Engineered by:

Hinicio

Prepared for:

GENVIA

AIRBUS

Competitive eSAF with SOEC technology

Coupling high temperature electrolysis with eFuel processes to foster aviation decarbonization

NOVEMBER 2025

Executive summary

The urgency

Sustainable aviation fuel (SAF) is essential to decarbonize aviation, but bioSAF alone cannot meet long-term demand. **By 2035, eSAF will become indispensable as regulation pushes for synthetic eSAF mandates, and bio-feedstocks reach saturation. Cost remains the primary barrier for eSAF deployment,** with current prices far from the fossil-based and even advanced biofuel equivalent. Electrolyser electricity consumption and eFuel plant hydrogen efficiency are key cost drivers in eSAF production. New technology bricks capable of reducing costs must be integrated now to impact projects reaching FID by 2035.

The opportunity

Solid oxide electrolysis (SOEC) offers a direct path to lower eSAF costs through more efficient hydrogen and syngas production, **significantly reducing electricity needs** — provided CAPEX remains within a competitive range. **SOEC enables thermal integration with downstream synthesis units, improving overall energy performance**. Our analysis shows by 2035 SOEC can lower the levelized cost of eSAF. **Early movers can future-proof their eSAF projects by including SOEC as a strategic option** in their design, while securing a long-term competitive edge and shaping supportive policies to their advantage.

The challenge

SOEC is not yet deployed at scale in Power-to-Liquid (PtL) applications; current findings combine modelling, theoretical analysis, and demonstration projects for similar applications. Project developers often lack the data or tools to assess full-plant heat integration and its impact on costs. For first movers keen to invest, uncertainty around policy frameworks and incentives can lead to hesitation. **The perceived overcomplexity or immaturity of SOEC may deter some risk-averse stakeholders, especially financing institutions**. Current funding programs may not always adequately reward plant-wide energy efficiency improvements.

The enablers

Early integration of SOEC in eSAF projects can accelerate learning and derisk scale-up. Targeted public support for pilot projects can help close the gap between promising models and commercial uptake. Design-phase tools and guidelines should highlight process performance, not just component benchmarks. **Shared understanding among stakeholders of a credible cost-reduction pathway — combining SOEC efficiency gains with advances in plant design, low-cost electricity, and financing — is a compelling argument for regulatory and industrial alignment**. Cross-sector collaboration of electrolyser OEMs, fuel synthesis tech providers, and aviation players is essential to validate the full process.

Contents

The urgency

Why SAF needs synthetic solutions

Decarbonizing aviation demands a scalable, long-term solution beyond bio-based Sustainable Aviation Fuels[1] (SAF), which face feedstock limitations. Multiple analyses show the availability of sustainable biomass cannot meet the projected long-term demand globally, making a shift to alternatives vital. In response, regulators worldwide — including the EU with its ReFuelEU Aviation mandate[2] — are driving a strategic move toward synthetic aviation fuels (eSAF). These policies aim to create guaranteed demand but face the challenge of eSAF's prohibitively high production costs.

What is a eSAF?

Electro-synthetic aviation fuel (eSAF) — also known as Power-to-Liquid (PtL) fuel, synthetic fuel, or e-fuel — is **produced by combining captured CO_2** with **hydrogen** of renewable or low-carbon origin.

Hydrogen production:

- Renewable hydrogen ("green" hydrogen, or RFNBO hydrogen as per EU's Renewable Energy Directive) is generated via water electrolysis powered by renewable electricity (wind, solar, hydro, etc.).
- Low-carbon hydrogen can be produced via water electrolysis powered by nuclear power or from fossil natural gas reforming with CO_2 capture and storage (CCS).

CO_2 sourcing:

- Point-source capture from industrial processes (fossil-based or biogenic emissions).
- Direct Air Capture (DAC), extracting CO_2 directly from the atmosphere.

Fuel synthesis:

- Hydrogen and CO_2 are combined through chemical pathways — such as Fischer–Tropsch or Methanol-To-Jet — to produce liquid hydrocarbons fully compatible.

