Unlocking the Full Potential of the EU STIP

From Quotas to Markets: How the EU Sustainable Transport Investment Plan Can Enable the Ramp-Up of eSAF

PTX LAB PAPER

The European Union (EU) is racing to defossilise aviation and maritime transport, and the EU's €2.9 billion Sustainable Transport Investment Plan (STIP) sends an important signal that the transition is accelerating. The plan mobilises substantial resources and builds on proven instruments, yet key design elements still need to be integrated to unlock the full market potential of synthetic aviation fuel (eSAF), one of Europe's most promising climate solutions. Without targeted enhancements, many producers with the capacity to scale remain stalled at the starting line. The opportunity is significant: getting STIP right will not only determine whether 2030 quotas are met, but whether the EU secures its competitive position in the rapidly emerging global clean-fuels market.

Background

Complementing existing quota and other mechanisms in the aviation (ReFuelEU Aviation Regulation) and maritime sector (FuelEU Maritime Regulation) that aim to create market demand, the STIP marks a critical step toward building an actual functioning market for eSAF. To date, the paradigm that regulated demand would automatically create a viable market has not materialised. The current landscape is dominated by small to mid-sized developers driving innovation, while larger corporations, despite having the capital and capacity to scale, remain reluctant to enter the space, because of significant first mover disadvantages. This underscores the urgent need for robust and well-tailored financial instruments to support these smaller players and accelerate the creation of a competitive and scalable market environment that takes into account the existing market reality. In this regard, the STIP represents an important signal of political commitment, not only to achieving quota compliance, but to establishing one of aviation's and Maritime's most vital climate mitigation pathways. However, a closer look reveals room for improvement.

The EU's STIP proposes a €2.9 billion funding envelope to accelerate low-carbon aviation and maritime fuels. This funding will support other measures, such as the mandate under the ReFuelEU Aviation, especially the 2030 quotas for eSAF. Current SAF demand to 2030 is around 6.7 Mt of SAF (of which around 0.54 Mt must be eSAF). However, eSAF production costs (ca. €7,000/t) remain far above conventional jet fuel (ca. €1,000/t). Closing this "cost gap" is the central challenge for policy support.

The STIP's funding architecture builds largely on existing EU instruments and introduces one additional mechanism to complement them. It relies on: Innovation Fund project calls, a forthcoming Hydrogen Bank auction, InvestEU guarantees, Horizon R&D funding, plus a pilot double-sided auction for eSAF. Together these measure sum to €2.9 billion across air/maritime. For example, a 2025 Hydrogen Bank auction will allocate €300 million to SAF projects, InvestEU earmarks €2 billion (mostly as loan guarantees, to hedge risks of financing/investments), Horizon Europe offers research funding (e.g. ca. €133.5 million) and the planned pilot double-auction (in 2026) is set at €500 million for eSAF.

The STIP must demonstrate not only political commitment but also its capacity to serve as a catalyst for tangible effects. The proposed instruments are partially fit for purpose when it comes to enabling an effective market ramp-up. Their effectiveness, is however potentially constrained by limited funding, cannot yet be reliably assessed and must prove itself over time. Given the significant cost gap between eSAF and conventional aviation fuel, financial support mechanisms must be structured to provide sufficient long-term price coverage and accommodate the complex financing needs of first-mover projects, many of which require coordinated investment from multiple actors at just the right time to succeed.

Taking Stock of the STIP

A positive aspect of the STIP is its clear focus on the sectors where alternative fuels are most urgently needed, such as the hard-to-abate sectors of maritime transport and aviation. The plan provides an important framework, outlining how a €2.9 billion funding package is intended to help overcome the key barriers to market ramp-up. However, it must be noted that most of the instruments listed in the STIP already exist. Of the five mechanisms identified, four are long-established tools that have been in use for years, together accounting for €2.4 billion of the announced budget, including roughly €430 million earmarked for calls in 2025 and 2026. The only new measure is the double-sided auction, a long-requested mechanism by industry and policy experts, which is allocated €500 million for a pilot auction in 2026. What is truly new, therefore, is not the architecture most of the instruments themselves but the significantly increased funding volumes assigned to them, such as the additional €2 billion allocated to InvestEU. This influx of capital is an important gain for the general market, yet it also highlights that the core mechanisms rely on established designs whose effectiveness in fostering a viable e-SAF market remains limited. As a result, aside from the pilot double-sided auction, the STIP largely repackages existing tools rather than introducing fundamentally new approaches.

- Supplementing regulatory mechanisms for air and maritime with funding framework of €2.9 billion to meet market ramp-up obstacles.
- As SAF targets 2025-2029 are not at risk, the focus is especially on 2030 targets for eSAF.

