# Jet Zero Taskforce Sustainable Aviation Fuels Task & Finish Group Report


## Abstract

This report examines lessons learned from the early operation of the SAF mandate and challenges related to the financing of First of a Kind SAF plants. It provides actionable recommendations and suggestions for future areas of work.

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# Foreword

Sustainable Aviation Fuel (SAF) is aviation's single most important lever as it seeks to meet its 2050 goals. The UK has established a leadership role in developing policy around SAF and creating a national bank of intellectual property in SAF technology. On 1 January the UK SAF mandate entered into force and on 14 May the Government introduced the Revenue Certainty Mechanism legislation into Parliament.

The Government has identified the link between the growth of aviation and wider economic growth. It has also identified the role SAF will play in enabling this growth and the economic and energy security benefits that a UK SAF industry could provide. All of this is welcome.

The SAF Task and Finish Group included experts from across the SAF value chain, including (but not limited to) representatives from academia, renewable energy provides, EPC contractors, fuel suppliers, fuel producers, airports, airlines, the finance sector, aircraft manufacturers and Government. I am extremely grateful to all of those that participated in the production of this report and for their employers who enabled them to do so. This report represents hundreds of hours of effort, over and above people's day jobs. The report's recommendations are informed by the experience and expertise of the Group's membership along with the feedback they have received from their discussions with partners across industry and Government.

As the SAF mandate is in its early days, there will inevitably be some teething challenges. This report recognises that it is important to avoid knee jerk reactions but provides some practical suggestions to support the long-term success of the mandate. These include measures to increase confidence in the fair operation of the market and to improve the interaction between the Emissions Trading Scheme and the mandate.

The UK will always rely on a level of SAF imports, just as it relies on Jet Fuel imports today. The UK does however have strong ambitions to create a domestic SAF industry. The UK has been very successful in helping projects cross the first 'valley of death', from the university lab to a pilot/demonstration phase facility, through measures such as the Advanced Fuels Fund. This report examines how we can support projects cross the second valley of death to secure funding for first of a kind (FOAK) commercial plants. This is a complex challenge that all capital intensive technologies will face. The Group has made recommendations to help address this that strongly recommend policy stability around the mandate's design and that are focused on strategically deploying existing levers within Government and Industry to support project finance, initially with 1-2 "pathfinder projects" before offering more co-ordinated support through a delivery council, modelled on that used to support offshore wind.

One strength of the UK system is the willingness of Government and industry to collaborate to find solutions to complex challenges. This year's SAF Task and Finish Group represented this best of this approach in practice.

Steven Gillard, Boeing

# Executive Summary

At the time of announcing the Government's support for UK airport expansion, the Chancellor of the Exchequer highlighted the importance of aviation to UK growth and the link between aviation's societal 'license to grow' and decarbonisation. SAF remains the single most important lever that aviation has at its disposal to meet the challenge of its 2050 goals.

The UK has a leading aviation sector which we should rightly be proud of. This sector is subject to global competition. SAF remains at least 2X the price of fossil fuel with the UK's mandate becoming increasingly demanding over the coming years.

The UK has one of the world's most sophisticated policy environments to support the use and production of SAF. Measures such as the Advanced Fuels Fund, SAF Mandate and forthcoming Revenue Certainty Mechanism (RCM) have created the environment where the UK is seen as an attractive destination for fuel producers and where the UK has developed significant intellectual property that has the potential to be a driver of UK economic growth and energy security.

The SAF Task and Finish Group's remit expressly excludes the design of the mandate or the RCM. It is recognised that the stability of mandate's design is important to supporting investor confidence. The exclusion of the RCM is due to the Department for Transport (DFT) having alternate consultation mechanisms as the legislation goes through Parliament. Nonetheless, the Group believes it is critical that the RCM receives Royal Assent and contracts are let no later than the end of 2026.

The SAF Task and Finish Group sought to examine 2 fundamental questions:

1. How is the mandate operating and how can any problems be addressed?

2. What short term steps can be taken to support the deployment of project finance into UK SAF plants?

The Group's work was split into three workstreams:

- Workstream 1 examined the first question.

- Workstream 2 examined impediments to project finance.

- Workstream 3 examined opportunities to support the deployment of project finance.

The aim of the workstreams was to provide actionable recommendations. These recommendations were informed by the collective experience of the Group and the feedback that was received during the outreach that each Workstream undertook. The workstreams have also highlighted areas that next year's Task and Finish Group may wish to focus on. The

workstream's detailed reports can be found in the subsequent chapters to this report. A summary of the recommendations from the workstreams is provided in the short summary sections below. The detailed analysis from each workstream is included in this report.

Workstream 1's recommendations focused on measures to improve confidence in the fair operation of the SAF market and to support the interaction between the mandate and UK ETS. Workstream 2 and 3 focused on measures that would deploy existing levers at the Government and Industry's disposal to support projects reach Final Investment Decision (FID), initially through 1-2 "pathfinder projects" and ultimately through a delivery council modelled on that used to catalyse the offshore wind industry.

# Workstream 1 – The Early Functioning of the UK SAF Market

Workstream 1 engaged widely across the SAF value stream to understand how the mandate is operating. It is very important to note that it is the early days of the operation of the mandate and teething issues are to be expected.

The group identified a strong divergence between the views of fuel suppliers (who are the obligated parties under the mandate) and the airlines (who ultimately pay the bill for compliance). Maintaining confidence in the fair operation of the market under the mandate was identified as being critical to its success. A variety of measures have been identified to support market transparency. In making recommendations, the group has taken the position that stability in the design of the mandate is important to support investor confidence in SAF and that Government assistance should only be asked for when industry cannot resolve an issue alone due to competition law or commercial barriers. Fuel contracting and pricing is an inherently sensitive area that directly relates to the profitability of airlines and suppliers, this is therefore a classic example of an area where Government assistance will be required to mitigate competition law risks.

The group also identified near-term issues related to the interaction between the SAF mandate and the Emissions Trading Scheme (ETS). These issues are creating immediate term challenges for airlines in meeting their compliance requirements and gaining benefits from the use of SAF under ETS.

The immediate term recommendations to address these issues are provided below:

| # | Theme | Recommendation |
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| 1 | Improving Market transparency | The Government, together with obligated fuel suppliers and airlines, should explore practical options for improving transparency in pricing (initially on a voluntary basis), aiming to deliver a clearer link between costs charged to airlines for mandated SAF, and the characteristics of the SAF to which these charges relate. Given competition law and commercial factors, suppliers and their customers are clear the process will require Government assistance and expertise, alongside industry proposals for practical measures. [see also recommendation 6] |
| 2 | Improving Market transparency | Best practice guidance should be developed for fuel procurement to help to bridge the gap between airline expectations and delivery from suppliers. It is recommended that the Government lead the development of this guide, working with airline and fuel supplier associations due to competition law considerations. This would |

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| | | necessarily need to consider how and if costs can be translated through the supply chain and draw upon both existing DfT requirements in sustainability and SAF mandate reporting (i.e. around SAF quantities supplied / GHG emission savings which are published regularly by the DfT on a pan-UK basis). [see also recommendation 6] |
| 3 | Improving Market transparency | Given the early nature of the SAF market, the Jet Zero Taskforce should commit to reviewing and monitoring the issue of compliance fees as part of its ongoing SAF work programme, to provide assurance to the industry that these are fair, sufficiently transparent and accountable as the market develops and mandated volumes increase. |
| 4 | Improving Market access | To support further competition, the DFT should conduct a study to understand what barriers to access exist for producers and how they could be addressed to promote competition, noting that producers have highlighted barriers to access that limit their ability to directly supply airlines both in the UK and EU markets. |
| 5 | Interaction of the mandate with ETS | Immediate steps should be taken to diagnose the problem that is preventing some airlines from gaining the SAF certification that is required to claim reductions in their UK ETS obligations and implement urgently an appropriate and robust method of transferring SAF related certification across the value chain.<br><br>a. Clarity could be supported by a government-backed centralised Digital SAF Registry to track SAF volumes, sustainability credentials, and chain of custody, towards the goal of automating issuance of documentation for UK ETS and CORSIA compliance (also dependant on timely approval of SAF carbon and sustainability data by the Department for Transport)<br><br>b. This could potentially include independent 3rd party solutions such an expansion of the Zemo renewable fuels assurance scheme, or an update to the international sustainability and carbon certification scheme.<br><br>c. Government departments responsible for the UK ETS should review the option to allow airlines to utilise the book & claim method for making an ETS claim without physically receiving the SAF from suppliers.<br><br>d. Transitional arrangements should be considered for documentary evidence requirements for evidencing 2025 SAF |

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| | | claims, to ensure airlines do not miss out on reductions in ETS liabilities for SAF received this year |
| 6 | Improving Market transparency and Interaction of the mandate with ETS | DfT should convene a working group (potentially under the auspices of the JZTF), including airline and fuel supplier associations, affected business and relevant government departments and agencies (including the UK ETS authority, Environment Agency, Defra) to deliver recommendation 5, whose remit might also cover exploring practical options for improving transparency in pricing (Rec 1) and the development of best practice guidance for fuel procurement (Rec 2), given the interplay between these issues and so as not to duplicate effort. |

Looking to 2026, the Group felt that the relative competitiveness of the UK SAF market should be an area of future work for the the Jet Zero Taskforce. It was recommended that in 2026, the SAF Task and Finish Group should assess the relative competitiveness of the UK SAF market and steps that can be taken to mitigate and minimise absolute and relative costs compared to our key competitors (particularly the EU market based on their SAF Mandate design and trajectory), as well as how the risk of supplier buy-out can be avoided by ensuring access to sufficient volumes of SAF, both domestically produced and imported. This should address factors including:

a. Feedstock availability and diversity, including for advanced biofuels and Power to Liquid ('3G') SAF (i.e. green hydrogen, renewable energy, captured carbon and carbon dioxide), the National Farmers Union should be encouraged to participate.

b. Incentives to close the price gap between Avtur and SAF, and alignment opportunities for incentives under the UK ETS following the commitment to create a functioning link between UK and EU carbon markets

c. Availability of both HEFA (Hydroprocessed Esters and Fatty Acids) and advanced feedstock SAF imports

d. The impact of Greenhouse Gas Removals on SAF market development, SAF competitiveness and its overall role within aviation's net zero pathway

A key lesson learned from this year is that representatives from Defra and the Environment Agency should be invited to join existing government colleagues within the SAF Working Group as it takes its work forwards, so that the full range of policy area expertise and responsibilities are represented.

# Workstream 2 and 3 – Unlocking Investment and Creating Deal Flow for FOAK SAF in the UK

Workstream 2 sought to diagnose what remaining issues may pose a risk to UK SAF projects achieving FID. Workstream 3 then sought to prescribe possible solutions. Both workstreams engaged widely across the value chain to inform their analysis.

One key finding was the importance of stability. Stability in the sense of maintaining the mandate but also stability in terms of delivering the RCM as soon as possible.

It may sound strange, but offering additional incentives at this time may actually delay the deployment of capital to support SAF. We have seen this with the RCM where project finance is hard to secure until the legislation has been passed.

A key focus of the Group therefore became how to better deploy the resources and levers that Government already has at its disposal and how to simplify the interface between projects and Government. The Group reached the view that we are now at the stage where we need to 'learn by doing' and the best way to start this would be work on 1-2 "pathfinder projects". The aim would be to use this learning to inform better coordination of existing levers through a SAF delivery council (modelled on offshore wind experience) and a SAF Value Chain Action Plan.

A summary of the recommendations is provided below (please see the detailed Workstream 2/3 section of this report for the full recommendations):

| **Recommendations** | **Description** | **Key objectives/**<br><br>**responsibilities** |
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| **Maintain policy stability** | The Group understands that the UK SAF market is at a delicate stage. Maintaining investor confidence is key to securing project finance. For this reason the Group strongly recommends measures to support policy stability and while noting the recommendations of the Whitehead GGR review, feels that any substantive change to the design of the mandate would most likely harm the UK SAF industry. | **Objective**<br><br>Maintain and enhance investor confidence |

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| **Execute 1-2 "Pathfinder projects"** | The UK Government should prioritise the rapid delivery of one to two first-of-a-kind (FOAK) Sustainable Aviation Fuel (SAF) plants as "pathfinder projects", treated as strategic national demonstrators, and bring them to Final Investment Decision (FID) as early as possible in 2026. 2 projects is felt to be the optimum balance between focus, risk and learning. | **Objectives**<br><br>To normalise SAF investment, overcome FOAK inertia and learn by doing |
| **Form a SAF Delivery Council** | Building on the process of supporting these "pathfinder projects" to FID, a SAF Delivery Council should be established. This proposed cross-sector body would bring together government, industry (airlines, fuel suppliers, developers), finance, and insurers to move FOAK SAF projects to FID. | **Key Responsibilities**<br><br>Development of a capability guide and Technical Help Desks;<br><br>Clear account management;<br><br>Facilitation of Government finance and offtake;<br><br>Enable Power-to-Liquid pathways |
| **Development of a SAF value-chain action plan** | To support the business case for first-of-a-kind (FOAK) SAF plants, the UK must ensure that sufficient sustainable feedstocks are available at predictable cost and quality. A dedicated UK Government authored SAF Feedstock Action Plan should be developed to provide clarity, reduce risk, and create confidence for investors and developers | **Objectives**<br><br>Secure long-term domestic feedstock supply;<br><br>Integrate SAF into existing fuel supply chains;<br><br>Improve market transparency and trade policy; |
| **Future work** | | **Objectives**<br><br>Further assessing challenges and opportunities to enable |

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| | | PtL development and uptake in the UK.<br><br>An examination of book and claim and its relationship with ETS, particularly unintended impacts on the SAF mandate, domestic production, and overall SAF uptake in the UK.<br><br>Potential design and opportunities of offtake aggregation schemes. |

# Conclusion

SAF in the UK is at a critical phase with two critical tipping points reached:

a. We are transitioning from a voluntary market to a mandated one.
b. We are at the point where UK projects need to secure project finance for commercial plants.

In both cases policy stability is key, however this should not be interpreted as cue for industry or Government to take a laissez-faire approach to the development of the market. Put simply, SAF in the UK has to succeed. It is critical to the future of aviation (an engine of growth) and it represents a generational opportunity for the country. The UK has established a global leadership position in SAF policy and technology. The world is watching and whatever happens in the UK will have implications beyond its shores.

The SAF Task and Finish Group identified a number of near-term opportunities to support this success. In the immediate term it is important that we collectively take steps to improve confidence in the operation of the mandate and the interaction between the mandate and ETS. These steps are essential to maintaining confidence in the mandate.

Looking to the keys to unlocking FOAK project finance, it is essential that the UK completes the legislative process for the Revenue Certainty Mechanism at the earliest opportunity. The Group recognises that offering additional policy incentives may now actually delay investment decisions. Beyond the RCM, overcoming FOAK inertia will largely rely on providing UK SAF plants with strategic focus and ensuring that all of the existing levers (planning, Government finance, insurance, MOD offtake, etc) and appropriately co-ordinated and deployed. It is hoped that once this inertia is overcome, SAF will transition into a normal asset class. For this reason, the Group feels strongly about the need for 1-2 “pathfinder projects” to be supported to FID with a delivery council being provided to support the wider industry.

Looking to next year, the group feels that there is still work to be done, highlights of this include a review of the relative competitiveness of the UK and an examination of PtL.

It is important to recognise progress. The challenges we are now facing are ones of delivery. The importance of SAF has been recognised, policy has been developed and now Government and industry need to remain focused on unblocking impediments to success. If we continue to do this, there is every reason to believe that the UK can continue to have globally competitive aviation sector that is a leader in sustainability, supported by a resilient and economically productive UK SAF sector.

# Workstream 1 Detailed Report

## Workstream 1 Summary

### Background

The SAF Mandate is the UK's key policy mechanism to secure demand for SAF. It delivers GHG emission savings by encouraging the supply of SAF within the aviation industry. It does this by setting a legal obligation on fuel suppliers in the UK to supply an increasing proportion of SAF over time. Suppliers will receive certificates for the SAF they supply. The number of certificates they receive will be issued in proportion to the level of GHG emission reductions that fuel delivered. That is, the greater the savings, the greater number of certificates they will receive. With SAF costing substantially more than traditional fossil jet fuel (Avtur), it is essential that the market is functioning effectively, efficiently, and transparently, so that costs can be mitigated and minimised to the greatest extent possible - in the interests of a competitive UK aviation sector and UK consumers.

This workstream was established to test anecdotal evidence that suggested that there may be latent systemic issues in the UK's SAF market, with the cost of SAF being delivered to airlines uplifting fuel from the UK significantly and unexpectedly above the prevailing voluntary market price for SAF.

Airlines and suppliers also reported being unable to access, produce or transfer the certification required along the complex supply chains to demonstrate SAF usage, without which airlines are unable to reduce their UK ETS obligations. This may in part be explained by misalignment between differences in compliance deadlines for the ETS and the mandate.

The working group set out to test if the UK SAF market is currently operating in a fair and transparent way, principally through gathering additional survey data from airlines and obligated fuel suppliers, with the aim of ensuring a balance of stakeholder views. The working group sought to make recommendations for how any issues identified might be addressed early, before mandated SAF volumes increase.

Stakeholder feedback was received within the context of commercial sensitivity and data protection requirements. Nonetheless, stakeholder feedback indicated:

- The UK's aviation fuel supply chain is complex, with fuel moving through multiple infrastructures and often mixing with other products. Differentiating SAF for voluntary and mandated markets is challenging.
- There is a misalignment between the perceived operation of the mandate from a fuel supplier and airline perspective. Airlines feel that they are currently subject to higher than anticipated costs and that these costs lack transparency, while suppliers feel that the mandate is operating effectively, and note that compared to conventional fossil jet fuel, the

UK mandate introduces additional operational requirements for suppliers including extra blending, certification, capital investment and logistics challenges.

- SAF pricing is not very mature. Suppliers expect the market to continue to develop, and that as the SAF market becomes more mature and liquid, external market quotes may become more standardised.
- Through the survey, many airlines confirmed they are experiencing problems receiving SAF certification required for making UK ETS claims, despite paying supplier compliance fees attributable to SAF being supplied under the Mandate. Suppliers also highlighted their difficulty receiving SAF certification input data through the supply chain.
- There is concern across the entire supply chain about the availability of non-HEFA SAF, especially PtL SAF, towards 2030, and the relative costs of SAF compared to the EU, given its mandate design and incentives regime.

Detailed results of the group's engagement activities are provided at Annex J.

## Workstream 1 Context

The UK SAF Mandate came into effect on January 1, 2025. It remains, therefore, very early in its operation (around six months old at the time of report writing), and mandated volumes remain relatively low (2% fuel usage for 2025).

