T&E Recommendations for the Sustainable Transport Investment Plan - Call for evidence

September 2025

Key messages

T&E welcomes the Sustainable Transport Investment Plan (STIP) as a key opportunity to unlock the urgently needed funding to decarbonise the transport sector and jumpstart reindustrialisation in Europe.

We particularly welcome the focus of STIP on e-fuels for aviation and shipping, which are the most urgently needed solution for the two sectors but are facing a complex financial outlook that only public funding can unlock until markets mature.

At the same time, STIP's focus on all modes of transport can provide an opportunity to clearly identify the technologies transport needs to decarbonise and direct EU efforts towards scaling up their sustainable production in Europe.

Our recommendations for STIP revolve around three main areas:

1. Unlocking e-fuels for aviation and shipping

- At a time when investments must be strategically prioritised, STIP should support aviation and shipping fuels that meet three core criteria of sustainability, scalability and sovereignty (made-in-EU) in the energy transition. E-fuels or Renewable Fuels of Non-Biological origin (RNFBOs) are the only fuel types that meet these criteria.
- E-fuels urgently need a Revenue Certainty Mechanism (RCM), whether in the form of double-sided auctions with a market intermediary or Contracts for Difference (CfDs). A well-designed RCM is paramount for the EU e-fuel projects to reach Final Investment Decisions (FIDs), in time to meet the goals of REFuelEU and FuelEU Maritime regulations.
- Earmarking 25% of shipping and aviation ETS revenues would provide sufficient support to green e-fuels production in Europe, with cumulatively €37 billion in carbon pricing revenues available for public investments between 2030 and 2039. STIP should provide such guidance to be operationalised through EU and national legislation.

- Public finance institutions like the EIB should be mobilised to clearly commit to supporting the creation of an EU e-fuels industry and use their full potential in terms of technical and financial assistance.

2. **Securing AFIF as a key tool for clean transport infrastructure**
   - The Alternative Fuels Infrastructure Facility (AFIF) has been an extremely important tool to roll out clean transport infrastructure. All modes of transport rely on AFIF to electrify or adopt hydrogen and e-fuels, but its last cut-off date is in March 2026, after which no more calls will be launched.

   - STIP must urgently provide EUR 1.5 billion to AFIF to continue operating until the end of MFF 2021-27, and it should call for its renewal under the MFF 2028-34 to complete the decarbonisation of TEN-T.

3. **Completing the electrification of TEN-T**
   - **For road transport,** although 80% of the TEN-T Core network is covered with ultra-fast charging stations, remaining gaps need to be filled as soon as possible. A continuation of AFIF calls is needed to support charging deployment in these less attractive regions.

   - **Support for Made in EU batteries**: STIP should secure Europe's battery industry in the short term while setting a clear mid- to long-term trajectory for a competitive, sustainable EU battery ecosystem. The immediate priority is launching the EU Battery Booster channeling emergency support (production aid) to help EU pioneers scale up. In the medium term, output-based support must be mainstreamed under the European Competitiveness Fund, backed by clear State aid guidelines covering capex and performance-based support to create a strong Made-in-EU business case.

   - **For rail transport**, STIP should look into ways of de-risking rolling stock projects following the spirit of InvestEU loans. Various options such as a small but dedicated call for rolling stock, a rolling stock bank or a European rolling stock company should be explored. STIP should also stress the need to harmonise rolling stock regulations across Europe to achieve a more interoperable fleet in a cost-effective way.

1. The urgent priority: e-fuels for aviation and shipping

As the call for evidence correctly assesses, the investments that need to be unlocked with the greatest urgency in transport are those related to e-fuels for aviation and shipping. T&E regularly monitors the market situation of e-fuels[1], and our latest assessments show that **while the EU remains a leader in the sector, the lack of Final Investment Decisions (FID) is favouring its competitors like China and the US**.[2] FIDs must come by 2026 at the latest for the EU to be able to meet the goals of REFuelEU and FuelEU Maritime with e-fuels that are both sustainable and scalable domestically in the EU.

In this section, we will define the specific challenges of aviation e-fuels (e-SAF) and shipping e-fuels, outlining the key measures the STIP can launch to provide an initial public support to the industry to unlock FIDs and crowd in private investment.

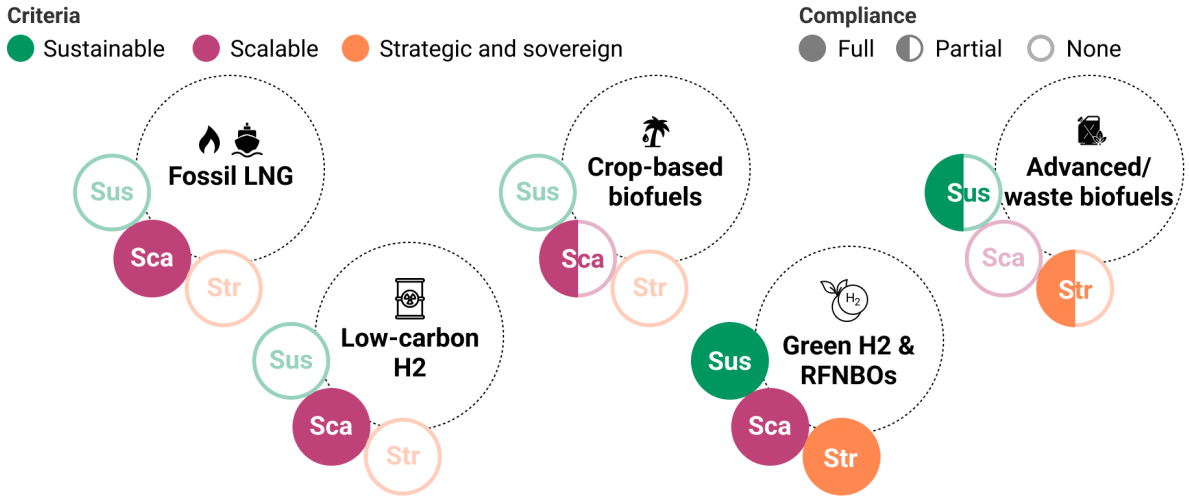
1.1. Scope: e-fuels should be prioritised

The technology neutrality principle cannot justify equal support for fuels with vastly different climate impacts, scalability and local production potential. At a time when investments must be strategically prioritised, the STIP should support aviation and shipping fuels that meet three core criteria in line with Competitiveness Compass:

- **Sustainable** - ensuring real emissions reductions across the entire lifecycle, avoiding harmful trade-offs, such as land use or food security impacts.
- **Scalable** - able to meet European shipping's and aviation's energy demand without technical supply constraints.
- **Strategic & Sovereign** - leveraging Europe's renewable energy potential and industrial capabilities to reduce reliance on imports and foster cross-sectoral innovation.

[1] For the latest updates see T&E's trackers for aviation e-fuels and shipping e-fuels
[2] See our latest studies on aviation e-fuels and shipping fuels

Only green e-fuels qualify for the EU Clean Industry goals and investment support



Source: T&E. The sustainability and and scalability criteria evaluate global fuel supply, and strategic & sovereign criteria looks at European production

