

**International Coordinating Council of Aerospace Industries Associations (ICCAIA)
Views Concerning Manufacturing Industry Expectations of the CAAF/3**

Over a decade ago the aviation industry was the first global sector to set ambitious emission reduction goals. With this document, we come together again to support the industry's commitment to achieving net zero carbon emissions for civil aviation by 2050 and to highlight the importance of the production, distribution, and availability of qualified Sustainable Aviation Fuel (SAF) needed to achieve this goal. The development of fuel-efficient aircraft technologies has been a priority for the aviation industry for over 50 years and will remain a priority well beyond 2050. Greater uptake of SAF would further mitigate the projected growth in aviation CO₂ emissions as the customer demand for global air travel increases and ICCAIA is confident that the CAAF/3 meeting positions ICAO to demonstrate leadership to help achieve significant increases in SAF production and availability globally. An ambitious agreement on a goal by States, along with a 'toolbox' of measures, would help to provide market certainty for financiers and fuel producers, consequently increasing available SAF volumes and driving down the price. Maximizing the amount of SAF available to the fleet is key to rapid decarbonisation of aviation.

ICCAIA companies, representing the civil aerospace manufacturing and services sector, are steadfast in delivering the technical solutions required to reduce the carbon emissions of the air transportation sector through our work in three key areas:

- Developing advanced aircraft and propulsion technologies that enable progress toward net-zero carbon emissions, while maintaining the safety and reliability standards of our industry;
- Implementing improvements in aircraft operations and infrastructure and in Air Traffic Management (ATM); and
- Supporting policies and measures that accelerate the availability, affordability, and adoption of qualified, international aviation industry standards based, SAF.

SAF is a blend of natural and/or synthetic components made from renewable sources with similar properties to conventional jet fuel. Carbon emissions are reduced through the creation of the SAF, as various production pathways remove atmospheric carbon that is later incorporated into the SAF. Pure SAF (also known as "neat" SAF) is currently blended with conventional jet fuel (also known as kerosene) for use in aviation. This blend, which is already approved for ratios of up to 50%, has the same characteristics as traditional jet fuel and is approved as such. As a result, all commercial and business jet aircraft certified for jet fuel are capable of flying with an up to 50 percent share of sustainable fuel mixed with conventional jet fuel (equivalent to Jet A1).

As mentioned above, maximizing the amount of SAF available to the fleet is key to rapid decarbonisation of aviation. The civil aerospace manufacturing community and our partners are working on certification of two separate solutions to increase the SAF use in the fleet. The first includes the

creation of synthetic additives (so-called 'aromatics') added to the neat SAF so that the resulting mix closely replicates all the characteristics of conventional jet fuel and ensures use as a 'drop-in' fuel compatible with the existing fleet with no modification needed. This process is currently in development with our fuel partners. The second solution, that could need some adaptations in aeroplane and engine designs, would allow use of 100% SAF without replicating all of the characteristics of conventional jet fuel.

Manufacturers recently stated that the first solution should be available before 2030 for all aircraft in service while continuing work on the second solution for future aircraft production with the same horizon. This means that all aircraft will be capable of being operated with 100% SAF by 2030 with one or the other solution, unlocking SAF blend limits. Increasing this capability will play an important role in the sector's decarbonisation journey.

Even today, SAF is being produced using production pathways that can reduce emissions by up to 80% (compared to traditional conventional jet fuel), on average, during the full lifecycle of these synthetic fuels. In the near future, reductions could be even greater with new production pathways coming on the market.

Increasing the production and utilisation of SAF is a critical step for achieving the air transport sector's net zero CO₂ emissions goal by 2050. However, the production of SAF is currently estimated at less than 0.1% of the global demand for jet fuel today. Moreover, SAF prices are typically two to five times higher than the price of conventional jet fuel. The supply is further constrained by competition for renewable fuels from other sectors that have alternative decarbonization options, such as surface transportation and heating.

Therefore, we support government policies and initiatives that stimulate investment in innovation of new technologies, promote a dramatic increase in production capacity, enable a reduction in costs/price, and encourage greater industry uptake.

This includes the US Inflation Reduction Act of 2022 (IRA), which provides a blender's tax credit. The IRA also authorises funding to support advanced technologies and infrastructure that enable expanded SAF production and distribution capacity in the US, as well as projects to develop fuel efficient aircraft or otherwise reduce emissions from flying. Public-Private Partnerships, such as the FAA FAST Tech Program, would enhance OEM adoption, testing, and technical clearance of new emerging SAF pathways to ensure seamless insertion into the commercial fleet.

Similarly, the industry welcomes the political agreement found on ReFuelEU Aviation which will provide a strong signal for the deployment of SAF in air transport and look forward to the legislation being adopted as soon as possible. The EU needs to implement the right industrial support policies, within the Net Zero Industry Act, to accelerate the availability of SAF at commercial scale, building on the work

of the Industrial Alliance for Renewable and Low Carbon Fuels (RLCF) and within EU ETS with the allocation of free allowances. In addition, qualification efforts that support the development of co-processing technologies that can harness the existing capital infrastructure will accelerate the availability of SAF at commercial scale.

Public-Private Partnerships can play a key role in increasing the development and use of SAF through policy definition and alignment, along with financial incentives. Policymakers have the chance to accelerate these processes by providing sustained and predictable support to the multi-year development of novel technologies, and by stimulating the ramp-up of capacity. Recognizing the technical challenges associated with decarbonizing aviation, greater public policy and financial support to accelerate SAF production and distribution is essential. Additionally, close collaboration with the aviation industry and fuel suppliers is required in the development of SAF production capacity to accelerate availability in support of demand. Lastly, establishing standards for qualification of 100% SAF pathways through American Society for Testing and Materials (ASTM) to ensure full compatibility with engines and aircraft for civil applications as they become available is essential.