The Mandate is supported by the UK aviation industry and aviation fuel suppliers as a key driver of aviation decarbonisation and a vital pillar of achieving its commitment to net zero carbon emissions by 2050. It requires the supply of an increasing amount of SAF in the overall UK aviation fuel mix, starting in 2025 at 2% of total UK jet fuel demand, increasing linearly to 10% in 2030 and then to 22% in 2040.

Today, all types of SAF are substantially more expensive than fossil Avtur. According to the Sustainable Aviation Fuel Mandate Final Stage Cost Benefit Analysis[1] published in April 2024, the use of SAF will add over £11bn to fuel costs between 2025 – 2040, under a central scenario in which the mandate is able to be met in full. This analysis assumes no buy-out penalty costs are incurred i.e., that obligated fuel suppliers can supply the mandated volumes of SAF in full. The scenario in which SAF volumes cannot be secured and substantial buy-out penalties are incurred - and passed onto airlines – would result in over £60bn in additional fuel costs over the same period, and much higher carbon emissions; a truly worse-case scenario for the UK and one which policymakers should do everything to avoid.

More recently, in evidence to the Sustainable Aviation Fuel Bill Committee[2], a major UK airline indicated that a 10% SAF mandate in 2030, representing around 1.2 million tonnes of fuel, would

[1] https://assets.publishing.service.gov.uk/media/66601969dc15efdddf1a872d/uk-saf-mandate-final-stage-cost-benefit-analysis.pdf

[2] https://hansard.parliament.uk/commons/2025-07-15/debates/5817a9f4-5a49-47f2-b871-9c18abd96f78/PublicBillCommittees

cost airlines uplifting fuel from the UK an additional £2bn in fuel costs, assuming a conservative premium for the SAF is about £2,000 per tonne.

Today, these higher costs of SAF to airlines can be mitigated to a degree through being "zero-rated" under the UK Emissions Trading Scheme (UK ETS) and in future as an offset under CORSIA. Under UK ETS, when airlines use SAF that meets the specified sustainability criteria, they can claim a reduction in their UK ETS obligations, effectively treating the SAF as having zero emissions. This policy is designed to help bridge the cost gap between SAF and conventional aviation fuel as the SAF industry develops. According to the same cost benefit analysis referenced above, this generates savings of around £2.2bn against the extra £11bn cost of fuel, between 2025 – 40. The UK currently offers no additional incentives to close the cost gap between traditional Avtur and SAF, whereas the EU has adopted rules on an ETS support system designed to accelerate the use of SAF by making available 20 million EU ETS allowances, estimated at around €1.6 billion, from 1 January 2024. These allowances cover all or part of the price differential between fossil kerosene and the eligible aviation fuels used by individual commercial aircraft operators on their flights covered by the EU ETS.

In this context, the importance of ensuring the effective functioning of the UK SAF market is apparent. Higher costs are 'baked in' through higher SAF costs, which ultimately will be felt by the UK aviation industry and UK consumers and will inevitably impact the relative competitiveness of the UK's aviation market. It is, therefore, vital that costs are mitigated and minimised as much as possible.

This workstream was established to test anecdotal evidence that suggested the UK's SAF market is not yet functioning effectively, with the cost of SAF being delivered to airlines uplifting fuel from the UK significantly and unexpectedly above the published spot price for SAF, even accounting for anticipated compliance fees. Initial understanding has been that this is due to some fuel suppliers charging additional management fees when delivering fuel to airlines, justified by the start of the UK mandate in January 2025.

Airlines have also reported experiencing friction between the operation of the Mandate and their obligations under the UK ETS, this may in part be explained by differences in the reporting timelines for ETS and the mandate. Here, airlines have reported being unable to access the certification required to demonstrate SAF usage, for that SAF they are being charged compliance fees for by fuel suppliers, citing the Mandate (as opposed to SAF directly, and voluntarily procured by airlines). Without this certification airlines are unable to reduce their ETS obligations and close the price gap, a benefit assumed by the cost benefit analysis referenced earlier. Fuels suppliers are also finding it extremely challenging to supply the documentation required, given the complex supply chains involved (including for example multi-product pipelines with interface cutting, marking of dual-purpose kerosene to heating kerosene and co-mingled storage). An appropriate and robust method of transferring the certification is therefore urgently desired. This could potentially include independent 3rd party solutions such an expansion of the Zemo renewable fuels assurance scheme, or an update to the international sustainability and carbon certification scheme. This could potentially include independent 3rd party solutions such an expansion of the

Zemo renewable fuels assurance scheme [3], or an update to the international sustainability and carbon certification scheme [4].

It is recognised that the UK SAF Mandate remains very early in its operation. Nonetheless, given the higher cost of SAF and the potential impact on the UK aviation market's competitiveness, it is vital that any issues are 'nipped in the bud' before they have opportunity to grow in severity as mandated volumes increase.

To that end, this workstream was tasked with addressing the following key question:

**Is the UK SAF market currently operating in a fair and transparent way, i.e. are SAF costs being passed through to airlines reasonable and accountable given the market context?**

## Approach to Work

The workstream was set a tight 12-week deadline to produce a standalone report making an evidence-based assessment of the facts pertaining to the initial functioning of the SAF market and make actionable recommendations to the Expert Group and Government on areas where possible solutions may be required to address additional SAF costs. A full list of working group members is included in Annex B.

The working group did not have access to specific budget or resource, or any government analytical function or data support. The report is therefore a product of the voluntary contributions of its industry members, and its scope reflects this, alongside commercial sensitivities around data sharing and the short timeline given for completion.

It was consequently decided that work would focus on a largely qualitative assessment via anonymised surveys to test concerns that have been raised anecdotally, as well as analysis[5] published by IATA following the initiation of this work that sought to highlight this problem.

[5] https://www.iata.org/en/iata-repository/pressroom/presentations/media-briefing-saf-and-net-zero-updates-agm-2025/

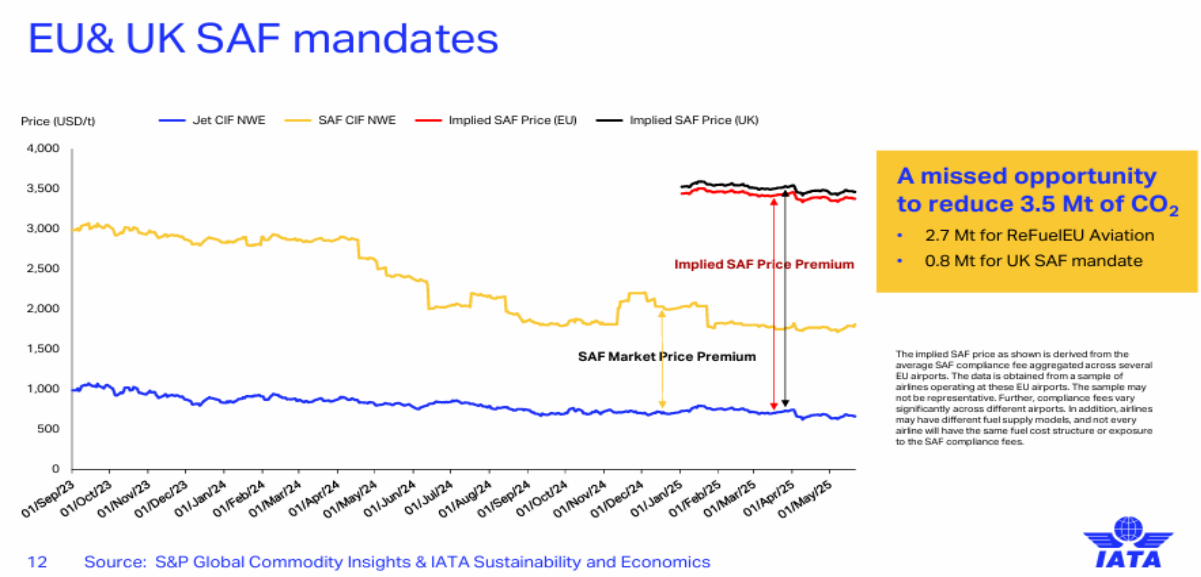


*Figure 1: IATA analysis of EU & UK SAF Mandates*

The IATA analysis published in June 2025 highlighted what it considered to be a 'major impediment' developing through both the EU and UK SAF mandates, whereby fuel suppliers have chosen to pass on their cost of compliance to airlines by charging a "compliance fee" that is added to each tonne of fossil jet fuel purchased. IATA is concerned that while a fair compliance fee based on the equivalent cost of procuring SAF in the market could be justified, the fees being imposed on airlines were over twice the prevailing market price premium of SAF.

The IATA implied SAF price premium was calculated following engagement with member airlines that had been charged a compliance fee, following the start of both the UK SAF mandate and the EU SAF mandate. Using data shared by airlines, IATA calculated average compliance fee values for both the UK and the EU (to note, these were based on data provided by those that have spoken with IATA and may therefore not be representative of all airlines). The compliance fee reflects a 2% mandated SAF uplift (in line with current EU and UK targets), therefore the calculated average was then multiplied out to give a figure that is representative of 100% SAF.

Unlike voluntary uptake – where the SAF that is purchased is as a replacement to using fossil jet – the mandatory uplift compliance fee has been added by suppliers to every tonne of fossil jet delivered. Therefore, the final implied SAF price premium values include the cost of fossil jet as this is an unavoidable cost of mandated SAF supply.

IATA quantified this for Refuel EU, assessing that airlines are due to face an additional USD 1.3 billion during 2025 in excess surcharges from the compliance fees - an amount that could purchase an additional 1.2 million tonnes of SAF (based on an average SAF market premium of USD 1,100 per tonne since RFEUA was implemented). Their analysis also indicates that similar issues exist with the UK SAF mandate where compliance fees are higher, 'effectively foregoing a further 0.8 million tonnes of CO2 reduction'.

## Surveys

The working group considered that additional data gathering was required to test this IATA assessment specifically in a UK context and to ensure that a balance of stakeholder views have been heard before making recommendations for action. Consequently, airline and fuel supplier surveys were created, seeking to overcome data protection and competition law concerns, and survey platform issues. Lists of survey questions are provided in Annex C and Annex D.

The working group generated two short, anonymous online surveys, one for airlines operating from the UK and one for mandated UK aviation fuel suppliers. These sought views on the early functioning of the UK SAF market since the initiation of the UK SAF Mandate, including on aspects such as transparency, functionality, and costs.

Due to the commercially sensitive nature of SAF contracting and purchasing, the surveys intentionally avoided seeking any pricing or other identifiable data, which group feedback showed would act as a major barrier to stakeholders' ability to meaningfully respond, in part because the surveys were industry generated with government unable to issue them or hold any data received as an independent third party.

The airlines survey was issued via Airlines UK and IATA, covering UK and overseas carriers operating from the UK, on 13th and 18th June respectively, with response deadline set for 27th June. Supplier survey was issued via RTFA to its members on 23rd June with response deadline set for 4th July.

Separately, Fuels Industry UK (FIUK) generated responses to the questionnaire on behalf of their members and a major fuel supplier provided a summary of their view of the SAF market's functioning following an initial review of the IATA report.

## SAF Mandate Interaction with UK ETS

Several airlines have noted a misalignment between the UK SAF Mandate and the UK ETS Regulation, resulting in airlines having or anticipating difficulty claiming SAF against their ETS obligations, resulting in financial exposure as they are unable to make zero-rated claims.

The issue appears to be with obtaining SAF documentation. The "trigger point" for obligations under the SAF Mandate is the duty point. Since the mandate is levied against the importer of record, fuel suppliers are dependent on the importer of record (their suppliers) to provide the documentation, which can subsequently be issued to customers, i.e. airports & airlines.

However, airlines are reporting difficulty obtaining the relevant documentation (e.g. ISCC) required to pass relevant SAF sustainability documentation along the SAF supply chain. For their part, importers of record are seemingly unable to guarantee their ability to provide documentation to fuel suppliers, who are nonetheless responsible for providing the documentation airlines need to make ETS claims. This appears at least in part a consequence of the fact that physical SAF is not delivered at certain airports, which nevertheless are the direct supplier to airlines and pass on the SAF compliance fee to them. The concern is that not

all parts of the SAF value chain are required or incentivized to obtain relevant certification, resulting in an inability to issue SAF documentation to airlines. Airlines recognise that it might, nonetheless, be too early to say definitively whether they will be able to obtain the right evidence to enable claims within the current compliance period, as most suppliers have not yet provided paperwork. Some airlines have indicated that they have been able to obtain the necessary SAF certificates to qualify for ETS alleviation but emphasise that this has only been for very small volumes of SAF, and that the system has not yet been tested at scale under the new SAF mandates that came into effect this year.

We note that the EU Refuel has a specific requirement for suppliers to provide documentation by a specific date but does not state what paperwork should be provided. The EU also is implementing a database for supply where all supply will be listed, and this will allocate volumes to the end buyer.

## Workstream 1 Conclusions and Recommendations

This working group was convened to assess the early functioning of the UK SAF market, and to test the proposition that some unexpected developments have occurred most notably around higher than expected compliance costs, and friction between the UK Mandate and UK ETS.

Given the high costs of SAF and the vital importance of ensuring the successful deliver of the UK SAF Mandate, it is important that early issues are identified and addressed, before mandated volumes increase further. Moreover, given the sensitive commercial nature of SAF market purchases and relationships between industry parties within it, we have determined that many of these recommendations require third party or government oversight to ensure impartial and transparent outcomes for the operation of the market and therefore cannot easily or appropriately be resolved by industry action alone.

The group feels that the recommendations below are essential steps to maintain confidence in the operation of the SAF Mandate. The ‘do nothing’ option would most likely result in a continuation of the trust deficit between SAF consumers, suppliers, and producers that the questionnaires have identified. Over time this may erode the broad support for the mandate with consequential impacts on aviation decarbonisation and the investability of the SAF sector. The group recognises that we are still relatively early in the operation of the mandate, but it is felt that action is required now before the costs of compliance increase. Government support is only being asked for in circumstances where industry cannot solve an issue itself due to the complexities of commercial and competition law issues.

**Improving SAF market transparency / improving market access**

Maintaining market confidence is critical to the success of the mandate, and improving transparency has been identified as a priority area. It is clear through investigating this complex subject that fuel procurement is an inherently commercially sensitive area for both the suppler and consumer, and that whilst some airlines have experience in SAF procurement, others are navigating SAF purchases as part of their fuel supply arrangements for the first time.

Recommendations for strengthening confidence and transparency are set out below, however given competition law and commercial factors, suppliers and their customers will need Government assistance around implementation.

**Recommendations:**

1. The Government, together with obligated fuel suppliers and airlines, should explore practical options for improving transparency in pricing, in line with competition law, (initially on a voluntary basis), aiming to deliver a clearer link between costs charged to airlines for mandated SAF, and the characteristics of the SAF to which these charges relate. Given competition law and commercial factors, suppliers and their customers are clear the process will require Government assistance and expertise, alongside industry proposals for practical measures. [see also recommendation 6]

2. Best practice guidance should be developed for fuel procurement to help to bridge the gap between airline expectations and delivery from suppliers. It is recommended that the Government lead the development of this guide, working with airline and fuel supplier associations due to competition law considerations. This would necessarily need to consider how and if costs can be translated through the supply chain and draw upon both existing DfT requirements in sustainability and SAF mandate reporting (i.e. around SAF quantities supplied / GHG emission savings which are published regularly by the DfT on a pan-UK basis). [see also recommendation 6]

3. Given the early nature of the SAF market, the Jet Zero Taskforce should commit to reviewing and monitoring the issue of compliance fees as part of its ongoing SAF work programme, to provide assurance to the industry that these are fair, sufficiently transparent and accountable as the market develops and mandated volumes increase.

4. To support further competition, the DFT should conduct a study to understand what barriers to access exist for producers and how they could be addressed to promote competition, noting that producers have highlighted barriers to access that limit their ability to directly supply airlines both in the UK and EU markets.

**SAF Mandate interaction with UK ETS**

Airlines report difficulty gaining the SAF certification required to claim reductions in their UK ETS obligations, despite being charged for SAF by fuel suppliers. Fuels suppliers are also finding it extremely challenging to supply the documentation required, given the complex supply chains involved.

Zero-rating of SAF is a hugely important policy designed to help bridge the cost gap between SAF and conventional aviation fuel. In the UK, this is the only means to incentivise SAF within the UK ETS system, which does not feature an equivalent to the EU's additional SAF allowances support system. It is, consequently, vital that the Mandate and ETS systems fully align and that

UK-based airlines can claim the full value of the SAF they are receiving, under both UK ETS and, increasingly going forward, CORSIA.

**Recommendations:**

5. Immediate steps should be taken to diagnose the problem that is preventing some airlines from gaining the SAF certification that is required to claim reductions in their UK ETS obligations and implement urgently an appropriate and robust method of transferring SAF related certification across the value chain. Better aligning ETS and mandate compliance timelines would be an obvious opportunity.

a. This could potentially include independent 3rd party solutions such an expansion of the Zemo renewable fuels assurance scheme, or an update to the international sustainability and carbon certification scheme.

b. Government departments responsible for the UK ETS should review the option to allow airlines to utilise the book & claim method for making an ETS claim without physically receiving the SAF from suppliers.

c. Transitional arrangements should be considered for documentary evidence requirements for evidencing 2025 SAF claims, to ensure airlines do not miss out on reductions in ETS liabilities for SAF received this year.

6. The Jet Zero Taskforce should convene a working group, including airline and fuel supplier associations, affected business and relevant government departments and agencies (including the UK ETS authority, Environment Agency, Defra) to deliver this recommendation, whose remit might also cover exploring practical options for improving transparency in pricing (Rec 1) and the development of best practice guidance for fuel procurement (Rec 2), given the interplay between these issues and so as not to duplicate effort.

**SAF availability and UK competitiveness**

Airline confidence in the market's ability to supply the SAF required to meet UK Mandate obligations is mixed. Whilst most airlines are broadly confident there is enough SAF for 2025 (a 2% requirement), most consider there will be insufficient SAF to meet mandate requirements in 2030. Suppliers, particularly in Europe, and more confident in supply security towards and beyond 2030, however it is unclear whether this confidence extends beyond HEFA supply (the EU has no HEFA cap) into the advanced 2G SAF required under the UK SAF Mandate. A shortfall of 2G supply would entail substantial and costly supplier buy-out penalties, which according to the Government's SAF Mandate final cost benefit analysis would have severe consequences not only for UK aviation decarbonisation, but also the competitiveness of the UK aviation sector.

Moreover, airlines overwhelmingly anticipate that the costs to meet the UK SAF Mandate will be higher than that under the EU Mandate to 2030 (reflecting the UK's bespoke advanced SAF sub-mandate, and higher mandate volume requirements to 2030).