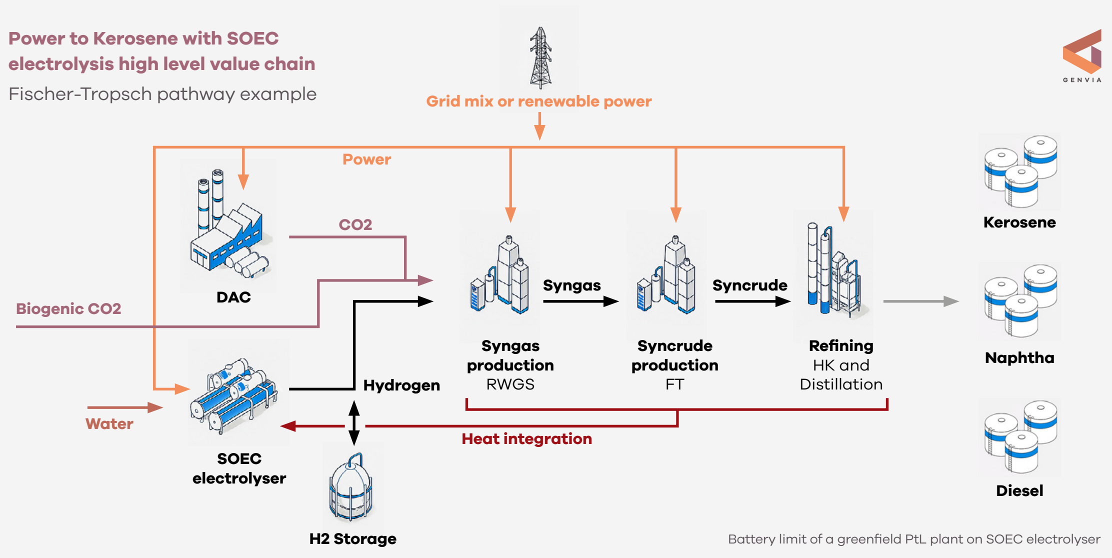


Figure 1: High-level value chain for a Power-to-Liquid (PtL) eSAF plant considering the FT pathway with Reverse Water Gas Shift using SOEC technology. This overview shows how electricity, water, and CO_2—either biogenic or captured from air—are converted into hydrogen, syngas, and eventually e-kerosene and other liquid fuels

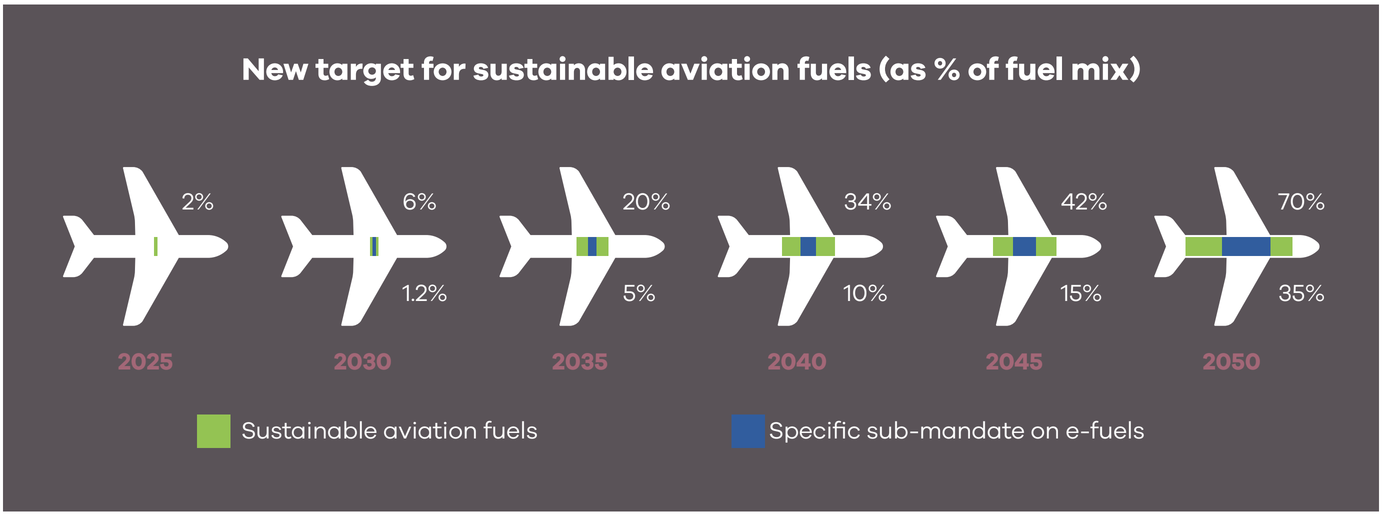
[1] Bio-based SAF refers to aviation fuels produced from sustainably sourced biomass. Several categories exist depending on the feedstock: waste oils and fats, agricultural or forestry residues, municipal solid waste, and dedicated energy crops. [2] EU Commission - Study supporting the impact assessment of the ReFuelEU Aviation initiative https://op.europa.eu/en/publication-detail/-/publication/46892bd0-0b95-11ec-adb1-01aa75ed71a1/language-en