Table 1: Funding mechanisms in the STIP and their budget.

Funding Mechanism	Future budget overall	Future budget next call	Status
Innovation Fund Call	-	-	Existing
Innovation Fund Hydrogen Auction	-	-	Existing
InvestEU	€2,000	-	Existing
Horizon Europe	-	2026: €133.5 million	Existing
Double-sided auction	-	2026: Atl least €500 million (only eSAF)	New

Assessment of STIP Funding Adequacy

A closer look at the objectives of the individual instruments reveals that roughly 70% of the STIP budget is earmarked for R&D and investment support. These measures are undoubtedly important for mobilising private capital, the €2 billion allocated to InvestEU, for example, plays a critical role as a de-risking tool for financing and investment. Horizon Europe likewise strengthens the EU's technological leadership and continues to expand its research and development base. By contrast, only three instruments, the Innovation Fund Call, the Innovation Fund Auction, and the double-sided auction, are explicitly designed to accelerate short-term market ramp-up and stimulate economic activity.

Table 2: Funding mechanisms in the STIP and focus of these mechanisms.

Funding Mechanism	Focus
Innovation Fund Call	Funding of ramp-up economic activity
Innovation Fund Hydrogen Auction	Funding of ramp-up economic activity
InvestEU	Support of investments
Horizon Europe	Funding of research and development
Double-sided auction	Funding of ramp-up economic activity

Roughly 70% of the €2.9 billion is earmarked for research, technology development and investment-grade guarantees. In practice only about €0.9 billion (ca. 30%) is directed at scaling up SAF supply. Even assuming this would be targeted entirely towards eSAF, with this spending, the cost gap is so wide that the current STIP budget covers only a small fraction of the needed financial demand. In short, the currently available funding falls short of what would be required to achieve cost parity or materially narrow the price gap with conventional aviation fuel for eSAF volumes mandated under the quota.

What remains missing is a coherent instrument, backed by sufficient funding, that is tailored to current market realities. With the appropriate design, the double-sided auction could fill this gap. However, it will be critical to ensure that this double-sided auction mechanism is supported by stable, long-term funding so it can operate over multiple years and continuously narrow the gap between the product price and the offtake demand price (see Figure 1).If successfully implemented and fit for purpose under prevailing market conditions (see CAPEX and OPEX funding), it has the potential to finance the eSAF volumes required to meet the mandate.