**Recommendation:**

7. Future work of the Jet Zero Taskforce SAF working group should assess the relative competitiveness of the UK SAF market and steps that can be taken to mitigate and minimise absolute and relative costs compared to our key competitors (particularly the EU market based on their SAF Mandate design and trajectory), as well as how the risk of supplier buy-out can be avoided by ensuring access to sufficient volumes of SAF, both domestically produced and imported. This should address factors including:

a. Feedstock availability and diversity, including for advanced biofuels and Power to Liquid ('3G') SAF (i.e. green hydrogen, renewable energy, captured carbon and carbon dioxide), the National Farmers Union should be encouraged to participate.

b. Incentives to close the price gap between Avtur and SAF, and alignment opportunities for incentives under the UK ETS following the commitment to create a functioning link between UK and EU carbon markets

c. Availability of both HEFA and advanced feedstock SAF imports

d. The impact of Greenhouse Gas Removals on SAF market development, SAF competitiveness and its overall role within aviation's net zero pathway

8. To support joined-up outcomes, representatives from Defra and the Environment Agency should be invited to join existing government colleagues within the SAF Working Group as it takes its work forwards, so that the full range of policy area expertise and responsibilities are represented.

# Workstream 2 and 3 Detailed Reports

## Workstream 2 and 3 Summary

Achieving the UK's net zero aviation ambitions will require rapid deployment of second and third generation SAF technologies. The UK has taken important steps to accelerate the deployment of SAF, including the introduction of a SAF mandate and the development of a RCM, which together provide a strong foundation for scaling the sector. However, these first-of-a-kind (FOAK) projects in the UK face significant barriers to reaching Final Investment Decision (FID), including high capital costs, technology scale-up risk, revenue uncertainty, feedstock availability, and competition for capital from other green investments. Potential SAF project financiers have emphasised the need to collaborate with the Government and industry on real FOAK deals and work directly with project developers to facilitate and expedite investment in FOAK production.

FOAK SAF projects are inherently complex, involving novel technologies, unproven commercial models, and high upfront capital requirements. The FOAK production pathways this report focuses on include gasification-Fischer-Tropsch, Alcohol-to-Jet, and emerging Power-to-Liquid (PtL) e-fuels. To overcome these challenges, innovation and coordinated action is needed across government, industry, and the investment community, alongside clarity on the services available and guidance.

This report examines how to unlock investment in FOAK SAF production in the UK, focusing on the key areas identified by the Department for Transport's Jet Zero Taskforce: investment barriers and risks; policy and regulatory measures to support SAF; funding mechanisms and financial models to support projects; the status of SAF technologies (TRLs and eligible pathways); international comparisons to the UK and insights from private sector stakeholders, including investors and industry, via a questionnaire and bilateral engagement.

The aim is to provide a comprehensive overview and actionable recommendations to catalyse the first wave of UK SAF facilities – thereby laying the foundation for a UK SAF industry that is investable, scalable, and strategically aligned with national climate and energy goals, in line with Jet Zero goals.

To effectively facilitate FOAK projects reaching FID, this project recommends that the UK Government, industry, and finance sector come together to:

1. **Maintain and enhance investor confidence.** The Group understands that the UK SAF market is at a delicate stage. Maintaining investor confidence is key to securing project finance. For this reason the Group strongly recommends measures to support policy stability and while noting the recommendations of the Whitehead GGR review, feels that any substantive change to the design of the mandate would most likely harm the UK SAF industry.

2. **Prioritise supporting 1–2 FOAK SAF "Pathfinder"** as strategic national demonstrators, to fast-track them to FID using existing government levers as early as possible in 2026. These projects will establish replicable delivery and financing models, de-risk financing, and build investor confidence to unlock the wider SAF pipeline. Two projects is felt to be the optimum balance between focus, risk and learning.
3. **Establish a SAF Delivery Council** to oversee coordination of public and private entities across the SAF value-chain, identify and help deploy available finance, and provide capacity building and guidance for developers and the finance sector.
4. **DfT to develop a UK SAF value-chain action plan** to secure sustainable, cost-predictable feedstocks and integrate SAF into existing fuel supply chains. This will reduce investor risk, ensure supply resilience, and enable scalable SAF deployment.

By aligning incentives and fostering transparent collaboration, these recommendations can help the first advanced SAF production facility secure FID by 2026, accelerating the commercialisation of FOAK SAF technologies across the UK, enhancing energy security, and positioning the UK as a leader in green aviation innovation.

## Workstream 2 and 3 Context

Decarbonising aviation is a central pillar of the UK's Jet Zero Strategy, which commits the sector to net zero emissions by 2050. SAF is expected to contribute most of aviation's emissions reduction by mid-century. In fact, industry analyses indicate SAF could deliver ~62% of the required emissions cuts in aviation's net-zero pathways[6]. The UK Government has responded by establishing a SAF mandate. The SAF mandate incentivises fuels with a higher GHG reduction but is agnostic about its geographic origin. This means that further measures are required to kick-start a homegrown SAF industry, reducing reliance on imports and supporting thousands of green jobs across the country[7].

However, the challenge is steep: currently, only one UK site (Phillips 66's Humber refinery) is producing commercial volumes if SAF via co-processing of waste oils. Several FOAK projects have been announced[8] not yet financed or built . Many of those projects may not be built without measures to deliver price certainty for investors. In other words, policy support must quickly translate into bankable investment conditions; otherwise, the 10% SAF target will need to be met primarily through imports, undermining UK energy security and economic opportunity[10].

[6] IEA Bioenergy Task 39 – "Progress in Commercialisation of SAF"
[7] UK Government – Advanced Fuels Fund Winners (2022–2024) – details of grants to FOAK SAF projects and background on competitions
[8] Sustainable Aviation – "SAF potential update" briefing (Nov 2022) – need for CfD, feedstock strategy, and economic benefits of UK SAF industry.

[10] ibid

FOAK SAF production facilities are pioneer projects deploying new fuel pathways or technologies at a commercial scale for the first time in the UK. These ventures carry higher risks and upfront costs than established technologies. Yet they are critical to seizing the opportunity to jump-start a domestic SAF sector and validating the technologies that can utilise the UK's ample feedstock resources (from municipal waste to agricultural residues, and renewable electricity with appropriate mitigation of high energy prices)[11]. The potential rewards are significant: if successful, a UK SAF industry could generate £1.8 billion in annual GVA and support ~10,000 jobs by 2035, according to government estimates[12]. It would also avoid offshoring fuel production, keep the economic benefits and intellectual property in-country, while contributing to aviation's decarbonisation.

Investing in FOAK SAF plants is a high-risk, high-cost multi-stage process involving complex technical, commercial, and regulatory milestones, which helps explain why the market alone has been slow to deliver projects. Several interrelated barriers currently hinder SAF projects in reaching Final Investment Decision (FID) in the UK:

- **High capital costs and scale-up risk:** most advanced SAF technologies (like MSW to Fischer-Tropsch or Alcohol-to-Jet) require complex new process plants with capital expenditure of £0.3-1.5bn, depending on scale and technology type. These plants are often world-firsts or first-in-country, so there is significant technology risk. Commercial banks and private investors tend to be conservative in financing FOAK projects, often requiring extensive due diligence, higher rates of return, or government guarantees. The World Economic Forum (WEF) noted that blending public and private finance is often needed to get FOAK SAF projects off the ground, through tools like loan guarantees or insurance, strategic equity from industry, and catalytic funding from government or multilateral banks. Until such risk-sharing is in place, purely private financing for a £200+ million SAF plant is hard to secure.
- **Feedstock and supply chain uncertainty:** FOAK SAF facilities need secure access to sufficient sustainable feedstock (waste oils, household and commercial waste, agricultural residues, $CO_2$ + low carbon hydrogen, etc., depending on pathway). Feedstock markets are volatile and competitive – for example, used cooking oil (UCO) is limited and already in demand for biodiesel, municipal solid waste has alternate uses (incineration, etc.), and renewable power for e-fuels depends on broader energy deployment, as well as there being many competing uses for it[13]. There is a risk that feedstock supply or price instability could undermine a plant's economics. Early investors see this as a major uncertainty, as highlighted by KPMG ("feedstock challenges" are a core concern)[14]. Mitigating this requires long-term feedstock contracts and potentially diversification of feedstock sources.
- **Product revenue uncertainty (Price Gap):** Perhaps the most significant barrier is the large price gap between SAF production costs and conventional jet fuel prices, combined with the evolving nature of the early SAF Certificates market. SAF is currently several times more expensive to produce per litre than fossil jet A-1[15]. The lack of a transparent, guaranteed market price for SAF makes revenue projections very uncertain. The UK government identified this as a top barrier: "the absence of a transparent market price for advanced

[11] UK Sustainable Aviation SAF Roadmap (2023) – Foreword and analysis on investment challenges and policy needs.
[12] UK Government (2023) UK SAF industry goes from forest waste to new heights with £53 million boost
[13] ibid
[14] ibid
[15] ibid

(non-HEFA) SAF" is impeding investment. Unlike renewable electricity (which benefits from long-term power purchase agreements or CfDs), SAF to-date has had no assured price floor. This revenue uncertainty raises the risk profile and scares off investors. Long-term offtake agreements with airlines can help but are often conditional or insufficient in duration/price to underwrite project financing. Offtake agreements potentially face bankability challenges, due to weak balance sheets of many airlines; this undermines investor confidence in their long-term creditworthiness and ability to honour multiyear purchase commitments.

- **Policy and regulatory stability:** A stable policy environment is critical for investor confidence in emerging industries. The UK SAF Mandate has created this, including having some useful features in the form of the HEFA cap (a requirement to supply some non HEFA / advanced SAF); and the greenhouse gas (GHG) basis, which means that the more GHG savings there are, the more credits the fuel will receive. However, the specifics of the new revenue support mechanism (RCM) are still in development. This has led to a lack of policy clarity regarding SAF production economics in the UK, while details of the RCM are finalised[16]. Investors and developers have been waiting for clear signals on things like: "Will projects be able to export fuel?", or "How long will the support mechanism last?" Uncertainty on these fronts delays investment decisions – as one industry report put it, "investments [are] on hold until the level, type, and longevity of policy support is known and sufficient"[17]. Regulatory risk also extends to planning and permitting hurdles, which can be significant for FOAK plants dealing with waste processing, local emissions, etc. In addition, grandfathering risks could occur if changes are implemented through Gov. guidance rather than legislation which could modify SAF mandate compliance.
- **Competing investment alternatives:** Even within the broad energy transition space, SAF projects must compete with other clean tech investments for capital. The UK and global investors have options to fund other projects including, renewable power, electric vehicle infrastructure, or other bioenergy projects, many of which have more mature technologies or clearer incentive frameworks. The government has observed "stiff competition for investment from other emerging low-carbon technologies both domestically and abroad" as a barrier to SAF[18]. For example, an investor might choose a simpler renewable diesel project (or one in a country with lucrative subsidies), over a riskier UK SAF project. Likewise, UK airlines have so far committed more SAF offtake and investment outside the UK than inside, chasing supply in markets like the U.S. where incentives make projects more financially attractive[19]. This puts competitive dynamic pressure on the UK to match or improve the risk-reward profile for domestic SAF investment and production.
- **Global supply chain and infrastructure risks:** Beyond the plant itself, a commercial SAF project depends on downstream logistics and market uptake. FOAK projects must integrate into the aviation fuel supply chain (transport, blending, airport fuelling systems) and ensure airlines can use the fuel. While technically drop-in SAF is compatible with existing aircraft and fuelling infrastructure up to certain blend limits, there can be practical challenges in distribution and certification. These factors are generally manageable (the UK has established a SAF Clearing House for fuel testing and certification, to help with technical approval), but they add another layer of complexity that investors factor into risk assessments.

[16] UK Sustainable Aviation SAF Roadmap (2023) – Foreword and analysis on investment challenges and policy needs.
[17] ibid
[18] UK introduces legislation to boost domestic SAF production | Biofuels International Magazine https://biofuels-news.com/news/uk-introduces-legislation-to-boost-domestic-saf-production/
[19] ibid

In summary, the major barrier to SAF investment is uncertainty around obtaining a return on investment in a reasonable timeframe. The unknown revenue certainty, combined with FOAK technical risks, creates a classic "valley of death" for first plants[20]. To overcome it, strong policy measures and financial support are needed to de-risk and incentivise private capital. The next sections discuss how the UK can address these barriers through targeted policy, regulatory clarity, and innovative funding models, thereby enabling FOAK projects to reach FID and begin construction.

## Policy and regulatory measures to unlock investment

Establishing a supportive policy and regulatory framework is critical to reduce investor risk and encourage capital deployment in FOAK SAF plants. The UK has recognised this and is in the process of implementing (or has already achieved) several key measures:

- **SAF blending mandate:** The UK's SAF mandate is a cornerstone policy to create guaranteed demand for sustainable fuel. It requires fuel suppliers to blend 2% SAF (by energy) into jet fuel by 2025, increasing to 10% in 2030 and 22% by 2040. This mandate sends a long-term signal to the market that there will be a steady and growing demand for SAF. By creating an assured market volume, the mandate helps give producers and investors' confidence that if they produce SAF, buyers (airlines/fuel suppliers) will be obligated to purchase it. The mandate alone, however, does not guarantee price support – it only ensures demand exists. Thus, while the mandate is crucial, it needs to be complemented by a mechanism to encourage the production of SAF in the UK.
- **Revenue Certainty Mechanism (Contracts for Difference for SAF):** In 2025, the UK government introduced the Sustainable Aviation Fuel Bill to enable a new revenue support scheme often described as a SAF Contracts-for-Difference (CfD)[21]. This is arguably the most important policy development for unlocking SAF investment. Modelled after the successful CfD scheme for renewables (which transformed the UK power sector), the SAF RCM will guarantee a fixed price (strike price) for eligible SAF produced. A government-designated counterparty company will sign contracts with SAF producers for a set term (likely 10+ years)[22]. Under the contract, if the producer sells SAF at a market price, which is below the strike price, the counterparty will pay them the difference; if the market price rises above the strike price, the producer will pay back the difference into the scheme. In effect, this stabilises the revenue for SAF producers at a level that should cover their costs and an adequate return, regardless of fluctuations in the price of SAF, fossil jet fuel or carbon. It is essential that the RCM is operationalised by 2026 at the latest.

    ***Key supplementary recommendation:*** *This means passing the Sustainable Aviation Fuel Bill into law swiftly in 2025, establishing the government-owned counterparty entity, and finalising contract terms and auction processes. The first auction for SAF contracts should ideally be held in 2026 to allow projects to reach FID and begin construction by*

[20] The "valley of death" paradigm refers to the critical gap between technology development and commercial deployment, where promising innovations often fail to attract the investment needed to scale. For FOAK SAF plants, this valley is particularly deep due to high capital costs, long development timelines, and complex regulatory and commercial risks.
[21] Sustainable Aviation Fuel Bill 2024-25 – House of Commons Library https://commonslibrary.parliament.uk/research-briefings/cbp-10279/
[22] ibid

*2027. Government should also consider holding regular annual or biennial auction rounds thereafter, scaling up support in line with mandate increases. The clear message to investors should be that "policy support is known and sufficient", removing the policy uncertainty that has stalled investment. In the short-term, an approach could be to facilitate RCM contract negotiations in parallel to the final stages of RCM implementation, allowing an expedited path to RCM contract signing for the first-round projects.*

- **Regulatory clarity on eligible fuels and sustainability:** The UK has also moved to clarify which SAF pathways are eligible under its mandate and support schemes, and to enforce robust sustainability criteria. The mandate legislation includes detailed definitions of SAF, feedstock restrictions, and a minimum 40% lifecycle GHG reduction requirement for counting toward the mandate[23]. Notably, the UK will cap the contribution of HEFA (waste oil derived fuel) within the mandate, to prevent it from crowding out advanced SAF in the long term[24]. This regulatory stance provides certainty on what types of projects and feedstocks are favoured (wastes, residues, PtL) so investors can focus on compliant pathways. On sustainability, the UK's criteria (aligned with EU RED II and largely with CORSIA) ensure any supported SAF delivers genuine carbon savings and doesn't cause unintended harm (e.g., land-use change)[25]. Clear and stringent criteria reduce the risk of policy pushback or reputational risk that could arise if SAF were to include controversial fuels. This clarity ultimately helps investors by de-risking the policy – they know the rules of the game upfront.
- Complementary measures and long-term strategy: Beyond the mandate and RCM, the UK is pursuing other policy measures to support the SAF ecosystem:
    - Grant funding and competitions: As described in the next section, the government has already provided grants (e.g., the Advanced Fuels Fund in 2022–2025) to help early projects with feasibility studies and engineering. These continue to be a policy tool to reduce upfront costs and technical risk.
    - Integration with carbon markets: The UK is considering ways to incorporate SAF into carbon pricing mechanisms. Airlines using SAF are able to benefit from credits under the UK Emissions Trading Scheme (UK-ETS).
    - Permitting and infrastructure support: The government can also assist FOAK projects by smoothing planning approval processes (perhaps designating SAF plants as strategic assets or guiding local authorities on their importance), and supporting necessary infrastructure upgrades (for example, pipeline connections for product distribution or improvements at storage terminals to handle SAF). Early engagement on these fronts can prevent delays to FOAK projects.
    - Defence procurements can play a catalytic role in supporting FOAK SAF plant strategy by providing a stable creditworthy offtaker for early production volumes. The MOD have significant aviation fuel demand and operate under long term strategic planning cycles making them ideal partners for de-risking early-stage investment. Furthermore, aligning SAF production with national security and energy resilience

[23] Sustainable Aviation – "SAF potential update" briefing (Nov 2022) – need for CfD, feedstock strategy, and economic benefits of UK SAF industry.
[24] UK sustainable aviation fuel mandate: consultation-stage cost benefit analysis https://assets.publishing.service.gov.uk/media/642478402fa8480013ec0f49/uk-sustainable-aviation-fuel-mandate- consultation-stage-cost-benefit-analysis.pdf
[25] ibid

goals, strengthens the strategic case for public funding or guarantees, enabling the UK to lead in SAF innovation while reinforcing sovereign fuel supply chains.

Overall, the emerging UK policy framework – anchored by the SAF mandate to create demand, and the RCM mechanism to ensure price certainty – is designed to de-risk and incentivise investment in SAF production. This combination is analogous to how offshore wind was scaled: a mandated market (renewable targets) plus long-term price support (CfDs), unlocked a wave of project investment, bringing a nascent industry to maturity. Industry reaction has been strongly positive: airlines and SAF developers have long advocated for a revenue guarantee, and they welcomed the SAF Bill as a "world- leading" step by the UK to create an investable SAF market.