The urgency

Regulatory pressure for the shift to eSAF

The need for eSAF is now a legal and commercial imperative driven by the EU's ReFuelEU Aviation regulation[3] and the UK SAF mandate[4]. These frameworks provide the market certainty necessary for large-scale investment by establishing legally binding quotas for SAF and, critically, a growing sub-mandate specifically for eSAF. This sub-quota addresses the limited scalability of biofuels and reflects a longer-term decarbonization pathway based on renewable electricity, water, and captured CO_2.

These regulations quantify this mandated demand with specific targets that increase steadily over the next two decades.



To enforce these targets in Europe, fuel suppliers face severe penalties that make non-compliance financially unsustainable. The EU also supports this transition with financial instruments such as the Innovation Fund which offers ~€40 billion to de-risk first-of-a-kind clean tech projects. In addition the European Hydrogen Bank uses competitive auctions to lower the cost of renewable hydrogen – eSAF's key feedstock – as well as EU ETS revenues that will offset part of the higher cost of SAF and eSAF production from 2024 to 2030. This combination of mandates, penalties, and funding will make the cost of inaction far higher than the cost of investment.

Shifting the industry's focus from 'if' eSAF is deployed to "how" it can be produced cost-effectively

[3] https://transport.ec.europa.eu/transport-modes/air/environment/refueleu-aviation_en
[4] https://www.gov.uk/government/collections/sustainable-aviation-fuel-saf-mandate

The urgency

Current barriers – prohibitively high production costs

Despite policy-driven demand, the primary barrier to eSAF uptake is the current prohibitive production cost of eSAF, which creates a significant "green premium" for the aviation industry.

Its high cost is rooted in the Power-to-Liquid process where electricity is the dominant cost factor, accounting for up to 60% of the total. Maximizing its energy efficiency is a critical lever for cost reduction.

The industry has converged on an ideal target price of ~€2,000 per ton of eSAF, the point at which eSAF could compete long term with other advanced SAFs and ultimately unlock mass adoption. This situation creates a strategic dilemma. For plants to be operational by 2030 project developers must make final investment decisions now. Yet their only choice is between mature but less efficient technologies or advanced, high-efficiency options like SOEC that carry higher perceived risk. By locking themselves into suboptimal infrastructure today they could jeopardize the long-term cost-competitiveness of the eSAF industry.