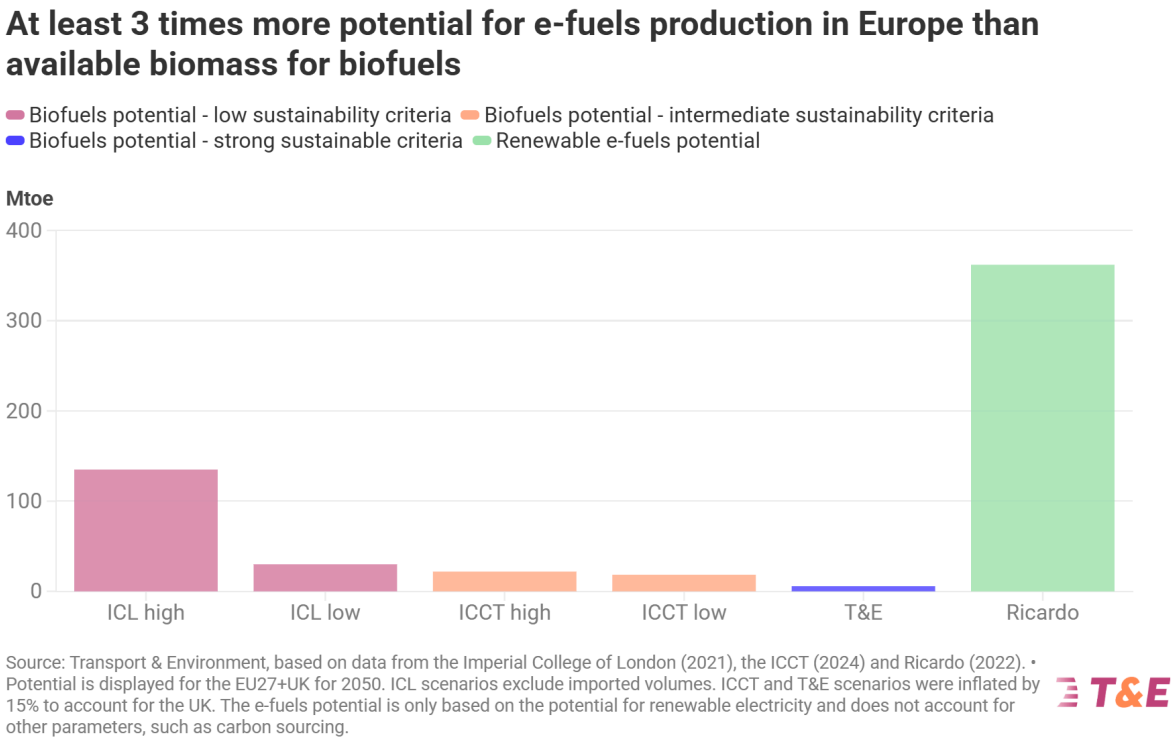
Fossil LNG and crop-based biofuels fail to meet these criteria. They risk prolonging Europe's energy dependence on imported fossil fuels and unsustainable and unscalable feedstocks.

Although **advanced biofuels** produced from certain European feedstocks can be sustainable, their limited feedstock availability makes them an unreliable choice for a competitive European industrial strategy where scale is essential.

Low-carbon hydrogen also falls short of Europe's clean energy and industrial objectives. Blue hydrogen, for example, depends on fossil gas and uncertain carbon capture performance, leaving Europe tied to methane imports and their associated risks.

Green hydrogen and its derivatives – such as e-ammonia and e-methanol for shipping, and e-kerosene (e-SAF) for aviation – are the only fuels that satisfy the criteria of sustainability, scalability, and sovereignty in Europe. A more detailed T&E analysis of maritime fuels and a breakdown of different e-fuels is available here.

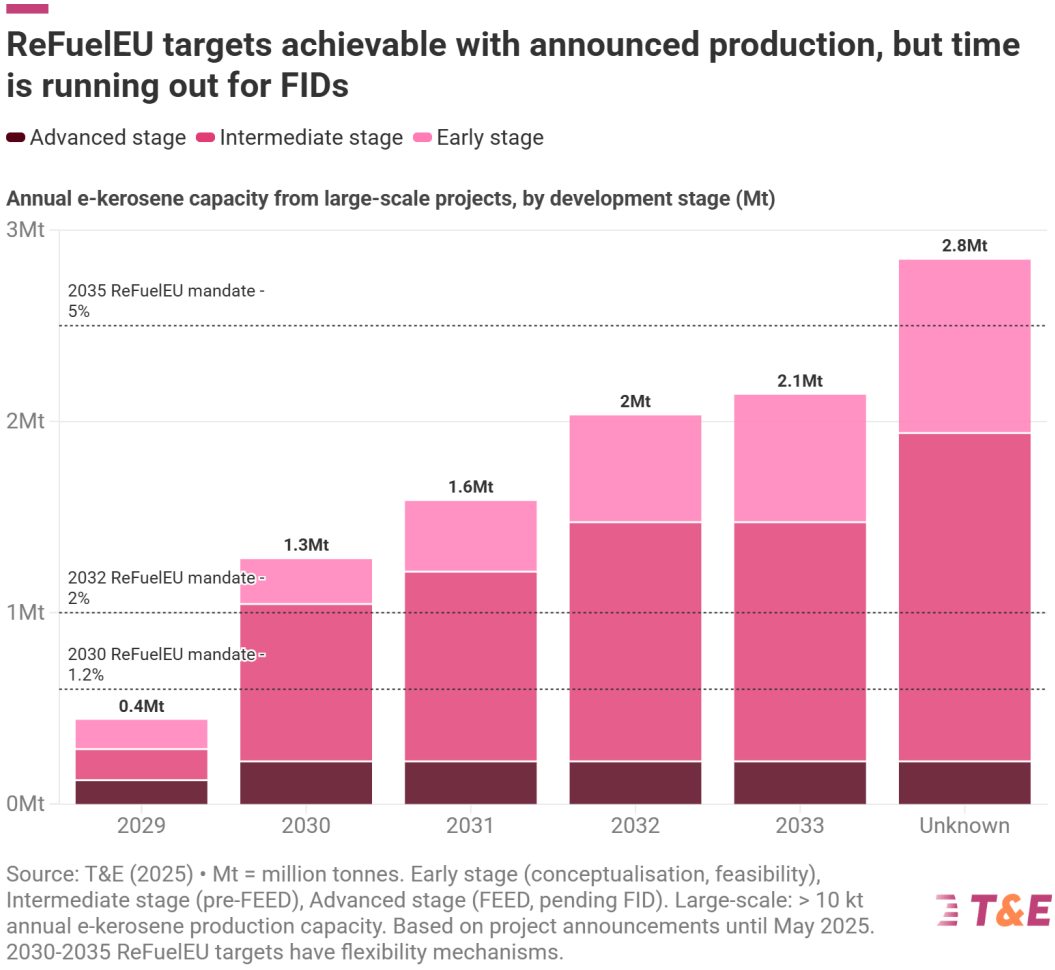
To align climate and industrial goals, **access to green fuels for shipping and aviation must go hand in hand with their local production**. Relying solely on imports risks replicating Europe's past energy dependencies, exposing the sector to supply disruptions, price volatility and sustainability uncertainties. In contrast, prioritising domestic production will enhance energy security, improve sustainability, and strengthen Europe's green industry (e.g. with a made-in-Europe criteria for e-fuels). It will also untap shipping and aviation's potential to help generate the cross-sectoral green energy demand essential for building the EU's green industrial base.



1.2. State of play: Europe's e-fuel lead is at risk as FIDs are lacking

Europe has the opportunity to position itself as a global leader in the emerging aviation and shipping e-fuels markets. ReFuelEU Aviation and FuelEU Maritime have created demand signals for e-fuels across aviation and shipping. These regulatory initiatives, combined with Europe's strong renewable power potential, early deployment of electrolyser manufacturing, and a rapidly growing pipeline of announced projects, have put the EU at the forefront of global e-fuel development. **Yet the lack of projects reaching FID in both the aviation and shipping markets threatens Europe's ability to turn its ambitions into reality.**

Aviation is a particularly telling case. Based on T&E's analysis, Europe accounts for around 50% of the world's announced e-kerosene production capacity, with **41 large-scale projects** representing a production potential of 2.8 Mt/year. If built, these plants would be sufficient to meet the 2030 and 2032 ReFuelEU sub-targets, **yet none have reached FID.**