## Funding mechanisms and models for SAF investment

Building capital-intensive SAF plants will require tapping diverse funding sources and financial structures. Traditional project finance for FOAK biofuel plants is challenging due to the risks noted, so creative combinations of public, private, and blended finance are needed. Below we outline key funding mechanisms and models – some already in use, others recommended – to mobilise investment in UK SAF production:

- **Government grants and capital co-funding:** Direct government funding in the form of grants, equity, or convertible loans can significantly de-risk early projects by absorbing some of the upfront cost. The UK's Advanced Fuels Fund (AFF) is a prime example: launched in 2022 with £165 million (later increased) allocated, it provides grant funding to first-of-a-kind commercial and demonstration-scale SAF projects[26]. Through competitive calls, the AFF has awarded grants to projects across various pathways totalling over £80 million in its first rounds[27]. This grant funding covers critical early expenditures like front-end engineering & design (FEED) and environmental permitting, which lowers the total capital that needs to be raised from private investors[28]. By doing so, grants improve project IRRs and provide a validation effect that can crowd-in private capital. The AFF and its predecessors (Green Fuels Green Skies, Future Fuels for Flight and Freight Competition, etc.) were specifically aimed to "unlock future environmental and economic benefits that the advanced fuels industry can bring to the UK" by sharing investment costs. In the future, continuing such grant programs will be important. Grants could also target specific needs – for instance, funding for first-of-kind equipment or novel feedstock collection systems, or top-up grants to projects that reach financial close by a certain date (to encourage timely FIDs). Compared to ongoing price support, grants are a one-time government expenditure, but they can be highly effective when used to get construction started on pioneer plants.
- **Loan guarantees and green finance instruments:** Another powerful tool to enable financing is public loan guarantees or debt financing support. FOAK projects often struggle to obtain commercial loans due to risk; a public financial institution (PuFin) bank guarantee can secure the debt portion. In the United States, for example, the Department of Energy's Loan Programs Office provides loan guarantees to innovative energy projects, and this has

[26] UK Government – Advanced Fuels Fund Winners (2022–2024) – details of grants to FOAK SAF projects and background on competitions
[27] https://www.safinvestor.com/news/142137/uk-advanced-fuels-fund-grants-82m-to-five-saf-projects/
[28] ibid

been used for biofuel projects in the past. For UK SAF plants, the government (potentially via National Wealth Fund and UK Export Finance) could guarantee a portion of project loans – meaning if the project defaults, the government covers lenders – which dramatically lowers the lenders' risk. This can unlock debt capital at reasonable interest rates, reducing the overall cost of capital. Additionally, green bonds or green project finance could be pursued: for instance, a project could issue green bonds to investors, backed by the future RCM revenue stream and possibly a partial guarantee. A well-structured SAF project with government backed contracts might attract pension funds or green infrastructure funds. The WEF recommends exploring "guarantees and insurance" as well as tapping infrastructure investors and green bonds to raise the ~$20–45bn needed globally for SAF this decade. The UK could create a SAF investment platform or work with the City of London's Green Finance initiatives to package SAF projects into investable securities.

- **Private sector offtake and equity investment:** The role of the private sector (airlines, oil & gas companies, logistics firms) in funding SAF is crucial. Such strategic investors not only bring capital but also industry know-how and offtake guarantees. Airline offtake agreements are a key model: an airline (or group of airlines) commits to purchase a certain volume of SAF from a project at an agreed price (sometimes with price linked to fossil jet plus a premium). While airlines historically were reluctant to pay more, many now have net-zero pledges and are entering into offtake deals to secure supply. These agreements can be used to secure financing – essentially acting like a forward contract for revenue. For FOAK plants, however, airlines are typically keen to avoid the risk of being locked into early technologies that may put them at a cost disadvantage without supportive policy.
- **International and multilateral funding:** Given SAF's contribution to climate goals, there is scope to access international climate finance. The EU Innovation Fund[29], for instance, has given grants to SAF projects in Europe (one example: the SAF+ Consortium PtL project in Sweden received a substantial EU grant). While post-Brexit UK cannot access EU funds, the UK could leverage institutions like the European Investment Bank (EIB) – which still funds UK climate projects – or the Green Climate Fund[30] (for innovative climate mitigation projects). The World Bank/IFC and other development banks might also invest in SAF supply chains if framed as climate infrastructure. These sources usually require strong fundamentals (policy support, viability) but can provide cheaper capital or guarantees. In addition, export credit agencies (like UK Export Finance) might support UK companies exporting SAF technology or for projects that have an export angle (though SAF is mainly domestic use, the technology/IP could be exported). In summary, while not the first resort, there is a web of climate finance globally, that UK SAF projects could access with government facilitation.
- **Novel market mechanisms:** Many corporates have signed up to the GHG-Protocol[31] or the Science Based Targets initiative[32]. Clarification of the GHG Protocol language, particularly around Scope 3 emissions, is essential, and Government support in driving this clarity would be instrumental in enabling credible and scalable offtake commitments. If a robust certificate trading market develops, through a book and claim model, it could become an additional revenue stream for producers (selling certificates for scope 3 emission reductions).
- In practice, bringing a FOAK SAF project to financial close will likely require a mix of the above instruments. For example, a hypothetical waste-to-jet project in Teesside might use:

[29] Innovation Fund - Climate Action - European Commission
[30] Homepage | Green Climate Fund
[31] Homepage | GHG Protocol
[32] Ambitious corporate climate action - Science Based Targets Initiative

a government grant for FEED from AFF; equity investment from the technology provider and an airline; a long-term offtake agreement for 50% of output with that airline; an RCM contract guaranteeing a strike price for all fuel; senior debt from a bank syndicate, 80% guaranteed by NWF; and possibly mezzanine financing from a green fund. The combination of grant + RCM + guarantee + offtake could give comfort that the project's construction and revenue risks are largely managed, enabling it to reach FID. While complex, these are exactly the kinds of structured finance solutions that have been used in other innovative sectors (e.g., renewables or LNG plants) to allocate risk to those best able to bear it.

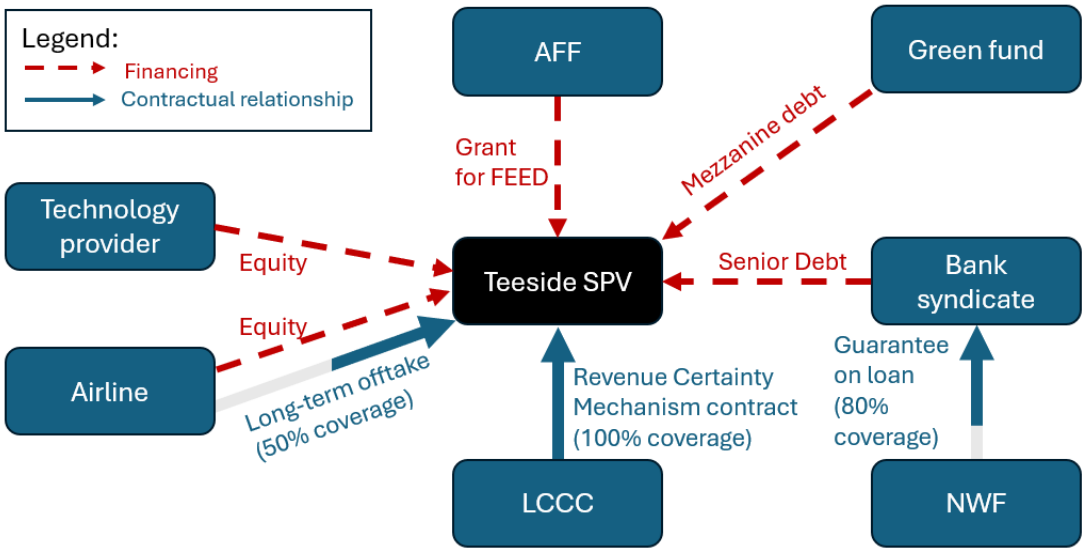


*Figure 2: Example high-level project financing structure – including only aforementioned relationships*

It is also instructive to consider international benchmarks: The US approach relies more on tax credits (which essentially improve operating cashflow akin to a price premium), and on large corporates investing in projects (e.g., United Airlines and other airlines started a $100M SAF investment fund). The EU approach couples mandates with some grant support (e.g., national subsidies and the Innovation Fund) and is exploring a double-sided auction model (e.g. H2 Global) and contracts for difference.

In summary, no single financing mechanism will unlock SAF at scale – a portfolio approach is required. The UK Government's role is to put foundational supports in place (mandate, RCM, grants, guarantees) that reduce risk enough for private capital to flow. The private sector will then bring innovation in financing (from offtake deals to ESG-driven investments). The combination of public and private funding can create the "bankable" conditions for FOAK projects that today face a financing gap. By using and sequencing these levers smartly, the UK can mobilise the billions in investment needed over the next decade to build a network of SAF plants. A description of Technology Readiness Levels and eligible SAF pathways is provided at Annex I.

## Key international lessons for the UK:

1) **Stable, ambitious mandates work** – They create guaranteed demand. The UK's 10% by 2030 is on par with the EU's 6% by 2030 (though some EU countries might effectively target higher via national measures). The UK might consider increasing post-2030 targets in line with EU or beyond (EU 2050 is 70% SAF; UK's Jet Zero scenario is 75% SAF by 2050)[33]. Ambition gives long-term market signals.
2) **Financial support lowers risk** – The massive U.S. subsidies demonstrate that money talks in accelerating projects. The UK's RCM is a strong mechanism; the level of support (strike price) needs to be sufficient to make projects NPV- positive. Monitoring global cost curves will be important to set those levels.
3) **Speed and certainty** – U.S. credits being in place means projects are being built now for operation by 2025–2026. The EU and UK, having more regulatory processes, risk lagging by a few years. The UK should try to streamline implementation (e.g., not overly complex secondary legislation) to keep pace. If the first UK SAF plant can be FID by 2026 and producing by 2028–29, that would maintain credibility.
4) **Tailor to strengths** – Every region has different feedstock strengths. The U.S. has huge volumes of soy/corn oil (hence HEFA and ethanol ATJ flourish), EU has a biodiesel industry and forestry residues, and the UK's niche might be municipal solid waste, industrial gases, and eventual offshore wind for PtL. The UK supporting pathways aligned with its resources (waste-based, PtL) is wise for long-term self-reliance.
5) **Collaboration** – Finally, international collaboration can amplify impact. For example, collective R&D could bring down PtL costs faster (as seen by EU's Horizon programs). The UK, though no longer in EU programs, can collaborate via Mission Innovation or bilateral agreements (the recent US-UK Sustainable Aviation Fuel Partnership is a positive step). This can help UK investors by providing access to innovations and larger markets.

In conclusion, the international landscape is both a competition and a source of inspiration. The UK has taken note of the formidable incentives in the US and the broad mandate in the EU and crafted a policy that aims to combine the best of both: a strong mandate plus an effective price support, funded in a way that is politically and fiscally workable. By doing so, the UK is positioning itself not to be left behind. Moving forward, keeping an eye on global policy shifts (like if the US extends credits beyond 2027, or if other countries set up their own CfDs) and regular benchmarking against these shifts will be important. This is because the UK may need to adjust its level of support to remain attractive – for instance, if the EU ETS-based SAF CfD ends up very generous, the UK might consider enhancing its scheme or collaborating (maybe allowing import/export of SAF credits with Europe).

Ultimately, international best practice confirms the UK's current course: mandates to force demand, plus substantial public/private funding mechanisms to kickstart supply. The UK's challenge is executing this at speed and scale to secure the benefits at home rather than importing solutions later.

[33] Uk Government (2024) The Renewable Transport Fuel Obligations (SAF)

# Recommendations

The analysis in this report makes it clear that unlocking investment in FOAK SAF production in the UK is achievable, but only with sustained commitment to the supportive policies and funding measures now being put in place. The UK has a unique opportunity to translate its Jet Zero ambitions into a new industrial reality – building sustainable fuel plants that cut aviation emissions and create economic value domestically. To seize this opportunity, the following key actions and recommendations emerge:

1. Maintain and enhance investor confidence
2. Execute 1-2 “Pathfinder projects”
3. Establish a SAF Delivery Council
4. Develop a SAF value-chain action plan
5. Support the development of PtL pathways

Some of the recommendations are aligned with challenges for both 2G and 3G development.. The group does recognise however that 3G (PtL) projects may benefit from additional JZTF work to understand the current state of 3G development in the UK. It is believed the UK has developed a significant bank of IP in this area that could form the basis for export success.

## Recommendation 1: Maintain and Enhance Investor Confidence

The Group understands that the UK SAF market is at a delicate stage. Maintaining investor confidence is key to securing project finance. For this reason the Group strongly recommends measures to support policy stability and while noting the recommendations of the Whitehead GGR review, feels that any substantive change to the design of the mandate would most likely harm the UK SAF industry.

## Recommendation 2: Execute 1-2 “Pathfinder projects”

The UK Government should prioritise the rapid delivery of one to two FOAK SAF plants as “pathfinder projects”, treated as strategic national demonstrators, and bring them to Final Investment Decision (FID) without delay.

These projects will have a level of technical and financing readiness and may include Advanced Fuels Fund (AFF) winners; robust feedstock/technology strategies, high TRLs, committed offtake, and planning readiness. Government should deploy coordinated, targeted support, using existing levers rather than creating new schemes, to overcome FOAK inertia, prove bankability, and build investor confidence. Ultimately, this process should establish replicable delivery and financing models for the wider pipeline, as well as provide proof of concept and inform the establishment of a SAF Delivery Council, as outlined in Recommendation 2.

**Why does this matter?**

- The core bottleneck is not technology, it's bankability. The "valley of death" for SAF has shifted to late-stage development: projects are technically proven (TRL 6-9) but struggle to align credit structures, offtake certainty, revenue support, and risk allocation to reach FID at an acceptable cost of capital. These "pathfinder projects" would, thus, demonstrate bankable structures and FID readiness for FOAK SAF in the UK.
- Theoretical modelling is no substitute for practical experience. A small number of well-chosen demonstrators will de-risk financing structures, validate risk-sharing, and reveal what works in planning, permitting, and revenue design, insights that stress-test and refine government levers (e.g., RCM implementation, UKEF/NWF participation) in live transactions.
- Confidence compounds. Delivering 1–2 "pathfinders" will shorten time-to-FID for followers, reduce perceived risk premia, and attract private capital at scale, critical to meeting Jet Zero ambitions.

**How to execute?**

- Invite a small pool of the most advanced UK SAF development projects to apply.
- Selection conducted by UKEF and NWF under their standard assessments, with DfT as lead sponsor; prioritise the top 1–2 AFF projects for immediate, intensive support. It is essential that "pathfinder projects" have a high probability of success. Therefore, it is recommended that the Government set the bar high but clear in terms of financing readiness. The objective would be to provide focused support to 1-2 projects, with the subsequent FOAK SAF projects being able to use the formally established Delivery Council.

1) Government should deploy the full range of available levers, supported by the RCM, loan guarantees, creditworthy offtake support (such as public procurement from the MOD), and accelerated permitting, to bring them to FID without delay.

- Establish a monitoring framework to track project milestones, investment flows, and policy impact. Use insights from "pathfinder projects" and stakeholder feedback to refine interventions and scale support.
- **Ultimately, this process should inform the formation of the SAF Delivery Council, which should be established in conjunction with this process of supporting the first SAF "pathfinder projects."**

Ultimately, this process will focus on coordinating existing support and not inventing new schemes. The programme's value lies in focus and orchestration, a Delivery Council that aligns departments, agencies, and industry around clear milestones to FID.

## Recommendation 3: Form a SAF Delivery Council

Building on the process of supporting these "pathfinder projects" to FID, a SAF Delivery Council should be established. This proposed cross-sector body would bring together government, industry (airlines, fuel suppliers, developers), finance, and insurers to move FOAK SAF projects to FID. It will provide a single place for developers to engage the government, it will coordinate decision-making across departments, and it will give investors a clear view of project quality and policy alignment. Such a model was deployed successfully in the scaling of Offshore Wind in the UK, which provides a template model to learn from for SAF. The Council's purpose is

practical: to identify and overcome barriers to SAF deployment, converting a pipeline of opportunities into bankable deals, with an overarching goal of providing the necessary conditions to deliver timely sustainable domestic production and enable the UK aviation industry to meet the SAF mandate whilst remaining competitive. The Council will be technology agnostic; however, it will maintain a transparent view of the project pipeline and will coordinate the timing of public interventions to maximise leverage of private capital. The council will look to better co-ordinate the deployment of existing policy and financial levers.

### Why does this matter?

At present, a key challenge in the UK SAF sector is the lack of coordinated industry engagement and a fragmented interface between developers and government. SAF projects involve complex value chains, spanning feedstock supply, fuel production, certification, logistics, and end-use, which require alignment across multiple stakeholders and Government departments. Currently, developers must navigate a maze of processes, policies, and institutions, often without the necessary expertise or support. This creates inefficiencies, delays, and uncertainty, particularly in securing long-term offtake agreements, one of the most critical enablers of investment.

A Delivery Council addresses these gaps. It provides a clear interface with government, it sets common expectations for project readiness, it convenes the right people at the right time, and it removes blockers before they become delays. It also signals to private capital that the UK is organised, predictable, and serious about a domestic SAF industry. That signal will reduce the cost of capital and crowd in investment, critical for FOAK SAF assets, where risk is hardest to price.

### Key responsibilities of the Delivery Council could include:

#### *2.1: Facilitation of finance and offtake*

The council would establish a focused public-private partnership framework to supports early projects, share risk, and build investor confidence. Key enablers to the success of this would include:

- Giving the NWF and UKEF a mandate to treat SAF production as a priority green infrastructure, offering support (financial and advice) on favourable terms or guarantees. Even a few pilot guarantees, for example, 50% of a project loan, would set a precedent and draw private lenders into this new asset class. These guarantees could be complementary to private sector technology performance insurance policies, which provide a level of protection around technology performance.
- Modifying Treasury rules to allow the MOD, through its fuel suppliers, to enter into long-term offtake agreements with UK projects alongside airline partners. The MOD is already subject to the SAF mandate's financial implications and has a vested interest in the resilience of domestic jet fuel infrastructure.
- UK Government support for unlocking demand from Scope 3 corporate buyers of SAF. This should include UK support for clarifying GHG Protocol's position on the use of SAF by Scope

3 buyers. In the absence of this clarity, the UK could examine options for clear national guidelines on how corporates can account for Scope 3 purchases within their emissions reduction reporting.

### *2.2: Clear account management:*

SAF projects involve complex value chains with potential engagement with multiple government departments, creating challenges for developers progressing from research to FID. Simplifying the interface between projects and the Government at every stage of their development would create a more investment-friendly environment. A Cross-Government Concierge service would:

Help navigate regulatory processes, planning, funding opportunities, and policy interfaces, offering each SAF producer a Government Account Manager as a single point of contact.