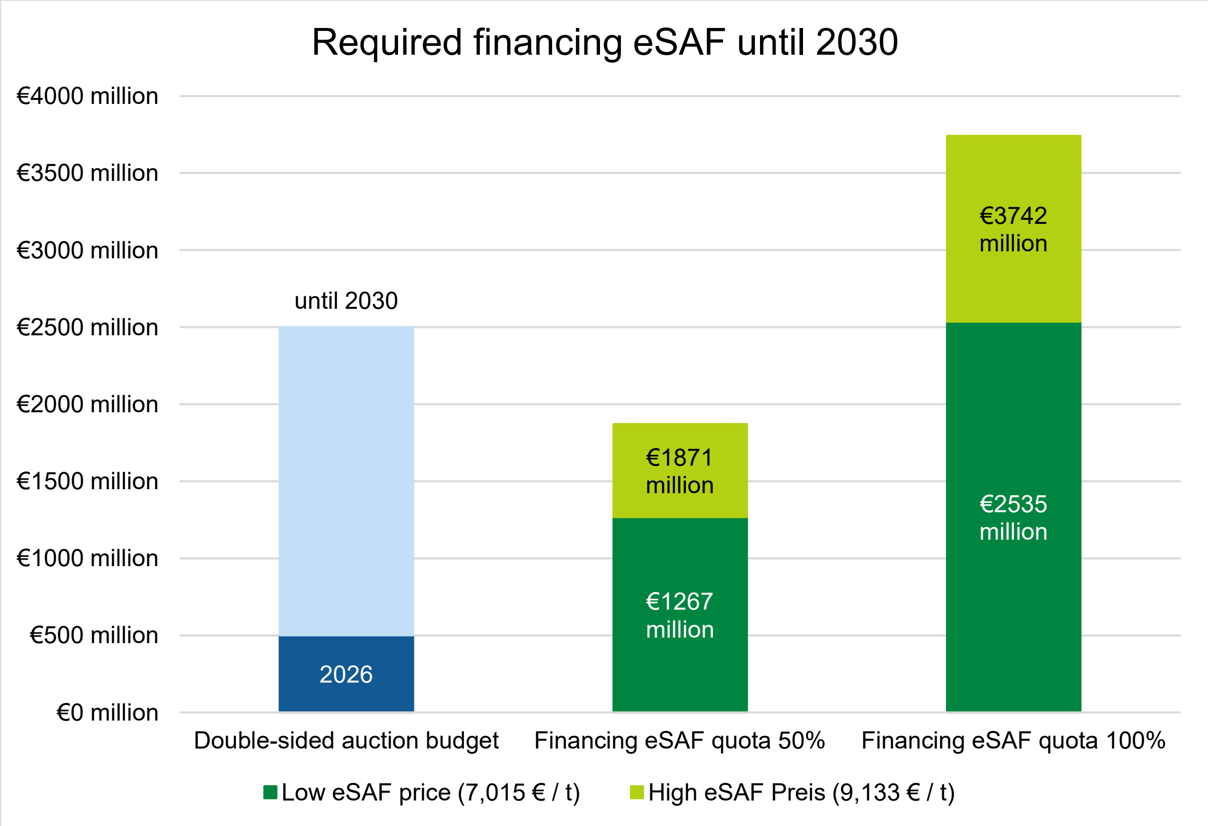

Figure 1: Budget of the double-sided Auction compared to eSAF price differences.

Gaps and Structural Shortcomings

The STIP instruments have several key limitations for eSAF scaling:

The Innovation Fund Call provides additional-cost funding, but this approach is not sufficient to achieve cost parity with conventional aviation fuel. The instrument ultimately leaves a substantial cost gap unaddressed.

- **Limited Cost Coverage:** The Innovation Fund Call covers only *additional costs* and is capped (e.g. 60% of the cost gap). In practice this means neither capital nor operating costs are fully funded.

Its partial payment before production reduces technology risk (project default risk) and improves bankability. This component is essential, as other instruments demonstrate how upfront costs without early partial payment can lead to hesitation and delayed action. If we look at the design of current double-sided auction mechanism such as H2 Global, certain elements can deter or make participation hesitant. This includes for instance initial fees and penalties (like for delay of commissioning) that apply before production even starts and funding is received. They increase the risk of financial losses, before any funding flows, thereby reducing bankability. Consequently, payment structures that provide support before production begins can play a crucial role in enhancing bankability and reducing financial risk.

- **Delayed and Milestone-Driven Payments:** Most other schemes reimburse costs after production or at project milestone and often only offer full disbursement after verification of output. There are *no provisions for upfront or early-stage funding* (pre-construction payments). This raises financing risks for first-of-a-kind plants, where investors face long lead times and technical uncertainties without assured cash-flow.

The Innovation Fund Auction offers full-cost funding, which is positive for financing, but its €4/kgH_2 price cap enables parity only with imports, not with CAF. Moreover, both the IF Call and IF Auction share a structural weakness: negotiations on contract terms occur only after award, creating a significant risk that funding may fail due to disagreements and add to the uncertainty of funding. This risks the delay of funding distribution or a failed funding effort. A challenge that H2Global partially avoids by finalising contractual details before bids are submitted and the award decision is finally made.

One unique advantage of the IF auction format, however, is the "auction-as-a-service" option, allowing Member States to add national budgets to EU calls, which is particularly valuable for projects in countries with high electricity costs. A mechanism that is widely used and accepted by countries. For example, Germany employs this service and has allocated €1.3 billion to the IF-25 Call to efficiently supply its core hydrogen network with renewable hydrogen.

The newly proposed double-sided auction provides full-cost funding, thereby enhancing bankability. It also strengthens offtake security by securing long-term offtake agreements through an intermediary and potentially covering accepted price and cost gaps on both sides, thereby reducing both price and offtake risks. However, as a newly established mechanism, it carries an inherent risk of implementation delays.

- **Offtake and Market Risk:** Except for the new double-sided auction, the STIP does not guarantee buyers for eSAF. Under current programs the producer must still secure commercial offtake (e.g. from airlines) on its own terms. This "merchant risk" is a major barrier: it deters banks and investors who see uncertain future demand. It is important to highlight that the double-sided auction is unique in that because it secures offtake for producers through an intermediary. Other existing tools lack such guaranteed offtake, leaving a critical gap.

Yet experience with H2Global shows that implementing such dual-auction systems can take considerable time: since its launch in 2022, only one supplier has secured a contract for 397 tonnes of sustainable ammonia in 2024, and buyer-side auctions have not yet begun. Evidence from H2Global also suggests the need for a sufficiently large tender volume, as indicated by the unsuccessful pilot lot of the eSAF double auction. Although a €300 million lot was put out to tender, the auction ended without an award because no final bids were submitted. The key reasons were legal uncertainties around regulatory requirements for eSAF production, as well as an insufficient tender volume and an offtake period that was too short relative to the required investment horizon.