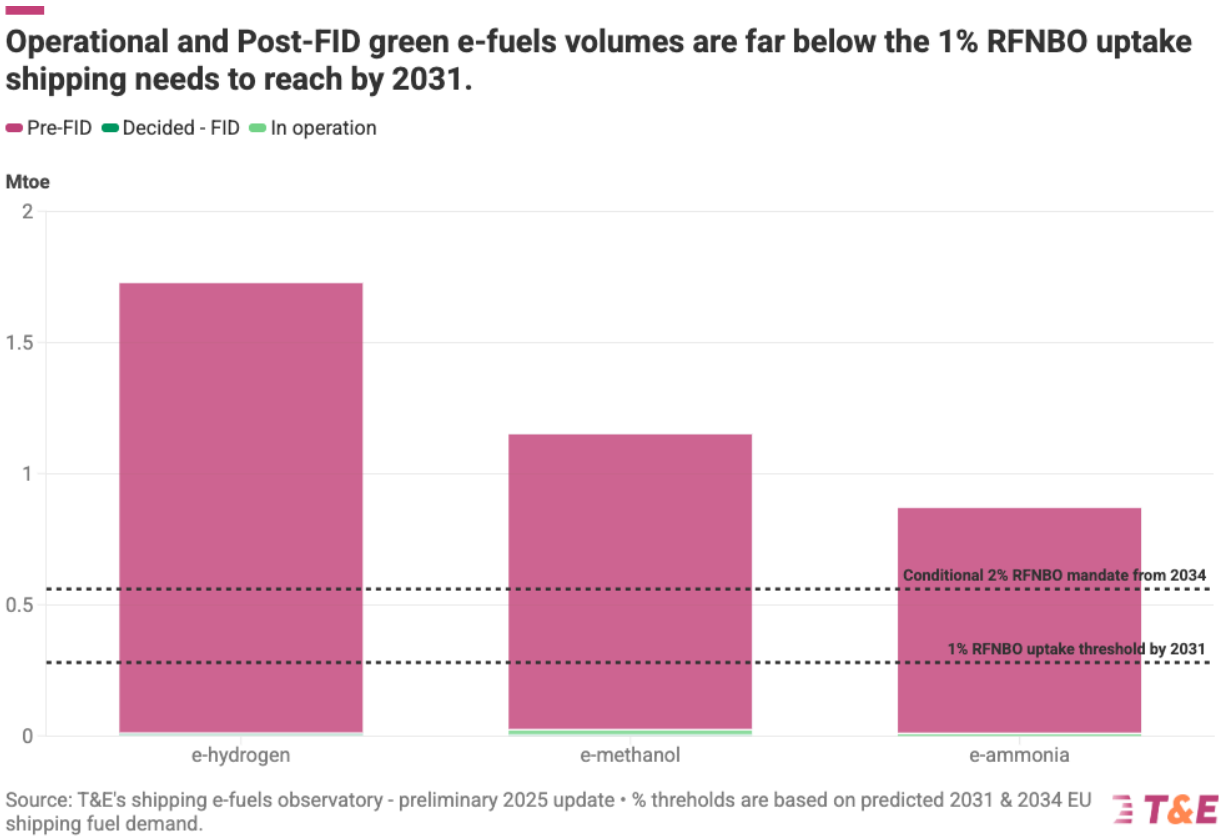
This stagnation contrasts with the biofuels market. According to EASA's report on the state of the EU SAF market in 2023, the 2030 bio-SAF target can realistically be met with biofuels through the established HEFA pathway. Current capacity, together with plants under construction and those that have already reached FID, is sufficient to meet the target. E-fuels, by comparison, are at a critical juncture: without targeted financial measures, many announced projects will not proceed, threatening the ability of the EU to meet its targets.

Meanwhile, international competition is accelerating. In the United States, Infinium was the first company in the world to reach FID for a large-scale plant. More than ten large-scale e-fuel projects are being developed across China, as shown in our analysis of the global e-SAF market (page 15 to 17). If the EU does not act quickly, it risks losing a major industrial opportunity (along with the jobs, supply chain development, ramp up of the green hydrogen economy and export potential it brings) and weakening its energy sovereignty and long-term competitiveness.

The development of the RFNBOs market for the **maritime** sector is also facing challenges. Minimal GHG reduction targets in FuelEU Maritime early years, combined with a small and

conditional RFNBO sub-target, fall short of providing market certainty. Preliminary results from the upcoming update of T&E's shipping e-fuels observatory show that **at least a third of e-fuels projects identified in 2024 appear to have been put on hold, abandoned, or diverted for other purposes**.[3] For example, the Megaton Project led by GreenGo in Denmark, which was aiming to produce 1 million tonnes or 2.87 Mtoe of green hydrogen by 2030, announced in May 2025 a shift from e-methanol to biomethanol in response to "the current reality".

While a couple of e-fuels projects with pilot-type electrolyser capacity (<=20 MW) and small-scale commercial (20-100 MW) have reached FID or started operating, 60% of industrial-size projects (>100-300 MW) are at pre-FID stage, while about 20% of the project developers have not disclosed at what stage their projects stand. Projects that have recently become operational, such as the European Energy's Kassø project in Denmark (52.5 MW electrolyser power capacity & 42,000 tonnes/year e-methanol), have secured long-term offtakers with Maersk, and **remain an exception**[4] in the current political context. In fact, green hydrogen or e-fuels projects that could benefit the maritime sector and that became operational in 2025 – such as BASF's H4Chem-El (54 MW electrolyser capacity) and Everfuel's HySynergy (20 MW electrolyser capacity) – will target first refineries, chemical plants, or road transport (e.g. buses).



[3] This is based on ongoing data research and final number could be higher.
[4] To our knowledge, this is the only project in Europe that has reached an FID with shipping as the main offtaker.

1.3. Barrier overview: why is the e-fuels market struggling to take off?

- **Financial barriers**

In the consultation document, **the Commission rightly identifies the high costs of e-fuels as a major hurdle.**

According to EASA, e-kerosene is estimated to be up to 10 times as expensive as fossil kerosene and 2-3 times as expensive as other types of SAF. Large-scale e-kerosene plants typically require €1–2 billion in capital expenditure, far beyond the capacity of most project developers, who are often start-ups without the balance sheets or credit ratings to secure such financing. Oil and gas majors, despite having the capital to act and a dominant position in the jet fuel market, have so far made little to no meaningful investment in e-SAF production (for more information on the profile of e-SAF project developers, see our analysis pp. 32-33).

Similar challenges are visible in the maritime sector: according to our estimates, Renewable Fuels of Non-Biological Origin (RFNBOs), such as e-ammonia or e-methanol, require around twenty times greater upfront capital expenditure than that of currently available waste oil biofuels, while RFNBO operational costs remain two to three times higher than bio-based marine fuels.

The high costs of e-fuels deter offtakers. Airlines and shipowners are reluctant to commit to decade-long contracts at today's prices, expecting that future production costs will decline, while many incumbent aviation fuel suppliers (who are subject to regulatory mandate) appear to be betting that the 2027 review of ReFuelEU will lead to a weakening of targets. In shipping, a fuel-neutral regulatory mechanism combined with a weak and conditional RFNBO subtarget makes the economics of RFNBOs unattractive to shipowners compared to cheaper bio-based fuels.

The result is a persistent "chicken-and-egg" problem: producers cannot commit without guaranteed demand, while offtakers hesitate to sign contracts until prices fall. Unless addressed, these dynamics threaten to stall the development of Europe's most strategic fuels.

Focus: why existing public funding mechanisms have so far failed to unlock FIDs in the aviation and shipping e-fuels market?

To overcome the financial barrier, targeted public de-risking support is required in the near term. The EU has acknowledged this by establishing the Innovation Fund (supporting CAPEX), the Hydrogen Bank (targeting OPEX), as well as a mechanism specific to aviation - the SAF allowances. However, these mechanisms appear inadequate to unlock large

investments in the first commercial-scale green marine and aviation e-fuel plants.

- The **Hydrogen Bank (H2B)**, largely funded through the EU Innovation Fund, was designed to support renewable hydrogen production through fixed premiums under competitive bidding. The goal was to reward the most cost-effective projects. However, given that the scheme design was not based on the "willingness to pay" gap, the **bidders were incentivised to understate their actual support needs to win, resulting in a "race to the bottom" on subsidy levels.** The first two H2B calls yielded average subsidies of respectively €0.45/kgH_2 and €0.63/kgH_2, far below the estimated production cost of €5–11/kgH_2. Such unrealistically low levels are unlikely to make projects bankable.