Provide signposting and coordination across departments to reduce administrative burden and accelerate project development – see Annex D.

In collaboration with industry develop technical help desks to answer questions, develop tools or platforms which can enable FID and engagement with cross-industry and cross-department stakeholders. (e.g. Insurance, construction and offtake),

This service would be embedded within the Delivery Council and operate throughout the lifecycle of SAF projects, from feasibility to FID and beyond.

### *2.3: Development of a capability guide and Technical Help Desks*

The Capability Guide is a practical handbook for developers, buyers, financiers, and Government officials who need a clear, shared map of what good looks like at each stage of a SAF project. It will shorten learning curves, reduce rework, and improve the quality of proposals that seek government support or investor capital.

Suggestions for the scope and content of this guide are included in Annex H.

**How could the Delivery Council be structured?**

- High-Level Co-Chairs: Appoint joint chairs – one from government and one from industry – to lead the council.[34]
- Executive Council Membership: Include all relevant government departments and industry stakeholders at the decision-making level.[35]

[34] For government, the chair could be the Secretary of State for Transport, as DfT leads SAF policy. Given the cross-cutting nature, the Secretary of State for Energy Security and Net Zero (or a Minister from DESNZ) could act as a vice-chair or co-chair.
For industry, a respected industry CEO or executive could co-chair, it would be important that this individual would be viewed by industry as independent of conflicts of interest.
[35] Government members should encompass DfT (aviation ministers/officials), DESNZ (net-zero and industry officials), HMT (for funding perspective), DBT (investment and trade), Devolved Administrations (Scotland, Wales, Northern Ireland officials).

    - Government stakeholders support at different stages of project development (e.g., NWF, UKEF, HMT, DBT, DESNZ, MOD, the devolved authorities, and Innovate UK[36]) with agreed points of contact and predictable response times. There could be a standing forum to resolve cross-cutting issues, such as the interaction between hydrogen, CCUS, and SAF project needs.
    - Industry membership will cover airlines, fuel suppliers and refiners, SAF developers, airports, feedstock providers, green hydrogen and $CO_2$ suppliers.
    - Finance and insurance representatives, including leveraging existing expertise, for example, from the ICAO's "Assistance, Capacity-building and Training for Sustainable Aviation Fuels" and its Finninvest Hub, as well as from the Green Finance Institute, which has played an active role in supporting the commercial development of the SAF industry.
- Sub Working groups: existing groups from the JZTF could be included in the council structure and be divided into key areas, e.g., Policy & Mandate Implementation, Commercial & Finance (Offtake and Bankability), Technology & Feedstock, Sustainability & Certification, Infrastructure & Logistics, and Skills/Supply Chain.

## Recommendation 4: Development of a SAF Value-Chain Action Plan

To support the business case for FOAK SAF plants, the UK must ensure that sufficient sustainable feedstocks are available at predictable cost and quality. A dedicated UK SAF Value-Chain Action Plan should be developed by DfT with cross industry and Government involvement, to provide clarity, reduce risk, and create confidence for investors and developers. This plan will address both domestic feedstock mobilisation and the integration of SAF into existing aviation fuel supply chains.

### Why?

Feedstock availability remains one of the most significant risks to SAF deployment. Without secure, affordable, and sustainable inputs, financed plants could sit idle, undermining investor confidence and delaying decarbonisation targets.

The UK consumes around 12 million tonnes of aviation fuel annually, with ~ 72% imported, a share expected to rise following domestic refinery closures[37]. Current supply chains are optimised for large-scale fossil kerosene imports, delivered efficiently via pipelines, and must meet the extant requirements of the fuel quality standard (typically DEFSATAN 91-091) and the Joint Inspection Group for aviation (a map of these networks is available in Annex E, Figure 3). SAF must integrate seamlessly into this system without compromising safety or efficiency, while

For industry, representatives from across the SAF value chain: *airlines*, *fuel suppliers/refiners*, *SAF project developers*, *airports*, *feedstock sector* (e.g. waste management or biomass providers, and green hydrogen/$CO_2$ providers for e-fuels), and the *finance/investment community*.

[36] Innovate UK could support developers successfully reaching SAF FID: Masterclass Series, such as the Grant Funding, could be tailored to enhance FOAK developers to navigate FID requirements, and SAF Cafes could shift focus from developing technologies to support projects in the 'valley of death'.

[37] Digest of UK Energy Statistics (DUKES) 2024 - GOV.UK

competing on cost and logistics with international SAF imports that benefit from economies of scale.

Domestic SAF production will remain limited in the near term. However, the UK must prioritise domestic feedstock mobilisation and infrastructure readiness to capture economic value, reduce exposure to global price volatility, and meet sustainability objectives. This includes addressing practical barriers such as the lack of truck receipt facilities at many terminals, which could restrict routes to market for UK-produced SAF.

A coordinated feedstock and logistics strategy will also help avoid unintended consequences, such as competition with other sectors or perverse incentives in waste management, while ensuring UK SAF can compete in a highly competitive market.

## Key attributes of SAF value-chain action plan

### 3.1: Secure long-term domestic feedstock supply

- Explore mechanisms such as priority access or price support for SAF producers sourcing domestic feedstocks, ensuring fair competition and compliance with sustainability standards
- Facilitate partnerships between SAF developers and waste authorities, waste management firms, farming cooperatives, and forestry operators to secure long-term contracts and aggregate eligible feedstocks like MSW, agricultural residues, and wood waste.
- Provide targeted funding or incentives for improved collection systems and regional hubs for high-value waste streams such as used cooking oil (UCO) and biomass.
- Defra and DfT to work together to explore if the waste hierarchy could include a sub-hierarchy within the “energy recovery” section, to prioritise fuel production over incineration. There is a past example of a similar approach with anaerobic digestion being given this treatment.

### 3.2 Integrate SAF into existing fuel supply chains

- Review and adapt airport fuel logistics to accommodate SAF delivered in smaller parcels, as current infrastructure favours large-scale imports and delivery via pipelines.
- Engage with refiners, importers, and fuel suppliers to align blending, quality control, and certification processes for large-scale SAF deployment.
- Consider targeted support for infrastructure upgrades at import terminals and airports to enable efficient SAF handling and blending.

### 3.3 Improve market transparency and trade policy

- Develop and maintain a national feedstock availability database with regular updates on volumes, locations, and sustainability status.

- Monitor SAF feedstock and intermediate imports to prevent domestic disadvantage and maintain a level playing field between the UK and imported SAF.

## Recommendation 5: Future work for the Jet Zero Task Force

Further work will be required in 2026 to the scaling of SAF. ***4.1 Enabling Power-to-Liquid pathways***

To unlock the long-term decarbonisation potential of aviation, the UK must enable PtL pathways as a strategic complement to bio-based SAF.

### Why

Producing PtL fuels in the UK is currently challenging and cost-prohibitive, both relative to global frontrunner locations and to the market value of the fuel itself. This stems from limited access to affordable, eligible renewable or nuclear electricity and qualifying green hydrogen, both of which must meet stringent criteria, including "additionality," where power infrastructure is commissioned post-electrolyser deployment. Achieving additionality is complex, as it couples renewables generation with PtL refining, creating interdependency and elevating risk. Most fuel producers are not positioned to develop renewable production assets.

Compounding this, green hydrogen producers are typically structured around the less demanding Hydrogen Business Model (HBM), which does not meet the SAF mandate's stricter requirements. Without access to compliant, low-cost power and hydrogen, PtL developers struggle to justify UK-based investment, especially as the SAF mandate are demand-side mechanisms indifferent to production geography.

To enable UK PtL deployment, a viable margin must exist between production costs and market value, achievable either through input cost reductions or enhanced product valuation. While the UK aims to fully decarbonise its grid by 2030, only then will grid electricity broadly qualify without additionality constraints. However, waiting risks forfeiting strategic advantage. Near-term interventions are needed to support industry development ahead of full grid decarbonisation, ensuring the UK remains competitive in the emerging PtL landscape.

Some measures that we would suggest next year's JZTF examine include:

- Continued support of pre-development and development funding for PtL projects through the extension of the AFF.
- Providing a dedicated RCM auction round for PtL developers[38].
- Enabling access to competitively priced renewable electricity for SAF producers through Power Purchase Agreements (PPAs) with GB Energy and offshore wind developers, complemented by participation in initiatives such as the British Industry Supercharger

[38] UK SAF Mandate Cost Benefit Analysis Sustainable aviation fuel mandate: final stage cost benefit analysis

scheme, which lowers electricity costs by removing or reducing renewables and capacity market levies for eligible energy-intensive industries.
- Considering introducing some flexibility in the application of 'additionality' for PtL projects, providing them a clearer path to commercial feasibility in recognition of the UK Governments target of grid decarbonisation by 2030.
- Leveraging insights from "pathfinder projects" and embed them within the Delivery Council's remit to support PtL development.
- DfT considering increasing the Buy-out price for the PtL sub-mandate.

### *4.2 Enabling Power-to-Liquid pathways. Book and Claim and ETS.*

*As Workstream 1 identified, there are challenges today around the interaction between the mandate and UK ETS, particularly for airports that are off pipeline. Book and claim may be a way to improve access between SAF users at these airports and producers, but this can only work if the ETS is modified to allow it.*

### *4.3 Private Sector Aggregation Schemes*

*This year's group considered the opportunity that private sector aggregation schemes could provide in terms of providing bankable offtake. Such schemes are complex from the perspectives of competition law, the design of the SAF mandate and UK ETS. Given the opportunity that these schemes could offer, it is recommended that next year's JZTF examine how they could be operationalised within a UK mandate context*

## Conclusion

In conclusion, unlocking investment in FOAK SAF production in the UK is a multi-faceted challenge that is being met with a comprehensive strategy. The UK is putting in place the critical demand pull (mandates) and supply push (RCM, grants) measures that analysis and industry consensus have long called for. If implemented well, these policies will significantly de-risk SAF projects, making the UK one of the first countries to truly bridge the commercialisation gap for advanced SAF technologies. The prize is substantial: by the 2030s, the UK could have a network of SAF plants converting everyday household waste, agricultural residues, and renewable power into millions of tonnes of clean jet fuel, fostering energy independence and green growth.

However, time is of the essence. The window to kick-start FOAK SAF projects is the next 1-2 years if 2030 targets are to be met. The recommendations above focus on accelerating and fine-tuning the tools to make that happen. The government and industry must continue to work together (through forums like the Jet Zero Taskforce) to troubleshoot issues and maintain momentum. Consistent messaging that "the UK is committed to a domestic SAF industry for the long haul" will further reduce perceived political risk. Early successes, such as reaching FID on the first few SAF plants by 2026, will build confidence and create a domino effect for further investments.

In summary, the UK has laid out the plan to unlock SAF investment; the priority now is execution. By providing revenue certainty, sharing investment risk, ensuring feedstock and regulatory clarity, and engaging the private sector, the UK can overcome the barriers that have stalled projects in the past. The result will be the realisation of first-of-a-kind SAF production at scale on British soil – turning policy ambition into practical climate action and industrial innovation, providing energy security and capturing a global innovation opportunity in this nascent but growing global industry.

# Abbreviations

| Acronym/Abbreviation | Full Form |
|---|---|
| ASTM | American Society for Testing and Materials |
| Avtur | Aviation turbine fuel |
| BCU | Book and Claim Unit |
| CIF | Cist Insurance and Freight |
| CORSIA | Carbon Offsetting and Reduction Scheme for International Aviation |
| ETS | Emissions Trading Scheme |
| FIUK | Fuels Industry United Kingdom |
| GHG | Greenhouse gas |
| HEFA | Hydroprocessed Esters and Fatty acids |
| HVO | Hydrotreated vegetable oil |
| IATA | International Air Transport Association |
| ISCC | International Sustainability & Carbon Certification |
| MB | Mass balancing |
| NWE | Northwest Europe |

| | |
|---|---|
| PDD | Proof of Delivery Document |
| PoC | Proof of Compliance |
| PoS | Proof of Sustainability |
| PS | Physical Segregation |
| PtL | Power to Liquid |
| SAF | Sustainable Aviation Fuel |
| RFEUA | ReFuelEU Aviation |
| RTFA | Renewable Transport Fuel Association |
| RTFO | Renewable Transport Fuel Obligation |

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# Annexes

## Annex A – Group Members

Steven Gillard, Boeing – Chair
Collette Campbell, Boeing - Secretariat
Tom Reid, RTFA

Paul Southall, Jet2
Deniese Ramsundarsingh, Octopus Energy Generation
Mohamed Pourkashanian, University of Sheffield
Candice (Carrington) Hughes, Petrofac
Juliana Scavuzzi, Heathrow
Kevin Goddard, Airbus
Thomas Harrison, MAG
Douglas Phillips, IATA
Hamzah Ahmed, Airbus
Anna Gibbs, P66
Chris Gould, Fuels Industry UK
Josh Garton, GFI
Roisin Crowe, UK Export Finance
Leena Kang, UK Export Finance
Rob Griggs, Airlines UK
Jamie Miller, MoD
Department for Transport Officials

## Annex B – Airlines Survey

| **QUESTIONS** | **ANSWER CHOICES** |
|---|---|
| 1. What type of airline are you? | [full-service, low-cost, leisure, cargo, regional, charter, military, other] |
| 2. Since the start of the mandate, have you experienced any additional costs from fuel suppliers associated with UK SAF Mandate compliance? | [Yes, no, do not know] |
| 2a. If you answered yes to Q2, in what form do these costs take (e.g. a surcharge, compliance fee, other) | [free text] |
| 3. Compared to SAF market price trends under the mandate, have fuel supplier charges to date been: | [Above expectations, at expectations, below expectations, unable to say] |
| 4. Considering the following, indicate your agreement level with the following statements:<br><br>a. SAF charging by fuel suppliers is transparent | [Strongly disagree, disagree, neutral, agree, strongly agree]: |

| QUESTIONS | ANSWER CHOICES |
|---|---|
| b. The level of charges by fuel suppliers attributed to SAF Mandate compliance is unreasonable<br><br>c. There is sufficient SAF to meet UK SAF Mandate requirements in 2025<br><br>d. There will be sufficient SAF to meet UK SAF Mandate requirements in 2030<br><br>e. [For those airlines that uplift fuel in the UK and EU] the relative cost of mandate compliance in the UK will be significantly higher compared to the EU to 2030 | |
| 5. Prior to the UK SAF mandate starting in 2025, have you previously procured SAF voluntarily? If yes, have you witnessed any changes between voluntary uplift and mandated uplift? | [free text – max 500 words] |
| 6. Do you have any suggestions for improving transparency, efficiency, or functionality in the UK SAF market? | [free text – max 500 words] |
| 7. What is your overall experience securing SAF since the start of the UK SAF Mandate? | [free text – max 500 words] |

## Annex C – Suppliers Survey

| QUESTIONS | ANSWER CHOICES |
|---|---|
| 1. Is your business an obligated aviation fuel supplier as defined in the UK SAF Mandate? | Yes, we are an obligated aviation fuel supplier / No, we are not an obligated fuel supplier |
| | |
| 2. Has you company purchased SAF through long term offtake agreements, on the spot market, both or neither? | Long term offtake agreements / on the spot market / Both / Neither |

| QUESTIONS | ANSWER CHOICES |
|---|---|
| 3. Have you had any challenges with the implementation of the operational rules for tracing SAF through the supply chain? If so, please explain. | [free text] |
| 4. From your company's perspective, is the UK SAF market pricing functioning as expected? | Yes / No If no, please explain |
| 5. Please share any insight related to structure of SAF pricing - Are you pricing off a benchmark with differentials? Are there any associated additional costs or charges that apply to SAF that don't apply to fossil jet? | [free text] |
| 6. Does your business have a view on how the fuel pricing structure will evolve as the mandated proportion of SAF in jet fuel increases through to 2030 and beyond? | [free text] |
| 7. Do you have any insights into the structure of SAF pricing in the UK compared to that of the EU? | [free text] |
| 8. Do you have any suggestions for improving transparency, efficiency, or functionality in the UK SAF market? | [free text] |
| 9. Does your company view Book and Claim as a positive or negative tool for selling SAF? | [free text] |
| 10. Please share any additional insights or experiences related to SAF sourcing, pricing, or market dynamics. | [free text] |

## Annex D - Sources of public support that aid private capital deployment

| F | TRL | Demand levers - DFT | R&D-grant funding | Revenue support | Innovate UK / UKRI – early stage | British Business Bank - | NWF – High Growth and Mature projects | UKEF – Mature projects |
|---|---|---|---|---|---|---|---|---|

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **1G - HEFA** | Trl 8-9 | SAF mandate | x | x | | | equity, mezzanine,<br>debt, (Mature projects only),<br>guarantees (Mature projects only) | Loans, guarantees, and insurance |
| **2G – ATJ / methanol / FT** | Trl 6-8 | SAF mandate | Advanced fuels fund | DFT - UK SAF RCM | ?? | | equity, mezzanine,<br>debt, (Mature projects only),<br>guarantees (Mature projects only) | Loans, guarantees, and insurance |
| **3G – PTL** | Trl 5-8 | SAF mandate | | DFT – UK SAF RCM | | | equity, mezzanine,<br>debt (Mature projects only)<br>guarantees (Mature projects only) | Loans, guarantees, and insurance |

project maturity stage

# Annex E – SAF projections in the UK & Suppliers' Networks map[39]

| Year | SAF Mandate | Fossil Projection [ktoe] | SAF Projection [ktoe] | Total Air Projection [ktoe] | AFF Projects {ktoe] |
|---|---|---|---|---|---|
| **2025** | 2% | 12,900 | 260 | 13,160 | 3 |
| **2030** | 10% | 13,000 | 1,440 | 14,440 | 688 |
| **2035** | 16% | 12,900 | 2,470 | 15,370 | |
| **2040** | 22% | 12,800 | 3,610 | 16,410 | |
| **2045** | 22% | 12,000 | 3,380 | 15,380 | |
| **2050** | 22% | 9,700 | 2,740 | 12,440 | |

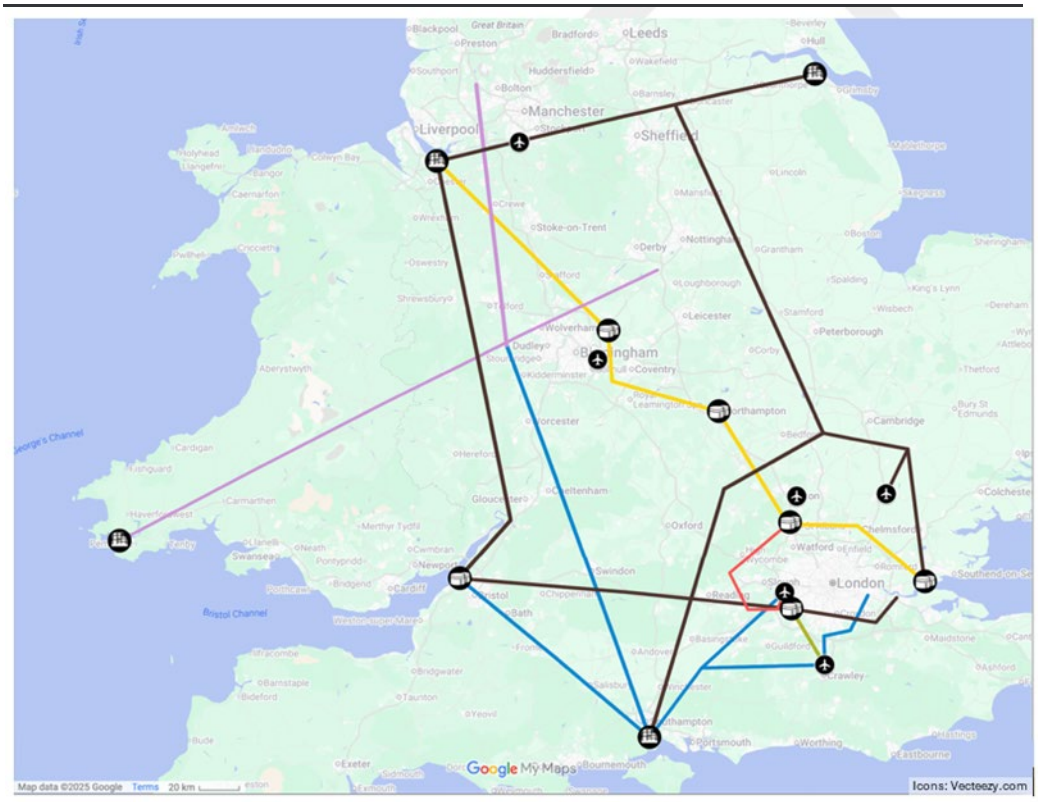



*Figure 3 - Pipeline network for large-scale kerosene distribution in England and Wales*

[39] The table shows the forward projection based on the DESNZ projections for aviation fossil fuel requirements. Using the SAF mandate (including PtL fuel) the SAF requirements and total aviation fuel requirements have been calculated. In addition, the sum of all Advanced Fuel Fund (AFF) approved projects has been included.