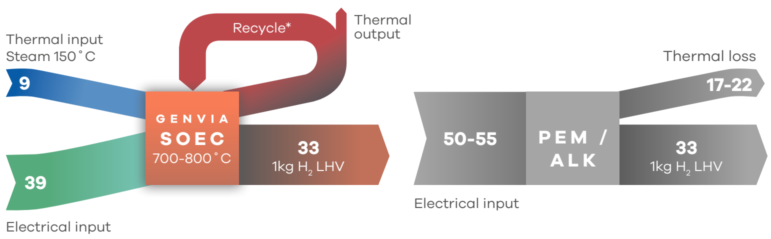
The urgency

SOEC: the bridge to eSAF cost reduction

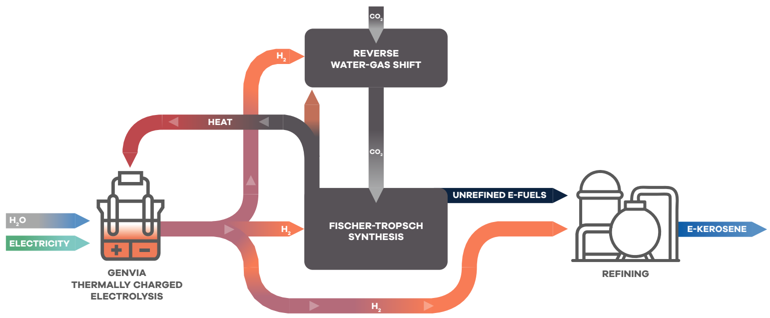
Solid Oxide Electrolysis Cell (SOEC) technology offers to bridge part of the gap between policy mandates and economic reality. It provides a clear pathway to improve eSAF competitiveness by directly addressing electricity cost.

SOEC's value comes from a trio of synergy advantages:

1. Higher electrical efficiency:
Operating at high temperatures, SOEC uses both heat and electricity to split water, reducing the required electrical input by up to 30% compared to low-temperature electrolysis. This directly attacks the largest eSAF cost component.



2. Unique thermal integration:
SOEC is uniquely able to capture and reuse the significant waste heat generated by downstream fuel synthesis processes (like Fischer-Tropsch or Methanol-to-Jet processes), further improving the overall energy efficiency of the plant.



3. Process simplification:
SOEC allows for the direct co-electrolysis of steam (H_2O) and carbon dioxide (CO_2) to produce syngas — the feedstock (H_2 + CO) for fuel synthesis. This eliminates the need for a separate reverse water-gas shift (rWGS) reactor, a mid-level maturity process that adds significant cost and complexity to plant design. By avoiding rWGS, SOEC reduces both CAPEX and integration risks while streamlining the overall process chain.

These benefits position SOEC as a cornerstone for improving eSAF competitiveness, offering a clear pathway toward the €2,000/ton target — but only as part of a systemic approach combining SOEC integration with advances in synthesis design, optimized heat recovery, low-cost electricity, and favorable financing conditions. SOEC is more than an incremental improvement – it's a foundational enabler for a competitive eSAF industry. For project developers, choosing to start working with SOEC today is a strategic decision that builds resilience against energy price volatility and secures a decisive long-term competitive advantage.

The urgency

The imperative to act now

Achieving technical and commercial maturity for eSAF production by 2035 or earlier requires immediate action. Enabling technologies such as Fischer-Tropsch reactors, Methanol-to-Jet processes, innovative electrolysis like SOEC, and their plant-wide integration must progress rapidly through R&D, pilot deployment, industrial demonstration, and scaling. Since these phases can typically span more than a decade, development must begin now to be ready in time.

For investors to commit at scale, technologies need to demonstrate reliability, efficiency, and efficient integration under real operating conditions. First-of-a-kind plants require time to operate, optimize, and build a performance track record that can de-risk future projects — a process that cannot be compressed into just a year or two.

eSAF production is not a single piece of equipment, but a complex chain involving hydrogen production, CO_2 capture, syngas generation for FT pathway or methanol generation for MtJ pathway, fuel synthesis, and refining. The performance of the overall process depends on how well all these elements are integrated, especially in terms of energy efficiency, thermal synergies, and the recycling of product gases. **Validating these interactions is impossible in isolation, and only possible through early deployment, where operational experience feeds directly into design improvements for the next wave of projects.**

From first concept to full commercial operation, the development cycle includes engineering, permitting, financing, construction, and commissioning, and will typically last at least six years. To have large-scale commercial plants operational by the early 2030s, **the first wave of projects must be launched immediately — waiting risks missing the 2035 window entirely.**

The imperative is clear:
eSAF isn't a post-2035 option it's urgent now.

