

Delivering the first ever CORSIA-certified Sustainable Aviation Fuel to American Airlines

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Introduction

CORSIA, or ‘Carbon Offsetting and Reduction Scheme for International Aviation’, allows airlines to reduce their offsetting requirements through the use of “CORSIA eligible fuels²” But until now, no airline across the world has actually used CORSIA-certified fuel. Neste’s recent ISCC CORSIA certified pilot delivery of sustainable aviation fuel (SAF) to American Airlines makes this a first in aviation history.

This article shares the learnings and experiences of Neste and American Airlines, working together in this pilot supported by ISCC. Or as Tom Opderbeck, Senior Sustainability Manager at American summarized: *“SAF is the key component of the aviation industry’s decarbonization strategy so we are very interested in promoting efforts that help accelerate its use.”*

What is Sustainable Aviation Fuel

Sustainable aviation fuel has been recognized as one of the key elements in helping the aviation industry to achieve the ambitious emissions reduction goals. SAF is the main term used by the aviation industry to describe an aviation fuel not made from fossil sources.

In general, SAF is produced from renewable resources (plant or animal material) and there are currently seven approved pathways for SAF. HEFA-SPK is currently the commercially most viable pathway for SAF, and it is the one being used by Neste, the world’s leading producer of SAF.

Neste has been producing SAF since 2011 and uses sustainably sourced 100% renewable waste and residue raw materials, like used cooking oil and animal fat waste. The main advantage of Neste MY Sustainable Aviation Fuel™ is that it reduces greenhouse gas emissions (GHG) by up to 80% in neat form and over the life cycle compared to conventional fossil-based jet fuel. This calculation is based on the CORSIA methodology. As these are life cycle based calculations, similar SAF produced by different companies from different raw materials, or other types of SAF produced with different technologies might provide different GHG savings.

SAF has been used in more than 370,000 flights since 2016 according to IATA, and that number is rapidly increasing. Currently SAF can only be blended with fossil-based jet fuel up to 50% based on ASTM standards, but in reality this percentage is rarely achieved. SAF is a drop-in fuel which

1 Neste is the world’s leading producer of renewable diesel and sustainable aviation fuel. Neste’s currently produces 100,00 tons of SAF per annum at its Porvoo, Finland refinery. With the ongoing expansion of Neste’s Singapore refinery and modification to its existing Rotterdam, the Netherlands refinery, Neste will have an annual SAF production capacity of 1.5 million tons by the end of 2023. In the past two years, Neste has been opening up SAF supply to the aviation sector with multiple cooperations and partnerships within commercial, business and general aviation, including working together with fuel providers, airports, and regulators.

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2 <https://www.icao.int/environmental-protection/CORSIA/Pages/CORSIA-Eligible-Fuels.aspx>

means that once blended, it can be supplied via existing infrastructure and uplifted without aircraft modifications, removing any logistical or technical barriers to its use.

The airline perspective – American Airlines

CORSIA covers all aircraft operators performing international flights. These operators, mostly commercial airlines, will either have to buy emission reduction offsets from other sectors to compensate for any emissions obligations or use sustainable aviation fuel in their own operations.

American Airlines (American) is one of the largest airlines in the world, offering an average of nearly 6,700 flights daily to 350 destinations in 50 countries. As such, CORSIA is also applicable to American. It has an ambitious strategy to reach net-zero carbon emissions by 2050 and a clear plan to get there. This includes a goal to replace 10% of the jet fuel it uses with sustainable aviation fuel by 2030. For this, American also works together with Neste supplying its Neste MY Sustainable Aviation Fuel™ to American at San Francisco International Airport (SFO).

Like many airlines, American is supportive of CORSIA and endorses the goals it aims to achieve. Emission reductions by using SAF will play a growing role in American's own strategy, although carbon offsets will also continue to play a role for the foreseeable future. But like many other airlines across the world, experience with CORSIA-certified SAF has been limited.

Tom Opderbeck describes it as follows: *“Until this pilot, our understanding of the CORSIA certification process was limited. Participating in this pilot project with Neste served as a perfect opportunity to see how it works and learn.”*

The ISCC CORSIA pilot

Until recently, no airline across the world had actually made use of CORSIA-certified SAF to mitigate emissions. While several companies had already received CORSIA certificates, CORSIA certified SAF had not been delivered and used.

Neste and American have a long-standing relationship, based on which the companies started discussions to see what the possibilities are to use CORSIA-certified SAF to mitigate the emissions of international flights. The companies decided to set up a pilot project as part of the voluntary CORSIA pilot phase.

What needed to be done

Although the aviation industry has extensive experience in using SAF, getting the SAF to be CORSIA-certified was a complicated task. Compliance to the CORSIA sustainability criteria is granted on the basis of independent attestation by ICAO-approved Sustainability Certification Schemes (SCS). This applies to both the fuel producer as well as the batches of fuel produced by the producer. For Neste, that meant a complete new certification needed to be implemented.

Currently, two certification schemes are approved by the ICAO Council as meeting the requirements. These are the International Sustainability and Carbon Certification (ISCC) and the Roundtable on Sustainable Biomaterials (RSB). For this project, the decision was made to pursue an ISCC certification as Neste had worked with ISCC on similar certifications (like ISCC EU).