## Annex F - Private sector perspectives and investor insights

The success of the UK's SAF strategy hinges on the engagement and confidence of private sector stakeholders – from airlines and fuel producers to financial investors and technology developers. Their perspectives provide on-the-ground insight into what is needed to unlock funding for FOAK SAF projects:

- **Airline industry view:** Airlines are the end-users of SAF and often the ultimate customers funding the transition (either through purchasing SAF or paying compliance costs). UK airlines, represented by bodies like Airlines UK, have been strong advocates for government action to support SAF production. They have voluntarily entered SAF offtake agreements (e.g., Virgin Atlantic and IAG/British Airways have each committed to purchase SAF from various projects), but they acknowledge that these alone are not sufficient to scale supply. The introduction of the SAF mandate and RCM mechanism was met with praise by airlines – Airlines UK called it a "welcome announcement". This indicates airlines want the mechanism to keep costs reasonable, but they fundamentally support it because it gives them a pathway to secure SAF volumes without bearing untenable cost premiums. Airlines fear that if flying becomes significantly more expensive in the UK due to climate measures, it could hurt demand or shift traffic to other jurisdictions. Therefore, while airlines support SAF (it's key to their net-zero pledges), they tend to push for cost-sharing across the industry and government. Some airlines have even invested equity in SAF producers or contributed to project development costs. In summary, airlines want assurance of supply to meet mandates and sustainability goals, but at a cost that is manageable and predictable.
- **Fuel producers and oil & gas majors:** The traditional jet fuel suppliers (oil & gas companies, refiners) are increasingly involved in SAF as well. In the UK, Phillips 66's refinery producing SAF from UCO is a case in point – it shows existing infrastructure can contribute, but volumes are modest compared to overall demand. These incumbents often have the refining expertise, capital, and logistics infrastructure that could be used for SAF delivery as well as fossil aviation delivery. From their perspective, a clear business case (demand + margin support) is needed to invest in updating or building facilities. Some have been cautious to commit significant capital in the UK without policy support, and significant challenges to investing in the UK. Oil majors generally welcomed the UK's SAF mandate and have engaged in consultations. A common ask from this group is regulatory certainty and a level playing field. They want to ensure that if they invest in SAF, there is a stable long-term policy (no roll-back of mandates) and that sustainability rules are uniformly enforced (so that compliant producers aren't undercut by any sub-standard imports).
  Many of these companies are also active in the global SAF market, so they compare UK incentives to, say, the generous U.S. credits. The feedback loop here is that if the UK did not implement something like the RCM, these companies might focus their SAF investments in the U.S. or other markets. The government's moves have signalled that the UK intends to be competitive. For instance, after the SAF Bill announcement, various industry players publicly supported it; Velocys CEO stated the revenue certainty scheme and mandate together are "a major step towards unlocking the capital" for their project and will "provide SAF producers greater assurance over earnings… enabling projects to attract necessary

finance"[40]. This underscores that tech developers and fuel companies feel policy risk was the missing piece – now being addressed – and with it, they can convince boards and investors to proceed. However, the issue of the UK being a higher cost environment in which to operate also needs to be addressed to encourage UK production over imports.

- **Investors and financial community:** For banks, infrastructure funds, and private investors, SAF projects to-date have been viewed as relatively high risk, but with the right structures they become attractive green investments. Investment risk experts highlight three main risks: technology, feedstock, and revenue, as discussed earlier. So, investors' perspectives often revolve around how these are mitigated.
    - Technology risk: Many investors will wait to see the first few plants in operation. Some, like venture capital or private equity specialising in clean tech, are willing to invest earlier but require higher returns. One insight is that investors prefer to see government or corporate co-investment to validate the technology. The AFF grants have helped here, as getting a government grant can signal that due diligence was done on the tech. Also, partnerships with established engineering firms (e.g., some SAF projects partner with major EPC contractors), bringing in knowledge of infrastructure and project development of complex projects, helps reassure investors that the project execution risk is under control.
    - Feedstock risk: Lenders often ask for long-term feedstock supply contracts or a diversified feedstock plan. An investor perspective is that offtake (product) contracts alone aren't enough; feedstock supply needs to be equally secure. Investors have called on the government to facilitate feedstock mobilisation (like ensuring waste policy allows enough MSW to be used for fuels, rather than all going to incineration or export).
    - Cost of capital: Another investor insight is that the cost of capital for SAF projects will drop with these policies. Initially, FOAK projects might have required double-digit returns (reflecting high risk). But with RCM contracts, one can expect projects to raise debt at moderate interest rates and equity requiring maybe single digit returns, similar to other infrastructure. This drastically improves project economics. It's a feedback loop: as more projects get financed and built, the perceived risk drops further, drawing in more capital at better terms.
    - International investors / developers: Some foreign companies are looking at UK SAF opportunities (for instance, U.S. companies like LanzaTech). If the UK did not offer competitive support, they might deploy their technology elsewhere. Now, with the UK's upcoming RCM, they see an incentive. However, they will also be aware of timeline – if the UK process is slow (support only by 2027, say), they might focus on a project in e.g., California where credits exist today. So, a common refrain from this group is speed and certainty. Essentially, developers want the government to move quickly from policy announcement to implementation so that they can finalise financing packages.
- **Sustainable aviation and industry coalition:** The UK's industry coalition, Sustainable Aviation (airlines, airports, manufacturers), has been vocal on what's needed. In late 2022 they warned the "UK is falling behind internationally" and called for "a rapid announcement of policies to drive investment in UK production facilities; specifically, a price support mechanism like a Contracts for Difference"[41]. The industry also highlights the economic opportunity cost: failing to support SAF means forfeiting potential jobs and export

[40] Velocys backs DfT sustainable aviation fuel scheme | Biofuels International Magazine https://biofuels-news.com/news/velocys-backs-dft-sustainable-aviation-fuel-scheme/
[41] Sustainable aviation (2022) Urgent Government action needed to meet 10% Sustainable Aviation Fuel by 2030 target

industries. They often cite that a domestic SAF industry could be worth £16.7 billion in exports by 2050 and support ~165,000 jobs[42] if fully realised – numbers which can sway government economic strategists.

- **Environmental Groups:** On the other side, environmental NGOs largely support SAF as part of decarbonisation but emphasise sustainability safeguards. Some groups, like Climate Catalyst, argue that scarce public funding should focus on truly sustainable pathways. There is also a call from some quarters to ensure that SAF policy does not become a distraction from curbing aviation demand growth or pursuing other solutions (like efficiency or electrification for short haul). However, the Jet Zero strategy encompasses those too; SAF is one part. Investors, for their part, want to ensure that SAF policy has broad support and is not likely to be undone by environmental concerns. The robust sustainability framework in place helps guarantee that supported SAF truly cuts emissions, keeping NGO criticism at bay and thus protecting the longevity of the policy – something investors indirectly care about.

The private sector insights essentially underscore the logic of what the UK is doing: de-risk investments sufficiently so that commercial finance can drive the deployment. With risk reduced, we expect to see pent-up projects moving forward and new proposals emerging. For instance, several energy companies had projects "on the drawing board" contingent on policy – those may now progress. Private capital is abundantly available for infrastructure-scale projects, especially green ones, provided the risk/return profile is acceptable. The UK's policy framework is reshaping that profile for SAF in a favourable way, and the general sentiment among investors and industry is now one of opportunity – where earlier it was mostly scepticism due to uncertainty.

## Annex G - International comparisons and best practices

The drive to scale up SAF is a global one, and the UK can learn from and be mindful of policy developments in other jurisdictions. In fact, a recurring theme has been that the UK must keep pace with international competitors to attract SAF investment. Here we compare notable international approaches:

- United States – incentives-led approach: The U.S. has rapidly become the world's top destination for SAF projects, thanks to a raft of financial incentives:
- The longstanding Renewable Fuel Standard (RFS) provides tradeable credits (RINs) for biofuels, including a category for advanced biofuel, which SAF can qualify under, adding value for producers[43][44].
- California's Low Carbon Fuel Standard (LCFS) awards credits for low-carbon fuels used in the state; SAF with high GHG reductions can earn significant credit revenue per tonne[45]. Other states are adopting similar schemes.

[42] Sustainable aviation fuel policy in the UK - Climate Catalyst. https://climatecatalyst.org/learning-hub/sustainable-aviation-fuel-policy-in-the-uk/
[43] Renewable Fuel Standard | US EPA
[44] ibid
[45] ibid

- Crucially, the Inflation Reduction Act (IRA) of 2022 created a new Blender's Tax Credit for SAF of $1.25–1.75 per gallon (~$300–$400/tonne) depending on sustainability, available for 2023– 2024, transitioning to a SAF Producer Tax Credit from 2025–2027 of up to $1.75/gal for SAF with >50% GHG reduction[46]. These federal incentives dramatically improve SAF economics – effectively the government pays a large chunk of the price gap.
- These incentives stack. A SAF producer in, say, California can get the IRA credit, generate an LCFS credit (worth perhaps another ~$1.50/gal at recent prices), and an RFS RIN credit – when combined, the "value stack" can exceed $3 per gallon of SAF. This means they can sell SAF to airlines at near fossil parity and still be profitable, all via policy support.
- Additionally, the U.S. has provided large grants (e.g., USDA and DOE funds for SAF pilot projects) and has a robust loan guarantee program (the DOE in 2023 announced a $50 million cost-share for a SAF project and is evaluating large loan guarantees for biofuel plants).
- The result is an investment boom: as noted, over 70% of announced global SAF production capacity is now expected in the U.S. Companies are flocking to build there (e.g., LanzaJet's first ATJ plant, Neste is expanding with a JV in the US). The U.S. approach essentially throws money at the problem via tax incentives – very effective in spurring projects, though with high public cost. The UK cannot match the sheer scale dollar-for-dollar, but the RCM approach is a more tailored way to achieve a similar outcome (price certainty) in a budget-controlled manner. One key lesson from the U.S.: Generous, performance-linked incentives attract investment quickly. However, those incentives currently have a time limit (IRA's SAF credit expires end of 2027). Many SAF developers are rushing to get plants operating by then to capture the credit.

- European Union – mandates with funding mechanisms: The EU's approach centres on regulation to create demand:

    - The ReFuelEU Aviation regulation mandates all fuel uplifted at EU airports to contain at least 2% SAF by 2025, 6% by 2030, 20% by 2035, and so on, reaching 70% in 2050. Within these targets is a sub-mandate specifically for synthetic e-fuels (PtL): 1.2% by 2030, 5% by 2035, etc. This is a strong market signal for supply. However, as of now the EU did not implement an EU-wide price support; ReFuelEU relies on the obligation and a penalty for non-compliance. Critics noted – and the IEA Bioenergy report echoes – that "the ReFuelEU policy did not include incentives to bridge the price gap between conventional jet and SAF"[47]. The EU expects that the mandate's guaranteed demand plus high carbon prices in EU-ETS will encourage production, but many believe additional support is needed to build plants in Europe.
    - To that end, the EU is exploring funding. Notably, the EU Innovation Fund[48] (a program using EU-ETS revenues) in 2022 awarded grants to a few SAF projects (e.g., SkyNRG's ATJ project in the Netherlands got ~€20 million, and a Swedish SAF project got funding)[49]. In the 2023 call, more SAF projects are in the pipeline. These grants are in the tens of millions – helpful but perhaps not enough for full capex. The European Commission also proposed using some ETS income to fund a SAF price

[46] IEA Bioenergy Task 39 – "Progress in Commercialisation of SAF"
[47] ibid
[48] Innovation Fund - Climate Action - European Commission
[49] Building of the first alcohol to jet plant in Europe – SkyNRG. https://skynrg.com/building-europes-first-of-its-kind-alcohol-to-jet-production-plant/

support (essentially a CfD) – indeed, the UK Sustainable Aviation noted "the EU has paired the ReFuel mandate with a contract-for-difference style mechanism, funded through revenue from the ETS". This refers to the concept of an EU SAF CfD where a portion of auction revenues from the EU carbon market would subsidise SAF producers to cover the price gap.

- Several EU member states have their own initiatives. Germany has launched a scheme to support PtL specifically: the H2Global foundation will run auctions to buy green e-fuels (including e-kerosene) with 10-year contracts and sell them to airlines, using €1.5 billion of government funding to cover the price difference. This is essentially a two-sided CfD funded by government, focusing on building the first e-fuel plants (likely sourcing from outside Germany where production might be cheaper). France has a SAF mandate starting 1% in 2025 and provided some grants under its stimulus package for a SAF plant. Nordic countries are also moving – Norway mandated 0.5% SAF already in 2020, Sweden has a gradual ramping mandate. These countries often leverage their existing biofuels policy (HVO diesel) infrastructure and in some cases provide tax relief for SAF.
- The EU Commission is considering an EU wide double-sided auction model akin to the H2 Global model and may announce the proposal in the upcoming Sustainable Investment Plan (STIP).
- The EU's approach shows the power of clear long-term mandates, but also that public funding (grants or CfDs) is being considered to realise projects. The UK's policy mix is quite aligned with emerging EU best practice (mandate + RCM). One difference is the funding source: EU is looking to fund via ETS revenues, whereas UK is opting for an industry levy – each has pros/cons, but both avoid general taxation.

- Asia and other regions: Several other countries are also making moves:

  - Singapore: Implemented a Sustainable Aviation Fuel Credits (SAFC) scheme – essentially a way for airlines to offset by funding SAF – and imposed a small levy on passengers to fund SAF R&D. Singapore is positioning as a SAF trading hub but doesn't have large feedstocks, so its approach is more about market mechanisms. The UK considered the Singapore model (levy on passengers funnelled to buy SAF centrally) but decided against government procurement of SAF, citing complexity and risk of market distortion[50].
  - Japan: Set a goal for 10% SAF by 2030 and is providing subsides to domestic industry (e.g., investing in pilot plants like a Nihon jet fuel project). Japanese airlines (ANA, JAL) have been proactive in offtake agreements. The government has a working group on SAF, but details are not fully clear, likely a combination of subsidies and industry partnerships.
  - Canada: Canada's Clean Fuel Regulations set a credit market for low-carbon fuels. While focused on ground transport, it can generate credits for SAF too. Canada also has some grants via its energy innovation programs.
  - Middle East: UAE and Saudi Arabia have shown interest in synthetic fuels (aligning with their petrochemical strategy) – the UAE's MASDAR is investing in a PtL demo,

[50] Government consultations – "SAF revenue certainty mechanism: industry funding – Govt response" (Apr 2023) – rationale for levy vs other funding options

and Saudi's NEOM project includes e-fuels. These are nascent but backed by strong state financing (often cost is no object if it aligns with diversification goals).
    - Australia/NZ: Early stages; Australia released a SAF roadmap in 2023 and is considering a blending mandate, and has recently announced a AU$1.1bn Cleaner Fuels Program to which will support SAF production. New Zealand is also exploring a mandate.

The global trend is clear: blending mandates are becoming more common (at least 50 countries have some level of SAF blending target or mandate for 2030 in their climate plans), and a mix of subsidies, tax credits, or grant programs are being launched to facilitate supply.

Another best practice internationally is fostering public-private partnerships. For example, in the U.S., many SAF projects are partnerships between technology startups, big energy, airlines, and government (through grants or loan guarantees). The UK's Jet Zero Council could emulate this by brokering partnerships or at least providing a forum for connections. The knowledge sharing between countries is also useful: the UK can work with allies (like through the ICAO Global SAF Framework or Clean Energy Ministerial Biofuel initiatives) to standardise sustainability criteria, trade SAF credits, and share R&D.

## Annex H - Suggestions for the Scope and Content of the Capability Guide

- **Project milestones:** Define entry and exit criteria for each phase, e.g., concept and feasibility, financing preparation, construction, commissioning, and operations, with evidence requirements for each milestone. There would be different levels of engagement at each project phase, i.e., it may just be DfT at the very beginning of the project, with more stakeholders engaged as projects approach FID.

- **Common technical baselines:** Outline expectations for technology readiness, track record, performance guarantees, and independent engineering reviews, including how to approach EPC engagement and construction risk allocation.

- **Commercial readiness:** Describe what a bankable revenue stack looks like in the UK context, the interaction with the mandate and any revenue support mechanisms, the evidence that buyers and lenders will expect to see, including alternatives to share risks aligned with SAF projects requirements (e.g. Insurance and Offtake Aggregation)

- **Sustainability and certification:** Set out the documentation and audit trail required to demonstrate compliance with sustainability criteria, with clear links to recognised certification schemes and audit processes. This should help unlock corporate offtake as corporates can claim emissions reduction of their SAF purchases against their carbon footprint.