  The consequences are already visible. **Four projects representing more than one-third of the supported capacity (1.3 GW) have already withdrawn from the scheme,** either before or after signing a grant agreement with the EU. The reasons invoked vary (inability to meet the EU-set operational deadline, regulatory uncertainty, or securing more attractive national subsidies), but the trend points to a deeper structural problem: the support awarded doesn't appear to provide revenue certainty for the project developers.

  In its second round, the H2B introduced a €200 million maritime basket, which led to three successful e-fuel bids. While one project received €1.88/kgH_2, the volume-weighted average subsidy still came to only €0.66/kgH_2, again far below real costs.

  By contrast, **aviation has no dedicated call.** E-kerosene projects can apply to the general scheme, but the combination of very high upfront capital needs and the cost-efficiency criterion makes it almost impossible for them to compete. As a result, no e-SAF project has been awarded support in either the 2023 or 2024 auctions, and without reform, the upcoming third round in December 2025 is unlikely to change this.

- The **SAF allowances** (deployed under the ETS) are meant to bridge the price gap between SAF and conventional kerosene. While the mechanism could, in theory, provide a generous subsidy to airlines purchasing e-SAF (95% of the price gap covered, vs 50–70% for biofuels), it fails to support e-SAF deployment in practice. The main reason is that the scheme expires in 2030, whereas e-SAF is unlikely to reach the market before then. As a result, most of the 20 million allowances available (~€1.6 bn) will likely be absorbed by biofuels, as confirmed by several studies (e.g. Cerulogy report, p. 16). Moreover, the way allowances are distributed does not provide airlines with enough visibility on whether they will receive support for their use of SAF. This is because allowances are distributed ex-post (the airline

needs first to buy and use the SAF to receive the support), on an annual and first-come-first-served basis. As a result, the SAF allowances fail to unlock the long-term offtake agreements needed by project developers to de-risk their projects in the eyes of investors.

- The **European Investment Bank (EIB)** is supposed to support the policy goals of the EU, including those of REFuelEU and FuelEU Maritime. However, under its Climate Roadmap 2020-2025, maritime and aviation e-fuels were given only marginal attention and no specific focus. From 2021 to 2025, the EIB has supported only one e-SAF project, compared to six biofuels projects. While this can be explained by the EIB's tendency to finance more mature or lower-risk technologies, it should rather be prioritising fuels that have the best long-term potential for scalability.

- **Technical and supply-side barriers**

The Commission also cites concerns over "the availability and cost of energy and materials". Our analysis of the e-kerosene market confirms that high renewable electricity prices in the wholesale market and grid congestion and grid fees in some Member States are problematic, as is CO_2 availability. In the medium to long term, biogenic CO_2 sources will not be sufficient, making early deployment of direct air capture (DAC) essential. Apart from green hydrogen and e-ammonia, which don't require carbon in their production process, maritime e-fuels will face similar challenges.

Beyond inputs, **first-of-kind (FOAK) plants face delivery risks** such as construction delays, technical underperformance, and supplier under-delivery, all of which deter lenders and insurers even where the long-term economics appear to be sound.

- **Regulatory and structural barriers**

For a complete picture regarding aviation e-fuels, the problem definition should also reflect structural and competition issues in the jet fuel supply chain. IATA research shows that some fuel suppliers are passing compliance costs to airlines through inflated **"compliance fees" or SAF surcharges** instead of offering direct SAF supply contracts. In addition, as explained in T&E's report on the e-SAF market (page 37 to 39), in several Member States, **access to airport fuel farms and pipelines is controlled by incumbent suppliers,** limiting market entry for new SAF producers.

(Perceived) uncertainty around the 2027 review of the ReFuelEU Aviation mandate also weighs heavily on investors and offtaker confidence. Some fuel suppliers appear to be holding back on investing in e-SAF in the expectation that targets may be weakened.

The national implementation of penalties under ReFuelEU creates another layer of uncertainty. In principle, penalties should be set at least twice the price difference between SAF and

conventional kerosene, using the price references provided by EASA. The Commission's overview of Member State enforcement of ReFuelEU shows that, while most Member States are following that approach, very few have chosen to give penalties a clear, pre-determined monetary value. This lack of visibility diminishes investor confidence.

In the maritime sector, the upcoming **Net-Zero Framework at the International Maritime Organisation** (IMO) may lead to EU rules further reducing already inadequate demand incentives for the e-fuel project developers. This may lead shipowners, fuel producers, and port authorities to take a wait-and-see approach in their investment decisions, as they are wary of shifting compliance requirements and potential misalignment between EU and international regulations.

1.4. Guiding principles and recommendations

To ensure that the STIP delivers on its objectives, two key principles should guide the design of aviation and shipping measures:

- **E-fuels focus:** The solutions deployed under the STIP should match the prominence that e-fuels are given in the problem definition and key role in Europe's long-term competitiveness, ensuring that targeted measures are designed with their specific challenges in mind. Given their strategic value, current financing gap and the urgent need to bring projects to FID, **any public support deployed under the aviation- and shipping-related measures of the STIP should ideally be limited to e-fuels.**

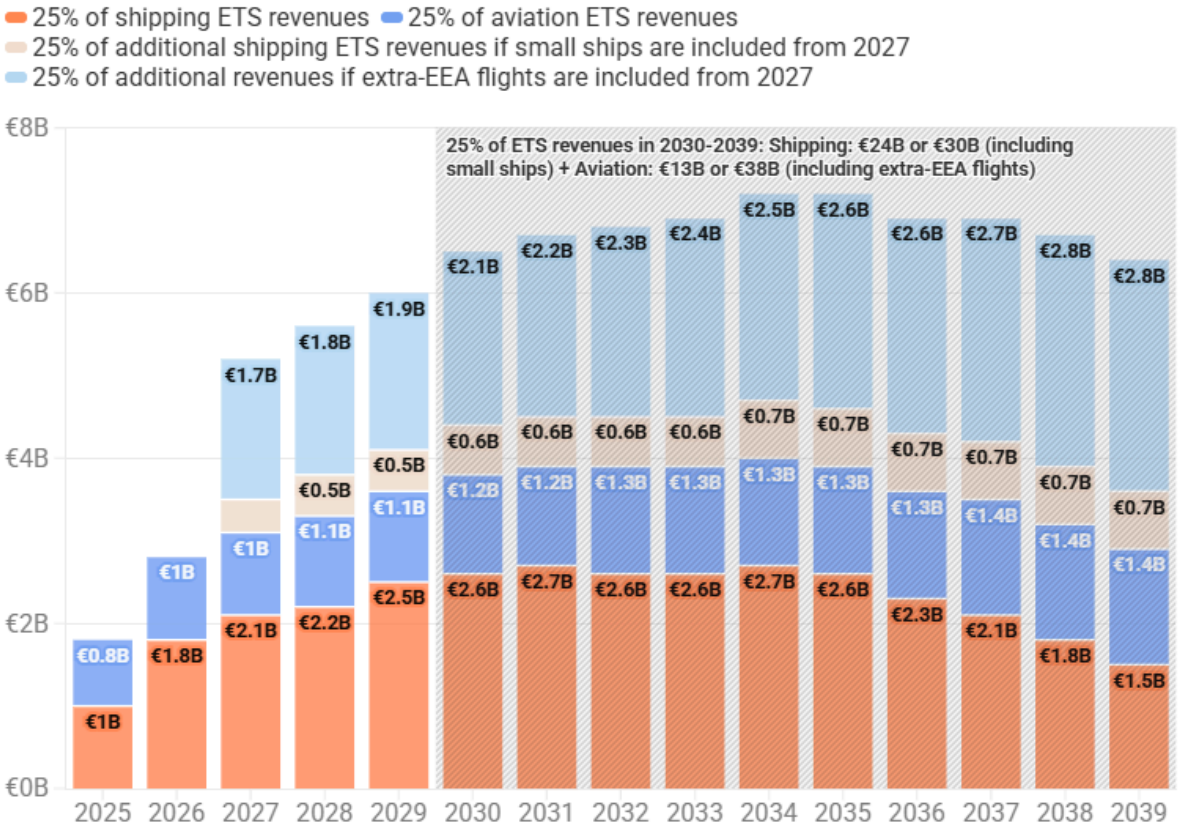
- **Polluter-pays principle - recycling ETS revenues to decarbonise aviation and shipping:** Applying the polluter-pays principle ensures that the costs of decarbonising aviation and shipping are borne by the sectors themselves, rather than by general taxpayers. The transition to e-fuels is costly, but Europe has the means to enable it:

