



POSITION PAPER

Making ReFuelEU work: Which mechanisms and support can aid eSAF uptake?

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MAKING REFUELEU WORK: WHICH MECHANISMS AND SUPPORT CAN AID ESAF UPTAKE?

The **aviation industry is in the midst of its transition**: Both in the EU and beyond, quotas and incentives for the use of Sustainable Aviation Fuel (SAF) are being implemented to ensure aviation is on the right track to reach climate neutrality. Simultaneously, the aviation industry is experiencing significant technical and operational advancements, such as research into hydrogen-powered and electric aircraft or more efficient air traffic management. While efficiency improvements can reduce overall fuel consumption and alternative propulsion may serve as viable options for regional and short-haul flights in the long-term, the majority of energy demand in aviation will still rely on liquid fuels in 2050 and beyond: **A swift ramp-up of the SAF industry is essential**, leading to economies of scale and thus sufficient supply at more affordable SAF prices for carriers. The SAF ramp-up needs to be supported in a way that ensures that both the fuel industry and aviation sector can thrive, creating the right regulatory and market framework to incentivize crucial investments in sustainable fuel production capacities from fuel producers that support the aviation sector's competitiveness and connectivity – even more so as the aviation sector, its suppliers and a thriving eFuel industry are vital for the EU's security and defense capabilities. Sustainable Aviation Fuel (SAF) includes, among others, bio-based aviation fuel as well as synthetic aviation fuel, notably renewable fuels of non-biological origin (RFNBO) according to the [Renewable Energy Directive](#) meaning green hydrogen and its derivatives such as eSAF.

The aviation industry faces several economic and strategic challenges in transitioning to SAF. Firstly, airlines are hesitant to commit to long-term offtake agreements due to high costs, limited production scale, and market uncertainty. For eSAF, which has not yet reached commercial-scale production, airlines confront additional risks, including potential first-mover disadvantages in a price-sensitive, low-margin industry. Secondly, the financing of eFuel projects is hampered by a misalignment between the up to 15-year offtake agreements required by investors to ensure bankability and the shorter, usually 6–12 month fuel procurement cycles of airlines. Thirdly, the current design of ReFuelEU Aviation and the Fit-for-55 Package risks the competitiveness of inner-EU hubs and thus EU airlines by imposing SAF blending requirements on flights departing from these airports, thereby unilaterally making transfer flights via EU hubs more expensive and encouraging a shift to non-EU hubs where EU climate, environmental and labor standards do not apply. At the same time, the EU's situation has changed since the Green Deal. Geopolitical and economic instability shifting political priorities, and limited national and EU budgets constrain the support available. With the first European eSAF targets approaching in 2030 and the climate neutrality goal in 2050, time is urgent. **To make the ReFuelEU Aviation achievable, tailored and targeted financial and regulatory measures are needed to reduce the cost gap - especially for the first production facilities – align offtake time horizons and ensure a level-playing field for European carriers by bringing down the cost of SAF, all while minimizing budgetary burdens and bureaucratic complexity.**

MANAGEMENT SUMMARY

RAISING FUNDS TO SUPPORT ESAF PRODUCTION

- **Earmarking a share of EU ETS for aviation revenues for SAF:** As much of the EU ETS revenues for aviation as possible should be directly allocated to SAF production and uptake to ensure funds from the aviation sector contribute to its own decarbonization, differentiating between eSAF and bioSAF.
- **Implementing competition-neutral financial mechanisms** with e.g. a passenger- and destination-based climate levy (as seen in Germany and Singapore) to generate additional funds for SAF ramp-up while ensuring a level-playing field.
- **Redirecting ReFuelEU penalties:** Any fines from non-compliance with SAF quotas should be reinvested into SAF production and uptake to bridge the cost gap, differentiating between bio-based SAF and eSAF.

LOWERING THE HURDLES FOR ESAF PRODUCTION

- **Revising the Delegated Acts for RFNBO production to save from 54 billion € to over 160 billion € from 2030 until 2050,** depending on production cost estimations. Both Delegated Acts are too restrictive as well as require further clarifications, especially with regard to electricity supply criteria and CO₂ sources. Among others, a temporary exemption with the goal of providing an easier working ground for first projects and grandfathering from pre-certification to increase long-term investment security should be implemented.
- **Implementing an ambitious and long-term overall RFNBO quota** within the Renewable Energy Directive that is cross-sectoral in nature to deploy eFuels across multiple sectors. This can significantly reduce costs by reflecting the technical realities of eFuel production, enhancing the bankability of fuel projects, accelerating economies of scale, and alleviating cost pressures on the aviation sector