Considering typical project lead times of 6 years between project concept and commercial operation, FID must be reached by 2026 latest to enable first large-scale production by 2030 - a critical milestone.

Such early SOEC large-scale adoption demand signal will drive investment to build the capacity required to bridge the cost gap with bio-based counterparts.

The SOEC solution

Superior performance with added advantages

Electricity is the dominant cost driver in eSAF production, representing up to 60% of total costs in power-to-liquid pathways, depending on technology choices, plant configuration, and electricity price. Solid oxide electrolysis cells (SOEC), which operate at high temperatures, offer compelling advantages over conventional low-temperature technologies such as alkaline (ALK) or Proton Exchange Membrane (PEM) electrolysis. Their superior energy efficiency and ability to integrate heat from other parts of the plant make them a promising option for future eSAF production.

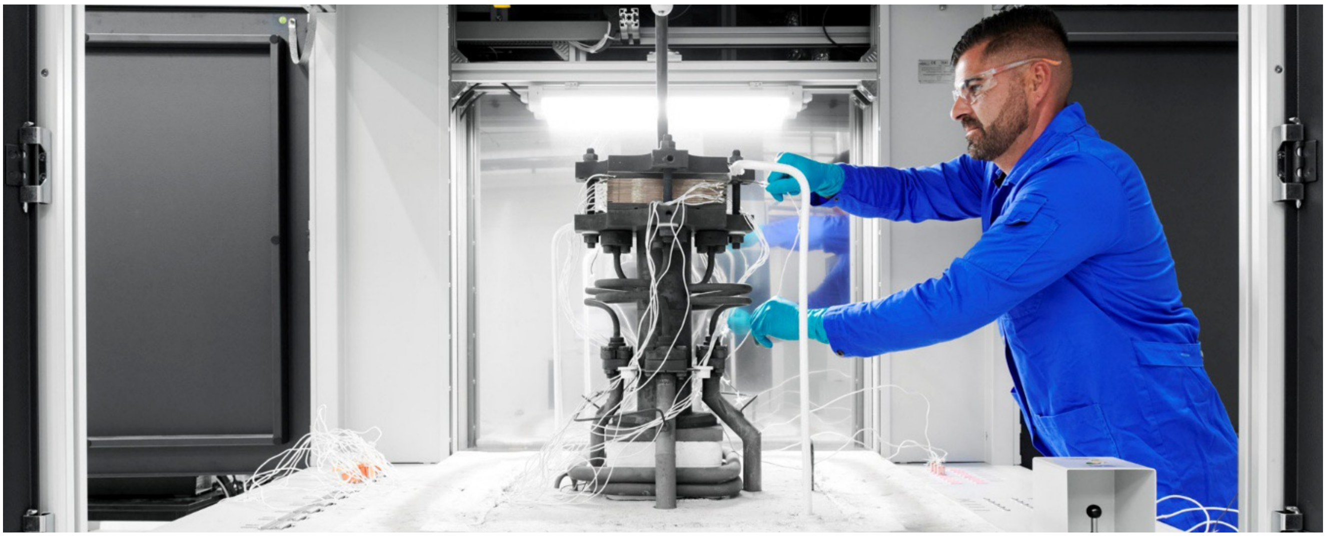


Figure 4: Genvia's SOEC technology

But the SOEC technical advantage goes far beyond just electrolyser efficiency. SOEC also introduces:

Thermal integration:
The high-temperature synthesis steps within Fischer-Tropsch and Methanol-to-Jet processes release large amounts of heat that can be captured and re-used to power SOEC, creating a highly synergistic plant design. Leveraging recovered thermal energy reduces overall electricity consumption, increasing cost competitiveness while reducing system footprint.