Table 3: Key points of the funding mechanisms dedicated to the ramp-up of economic activity.

Points	Innovation Fund Call (IFC)	Innovation Fund Auction (IFA)	Doubel-sided auction
Funding object	Additional costs for 10 year (max. 60%)	Full costs for 10 years max. 4 €/kgH2	Full costs for 10-15 years
Supported value creation stage	Production		Production & Demand
Market risk/offtake responsibility	Beneficiary bears market risk; no guaranteed offtake		Guaranteed offtake through the intermediary
Subsidy payments	Partially, advance payments available prior to commissioning	Yes	Probably Yes

These gaps mean that project developers face a difficult combination of high costs, delayed funding, and market uncertainty. Neither the Innovation Fund nor Hydrogen Bank auctions address all these issues: the IFC is essentially a partial grant, and the IFA (Hydrogen Bank) pays only as-produced amounts with no early tranche or buyer guarantee.

Each of the existing instruments brings important strengths but also clear limitations, which is why a complementary support mechanism is needed to close these gaps and accelerate the eSAF market ramp-up.

Proposed Approach for CAPEX & OPEX Funding

It is essential to design a funding instrument that reflects current market realities and incorporates the elements required to unlock e-SAF deployment at scale. A CAPEX & OPEX funding would provide exactly this, as it directly addresses both the high upfront investment needs and the ongoing cost gap that producers face.

Such a design should include the following key features:

- **Full-Cost Coverage:** This ensures that both investment and operating expenses are supported, making the production of RFNBO-compliant e-SAF competitive with imports and, where necessary, even with conventional aviation fuel. Subsidies would be paid per tonne of eSAF produced, explicitly covering both capital and operating costs (not just the cost gap). (In practice, this means contracts or grants calibrated so that eSAF production becomes economically competitive).
- **Supported value-creation stage: Long-term production support.** Funding should cover up to 15 years of e-SAF production. This provides stability during the crucial transition toward a mature market and allows producers to plan with confidence.

- **Partial Up-Front Payments:** Providing an upfront tranche significantly improves bankability by easing CAPEX burdens, facilitating external financing, and reducing interest rate risks. A portion of the total subsidy would be paid before commercial operation (e.g. 30-50% upon reaching construction milestones). Early payments reduce financing risk, shorten payback periods, and encourage investment in first-of-kind projects. The remaining 50-70% would be paid per unit of verified production, ensuring accountability and performance.
- **Long-Term Offtake Guarantees:** The scheme could incorporate modelled offtake guarantees to de-risk sales.
- **Bidding process: Competitive, transparent, and performance-oriented.** Funding agreements should be awarded based on a scoring system that considers the volume-weighted bid price, the expected time to commissioning, and the security of e-SAF offtake. The total funding volume — calculated as *bid price* × *volume* × *funding period* — would then be divided into pre-production and production-linked payments.

Table 4: Design of the supplementary funding mechanism CAPEX & OPEX funding.

Design Element	Description
Funding Object	**Full costs** (CAPEX & OPEX) Sufficient for cost or price parity with imports and conventional aviation fuel
Supported value creation stage	Production of e-SAF (RFNBO-conformity) **of up to 15 years** Sufficient for transition in a then-existing market
Bidding process	**Competitive bidding** based on a score. Award criteria: Volume-weighted bid price, Time up to commissioning, Security of e-SAF purchase.
Payment mechanism	Allocation of the total budget: **30% before** production **70% during** production (payment per production unit) Increase bankability regarding CAPEX, external financing and interest rates.

By combining full-cost support with early payments and long-term certainty, a CAPEX & OPEX design would fill a crucial gap in the current landscape. It would give developers, especially first movers, the financial stability needed to build, operate, and scale e-SAF production in line with Europe's climate and energy ambitions.

Complementarity with Existing EU Programs and a good design

The proposed CAPEX/OPEX design would fit into the double-sided auctioning model and complement existing tools:

- **Innovation Fund Calls:** These remain crucial for R&D and technology demonstration, but their cost-sharing limits (ca. 60%) mean they cannot by themselves make projects viable
- **Innovation Fund Auction (Hydrogen Bank):** The new hydrogen auction (with an upcoming price cap of €4/kg H_2) offers full-cost support and long contracts, benefiting bankability. Yet as with IF, it only pays after production and requires separate supply agreements
- **H2Global:** The German H2Global pilot pioneered double auctions, but in practice concluded only one transaction by late 2025. The EU double sided auction can be seen as an evolution of H2Global.
- **Horizon and InvestEU:** These programs address broader R&D and financial risk but do not target eSAF volumes directly.