And ICAO has an important role to play.

Following two ICAO Conferences on Aviation Alternative Fuels (CAAF) in 2009 in Brazil and in 2017 in Mexico, a third conference will be held in November 2023. With a successful outcome at CAAF/3 that sets ambitious medium term (2030) and long term (2050) goals for SAF uptake, and that offers a toolkit of policy and implementation measures, ICAO can demonstrate its leadership on climate change and aviation. The outcomes of CAAF/3 are important in the context of the LTAG ambition and implementation roadmaps.

At CAAF/3, ICAO can encourage Member States to develop policies and regulations to foster SAF usage, noting that various approaches will maximise unique benefits available in the different regions of the World. ICAO will guide Member States to implement the right policies and take the relevant actions to ensure Sustainable Aviation Fuels will be available to the aviation sector while harmonising SAF production and use, allowing consistent results from diverse stakeholders.

ICAO can also provide technical assistance, facilitate financing and encourage “capacity building” projects (ACT-SAF). Industry supports ICAO initiatives on SAF as part of the implementation of the ICAO Long Term Aspirational Goal to reach net zero carbon emissions for international aviation in 2050.

Some OEMs, in early 2023, began participating in the ACT-SAF programme of ICAO aiming at providing support for States in various stages of SAF development strategies and deployment under ICAO coordination.

Some industry members have validated or are in the process of validating Science Based Targets, which further exemplify commitments to contribute to the global and aspirational goal of reaching net zero carbon emissions in aircraft operations by 2050. This further reinforces the need for governments

to act now, and support the SAF ecosystem (Aircraft, engine, innovators, financial stakeholders, producers, and operators) in having Sustainable Aviation Fuels in sufficient quantities, with worldwide availability and at the right price.

The aviation industry cannot achieve its ambitious goals without the support of the entire air transport ecosystem (including other modes of transportation). This is also true for increasing the availability and affordability of Sustainable Aviation Fuels. In the meantime, some of the members of ICCAIA have engaged in local initiatives around the world, partnering with ecosystem key stakeholders (as stated above), and many others to develop the demand and supply of SAF for those local markets.

More than 40 Airlines who, between them, consumed more than 50% of jet fuel in 2019, have already taken action, are pledging for 10% SAF or more in 2030, either individually or through coalitions or collective initiatives. 50 off takers (including 37 airlines and fuels brokers/distributors) have concluded a cumulative volume over 44 Mtons of SAF offtakes since 2016. As of the writing of this paper, SAF production planned for 2030 is already close to 24 Mtons according to industry analysis.

In addition, ICAO assessed¹ what global volumes of SAF could globally be, under a medium traffic demand scenario, to be on track to net zero carbon emissions in 2050.

- In 2030: from 44 Mtons to 70 Mtons
- In 2050: from 414 Mtons to 522 Mtons

According to the study, the corresponding CO₂ emission reductions resulting from SAF and LCAF uptake up to those volumes, could range from 10% to 17% in 2030 and from 56% to 80% in 2050.

The CAAF/3 is a powerful and unique opportunity to join forces again around ambitious and collective objectives with:

- Ambitious, quantified and collective ICAO Vision for SAF. While noting the impressive progress from airlines in the form of offtake commitments since the CAAF/2², a high level of ambition will be needed to achieve the Net Zero trajectory and to send a strong signal to the energy sector, address demand and avoid market distortion, driving toward lower SAF prices as volumes increase. This leads ICCAIA to believe that there are three elements that need to be considered in any ICAO agreement.

1. Analysis by ICCAIA manufacturers, acknowledging that States are at different stages of development, suggests that current projects launched or announced should bring the global production of SAF to 20Mt-25Mt in 2030. This would mean a potential reduction of CO₂ emissions of around 5%. This is a significant step in the development of the SAF market and in the reduction of CO₂ emissions of aviation, but will still require a steep ramp-up in SAF production beyond 2030 to reach the Net Zero 2050 commitment.

¹ ICAO LTAG report (<https://www.icao.int/environmental-protection/LTAG/Pages/LTAG-data-spreadsheet.aspx>) – Data for F2 and F3 scenario.

² 10x increase in publicly announced airline offtake commitments; www.icao.int

2. We therefore encourage States to support the necessary SAF and LCAF ambition with a package of measures including policy and efficient access to financing to facilitate investments and create a competitive market for these fuels.

3. Knowing that to deliver on the LTAG commitment made at the 2022 Assembly, by 2050 a 70%³-80%⁴CO₂ emission reduction should be targeted from the use of SAF, we also encourage States to give a longer-term direction for SAF and LCAF development by defining some milestones to reach in 2035 and 2040 or to convene another conference on aviation and alternative fuels before 2030, to measure progress and define these milestones.

- Policies: each Member State implementing SAF policies to encourage SAF development in its own country and contributing to the global objective
- Implementation: assistance, capacity-building and training, feasibility studies, pilot projects will be essential for a smooth transition
- Adequate and harmonised guidance for a global “book and claim” framework, training and toolkit that could be used as the reference for local implementation.
- Continued and harmonised approach on fuel sustainability criteria, fuel approval and equipment certification schemes
- Access to public & private finance for the development and deployment of SAF

ICCAIA members are committed to supporting policies that increase the supply of SAF while ensuring a consistent and predictable demand through harmonised global measures. ICCAIA members stand ready to support States’ initiatives in this regard.

³ IATA Energy and New Fuels Infrastructure Net Zero Roadmap; 2023

⁴ ICAO Long Term Aspirational Goal (LTAG) report; 2022