EFFICIENTLY DISTRIBUTING FUNDS

- **Extending the SAF allowances/FEETS within the EU-ETS** beyond 2030, with a dedicated amount of SAF Allowances/FEETS support allocated towards eSAF to increase the transparency and plannability. A differentiation between SAF Allowances/FEETS support for eSAF vs. bioSAF also enables a redesign with a longer duration mirroring the offtake contract, compensated by a possibly lower support level.
- **Including a dedicated aviation funding window** within the next EU Hydrogen Bank auction (similar to the maritime sector) for eSAF.
- **Scaling up a double-sided auction mechanism** similar to H2Global as a financing model to match the lowest production costs with the highest willingness to pay while bridging time horizon differences in contracts. An accompanying clear roadmap with short-term, mid-term and long-term support systems can avoid a “wait-and-see”-approach and ensure that incentives for first movers are in place.

HOW TO RAISE FUNDS TO SUPPORT ESAF PRODUCTION

Earmark a share of EU ETS for aviation revenues for SAF uptake

Similarly, revenue from the EU ETS for aviation is not sufficiently redirected towards the uptake and production of SAF. While the EU ETS obligates the Member States to use their national share of EU ETS revenues for environmental purposes, it does not connect the sector where the revenues stem from with the sector where the revenues are used. Instead, **as much of the revenues generated from EU ETS as possible should be earmarked for aviation and the usage and production of SAF**, with a sufficient amount of EU ETS revenues specifically earmarked for SAF, and a dedicated share allocated specifically to eSAF, given its lower technological maturity compared to bioSAF

Implement competition-neutral financial mechanisms

While the functioning of the ReFuelEU Aviation Regulation aims to create a level playing field within the EU by mandating that the SAF quotas have to be met at all European Union airports in the long term, there is a risk that inner-EEA hubs, and thus the European aviation industry, will suffer competitive losses compared to non-EEA hubs. An example for this is a trip from Berlin to China via Frankfurt, where blending SAF is required for both legs of the flight, while when transferring via Istanbul, the SAF quotas only have to be met on the first leg. Additionally, when using a route via an EEA hub, the feeder flights are covered by the Emissions Trading System, which creates additional costs, while the ETS does not apply when transferring at a non-EEA hub. This creates additional costs and a competitive disadvantage for EU network airlines. As a result, the current regulation risks not reducing CO₂ emissions to the extent planned but leading to unintended carbon leakage. This problem can be solved by **implementing fund-raising measures such as a passenger- and destination-based levy**. Similar measures are already in place in Germany and Singapore. A possible design with view of optimally supporting the SAF uptake prompted by the ReFuelEU Aviation has recently been detailed in a [report by Steer](#). Alternative mechanisms to generate funds and spread the impact of the ReFuelEU Aviation quotas could be a “CBAM-like-mechanism”, so a carbon border adjustment for aviation, taking into account both the EU ETS and the ReFuelEU Aviation Regulation. This mechanism would not impact fuel imports but rather focus on extra-EU aviation to equalize the playing field with intra-EU aviation and hubs.

Redirect ReFuelEU Penalties into decarbonization of aviation

Currently, ReFuelEU Aviation includes a non-binding clause stating that revenues generated from fines, or the financial equivalent of such revenues, should be used to support research, innovation, and production in the field of SAF, as well as mechanisms to bridge the cost gap between SAF and conventional aviation fuels, with Member States required to publish their use of these revenues. While this represents a step in the right direction, the framework does not ensure a direct and targeted link between the source of the revenues and the sector that benefits from them. To maximize the impact of ReFuelEU Aviation and accelerate the uptake of sustainable aviation fuels, Member States could be obliged **to reinvest any revenues generated from ReFuelEU fines directly into SAF deployment**. Differentiating the allocation of these revenues between the overall SAF quota and the eSAF sub-quota would ensure that both bio-based SAF and the less mature eSAF receive dedicated support. This approach would strengthen the financial and operational conditions for SAF projects, enhance the bankability of early production facilities, and contribute to reducing cost pressures on airlines. Importantly, this reinvestment mechanism is not a provision for planned non-compliance, but a necessary safeguard to ensure that in the event of third-party supply deficits, capital remains within the aviation ecosystem to address those very supply gaps.