    - The ETS Maritime will generate about €10 billion annually once fully phased in, or around €100 billion between 2030 and 2039, with revenues distributed to the Member States and the EU's Innovation Fund. If the scope is extended to cover smaller ships, on average additional €2.4 billion would be collected annually.
    - The ETS Aviation is projected to generate around €52 billion between 2030 and 2039, but substantial additional revenues are expected if the scope is extended to cover all flights departing from the EU (~ €152 billion). RefuelEU penalties could also provide additional revenues (see T&E briefing).

  While the lion's share of investment into RFNBOs will need to come from the private sector, in the short term, public funding must steer the market toward the fuels that align with Europe's industrial competitiveness, energy sovereignty and climate goals.

We recommend earmarking 25% of these ETS revenues to support green e-fuels production in Europe, which would represent a cumulative budget of **€24 billion for shipping** (€30 billion if the shipping ETS is extended to include small ships with less than 5,000 gross tonnage) and around **€13 billion for aviation** (€38 billion if the aviation ETS scope is extended to include extra-EEA flights) between 2030 and 2039.

25% of aviation and shipping ETS revenues could support aviation and shipping e-fuels production in Europe with €37 billion from 2030 to 2039



Source: T&E, based on own modelling and Ricardo (2024) • Small ships = <5,000 gross tonnage. Tenders and contracts would be awarded in 2027-28 and run from 2030 to 2039.

These budgets could support substantial volumes of e-fuels (see graph below). For example, for shipping, with a dedicated budget of €24 billion, at a subsidy level of 1,000 €/toe, 5 Mt of annual e-methanol production or 5.4 Mt of annual e-ammonia production could be supported over 10 years. This level of support would make marine e-fuels cost-competitive with biodiesel. If the ETS scope were extended to smaller ships, the additional ETS funds would allow funding an extra 0.6 Mtoe every year.

For e-SAF, IRA subsidies reach ~1,500 €/toe. Matching that level in the EU would already reduce costs significantly, but subsidies of at least €3,000/toe are needed to bring the cheapest e-kerosene to cost-parity with bio-SAF. At that level, a €13 billion budget would cover about 0.4 Mtoe of annual e-SAF capacity over 10 years — equivalent to two-thirds of the ReFuelEU 2030 target. Extending ETS Aviation would allow supporting more than 1 Mtoe of e-SAF (with subsidies of €3,000/toe).

In the graph below, *T&E highlights in green the volumes of e-fuels that can be supported under 10-year contracts if an adequate level of subsidy is applied, under different total budgets for aviation and shipping (corresponding to 25% of ETS revenues).*

25% of shipping and aviation ETS revenues could help fund long-term offtake agreements for shipping and aviation e-fuels projects in Europe

Supportable e-fuels production (Mtoe/yr) under 10-year contracts, based on total public funding availability (€B) and subsidy level (€/toe of e-fuel).

Fund at least 1 Mtoe/yr of shipping e-fuels capacity at an appropriate subsidy level

Fund at least 0.3 Mtoe/yr of e-SAF capacity at an appropriate subsidy level

Funding (€B)	500 €/toe of e-fuel	1000 €/toe of e-fuel	1500 €/toe of e-fuel	3000 €/toe of e-fuel	6000 €/toe of e-fuel
€38B (25% of extended-scope aviation ETS revenues from 2030-2039)	7.6 Mtoe/yr	3.8 Mtoe/yr	2.5 Mtoe/yr	1.3 Mtoe/yr	0.6 Mtoe/yr
€30B (25% of extended-scope shipping ETS revenues from 2030-2039)	6 Mtoe/yr	**3 Mtoe/yr**	**2 Mtoe/yr**	1 Mtoe/yr	0.5 Mtoe/yr
€24B (25% of shipping ETS revenues from 2030-2039)	4.8 Mtoe/yr	**2.4 Mtoe/yr**	**1.6 Mtoe/yr**	0.8 Mtoe/yr	0.4 Mtoe/yr
€13B (25% of aviation ETS revenues from 2030-2039)	2.6 Mtoe/yr	1.3 Mtoe/yr	0.9 Mtoe/yr	0.4 Mtoe/yr	0.2 Mtoe/yr

Source: T&E, inspired by Project SkyPower (2024) • toe = tonne of oil equivalent

1.4.1 Short-term financial support (2026)

Because large-scale e-fuel plants require at least 3–4 years between FID and commercial operation, waiting until 2028 to launch new support instruments would leave insufficient time to deliver volumes of e-fuels by 2030. This makes short-term financial support measures essential.

- **Aviation**

The STIP should make explicit the urgency of action: to meet the 2030 ReFuelEU target, FIDs for the first wave of large-scale e-fuel plants must be taken by the end of 2026. Current EU instruments offer limited short-term options for aviation e-fuels. The Innovation Fund and Hydrogen Bank have no aviation-specific envelopes, while the SAF allowances do not, in their current design, provide effective support (as explained in more details above).

Given these constraints, the most practical option is **to encourage and coordinate Member State contributions to a pooled funding mechanism such as H2Global**, with the aim of running **a pilot e-SAF auction operational in 2026.** This option is supported by a broad coalition of airlines and e-SAF producers (see joint letter). A pilot auction would provide a first demonstration of price discovery and unlock one or two pioneer projects without waiting for legislative changes.

Which funds? To fund such a pilot auction, Member States should in priority draw on existing or new tax revenues collected from aviation (e.g. ETS Aviation revenues). Member States could also draw on unspent grants from the Recovery and Resilience Facility (over €100 bn still undistributed), which would help them deliver on their National Recovery and Resilience Plans.

How much? For example, bringing in around €500 million for a pilot auction would be sufficient to support approximately 50,000 tonnes of e-SAF over ten years, assuming a subsidy level of ~€1,000/t. This would be equivalent to enabling one commercial-scale plant, thereby giving the EU a visible proof-of-concept at industrial scale.

- **Maritime**

For shipping, the short-term funding can be delivered through different but complementary mechanisms, depending on the preferences and implementation capacities of the EU and Member States:

1. One route is to channel Member States' (and potentially the EU's) maritime ETS resources as well as remaining Recovery and Resilience Facility funds into a pilot **H2Global-style auction for maritime fuels.** This would mirror the approach proposed for aviation, enabling early price discovery and project support without requiring legislative changes.
2. Alternatively (or in parallel), the EU could reform the Hydrogen Bank to make it a more effective delivery vehicle for maritime projects. Key improvements could include:

a. **Transitioning to a CfD-based model**, where producers bid the strike price needed to reach FID. This avoids the "race to the bottom" seen in fixed-premium auctions, enabling more realistic bids (see section 1.4.2).
b. **Introducing (conditional) binding offtake commitments in bids:** building on the existing H2B design, subsidies could be linked to binding purchase obligations once awarded. This would increase revenue certainty for producers, enhance project bankability, and allow offtakers to signal their true willingness to pay, potentially through higher, more accurate bids.

Both delivery models could be pursued independently or in combination, but the priority is to have **at least one functional support channel** operational by 2026 to unlock FIDs for the first generation of maritime e-fuel plants.