Process simplification:
SOEC enables co-electrolysis of water and CO_2 to produce syngas directly (a mix of H_2 and CO), which feeds the eSAF synthesis processes. This avoids the need for a separate reverse water-gas shift (rWGS) reactor, reducing capital and operational complexity.

Compliance advantage:
Additionally, SOEC's higher efficiency can help projects meet compliance thresholds for hydrogen carbon intensity, especially in cases where partial grid electricity with non-zero carbon intensity is used.

Together, these attributes make SOEC both an efficient hydrogen production solution and a strategic enabler for integrated, energy-optimized eSAF plants.

Beyond its process efficiency, SOEC offers the operational advantage of maintaining a steady output — even as stacks age. This is in contrast to low-temperature electrolysers that typically lose performance over time. This greater resilience can reduce operational disruption and improve long-term reliability, ultimately having a positive impact on OPEX.

The SOEC solution

CASE STUDY - How can SOEC lower eSAF costs?

To assess the potential of SOEC technology for sustainable aviation fuel (eSAF) production, **Genvia and Airbus performed two techno-economic process modelling studies. eSAF production through the Fischer-Tropsch (FT) and Methanol-to-Jet (MtJ) pathways** was evaluated in deeply heat-integrated plant configurations.

These studies compared commercial-scale eSAF plants using Genvia's SOEC technology to conventional designs based on low-temperature electrolysis, using a reference case in 2035 for a plant producing 150,000 tons of liquid fuels annually.

Key elements of the study included:

- Full plant-level analysis, from CO_2 input to eSAF and co-product refining
- Two power sourcing scenarios: grid-connected (excluding peak hours) vs. 100% renewables (wind + solar)
- Two CO_2 sourcing options: biogenic CO_2 or direct air capture (DAC) with associated heat requirements
- Thermal integration between heat sources and heat sinks assuming 100% heat transfer efficiency and a minimum delta temperature of 10 °C. Complementary heat supply, when needed, covered via off-gas burner or electric heater.
- Evaluation of off-gas recycling and co-product upgrading routes

