply only to 2030, while others extend to 2050 and beyond.

Where targets have been kept flat or extended over their current end-date, aviation growth drives greater SAF volumes even where blending percentages are fixed.

Scenario design

Across the three scenarios, blending assumptions vary by the country grouping, representing the difference in political intent and credibility. Importantly, these scenarios do not represent forecasts for SAF uptake, instead they are used to illustrate the strength of demand and the variance in possible outcome from this. A breakdown of blending rates used in this analysis is provided in Table 3.

Supply and feedstock assessment

The project pipeline is live and ever-changing as projects are cancelled and new projects are announced. The reference points provided from the present view in January 2026 are used as an illustrative contextual tool to compare alternative fuel supply and demand as likely today.

The project pipeline is also expected to change based on the demonstration of construction and operational success. Replicability of certain SAF pathways and plants may influence developers and new project announcements after 2030. The impact this would have on the make-up of the pipeline would also be influenced by political support and the 2030 SAF blending targets being met.

Feedstock analysis focuses on the use of used cooking oil for HEFA technology to illustrate the relationship between feedstock supply and fuel demand. BNEF estimates that there will be around 105 million tonnes of used cooking oil from residential and domestic use available in 2040. This has the potential to produce 52.5 million tonnes of SAF, assuming a 50% conversion rate and a 100% recovery rate. However, only 16% of used cooking oil is currently being recovered globally, with the potential to make 8.6 million tonnes of SAF.

Other feedstock sources such as tallow and distillers' corn oil, as well as oils from rapeseed, palm and soybean, can raise the upper bound on potential supply.

TABLE 3 | **Blending rates across countries and scenarios**

		Reduced	Base	Momentum
Highly likely	EU	20%	34%	34%
	UK	15%	22%	22%
Likely	Brazil	10%	13.33%	16%
	Singapore	4%	4%	14%
	Japan	10%	10%	20%
	South Korea	8.5%	8.5%	14%
	Malaysia	1%	1%	20%
	India	5%	5%	15%
	Turkey	5%	5%	15%
Possible	Canada	5%	10%	20%
	China*	2.5%	5%	15%
	Chile	-	-	20%
	Indonesia	6.25%	12.5%	12.5%
	Thailand	4%	8%	12%
	UAE	0.5%	1%	10%
Speculative	Australia	-	5%	10%
	US	-	7.5%	15%

Note: Assumed 5% blending target introduced in China.

Appendix 2 Methodology for main analysis

The analysis presented in this report is based on a comprehensive and multi-faceted approach, combining qualitative and quantitative inputs to reflect perspectives from across the Airports of Tomorrow, Green Fuel Forward and First Movers Coalition communities, as well as the wider aviation ecosystem. The methodology has been replicated from the previous edition to ensure consistency and comparability of insights over time.

The findings presented in this report draw on the following sources:

1 Regional aviation roundtables

A series of in-person aviation events and roundtables were held throughout 2025 and early 2026 in Switzerland, Singapore, New York and Dubai, complemented by the Airports of Tomorrow Chief Executive Officers Meeting hosted during the World Economic Forum Annual Meeting in Davos-Klosters in January 2026.

These closed-door discussions convened over 300 senior executives and experts from across regions and different segments of the aviation value chain, enabling candid exchanges on sustainability progress, challenges and priorities.

2 C-suite executive survey

An anonymous survey was conducted among senior executives at the end of 2025, gathering responses from approximately 40 leaders from airports, airlines, fuel producers and suppliers, investors, original equipment manufacturers, industry associations and trade bodies, with activities spanning Europe, North America, the Middle East and Asia-Pacific.

The survey explored five high-level themes:

- Assessment of the aviation sector's progress on decarbonization in 2025 and outlook for 2026.
- Confidence in achieving the 2030 CAAF/3[209] vision on reducing the carbon intensity of jet fuel.
- Key sustainability and external challenges expected to shape decarbonization decisions in 2026.
- The impact of geopolitical uncertainty on trade, investment and strategic planning.
- Expectations for policy evolution and priority technologies or practices for the year ahead.

3 Bilateral interviews

More than 40 bilateral interviews were conducted during the last quarter of 2025 with CEOs and senior executives. These interviews enabled deeper exploration of organization-specific challenges, opportunities and strategic choices, providing context and nuance beyond the survey and roundtable discussions.

Insights from these sources were analysed alongside targeted desktop research and a review of recent market and policy developments. The objective of this methodology is to provide a neutral and factual snapshot of the aviation sector's sustainability progress and sentiment heading into 2026. This analysis is not intended to serve as a forecast, but rather as a foundation for informed discussion and continued collaboration to advance aviation decarbonization.

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