1.4.2 Mid- to long-term financial support (from 2027)

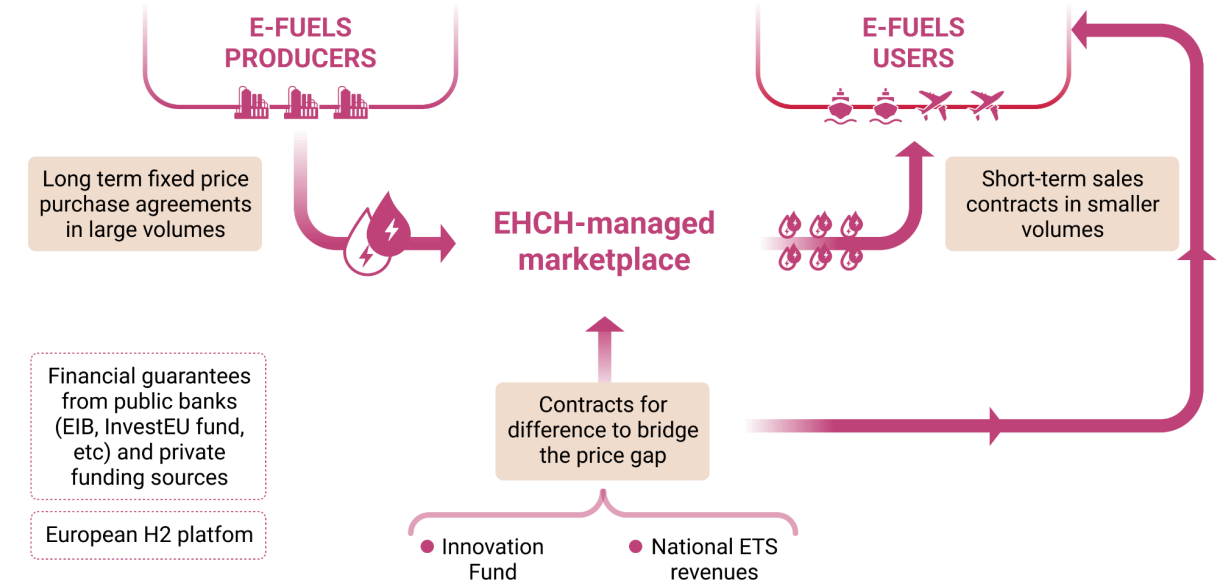
From 2027 onwards, using the opportunity of the revision of the EU ETS directive, new mechanisms or revisions to existing ones will be necessary.

- **Policy option #1: market intermediary with EU-backed double-sided auctions**

One option is to establish a **market intermediary** that would act as both a trader and an auction platform for aviation and maritime e-fuels. This entity would purchase fuel from producers under long-term contracts, providing the revenue certainty needed for project financing, and resell it through shorter-term contracts (3-5 years) to airlines/shipping companies and/or fuel suppliers, enabling them to manage their price risk.

Crucially, the intermediary would run **double-sided auctions (DSAs)** to match supply and demand competitively. Producers would bid for the minimum price at which they are willing to sell, while buyers would bid for the maximum price they are willing to pay. **The intermediary would cover the gap between these bids,** using its budget to ensure transactions can take place. This structure creates competitive pressure on both sides, narrows the price gap, reduces the subsidy requirement, and results in transparent price signals that can support the emergence of a liquid e-fuels market.

European Hydrogen Clearing House: igniting the e-fuels market



Source: T&E

Because the intermediary holds the long-term contracts with producers and the short-term sales contracts with buyers, it reduces counterparty risk for developers and provides flexibility to buyers who may be reluctant to lock in decade-long agreements.

How to set it up? If the H2Global pilot e-SAF auction proves successful, it could be scaled up at the EU level to launch two large e-fuels tenders in 2027/28, one targeting aviation and the other targeting maritime e-fuels, with funding sourced from ETS revenues.

There are concerns that a true market intermediary (i.e. trader) approach might not be suitable at the EU level due to legal constraints. Instead, the mechanism might have to operate only as a matchmaking platform: buyers and sellers submit bids into double-sided auctions, and the Commission bridging the gap between the bid price of the producer and the bid price of the offtaker. This implies that the contracting model of H2Global (long-term contracts with producers and short-term with the offtakers) might be affected, as the Commission might no longer be able to take on trading risks but only underwrite the difference between bids and offers.

How much? Estimating the subsidy needs of a double-sided auction mechanism for e-fuels is inherently challenging at this stage, as there is very limited visibility on the actual willingness to pay by airlines and shipowners. A pilot auction would help address this uncertainty, as it would provide first insights into how much offtakers are willing to pay for e-fuels in practice. Regardless, competitive dynamics on the demand side can be expected to drive demand side strike prices upwards, thereby reducing overall subsidy requirements.

- **Policy option #2: Contracts-for-Difference via one-sided auctions**

As an alternative, the Hydrogen Bank could be revised to offer **Contracts-for-Difference (CfDs)** to maritime and aviation e-fuels producers, similarly to the UK SAF Revenue Certainty Mechanism.

In this design, e-fuels producers would competitively bid strike prices, i.e. the minimum revenue per tonne they require to reach FID. Once awarded, the Hydrogen Bank would guarantee this revenue level by paying producers the difference whenever the actual offtake price falls below the strike, and requiring paybacks if market prices rise above it. Unlike in the market intermediary mechanism outlined above, under a CfD scheme, producers remain responsible for securing offtake agreements with shipowners, airlines or fuel suppliers, but the CfD removes revenue volatility by stabilising prices and ensures bankable cashflows by guaranteeing predictable income.

Unlike in the current Hydrogen Bank design, where producers bid a fixed subsidy level, producers would bid the minimum strike price reflecting the levelised cost of e-fuels (LCOX). This has the key advantage of avoiding the "race to the bottom" on subsidy levels. In fixed-premium auctions, bidders are incentivised to understate their actual support needs in order to win, often resulting in unrealistically low bids that jeopardise project delivery. By contrast, bidding on strike prices allows developers to reveal the true revenue levels they require to reach FID, with the CfD bridging the gap to actual market prices revealed through sales contracts. This improves the bankability of projects and increases the likelihood of real deployment.

A key challenge of the CfD scheme is the perverse incentive it creates on the demand side: producers are encouraged to offer their fuel at the lowest possible price to capture market share, knowing that the CfD will compensate for the gap up to the strike price. This risks inflating subsidy costs and undermining fair price discovery. To mitigate this, a **minimum market price floor** should be established, ensuring that offtakers contribute a baseline level to the cost of e-fuels and that public support only bridges the remaining gap.

Setting a market floor price in the absence of a transparent, liquid market is particularly delicate. Without reliable reference prices, any floor price runs the risk of being either too low, forcing excessive subsidy payments, or too high, deterring buyers and slowing uptake. Several approaches can be envisaged:

- **Anchor the floor price to existing reference fuels, such as conventional Jet A1 or marine fuel oil, or to biofuels.** This would likely translate into very high subsidy levels given the large cost gap with e-kerosene. For example, based on EASA's aviation fuel reference prices for 2024, the gap between average synthetic aviation fuel production costs and the aviation biofuel market price was around 6,000 €/t. If tied to biofuels, the floor price would also risk high volatility due to the uncertain feedstock availability and competition from other sectors.

- To mitigate the cost of the mechanism, **a tiered floor price mechanism** could be implemented where in the 1st phase, floor price would be equivalent to fossil fuels (e.g Jet A1 and VLSFO), encouraging entry at minimal risk; in phase 2, floor price would increase to the average HEFA/biodiesel market price and in phase 3 (applicable to shipping only, due to lack of fixed penalties in aviation), floor price would reflect the FuelEU penalty price, aligning subsidy with avoided compliance costs. This approach would track realistic cost benchmarks, ensuring a balance between project de-risking and affordability of the scheme.[5]

- **Set a hybrid floor price coupled with a subsidy**, where the floor price is tied to fuel oil, but the subsidy covers 60% of the cost gap (the top ceiling for public support used by the Innovation Fund in the past); alternatively, the maritime CfD could be tied to **fuel oil price plus a % of the FuelEU Maritime penalty**. Fuel oil price provides a liquid and transparent benchmark, while adding a share of the compliance penalty would bring the floor price closer to the avoided cost baseline for the and would reduce subsidy needs. This would not be suited for aviation due to the absence of a fixed penalty value.