The perspective of the sustainability certification scheme – ISCC

The ISCC (International Sustainability and Carbon Certification) system is a leading global sustainability certification system for renewable products and their supply chains. Today, almost 6,000 companies in more than 100 countries use the ISCC system to demonstrate sustainability and credible greenhouse gas emissions reductions along their supply chains. ISCC is widely applied for the certification of alternative fuels, including SAF, with most major producers and suppliers part of the ISCC system.

In addition to providing SAF certification solutions for a wide variety of raw materials and pathways, as well as for important aviation markets (e.g. CORSIA, EU RED II, EU ETS), ISCC intends to play a major role by leveraging

its vast stakeholder network to support the sustainability transition of the aviation sector.

A general task for certification systems lies in taking sustainability regulations and helping to interpret them to guide practical application on the ground. *“One of the main questions we deal with is: How can we take the relevant parts from the regulation and effectively and efficiently apply them along global and often complex supply chains, while taking into account the realities ‘on the ground’ that companies work in,”* says Thomas Bock, Sustainability Certification Expert at ISCC.

For ISCC, this pilot proved to be a valuable opportunity to test the relatively new ISCC CORSIA audit procedures in practice, ensuring both the integrity and practicability of the certification approach. Or to put it into the words of Thomas Bock: *“ISCC puts great focus on doing pilot projects to ensure that certification approaches are practical and can actually realistically be applied. One of our goals here was to show that ensuring sustainable SAF supply chains is not only possible, it can also be practical and realized with relatively little additional cost.”*

CORSIA certification scope

The CORSIA certification scope covers the entire supply chain for the specific batch of SAF, from the raw materials through each supply chain step to the fuel producer. Ensuring the supply chain meets the strict sustainability criteria requires, for example, thorough processes, auditing, and a clear chain-of-custody through every step of the process.

This means a certification process is quite complex, especially for a producer like Neste, which sources feedstocks globally from many different suppliers, has multiple production facilities in different parts of the world, as well as systems and procedures to produce high quality renewable fuel and other renewable products meeting not only sustainability criteria, but also all the strict safety standards and guidelines for aviation use.

For this pilot, it was therefore decided that a CORSIA certification would be done for only one feedstock supplier, limiting the costs while maximizing the experience to be gained.

The delivery to American Airlines

Neste has ample experience in delivering SAF to airlines and airports. Neste has, for example, been delivering SAF to the fuel system at San Francisco International Airport since 2020.

Arranging for a specific batch of ISCC CORSIA certified SAF to be delivered at San Francisco International Airport was completed as part of normal procedures but with some additional work. As the integrity of the batch of ISCC CORSIA certified SAF needed to be certified separately, special transport and administrative arrangements were made, for example, to deliver the specific batch separately from the normal continuous SAF deliveries.

The ISCC CORSIA certified batch of SAF was delivered to American Airlines at San Francisco in May this year.

The results and conclusions

A successful pilot

The pilot project achieved what it was set out to do: deliver the first CORSIA-certified batch of sustainable aviation fuel to American Airlines, proving its feasibility. Along the way, quite a bit of “trailblazing” had to be done but we gained useful insights into setting up the process and the challenges we need to overcome to enable CORSIA certified SAF to be actually delivered and used going forward.

Challenges remain

Sustainable aviation fuel is the only viable alternative to significantly reduce the dependency on fossil jet fuel in the near term. But current price levels for SAF are generally 3–5 times higher than for its fossil counterpart, depending on where the fossil prices are at any time, hampering the wider adoption of SAF. Both Neste and American are committed to helping promote the use of SAF and make it more cost-competitive. Incentive or mandate schemes can play a major role in this process but it is currently unclear if different schemes can be combined (“stacked”), which would help addressing part of the pricing issue.

Accelerating demand for CORSIA-certified SAF

CORSIA is an extra tool to scale SAF production and use. But until this pilot project, no CORSIA certified SAF had been actually delivered to an airline. The certification can be done but today there is not enough demand for CORSIA-certified SAF. One of the reasons is that the economic incentive for CORSIA is less competitive compared to other schemes, like the EU RED or the Renewable Fuel Standard (RFS) in the United States. Competition between different incentive and mandate schemes will draw the supply of SAF to the most economically-attractive schemes. ICAO can play an important role in getting clarity about incentives and setting up the appropriate supporting policies.

Harmonizing certification schemes

Certification for the SAF to be CORSIA eligible required certification to another sustainability standard than the standards used until now. As certification can only be done against one standard, for this pilot Neste had one raw material supplier specifically certified for the production of the CORSIA certified batch of SAF. With

global and complex sourcing, certifying a value chain against multiple similar certification schemes not only creates extra costs but can potentially create a similar situation as with incentives. Uniform certification standards will help simplify this process, keep the costs down as well as the administrative and reporting burdens for all stakeholders involved, resulting in a faster adoption of CORSIA.

Cooperation is key to succeed

This pilot project shows that cooperation and alignment within the whole value chain was essential to succeed. Just as cooperation within the aviation industry will be crucial to make CORSIA work. Both Neste and American see a great willingness of stakeholders to cooperate and facilitate, including ICAO. ISCC shares similar experiences. And we should also not forget the role that businesses and the individual traveler can play. Challenges remain and the goals set out are ambitious, but we see encouraging developments and actions unfolding, helping to achieve a sustainable future for aviation.