The double-sided auction model, in particular, offers a strong opportunity to integrate these essential funding design features. As a mechanism still in development and one that aligns closely with the logic of CAPEX & OPEX support, it provides a natural starting point for introducing a pre-production payment component that would significantly enhance bankability. Because the instrument is not yet finalized, there is a real window to design it in a way that addresses the eSAF market reality by:

1. To make the funding Full-Cost Coverage
2. Ensuring high subsidy budgets in the auction to actually kick-start production
3. Introducing partial upfront payments of the total funding budget to reduce financing risk and enable investment decisions; and
4. Implementing an “auction-as-a-service” option, allowing Member States to add national budgets and thereby support projects in countries with higher electricity costs.

With such enhancements, the double-sided auction could become a very powerful tool, but it must be launched more quickly and scaled up far beyond the pilot size to meet near-term needs.

What remains uncertain, however, is how quickly the double-sided auction can realistically be implemented. If it becomes apparent that the mechanism cannot be operationalised at the speed required, particularly given the tight timeline to meet the 2030 eSAF quotas and the roughly three-year construction period following final investment decision (FID), alternative solutions might be necessary.

One such option is the establishment of a national-level, independent support mechanism. This could be deployed far more rapidly and serve as a bridging instrument until the double-sided auction is fully functional. A national mechanism would however have no cross-border competition between projects and facilitate fast deployment.

Considering the potential drawbacks of a parallel or bridging design, it becomes evident that the EU-level mechanism cannot be deployed swiftly enough. As a result, national instruments may be indispensable to ensure that e-SAF production capacity is built in time to meet the 2030 targets.

The advantages of CAPEX/OPEX design are clear: it achieves **full-cost subsidy**, allows **front-loaded payments**, improves project bankability and lowers risk for first movers. By comparison, the Innovation Fund Call and Innovation Fund Auction provide only partial cost relief, and often only after commercial operation. A dedicated double auction design around CAPEX/OPEX funding could fill this gap.

Conclusion and Recommendations

The STIP is, at its core, a political instrument designed to showcase EU-level action in support of the e-SAF market ramp-up. It is a valuable political signal and provides substantial new money for sustainable fuels. But its current design leaves a clear financing gap for eSAF. Yet of the €2.9 billion announced, only about 30% is actually dedicated to large-scale fuel production, the very area where support is most urgently needed. With eSAF costs so high, this is insufficient to meet 2030 targets. The proposal to introduce a double-sided auction is therefore an encouraging development: it has the potential to provide long-term purchase guarantees and achieve cost parity through full-cost subsidies. However, significant uncertainties remain regarding how quickly this mechanism can be implemented and whether the process of matching suppliers and off takers might hinder the emergence of a competitive, functioning market.

To mitigate these risks, we propose two complementary approaches

1. **Fast-track and strengthen the double-sided auction**. The double-sided auction is a promising innovation (offering guaranteed offtake and full-cost subsidy), but it must be launched quickly and with ambitious size and be designed right. The double-sided auction should incorporate a pre-production payment component to enhance bankability, along with an "auction-as-a-service" feature to ensure fair access for projects across all Member States. It should include the necessary features mentioned previously for the CAPEX and OPEX design for funding. Moreover, financing must be provided on a continuous basis to cover the full volume required under the mandate.
2. **If the EU wide double-sided auction takes time** an interim measure should be introduced. A national CAPEX & OPEX funding scheme should be deployed rapidly as a bridging instrument, enabling first movers to proceed without delay while the EU-level auction is still under development.

These steps will ensure STIP delivers on its promise. By adjusting the funding mix, adding CAPEX/OPEX support and enhancing the auction design, policymakers can drive a sustainable ramp-up of eSAF, closing the cost gap and meeting Europe's climate goals.

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PtX Lab Lausitz – Think and Do Tank for Fuels and Basic Materials from Green Hydrogen
Calauer Straße 70, D-03048 Cottbus

Phone: +49 (0) 355 478 89-131
Email: PTX_Lab@z-u-g.org
Internet: www.ptxlablausitz.de/en

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The 'PtX Lab Lausitz – Think and Do Tank for Fuels and Basic Materials from Green Hydrogen' is developing the technical basis for the market ramp-up of environmentally compatible and sustainable production and utilisation of Power-to-X (PtX) products based on green hydrogen. Based in Cottbus (Brandenburg), the competence centre is a knowledge platform, source of inspiration and the partner of choice for business, government, research and the general public.

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