

# Monitoring of SAF R&D, demonstration and deployment

This information sheet provides a brief overview on the topic of the third workshop of the IEA AMF Task 66 free online seminar series on recent progress in Sustainable Aviation Fuels (SAF) research. This workshop highlights research activities in the field of monitoring of SAF R&D, demonstration projects and production deployment.

## Introduction

In order to reach the IEA's net-zero target or the ReFuelEU Aviation targets, SAF production must be scaled up. It is useful to monitor SAF demonstration and deployment and track progress of implementation and hence the status of reaching these targets. There are several approaches to monitor the development of SAF, with different focuses and outcomes.

## SAF offtake agreements

An offtake agreement is an arrangement between a producer and a buyer to sell or buy a specific amount of the producer's future products. These agreements help to secure funding for new projects by showing demand and future revenues. They're especially common in unstable markets, often negotiated before a company builds a production facility. In the SAF market, offtake agreements encourage investments in production capacity, secure future SAF supply for airlines and guarantee a market.

ICAO tracks SAF offtake agreements between SAF producers and purchasers (airlines) on their website. Currently, there are more than 170 offtake agreements in place, securing a total of more than 50 billion liters of SAF. The announcements of new offtake agreements peaked in 2022 with 21 billion liters SAF and is decreasing to 850 million liters SAF in 2025.

## Monitoring of SAF demonstration projects

To track global progress, IEA Bioenergy Task 39 (Biofuels to Decarbonize Transport) maintains a public database of advanced biofuel demonstration and production plants, covering a wide range of technologies. The database compiles systematically verified information from Task 39-member countries, international networks such as ETIP Bioenergy and the IEA Advanced Motor Fuels TCP, and publicly available sources including scientific and technical literature. It also lists operational and planned facilities for the production of SAF via different technology pathways covering:

- Hydrotreatment (HEFA)
- Alcohol-to-jet (ATJ)

- Gasification and Fischer-Tropsch Synthesis (FT)
- E-fuels biomass hybrid systems

This enables analysis of long-term trends, showing strong growth in areas like sustainable aviation fuels, especially via the HEFA (hydrotreated esters and fatty acids) pathway.

## SAF production outlook

There are several attempts to project future SAF production, with varying approaches. For example, IATA published an outlook of global SAF production potential with a long-term bottom-up assessment, based on feedstock availability, technology readiness and current regulatory landscape. It is forecast that about 400 million tons of SAF could be produced by 2050, which is 100 million tons less than demanded. The availability of feedstock is not seen as a bottleneck, but the pace of technology roll-out.

SkyNRG uses a more short-term approach for their annual SAF outlook, focusing on announcements of SAF production facilities and their nameplate capacity. Low probability announcements and operation below full capacity is excluded from the assessment, resulting in a theoretical maximum SAF output. The outlook shows a rapid development on the SAF market, mainly driven by the HEFA pathway, which represents more than 80% of current SAF capacity. After 2030, a HEFA tipping point is expected, where the feedstock limitation of this particular pathway will lead to a more diversified set of SAF production technologies and thus feedstocks. By 2035, the expected SAF capacity is 18 million tons, while the expected demand is 40 million tons of SAF.

## References

- ICAO, SAF Offtake Agreements: <https://www.icao.int/SAF/saf-offtake-agreements>
- IEA Bioenergy Task 39 Biofuels to decarbonize transport, Database on facilities for the production of advanced liquid and gaseous biofuels for transport: <https://demoplants.best-research.eu/>
- IATA, Global Feedstock Assessment for SAF Production - Outlook to 2050: <https://www.iata.org/globalassets/iata/publications/sustainability/global-feedstock-assessment-for-saf-production-outlook-to-2050.pdf>
- SkyNRG & ICF, Sustainable Aviation Fuel Market Outlook 2025: <https://skynrg.com/safmo25/>