LOWERING THE HURDLES FOR ESAF PRODUCTION

Ensuring more pragmatic production criteria to reduce eSAF costs

Cost reduction is critical for making eFuels competitive. Currently, production requirements for RFNBOs under the Renewable Energy Directive II and the accompanying Delegated Acts create significant barriers. According to a [study by the University of Duisburg-Essen](#), the requirements of the Delegated Acts reduce electrolyser capacity by up to 33% within the EU (especially in Central Europe and on the Iberian Peninsula) and eFuel production by over 50%. The [European Court of Auditors](#) has summed up scientific results on the impact of the planned switch from monthly to hourly time correlation from 2030, finding that this requirement alone will lead to an increase in renewable hydrogen cost between 25% and 35%.

Another immense cost factor is the lack of flexibility on permitted CO₂ sources: Industrial CO₂ point sources can only be utilized as feedstock until 2041 and in jurisdictions where they are subject to an effective carbon pricing system, leading to a high demand for biogenic CO₂ sources which further increases their price. In addition, as there is only a limited number of carbon pricing systems outside of the EU, importing RFNBO from favorable places outside of the EU which have been produced using existing industrial CO₂ sources is made impossible.

Thus, **there needs to be a swift and targeted revision of the Delegated Acts. By focusing on minimal, strategic adjustments to existing parameters, the EU can provide the regulatory flexibility needed to increase availability, reduce production costs of eFuel.** Importantly, these refinements would safeguard investments already made under the current framework while effectively bridging the gap between SAF and fossil kerosene. Furthermore, explicitly recognizing the co-production of eSAF via existing pathways, such as HEFA, would allow producers to leverage infrastructure to accelerate the scale-up of synthetic fuels.

Even based on the theoretical assumptions given in the [Destination 2050](#) report, cumulative savings in achieving the ReFuelEU Aviation quotas from amending the Delegated Acts could surpass 54 billion €, having the potential to reduce the additional costs for the transition of the aviation sector expected by the Destination 2050 report by over 6.8 %. When calculating using more realistic average production costs based on [Project Skypower](#), **the potential savings are even more substantial and can be between 108 billion € and 168 billion €**, depending on assumptions regarding regional electricity prices, availability of CO₂ feedstock, and the scale of eFuel production facilities.

The following measures should be implemented:

- Temporary exemption from all electricity supply criteria to incentivize early investments.
- Postponement of additionality criteria until 2035 while maintaining a monthly time correlation instead of switching to an hourly framework, ensuring a more practical and cost-effective transition.
- Implementing grandfathering to protect ongoing investments that already comes into effect from pre-certification, especially for time-bound measures such as an exemption from electricity supply criteria, the introduction of additionality or a limitation of CO₂ sources.
- Inclusion of industrial CO₂ point sources, such as non-abatable industrial CO₂ from the cement and steel industries. This would increase the availability of CO₂ for eFuel production.
- Removal of the definition of ‘effective carbon pricing’ and replacing it with a more pragmatic measure that provides investment security for the use of unavoidable industrial CO₂ sources both within and outside the EU while ensuring a level-playing field for both intra- and extra-EU production.
- Explicitly recognize the co-production of eSAF via the HEFA pathway within the implementing legislation for RFNBOs and low-carbon fuels. This ensures technology neutrality and allows the industry to utilize existing SAF infrastructure to increase eFuel availability

By implementing these adjustments, the regulatory framework can better support the scale-up of RFNBO production, ensuring a more cost-effective and sustainable supply of eFuels. More information on the Delegated Acts for RFNBO production can be found in our Position Paper.

Reducing eFuel costs by deploying to a broad market

Instead of just focusing on aviation, the production of eSAF can greatly benefit from a holistic, cross-sectoral approach. This holistic approach is given in the Renewable Energy Directive (RED): It obligates Member States to fulfill quotas for renewable fuels, among them RFNBO, across all transport modes. Member States can thus include the fuel amounts stemming from the ReFuelEU in their reporting on the RED. As the ReFuelEU is the main regulatory instrument for renewable fuels in aviation and its quotas should not be surpassed when implementing the RED on a national level according to the European Commission, the RED itself does not affect aviation. It can, however, incentivize eFuel production for other transport modes, such as road.

The importance of the road sector for eSAF stems from three main reasons: Firstly, according to [Eurostat](#), the road sector accounts for over 70 % of fuel consumption in the transport sector. The bigger the market, the faster economies of scale can be reached and the lower the price of eFuels, including eSAF will be. Secondly, major eFuel production pathways inherently generate byproducts that can serve various markets, meaning that eSAF production inevitably leads to a road sector output share. This holds true for both existing refineries, where kerosene amounts to 7.7 % of the OECD refinery output in 2020 according to FuelsEurope, as well as new production facilities using the Fischer-Tropsch-route, where the eSAF share can vary between 24 % and 63 % according to the [International Energy Agency](#). As there is currently no big incentive to produce eFuels for the road sector, however, projects' main financing has to come from the high value product eSAF, putting the most financial pressure on aviation as the main offtake market. This is in strong contrast to usual financing in the refinery business, where kerosene only makes up a small share of the end products and can be cross-subsidized by selling fuels to the higher-paying road transport. Thirdly, cross-sector offtake improves project bankability by distributing financial risk beyond the aviation sector, making investments in eSAF production more viable.