- Floor price as **a fixed delta to strike prices.** For example, say the delta is set at 0.5 (meaning offtake prices cannot fall below 50% of the strike price), the resulting market floor price for e-SAF would likely be set at ~4,000€/t, leaving a gap of 3,000–4,000 €/t to be bridged by public support[6]. While this is a simple way to keep public support within a manageable range, determining the right level of delta is particularly delicate, as too high a floor jeopardises the ability of producers to find offtakers, while too low a floor risks locking in excessive subsidies.

- **Comparing CfDs and DSAs**

Criteria	Market Intermediary with Double-Sided Auctions (DSAs)	Contracts-for-Difference (CfDs) via one-sided auctions
1. Long-term revenue certainty	✔ Provides certainty through long-term purchase contracts with producers	✔ Provides certainty via guaranteed strike prices
2. Price risk management (demand side)	✔ Enables short-term (3–5 year) contracts for airlines/fuel suppliers	~ Can potentially reduce the need for long-term offtake agreements

[5] A tiered approach can be operationalised in a temporal sense, i.e. phases reflecting years of production, or in a volumetric sense, i.e. phases reflecting volumes of production.
[6] Assuming an average strike price of 7,695 €/t in line with EASA's production cost estimates (2024).

3. Public capital use optimisation and predictability	✔ Competitive bidding on both supply and demand minimises subsidy needs ~ Costs are hard to predict as offtaker's willingness to pay is unknown *	✘ No demand-side competition → risk of oversubsidising ✔ But ceiling and floor prices make costs more manageable;
4. Market transparency & liquidity	✔ Both purchase & sales prices are published, supporting a liquid market	~ Weaker price discovery *
5. Ease of implementation, precedents and reliability	✘ More complex to design/administer (two-sided auctions); ✘ Disparity between the UK and EU systems; ✘ Limited deployment experience and success to date	✔ Simpler, tested instrument, especially at the national level; ✘ but still administratively challenging (e.g. setting market floor); ✔ Alignment with the UK RCM system for SAF; ✔ Already effectively applied to other low-carbon energy sectors, such as wind power
6. Legal feasibility	~ Legally challenging as the EU cannot act as a market participant or trader → need to use external entities *	✔ Legally feasible; well-established precedents under EU and national law

* *Caveat: This comparison intends to focus on the inherent features of the two approaches, but several of the differences ultimately depend on how schemes are designed. For example, the weaker price discovery often associated with CfDs can be mitigated through appropriate terms and conditions, while the cost predictability challenges of DSAs can be addressed through the introduction of ceiling and floor prices. Similarly, while H2 Global is a concrete case of a market intermediary with DSAs, its current design includes features such as high non-delivery penalties and strict maturity requirements that restrict participation, as well as very high capitalisation requirements. These are adjustable elements of design rather than intrinsic characteristics of the model, and have therefore been set aside in this comparison.*

Overall, both options come with trade-offs. Double-sided auctions with a market intermediary are, in theory, better suited to minimise public subsidy needs, since competitive pressure on both producers and buyers helps minimise subsidy needs. In contrast, CfDs offer a less administratively complex option but risks having higher expenditures due to the absence of demand-side competition; however, this can be mitigated through a market floor price, which

also has the benefit of making subsidy requirements more predictable than under DSAs, where limited visibility on offtakers' willingness to pay creates uncertainty.

Beyond cost optimisation, the additional benefits of double-sided auctions are less conclusive. While they are often presented as more effective in fostering market liquidity (thanks to the publication of both purchase and sales prices), CfDs can also be designed to ensure transparency on the demand side.

Moreover, CfDs are already a well-established and proven instrument, whereas market intermediaries running double-sided auctions have only limited practical experience and success to date. DSAs also tend to be more administratively demanding than one-sided CfDs, and establishing a market intermediary raises legal complexities, given that the EU cannot act as a market trader.

Debates over the relative merits of CfDs and double-sided auctions should not distract from the core issue: **without a strong revenue certainty mechanism, aviation and maritime e-fuels will not scale.** T&E strongly supports moving forward with a reliable scheme without delay.

Focus: What to do with the SAF allowances?

As the SAF allowances are set to expire in 2030, their future is under discussion. While they have the advantage of being a relatively simple and straightforward mechanism, they cannot compete with double-sided auctions or CfDs when it comes to bringing projects to FID, especially in their current design: they fail to provide producers with revenue certainty (due to ex-post allocation) and do not eliminate the need for long-term contracts. Moreover, prolonging them beyond 2030 would reduce ETS revenues available to fund other schemes in place to support the sector, whether CfDs or DSAs. To maximise the impact of available resources and avoid the inefficiencies of overlapping schemes, **T&E considers it preferable not to extend the SAF allowances – at least not in their current form – beyond 2030, and to focus support on a single, well-designed revenue certainty mechanism instead.**

However, *if* the SAF allowances were maintained and extended, then several reforms would be needed to make the scheme effective for e-SAF:

- **Extend the mechanism beyond 2030**, e.g. until 2034 as a first step, with a review before deciding on further prolongation. This ensures e-SAF can actually benefit from the scheme once it reaches commercial scale.

- **Exclude HEFA SAF** from eligibility, as it is already mature and enjoys a much lower green premium compared to e-fuels.

- **Create a dedicated e-SAF basket** within the allowances to ensure part of the budget is earmarked for synthetic fuels rather than absorbed by biofuels.

- **Lower the coverage rate from 95% to ~50% for e-SAF** (and 30% for advanced biofuels). At the current premium (~€7,000/t), this would bring subsidies down from ~€6,600/t to ~€3,500/t and enable twice as many volumes to be supported. For example, if 12 million "e-SAF allowances" are made available from 2030 to 2034 (~ €1 billion), around 60 kt/year, or 10% of the 2030-31 mandate, could be supported, compared to 5% with the current level of support.

- **Allow airlines to book allowances in advance** based on signed long-term offtake agreements, instead of ex-post annual allocation. This would give airlines certainty that they can benefit from the allowances over at least part of the duration of their contracts and therefore make the mechanism more efficient in bringing airlines to sign long-term offtake agreements.

- **The role of public finance institutions**

Public finance institutions, particularly the European Investment Bank, have a key role to play in providing targeted project de-risking instruments, such as guarantees covering construction delays or initial operational performance risks for First-Of-A-Kind plants.

In a recent study T&E has shown that the EIB's support for e-fuels between 2021-24 was extremely limited, with only a handful of projects approved and a major project being withdrawn after approval. The table below provides an overview.

	Approved on	E-fuel	Country	Total cost	EIB contribution
JT BIOMASS METHANOL	2025	Methanol (shipping)	Spain	€893.000.000	€445.000.000
INERATEC	2024	E-kerosene (aviation)	Germany	€108.000.000	€40.000.000
BLUE WORLD	2024	Methanol engine (shipping)	Denmark	€63.000.000	€25.000.000
REN-GAS	2024	E-methane (road)	Finland	€924.000.000	€231.000.000
FlagshipONE	2022 (terminated)	Methanol (shipping)	Sweden	N/A	€420.000.000

Source: https://www.eib.org/en/projects/all/index

Despite its limited involvement to date, the EIB has acknowledged the importance of accelerating the scale-up of e-fuels. In a 2024 report, the EIB identified the financial challenges facing the alternative fuels sector and outlined several public funding solutions - from CfDs and double-sided auctions to loans and guarantees.

The STIP should take stock of these proposals and clearly identify a role for the EIB in the scaling-up of the e-fuels industry in Europe. While the EIB cannot run all the types of solutions we envisaged in this contribution, its technical and financial expertise coupled with its investment firepower can provide critical support to e-fuels projects in parallel with the other instruments we identified.