- **Permitting and consents:** Provide a signposted checklist for planning, environmental permits, safety cases, and any relevant infrastructure access applications, with realistic timelines and decision points.

- **Government financial levers and signposting:** Catalogue available public finance options, for example, guarantees or cornerstone debt where applicable, export credit support where relevant, and how these interact with private debt and equity. Signposting, for example, NWF's offer, including ticket size (>£25m), TLR thresholds (>7), and product offering, can save resources and expedite FID approval.

- **Templates and examples.** Include short model outlines for project information memoranda, due diligence request lists, and risk registers. Provide anonymised case studies drawn from adjacent sectors to show how FOAK risk has been managed before.

## Annex I - Technology readiness levels (TRLs) and eligible SAF pathways

The term "SAF" encompasses a variety of fuel pathways and feedstocks, each at different stages of technological maturity. Understanding the TRLs of these pathways and which are eligible or prioritised in UK policy, is important for targeting investment in FOAK projects.

### Approved SAF Pathways

Globally, there are currently nine ASTM-approved pathways for producing drop-in SAF that meets jet fuel specifications[51], with more currently undergoing the ASTM approval process. They can be grouped into three generations, starting with First Generation SAF (HEFA). This is produced by hydrogenating lipid feedstocks (e.g., used cooking oil or tallow) to create synthetic kerosene. This is the most commercially developed pathway – facilities exist worldwide (e.g., Neste's refinery in Singapore), and it's essentially an adaptation of HVO technology. HEFA is considered TRL 9 (fully commercial). Thus, while HEFA is important, it is not the focus for FOAK investment unlocking.

Second Generation SAF (bio or waste-based, non-lipid feedstocks): These pathways use waste biomass or residues as feedstock – for example, municipal solid waste, agricultural waste, forestry residues. Key technologies in this category include:

- Fischer-Tropsch (FT): Solid wastes or biomass are gasified into syngas, which is then catalytically converted (FT synthesis) into a mix of hydrocarbons, followed by upgrading to jet fuel. This pathway of projects includes Altalto (Velocys) and Alfanar's Lighthouse project. It has been proven at pilot scale and is near-commercial. TRL is 7–8: demo scale integrated units exist, but no large-scale commercial plant has operated yet. The ASTM approved FT pathways can also use syngas made without gasification, for example by reforming of biomethane, which has the advantages of high TRL and simple feedstock logistics.

[51] ECAC GUIDANCE on Sustainable Aviation Fuels (SAF) https://www.ecac-ceac.org/images/activities/environment/ECAC_Guidance_on_SAF_DGs_endorsed_HighRes.pdf

- Alcohol-to-Jet (AtJ): Biomass is first converted to ethanol or other alcohols (via fermentation or gasification-fermentation), then the alcohol is dehydrated and oligomerised to jet-range hydrocarbons. LanzaTech's approach (fermenting industrial waste gases to ethanol, then ATJ to SAF) and LanzaJet's Freedom Pines facility (ethanol-to-jet in Georgia, US) exemplify this. ASTM has approved ATJ from isobutanol and ethanol. Current TRL for ethanol-to-jet is ~7: demonstration units exist (like LanzaTech's pilot in Japan, Gevo's demo in Texas), and the first commercial ATJ plant (LanzaJet) is under construction in the US. The UK's planned Dragon project in Wales would be the world's first commercial ATJ using waste-based ethanol if built[52].
- Pyrolysis + upgrading: Some projects (e.g., the ABLC Abundia project in Teesside)[53] use fast pyrolysis to turn solid biomass into bio-oil, then hydro-treat and upgrade that bio-oil into jet fuel components. This is analogous to HEFA but with a different feedstock. Pyrolysis oils may be challenging to upgrade, and this pathway is still in demo stages (TRL ~6–7), but companies like Ensyn and Preem (Sweden) have piloted it.
- Others: There are other novel pathways like municipal solid waste to ethanol (via gas fermentation) which then goes to ATJ (a variation of LanzaTech's process); or hydrothermal liquefaction (e.g., Firefly).

Second-generation pathways are generally in the TRL 6–8 range – i.e., pilot or demo proven, seeking scale-up. The UK considers these "advanced" SAF. All the projects funded by the Advanced Fuels Fund are in this category (non-HEFA bio-based), except those that are in the PtL category below[54]. It's worth noting that these advanced biofuels can often achieve greater GHG savings than HEFA and have larger resource potential when including solid wastes. But they also require higher capital investment. This is why policy support is crucial; as Sustainable Aviation wrote, "utilising UK feedstock requires new conversion technologies to be commercialised… These technologies hold great promise but will not be feasible without additional support"[55].

Third Generation SAF (Power-to-Liquid e-fuels): This refers to synthetic jet fuel made from green hydrogen and captured $CO_2$ – essentially producing a hydrocarbon by combining $H_2$ (from water electrolysis using renewable energy or nuclear), with $CO_2$ (from direct air capture or industrial sources), often via Fischer-Tropsch or methanol synthesis routes. PtL SAF (also called e-SAF) is attractive because its feedstocks ($CO_2$, water, renewable power) are theoretically abundant, meaning in the long term it could scale to meet a large portion of aviation fuel demand[56]. It also can yield very high lifecycle GHG reductions (>90% if using DAC and renewables)[57]. However, current TRL is lower (around 5–6) – there are pilot plants (e.g., in Germany and Switzerland), but no commercial PtL fuel plant is operating yet. The challenges are the cost and energy intensity: abundant renewable electricity is needed to produce hydrogen, and $CO_2$ capture is still costly. Because of these hurdles, PtL SAF today costs easily 5–7 times the price of fossil jet[58]. Despite that, the UK and EU are keen to promote e-fuels as the ultimate scalable solution – the UK SAF mandate has a sub-target for PtL fuels starting in 2028. While commercial readiness for PtL SAF

[52] ibid
[53] ibid
[54] ibid
[55] ibid
[56] ibid
[57] ibid
[58] ibid

is likely 5-10 years behind the advanced biofuels, supporting it now is important to drive innovation.

### Eligible Pathways in UK Policy:

The UK's definition of SAF for the mandate and RCM covers waste derived biofuels and renewable fuels of non-biological origin (RFNBOs) which include PtL. The Advanced Fuel Fund winners list gives a snapshot of what the UK considers priority pathways: gasification-FT (wastes), pyrolysis + upgrading (wood waste), ethanol-to-jet (from agri waste sugars), waste-based ethanol via fermentation (LanzaTech), direct air capture to jet (OxCCU)[59]. These are the technologies the UK is putting money behind. So eligible FOAK projects are those utilising abundant domestic feedstocks (household waste, woody residues, industrial off-gases, even $CO_2$) to make SAF via advanced processes.

In terms of readiness: – FT and ATJ: FOAK commercial projects in construction globally already. UK projects could be among the first in Europe if funded now. These are "bank-ready" with the right support – essentially TRL8 (demo done, first commercial unit being built). Other advanced (e.g., pyrolysis, novel gas fermentation): TRL7 – require demonstration at scale but could be next in line. PtL e-fuels: TRL5-6 – needs R&D and pilot scaling; commercial FOAK likely late 2020s at earliest. But it is important to prepare (e.g., securing cheap renewable power dedicated to e-fuel production).

In conclusion, the UK is targeting its investment support at the middle band of TRL – not the fully mature HEFA, and not the very experimental lab concepts, but the technologies on the cusp of commercialisation (TRL ~7-8). These pathways, if commercialised, unlock the largest sustainable feedstock pools (solid waste, alcohols, $CO_2$) needed for scaling to meet national objectives. By catalysing FOAK plants for these pathways, the UK can move up the learning curve, bring costs down, and then later incorporate the truly novel PtL at larger scale. The approach ensures a pipeline of technologies: use HEFA in the immediate term (mostly via imports) to start meeting targets, bring in advanced biofuel plants by the late 2020s to take overgrowth[60]domestically. This tech strategy, combined with the policy support above, will give investors clarity on which projects are worth pursuing in the UK. FOAK investment should flow into waste-to-jet and e-fuel facilities, which the government has signalled as the priority for revenue support and incentives.

## Annex J - Survey Results and Analysis – Airlines

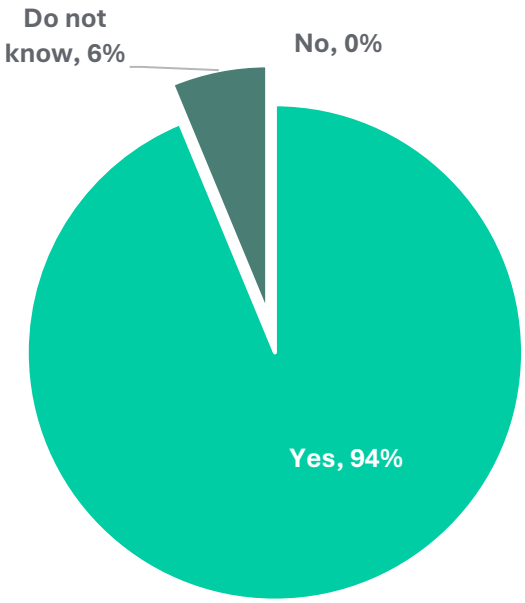
#### 4.1 What type of airline are you?

16 responses were received from a range of airlines including full-service, low-cost, leisure, cargo, and charter carriers.

[59] ibid
[60] IEA Bioenergy Task 39 – "Progress in Commercialisation of SAF"

**4.2 Since the start of the mandate, have you experienced any additional costs from fuel suppliers associated with UK SAF Mandate compliance?**

| | Yes | No | Do not know |
|---|---|---|---|
| **Number of responses** | **15** | **0** | **1** |
| **%** | **94%** | **0%** | **6%** |




**4.3 If you answered yes to Q2, in what form do these costs take (e.g. a surcharge, compliance fee, other)?**

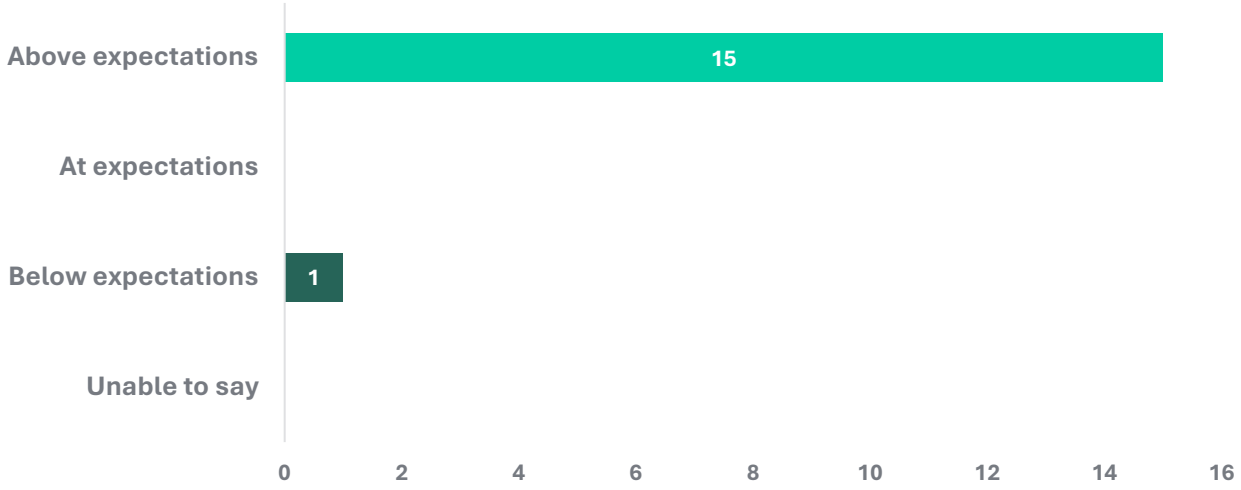
[Free text answer. Number of responses 16]

Responses summary:

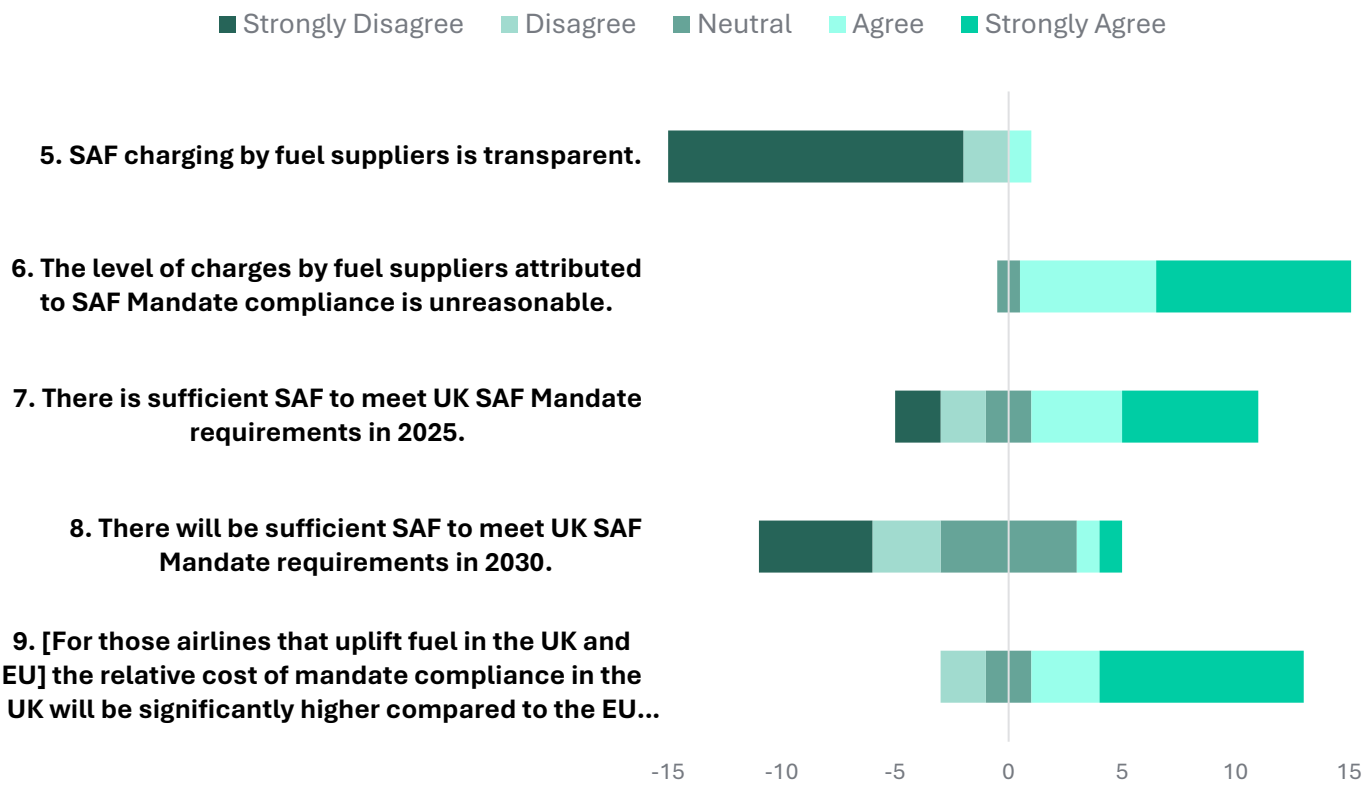
Airlines reported several different mechanisms but the majority said that costs take the form of a new line item 'compliance fee' or SAF Mandate surcharge, additional to fuel cost (similar to how an airport storage fee might be charged, for example). One airline cited fees for SAF based on index (ARGUS) plus specific SAF differential.

One airline flagged the noticeable price difference between mandated volumes and above mandated (voluntary) volumes. This is expanded upon by airlines in later responses to survey questions. Airlines reported that some suppliers have insisted they need to add "risk premium" to SAF price.

**4.4 Compared to SAF market price trends under the mandate, have fuel supplier charges to date been:**




**4.5 – 4.9 Considering the following, indicate your agreement level with the following statements:**




**4.10 Prior to the UK SAF mandate starting in 2025, have you previously procured SAF voluntarily? If yes, have you witnessed any changes between voluntary uplift and mandated uplift?**

[Free text answer. Number of responses 16]

Responses summary

Most airline responders had previously procured SAF voluntarily, to a greater or lesser degree, and some flagged the challenges of securing supply.

Most airlines noted: 1) a significant price differential between SAF procured voluntarily and that received under the UK Mandate, and 2) that for mandated SAF airlines are a price taker with limited transparency on cost structure - unlike in the voluntary market where airlines can negotiate lower pricing. A price difference of around 30-40% between voluntary and mandatory SAF was noted by one respondent, with others suggesting mandated SAF costs twice as much as SAF procured voluntarily. Others noted more broadly the 'sharp' increase in cost via mandate 'compliance changes' compared to the voluntary market for SAF.

One airline suggested that as more suppliers have entered the voluntary market, this has given airlines more ability to choose from different SAF profiles (e.g., feedstocks, sustainability criteria, price) based on airline and customer needs, and that documentation processes to demonstrate chain of custody and proof of sustainability have matured in the voluntary market, in contrast to the mandated market. Indeed, greater transparency was highlighted by several respondents as a benefit in the voluntary market, including full transparency of component costs of previous voluntary SAF purchases and certainty with regards to the sustainability credentials and schedule for receiving proof of sustainability and other required documentation. By contrast this transparency was cited as lacking when in receipt of mandated SAF, with little or no transparency of the component costs of mandated SAF compliance fees, e.g. SAF costs, risk premiums applied, logistics, as well as sustainability credentials and timeframes for receiving mandated SAF and related documentation.

Several airlines noted challenges gaining documentation required to make a valid ETS claim in a timely way (see section 6). It was also noted that airlines typically have no control over the sustainability credentials of the SAF being purchased by suppliers as many suppliers insist that this is an obligation that they must fulfil and therefore no choice exists for airlines despite being the ultimate end user of SAF and bill payer, with costs ultimately needing to be passed through to customers.

**4.11 Do you have any suggestions for improving transparency, efficiency, or functionality in the UK SAF market?**

Free text answer. Number of responses 16

Summary of responses

Airlines cited lack of transparency around compliance fees currently being applied, suggesting that fuel suppliers control the infrastructure and exercise considerable market power.

Airlines suggested several recommendations, including:

- The UK Government require supplier fees and costs to be more open and clearer, including via regulation if transparency is not delivered voluntarily – and moving away from usage of vague 'SAF fee'.

- Establish a publicly accessible, centralised SAF registry that tracks all SAF transactions, including volumes, feedstock types, lifecycle emissions, and certificate issuance, or similarly a standardised digital platform for SAF sustainability verification and certificate issuance, integrated with the UK ETS and SAF Mandate systems.