Therefore, **putting in place a high and long-term sub-quota for RFNBO in the Renewable Energy Directive until at least 2040 would benefit eSAF production significantly**. This RED quota would be an option to support the eFuel industry overall without setting additional mandates for aviation and thus competing with the ReFuelEU Aviation. More information on the Renewable Energy Directive can be found in our Position Paper. In addition to implementing a cross-sectoral approach for private economy, further support can be achieved by increasing the public procurement of SAF for government activities, public services and military.

HOW TO DISTRIBUTE THESE FUNDS EFFICIENTLY

The question of how to distribute available funds efficiently needs to look at two aspects: Firstly, which kind of schemes are already in place and how well do they work? Secondly, with view to the Sustainable Transport Investment Plan, how can these schemes be improved or further developed to put in place new support mechanisms?

Extend SAF allowances/FEETS support and make them more predictable

The free certificates introduced via the EU ETS for SAF cover up to 100 % of the price difference between sustainable and fossil fuels uplifted on flights under the scope of the EU-ETS for aircraft operators. In the case of RFNBO, 95 % of the differential costs are covered. However, this mechanism is limited in both quantity (20 million allowances, approx. 1.5 billion €) and duration (from beginning of 2024 until end of 2030). Under the current design, this mechanism is fit to support uplifting SAF with an already liquid market but cannot provide the long-term support security necessary to facilitate the eSAF ramp-up, where no liquid market is established and long-term offtake agreements have to be in place to realize projects.

Because these allowances are currently pooled into a single “basket” on a first-come, first-served basis, there is a significant risk that the budget will be entirely exhausted by mature bio-SAF pathways before eSAF production reaches scale. This design leads to insecurity for industry stakeholders regarding whether support via the SAF Allowances/FEETS support will be available for new eSAF production. We therefore call for an **extension of the SAF allowances/FEETS support** within the 2028 review clause to make available further allowances until at least the proposed extension date of 31 December 2034 to support all SAF (optimally until 2040). Providing a sufficient volume of allowances for this extended duration is essential to give more security for long-term offtake contracts.

Additionally, there needs to be a **dedicated amount of SAF Allowances/FEETS support allocated solely towards eSAF as a part of an overall increase in the total amount of allowances under EU ETS**, in order to increase the transparency and plannability of this support mechanism for producers, investors and offtakers of eSAF. To ensure full utilization of the fund, any dedicated eSAF allowances that remain unallocated due to the market supply constraints should be made available to support bio-SAF on an annual basis. Optimally, eSAF should benefit from SAF Allowances for a duration that aligns with the length of long-term offtake agreements, providing support for market ramp-up and investment security. With a separation between SAF Allowances/FEETS support by fuel type, a redesign of the scheme would be possible to ensure that aircraft operators taking up fuels without an established market like eSAF can benefit from the SAF Allowances for longer, mirroring the longevity of the offtake contract. Redesigning the scheme in this manner, while retaining its first-come-first-serve principle, can encourage early eSAF offtake. However, the impact of these SAF allowances depends on the SAF offtaker to accept a higher fuel price in connection with the funding going to

As long as there is uncertainty about the scope and duration of the SAF allowances, they will not be able to live up to their potential. **Offtake incentives therefore have to be accompanied by financial support on the production side.**