2. Retaining AFIF as a key tool to deploy clean transport infrastructure

The Alternative Fuels Infrastructure Facility (AFIF) under the Connecting Europe Facility - Transport has been a key instrument in the last years to unroll alternative fuels like electricity, hydrogen and e-fuels across the TEN-T network.

AFIF is an instrument that supports all modes of transport, from charging points for EVs to Onshore Power Supplies (OPS) and e-fuels bunkering for shipping to the electrification of airports. All of these investments are extremely important to decarbonise their respective modes of transport and need to be continued until clean infrastructure becomes the norm in Europe.

The final cut-off of AFIF in March 2026 creates a looming funding gap for 2026–2027, which risks stalling infrastructure deployment during a critical phase of uptake. **The EU must urgently secure €1.25 billion to bridge this gap until the next MFF**, ideally through remaining funds in existing instruments like the Recovery and Resilience Facility (RRF), European Regional Development Funds (ERDF) or the Cohesion Fund (CF), to maintain progress toward the 2025 and 2030 AFIR goals.

In the post-2027 period, AFIF should be explicitly included into the future MFF under the Connecting Europe Facility Transport (CEF-T), which is not the case under the July 2025 MFF proposal from the European Commission.

3. Road and rail: completing the electrification of TEN-T

3.1 Road transport (Light Duty Vehicles & Heavy Duty Vehicles)

The STIP is a critical opportunity to close the remaining LDV charging gaps along the TEN-T network, deploy HDV charging along the TEN-T, and strengthen the LDV network where needed (urban nodes, large stations along the TEN-T). Funding schemes should prioritise gaps and future needs, e.g. provide reduced or no funding for more profitable locations and increased funding for less profitable locations.

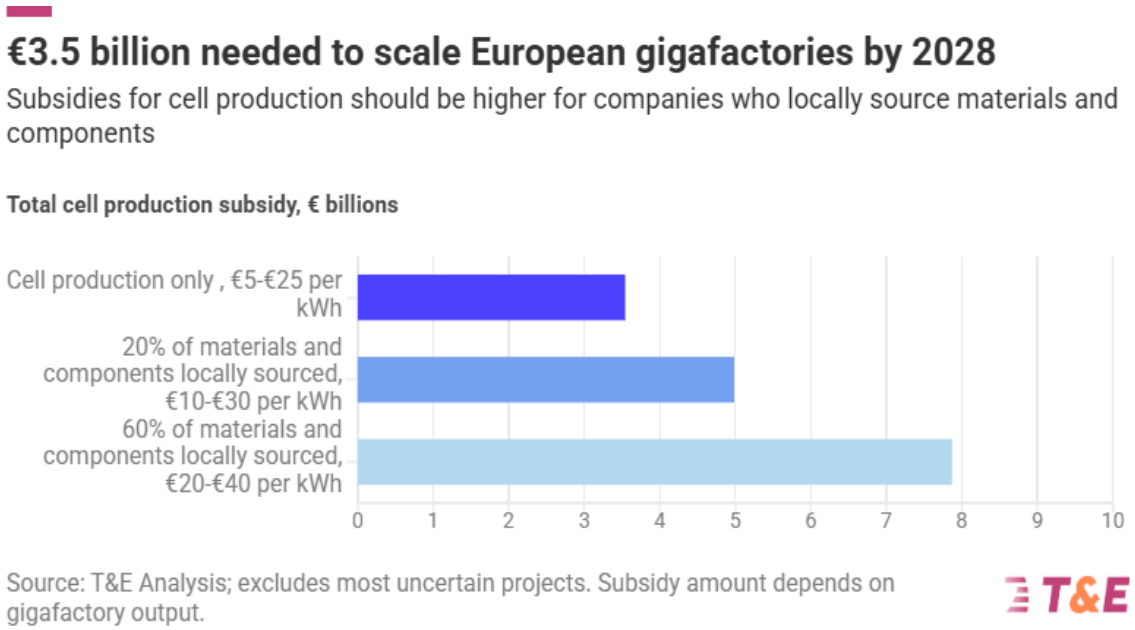
The EU should make use of existing EU-funding mechanisms, notably AFIF, and further mobilise the InvestEU to provide sufficient public funding. **In addition, T&E proposes the creation of an EU-level low-price electric vehicle platform ('Affordable EV Platform'),** to accelerate the transition to electric vehicles in a socially inclusive and industrially competitive way. The platform would: 1) boost demand for compact made-in-Europe EVs, and 2) help EU member states design support schemes by aggregating demand for and supply of affordable electric vehicles made in the EU. The STIP could propose this initiative as a critical moment for the scale-up of the EU's EV market.

More attention is also needed for trucks and other HDV that require high-power charging points. Under AFIR, a total of more than 20,000 recharging points dedicated for HDV along TEN-T is mandated until 2030. Beyond AFIF, additional efforts will be required to those targets for dedicated HDV recharging infrastructure. The roll-out of HDV charging points must move beyond a one-size fits all approach but prioritize locations in light of HGV traffic flows. This requires more transparency on grid use and projected demand from electric transport operations.

Alongside grid upgrades, special attention should be devoted to private and semi-private charging rollout. Depot charging is especially critical for regional freight transport, as most trucks return to the depot at the end of the day and can be charged there overnight. Despite its central role, depot charging currently lacks adequate EU and Member State support, as well as a stronger framework to accelerate its deployment.

Finally, the STIP should design a pathway for the future of the EU battery ecosystem. The EU's battery industry is at a critical juncture. While EU start-ups have the technology and scale to compete globally, they face the "valley of death" between R&D and mass production – a stage where Asia is years ahead and Europe lacks policy support. Without time-limited, output-based

production aid, these companies risk collapse before they can reach commercial scale. The upcoming Battery Booster is the key opportunity to bridge this gap, through an EU-level instrument that reallocates existing funds (e.g. €1.8bn under the Innovation Fund's battery package) and provides temporary per-kWh production aid until factories reach scale.



Beyond short-term survival, the STIP should lay the groundwork for a longer-term framework. This means embedding production aid under the next MFF (European Competitiveness Fund), complemented by State aid guidelines that allow Member States to deploy the full toolbox (capex, and performance-based support). By establishing clear sectoral guidance, the EU can ensure consistent rules for manufacturers, attract private capital, and prevent further investment leakage to the US or Asia.

Finally, STIP should chart the mid- to long-term industrial strategy to make Europe a competitive and sustainable battery hub. This includes:

- incentivising Made in EU content in all EU funding programmes,
- phasing in requirements for local value-add;
- rewarding Europe's lower-carbon electricity grid to create a competitive advantage;
- tightening FDI rules to ensure foreign entrants bring real technology and skills transfer rather than just assembly capacity.

Together, the Battery Booster and STIP can deliver both the urgent lifeline for Europe's battery pioneers and the structural policies needed to build a resilient, competitive, and sustainable battery ecosystem.

3.2 Rail transport

The Commission's 2021 action plan on long-distance and cross-border rail primarily relied on the EIB to resolve rolling stock scarcity**. But the EIB is only able to support large-scale projects with a strong financial backing**, which negatively affects smaller ones, including night trains. The STIP should look into ways of **de-risking rolling stock projects** following the spirit of InvestEU loans, with either a **small but dedicated call** for interoperable rolling stock, the establishment of a **rolling stock bank** or a **European Rolling Stock Company** (ROSCO).

A European Rolling Stock Bank would provide a combination of loans and financial guarantees in order to attract private investment by de-risking the ventures of new entrants. Alternatively, a European Rolling Stock Company would be able to lease trains to operators for key cross-border routes. At the same time, the Commission and the European Union Agency for Railways (ERA) should accelerate their efforts to **harmonise rolling stock regulations** across Europe to achieve a more interoperable fleet in a cost-effective way.

Further information

Lorenzo Manca
Sustainable Finance Officer
Transport & Environment
lorenzo.manca@transportenvironment.org
Mobile: +32 (0) 492 572 946