- Publish a SAF Price Index reflecting all costs to the supplier (blending, logistics, compliance costs), managed independently and tasked with providing quarterly SAF market reports, including price trends, volumes, and forecasts. Standardized reporting or benchmarking tools could help stakeholders better understand price differentials and support more competitive market development and improve visibility of bottom-line expenses of SAF supply chain and its production.

- Tying mandate compliance fees to real-world SAF market data, such as the Argus price index, to support transparency of costs and give greater certainty for airlines, to support transparency and allow Government to ensure and track that compliance charges are not unreasonably above the market price.

- Open access to the UK aviation fuel supply chain. Increased competition for fuel supply will aid increases in the transparency and efficiency of the process.

Airlines also highlighted cost implications of the mandate, and several suggestions were made to lower costs and improve efficiency. These included:

- Alignment by the UK with the EU's ETS support system on SAF allowances to reduce the net cost to airlines, to ensure level-playing field and help airlines bridge the price gap between kerosene and SAF. The UK currently offers no such mechanism, creating a competitive imbalance and risks of adverse impacts on passengers' cost of flying.

- Widening the eligible feedstock pool to increase supply and reduce cost.

- Implement the Revenue Certainty Mechanism as long-term pricing remains a concern for both buyers and investors.

- Introduction of a mechanism that would allow airlines to voluntarily uplift the SAF in a way that aligns with a supplier's mandate, negating the need for a compliance fee[61].

[61] The group notes that this suggestion might not be compatible with the design of the SAF mandate, whereby SAF credits will be generated by suppliers who supply fuel at the "assessment point" - this can be either SAF suppliers or aviation fuel suppliers who supply blended product. These credits can then be

- Allow SAF purchased in one compliance year to be credited in the following year if documentation is delayed, as long as the fuel meets sustainability criteria.

**4.12 What is your overall experience securing SAF since the start of the UK SAF Mandate?**

Free text answer. Number of responses 16

Summary of responses

Views were mixed. Several airlines described the overall experience securing SAF since the start of the UK SAF Mandate as 'challenging' unsatisfactory or simply 'not very good', whilst another noted that the mandate has provided a structured and predictable compliance environment, and greater interest in SAF from fuel suppliers.

One airline highlighted the straightforward nature of receiving SAF since the start of the SAF mandate given that Fuel Suppliers, as obligated parties, are securing SAF and passing on the related costs via a compliance charge.

Airlines again noted an increase in compliance charges vs. the available market price for voluntary SAF, and that it appears most Fuel Suppliers have opted to use this compliance charge approach, with very limited number opting to price mandate related SAF costs on a market index price. One airline deemed the overall experience of securing SAF since the start of the UK SAF Mandate as 'both very opaque and expensive'.

Respondents noted that SAF production capacity in the UK remains constrained, with high capital costs and long lead times for new facilities. This has led to reliance on imports and increased competition for available volumes. This competition will increase as more countries introduce their own mandates. Some airports and fuel supply chains are not yet fully equipped to handle SAF blending and distribution at scale, which can limit uptake even when SAF is available.

Several airlines noted the ability to provide SAF sustainability documentation to airlines for SAF zero-rating under UK ETS is another issue - as there are instances of a lack of clarity as to who in the supply chain is responsible for providing what documentation and what eventually gets to the aircraft operator, and several airlines highlighted difficulties receiving formal documentation from suppliers, hindering their planning and compliance efforts.

**Key Takeaways:**

- Almost all airline respondents cite additional compliance costs for SAF associated with mandate compliance – usually via fees as an additional line item in fuel bills.

traded, as per the RTFO. Airlines in this case could not fulfil the mandate for fuel suppliers as that is not where the mandate sits.

- Mandated SAF costs are higher than anticipated, and much higher than voluntary SAF previously or separately procured.
- These charges are not seen as transparent or reasonable.
- Airline confidence in the market's ability to supply SAF is mixed – most airlines are broadly confident there is enough SAF for 2025, but most fear there will be insufficient SAF to meet mandate requirements in 2030.
- Airlines overwhelmingly agree that costs to meet the UK SAF Mandate will be higher than that under the EU Mandate to 2030.

Airlines support further steps to deliver additional transparency of SAF compliance costs by mandated fuel suppliers, notwithstanding that in and of itself the Argus price index is a useful but incomplete proxy. Several are looking to government to play a greater role in ensuring transparency and fairness is delivered, particularly as SAF Mandate requirements increase each year. This could, for example, be via published index or registry reflecting supplier costs.

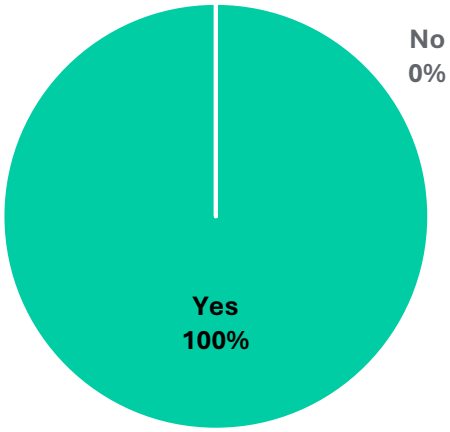
Compliance costs are being felt in a broader context of limited SAF availability and ambitious mandates. Airlines cite the cost of SAF as a concern and many reiterate calls for steps to help close the SAF price gap to fossil jet fuel, particularly as compliance with the UK Mandate is expected to be more expensive than the equivalent EU Mandate at least to 2030.

A further common theme cited by several respondents were difficulties securing documentation/certification in a timely way (if at all), creating challenges for several airlines in making valid ETS claims because they are not receiving necessary sustainability documentation (see section on SAF Mandate interaction with UK ETS).

## Annex K - Survey Results and Analysis – Suppliers

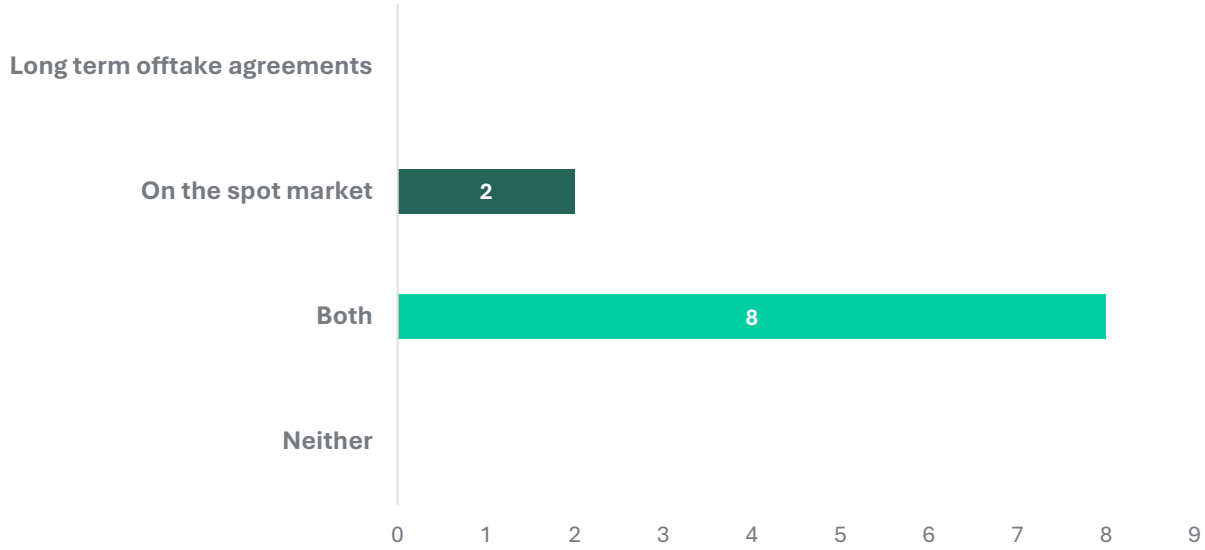
Note that although 4 responses were received from the Supplier survey, one of these was by FIUK, which represents 7 member companies across the downstream oil sector. FIUK have answered on behalf of the fuel suppliers as their representative industry body. Therefore, where their responses are listed, they will be counted as 7 responses and in total, it is considered that 10 responses have been received.

**5.1 Is your business an obligated aviation fuel supplier as defined in the UK SAF Mandate?**




**5.2 Has your company purchased SAF through long term offtake agreements, on the spot market, both or neither?**

| | Long term offtake agreements | On the spot market | Both | Neither |
|---|---|---|---|---|
| **Number of responses** | **0** | **2** | **8 (1 + FIUK)** | **0** |
| **%** | **0%** | **20%** | **80%** | **0%** |




Responses summary

There is a combination of spot market purchasing and both methods. Respondents are familiar with mandate requirements from years under the Renewable Transport Fuel Obligation (RTFO). Ultimately, their SAF sourcing choices will be commercial decisions.

**5.3 Have you had any challenges with the implementation of the operational rules for tracing SAF through the supply chain? If so, please explain.**

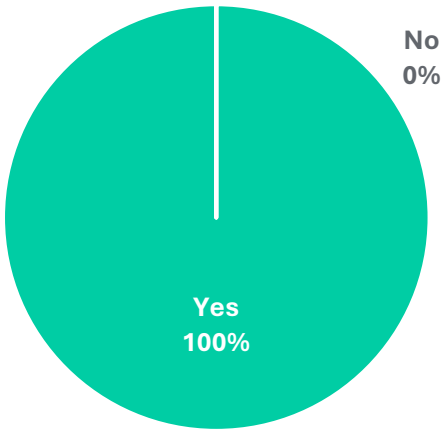
Free text answer. Number of responses 10 (3 + FIUK)

Responses summary

The UK's aviation fuel supply chain is complex, with fuel moving through multiple infrastructures and often mixing with other products. Pipelines carry both aviation and non-aviation fuels, separated by buffers. Dual purpose kerosene (DPK) is marked before domestic use. These established practices complicate tracing SAF to aircraft, so simplification would help. There is uncertainty about when volumes should be reported for tax purposes versus when they are sold to airlines. Differentiating SAF for voluntary and mandated markets is challenging, and obtaining specific emissions data for SAF components is often difficult due to limited availability.

In addition, not all SAF producers have been able to supply actual GHG values, making it non-compliant with the UK SAF Mandate and causing its SAF to be treated as fossil fuel. In the EU, there is the option to use default values, but the UK mandate is based on actual GHG reduction, so actual values are required to be calculated. As a result, the UK is effectively excluded from accessing significant sources of SAF. This is expected to be a temporary situation as there is a natural market incentive for being able to supply SAF to the UK as well as the EU.

**5.4 From your company's perspective, is the UK SAF market pricing functioning as expected?**




Responses summary

Due to competition law, respondents could not be explicit about pricing. The respondents replied positively that market function was as expected. The current market price is considered to be lower than previous and potential future levels due to an existing oversupply of SAF. One respondent noted significant regional variation in SAF fees from UK suppliers. These were the only points raised and there were not currently aware of any concerns about the SAF mandate's operation.

**5.5 Please share any insight related to structure of SAF pricing - Are you pricing off a benchmark with differentials? Are there any associated additional costs or charges that apply to SAF that don't apply to fossil jet?**

Free text answer. Number of responses 10 (3 + FIUK)

Responses summary

Again, due to competition law, respondents could not discuss pricing specifically. However, compared to conventional fossil-jet, supplying SAF typically involves extra blending, certification (such as ASTM or ISCC), and logistics challenges like operating smaller, partially loaded vessels or barges. Additional expenses involve higher feedstock costs, participation in alternative renewable fuel markets, capital investment, and increased working capital requirements due to the greater value of SAF compared to fossil jet. In the spot market, buyers typically referenced either SAF benchmark pricing or fossil jet pricing with an added premium.

**5.6 Does your business have a view on how the fuel pricing structure will evolve as the mandated proportion of SAF in jet fuel increases through to 2030 and beyond?**

Free text answer. Number of responses 10 (3 + FIUK)

Responses summary

It was commonly stated that the market will continue to develop, and as the SAF market becomes more mature and liquid, external market quotes may become more standardised. This was the view for HEFA SAF, while the outlook for other types of SAF remains uncertain. One perspective indicated that SAF prices could eventually increase, although it was not specific about which type of SAF and reasons for the opinion. Note that other feedback mentioned that the current price might be suppressed due to a current oversupply in relation to the current level of the mandate.

**5.7 Do you have any insights into the structure of SAF pricing in the UK compared to that of the EU?**

Free text answer. Number of responses 10 (3 + FIUK)

Responses summary

The respondents were unable to provide specific information regarding pricing due to competition law constraints. However, feedback on interactions with Fuels Europe indicates that similar discussions are underway within the EU. It has been observed that, unlike in Europe, the UK Mandate offers incentives for the adoption of SAF with higher GHG reduction, which might result in a price premium. Alternatively, because the EU mandate contains higher PtL targets, there may be more competition for PtL, resulting in lower prices for non-HEFA, non-PtL SAF. Another response stated no difference seen in the pricing structure between the UK and EU currently. It is difficult to predict which way the pricing may be affected.

**5.8 Do you have any suggestions for improving transparency, efficiency, or functionality in the UK SAF market?**

Free text answer. Number of responses 10 (3 + FIUK)

Responses summary

Competition law prevented respondents from commenting on pricing specifically. However, there was an expectation expressed that as the SAF market develops, increased liquidity may lead to established external quotes from sources such as Platt's Marketscan or Argus. One proposal was to use default values, while another recommended increasing airport access for more fuel suppliers to boost competition and accelerate SAF market growth. Concerns were raised about the lack of compliance options for the upcoming 2027 HEFA cap, and it was noted that buy-outs and obligations should consider the limited commercial supply of non-HEFA SAF.

**5.9 Does your company view Book and Claim as a positive or negative tool for selling SAF?**

Free text answer. Number of responses 10 (3 + FIUK)

Responses summary

Mixed reviews were received on Book & Claim. Book & Claim is not accepted by the UK Environment Agency for aircraft operators' Emission Reduction Claims, where only Physical Segregation (PS) or Mass Balancing (MB) are valid. This difference matters for potential EU-UK ETS linkage, since the UK SAF Mandate does not support PS or MB to the individual airport level as required in the EU. B&C was seen as beneficial for voluntary demand but criticised for favouring those with supplier blending capabilities and initial BCU registration. Its impact on air quality may be mixed: while SAF is not always used by the designated aircraft, the reduction in general transportation directly to end users may cut emissions.

**5.10 Please share any additional insights or experiences related to SAF sourcing, pricing, or market dynamics.**

Free text answer. Number of responses 10 (3 + FIUK)

Responses summary

The SAF mandate, enacted on 1st January 2025, has been in effect for six months and requires time to become fully established. Currently, pricing remains subject to volatility, and availability may be influenced by production factors such as HVO compared to SAF. Fuel suppliers continue working with stakeholders to ensure SAF achieves expected greenhouse gas reductions and support UK policy objectives.

**Contribution from a major fuel supplier:**

The SAF marketplace presents a complex landscape for suppliers. One significant challenge is navigating the intricacies of hedging against market exposure. Hedging typically involves entering contracts at a fixed price to protect against price fluctuations and offset potential losses. Suppliers have observed that customers generally prefer this strategy over agreeing to a fluctuating index price, primarily due to concerns about the volatility of the SAF market, market which can vary in hundreds of dollars per ton over the course of the year. Negotiations for mandated SAF volumes can take place six months to a year prior to the beginning of a full year contract, during which SAF prices may change significantly from the initially hedged price.

When settling a tender with a customer, transparency is crucial. Suppliers need clarity on whether the contract will be exposed to market fluctuations or hedged, as well as the specific location from which the fuel will be supplied - as different locations may incur varying compliance fees. Additionally, suppliers face uncertainty regarding their ability to deliver fuel to the right place at the right time, underscoring the importance of effective risk management strategies. To mitigate these risks, airlines typically include a volume clause of ±10% delivery allowance in their contracts. This clause enables airlines to manage uncertainties associated with fuel procurement, allowing them to hedge against potential shortages or surpluses. By incorporating this flexibility, airlines can maintain operational efficiency while minimizing financial exposure. However, the volume clause also requires a buffer for suppliers to accommodate potential delays in production and delivery schedules, which can be influenced by factors such as production capacity, logistics, and regulatory compliance.

Another critical aspect of the SAF marketplace is the issuance of certificates, which often experiences time delays. Suppliers are cautious about issuing certificates too early, as this could lead to the need for corrections later in the year. To avoid this, suppliers must ensure that all necessary data is accurately compiled and verified before certificates are issued. Certification schemes such as ISCC and RSB establish requirements for suppliers in order to provide Proof of Sustainability (PoS) documentation to substantiate their compliance obligations under their respective schemes – those PoS can only be issued once and for one regulatory program only. Hence, Proof of Compliance (PoC) or Proof of Delivery Document (PDD) may be issued from suppliers to airlines, containing the same compliance information when the PoS has already been submitted.

Looking ahead, there is optimism that the upcoming year will bring improvements, driven by a reduction in SAF prices and enhanced demand forecasting capabilities. These developments could facilitate increased competition, potentially benefiting both suppliers and consumers alike.

**Key takeaways:**

- The aviation fuel supply chain in the UK is highly complex. Established protocols for ensuring compliant fossil jet fuel delivery complicate the process of tracing SAF from source to aircraft, indicating that simplification could be beneficial.
- Suppliers note that the gap between starting mandated SAF price negotiations and receiving fuel can result in significant price changes, leading to a perception that contract prices are much higher than market rates, without considering market volatility and timing lag.
- Voluntary SAF procurement typically uses spot pricing and does not require extended negotiations as mandated volumes do, resulting in prices that reflect the market rate at the time. Additionally, there is no compliance risk associated with voluntary SAF.
- Suppliers have indicated that the UK SAF market pricing is currently functioning as anticipated, and they are not presently aware of any issues related to the implementation of the SAF mandate.
- In comparison to conventional fossil jet fuel, the UK mandate introduces additional operational and logistics requirements for suppliers providing SAF.
- Stakeholders expressed differing perspectives on how SAF prices might evolve through 2030 and beyond.
- There are notable differences in the execution of SAF mandates between the UK and the EU, which could impact market operations in each region. Examples include varying incentives for the adoption of sustainable SAF, differing approaches such as Book & Claim versus physical segregation or mass balancing at the individual airport level, and specific requirements for reporting actual GHG emission values.
- SAF certification follows standards such as ISCC, requiring suppliers to provide Proof of Sustainability (PoS) to fulfil the mandate. It also supports suppliers to provide Proof of Compliance (PoC) for airlines' ETS claims. These documents are due after the relevant year, with different reporting deadlines for suppliers and airlines. Communication around these intended provisions has not always been clear between fuel suppliers and airlines.
- Notably, the UK is currently unable to access some significant sources of SAF due to the lack of actual GHG emission data as stipulated by the UK SAF mandate.