European Hydrogen Bank and Innovation Fund

The EU Framework offers several funding possibilities for domestic eSAF production. Focusing on the two main pillars, the Innovation Fund provides grants for capital expenditure (CapEx), while the EU Hydrogen Bank aids with output-based 10-year annual operational support (OpEx) as fixed premium in €/kg. Both the European Hydrogen Bank as well as the Innovation Fund offer Member States to invest additional national funds – e.g. from EU ETS revenues – via the “Auction/Grant as a Service” scheme. These schemes give projects a chance of receiving funding that initially were not rewarded due to heavily over-subscribed funding calls while lowering the bureaucratic effort for Member States to support projects in their territory. Comparing these two schemes, it can be seen from projects having been awarded by the Innovation Fund that CapEx support has a limited impact on reaching FID. Instead, for eSAF producers, schemes like the Hydrogen Bank provide better support by lowering fuel prices and making eSAF more attractive to offtakers. However, the results from the [first Hydrogen bank auction](#) have shown that aviation offtakers are only able to pay a significantly lower price compared with e.g. the steel or chemical sector, meaning eFuel projects with aviation as their main offtake sector will likely submit higher bids and thus will be less competitive than projects targeting other sectors. In order to ensure that eSAF projects can benefit from the Hydrogen Bank, we recommend putting in place a **separate Hydrogen Bank funding window for aviation in the early ramp-up of eSAF production** as has been done for the maritime sector – starting with the upcoming third auction of the European Hydrogen Bank, which is planned to launch before the end of 2025.

H2Global

H2Global is Germany's import mechanism for green hydrogen and hydrogen derivatives. In a first step, the responsible organization Hintco conducts international auctions for 10-year offtake contracts to producers of green hydrogen and its derivatives, in a second step these volumes are auctioned in short-term contracts to end customers. **The two-sided auction mechanism thus pairs the most inexpensive RFNBO production with the highest willingness to pay while bridging the gap in favoured contract duration, with the price difference being offset by German subsidies.** This model demonstrates how an organized, two-sided auction can mobilize investment and ensure predictable supply for emerging renewable fuels. Therefore, incorporating a similar EU-wide mechanism with dedicated aviation windows would be highly beneficial, allowing eSAF producers and offtakers to secure long-term contracts, reduce market uncertainty, and accelerate the ramp-up of sustainable aviation fuels across Europe. Beyond this intermediary model, the framework should also evolve to support direct B2B contracts for difference, where the mechanism acts as a financial guarantor for private offtake agreements rather than the physical purchaser.

Outside the EU, various approaches to financial SAF support are being implemented. The US Inflation Reduction Act provides direct production-side support via tax credits, while the planned UK SAF Revenue Certainty Mechanism guarantees a minimum price per tonne of SAF through one-sided Contracts for Difference. If market prices fall below the agreed strike price, producers receive a top-up payment from the government; if prices exceed the threshold, they pay back the difference. While these mechanisms offer long-term price stability, they either fall under national jurisdiction (US) or lack a transparent market reference price (UK), complicating fair compensation in immature SAF markets. In contrast, H2Global's double-auction system demonstrates an efficient allocation of funds, combining investment certainty with market-driven efficiency.

From the perspective of the eFuel Alliance, the H2Global model presents significant benefits for eSAF integration into EU aviation. Its double-sided auction reduces the price gap between eSAF and fossil kerosene, lowering budgetary needs. It allows for demand aggregation and addresses time discrepancies in production and delivery, ensuring efficient, market-based allocation. Such a mechanism could be extended to both imports and domestic production, covering the scope of H2Global and the European Hydrogen Bank, while leveraging existing institutional expertise (CINEA, Hintco) and avoiding lengthy legislative procedures required for SAF allowance extensions.

The inclusion of double-sided auctions in the European Commission's Sustainable Transport Investment Plan demonstrates the practical viability of this approach. These auctions, combined with SAF Allowances and/or dedicated aviation windows within the European Hydrogen Bank, provide an effective framework to support eSAF production and offtake. Additional national measures, such as tax credits, can further complement EU-level support, provided they comply with cumulation and state aid rules. **However, several important lessons must be considered when designing and implementing a new funding mechanism. First, the current “wait-and-see” approach of many market actors could be further reinforced if a new mechanism is introduced without clear guidance. To counteract this, the European Commission should provide a well-defined roadmap with short-, medium-, and long-term support systems that incentivize early investment, production, and offtake of eSAF. Second, applying for funding often requires significant personnel and financial resources, which can pose a particular challenge for smaller companies. More lenient application criteria, coupled with comprehensive guidance, would help reduce these barriers and make support more accessible. Finally, the first eSAF tender under H2Global has shown that even substantial funding cannot compensate for overly restrictive regulations.**

eFuel Alliance

The eFuel Alliance is a stakeholder initiative committed to promoting the political and social acceptance of eFuels and to securing their regulatory approval. We represent more than 170 companies, associations and consumer organizations along the value chain of eFuel production. We stand for fair competition and a level-playing field for all relevant emission reduction solutions. We are clearly committed to more climate protection and aim to win broader recognition of the significant contribution eFuels can make in the drive for sustainability and climate protection. Our goal is to facilitate the industrial production and widespread use of carbon neutral fuels made from renewable energy sources.