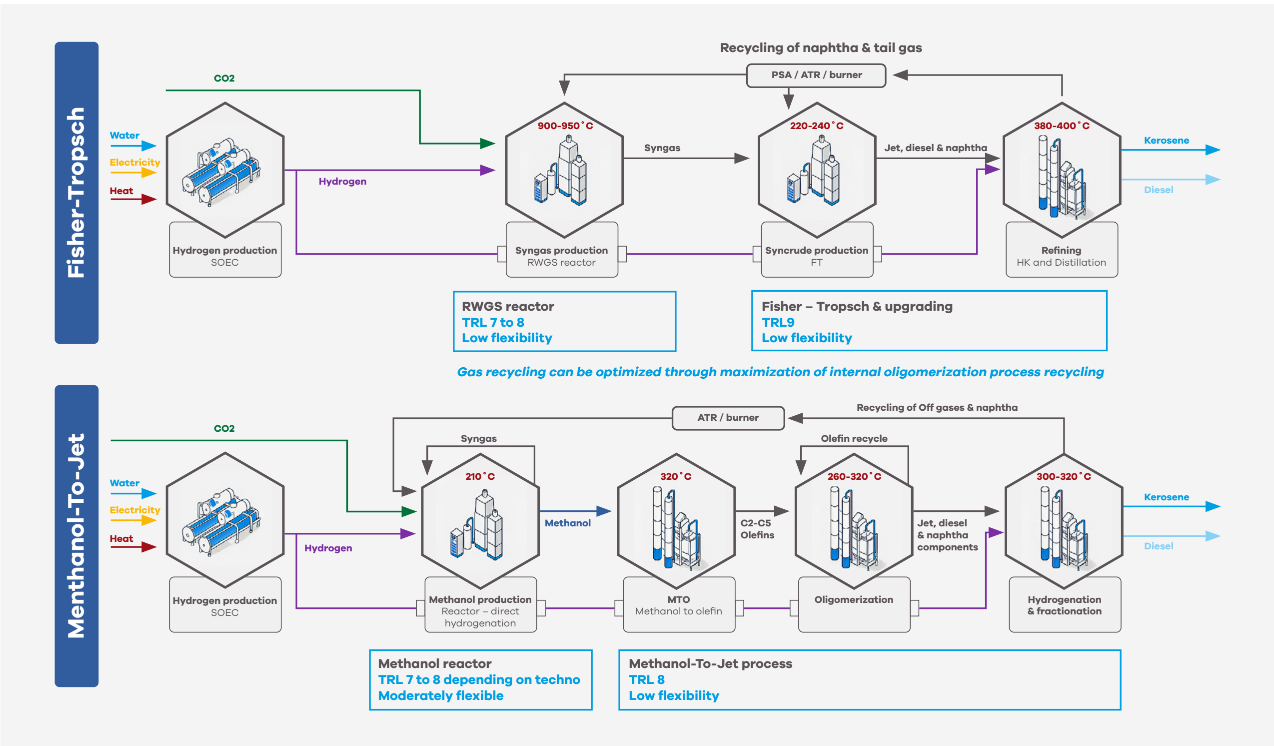


Figure 5: FT and MtJ pathways with SOEC electrolysis scope analysed

SOEC excels in contexts with high load factors and/or high electricity prices, such as regions with decarbonised baseload power.

The SOEC solution

Both studies confirmed a key insight: integrating Genvia's SOEC technology into eSAF plants is a promising way to reduce hydrogen production costs and boost overall efficiency—whether using Fischer-Tropsch or Methanol-to-Jet pathways.

The results showed that **across all scenarios, SOEC-based configurations achieved significantly higher energy efficiency — on average +13 percentage points compared to baseline low-temperature technologies**. In one specific case (see Figure 6), an FT-based eFuel plant with **SOEC co-electrolysis demonstrated a 31% reduction in electricity consumption**, driven by an increase in overall energy efficiency to 49% compared to the 34% achieved with a conventional alkaline-electrolysis configuration. This improvement is largely due to co-electrolysis eliminating the endothermic RWGS step, which reduces the need for high-temperature heat from burners and enhances overall thermal integration.

	Methanol-To-Jet					
	SOEC co-electrolysis		SOEC electrolysis		Alkaline electrolysis	
Electrolyser capacity	297 MW (co-SOEC) 290 MW (SOEC)	(79% load factor)	570 MW	(79% load factor)	803 MW	(79% load factor)
Plant Energy efficiency	**48 %**		**46 %**		**34 %**	
Kerosene selectivity	**95 %**		**95 %**		**95 %**	

Key assumptions: efficiency of stack + BoP: 39 kWh/kg H2 for SOEC and 55 kWh/kg H2 for ALK, optimal internal heat recycling for plant's operation, 150kton/year of liquid products, electrolyser load factor of 79%.

	Fischer-Tropsch					
	SOEC co-electrolysis		SOEC electrolysis		Alkaline electrolysis	
Electrolyser capacity	472 MW (co-SOEC) 72 MW (SOEC)	(79% load factor)	570 MW	(79% load factor)	803 MW	(79% load factor)
Plant Energy efficiency	**49 %**		**45 %**		**34 %**	
Kerosene selectivity	**80 %**		**80 %**		**80 %**	

Figure 6: Example of technical performance comparison for a MtJ based plant and a FT based 150 ktpa eFuel plant

Electricity, the sole energy source in the configurations studied, was confirmed as the largest cost driver, representing 32–48% of total eSAF production costs in SOEC-integrated designs, depending on configuration, based on the study's specific power price and profile assumptions. SOEC's lower specific energy consumption — as low as 39 kWh/kg H_2 at electrolyser system level — provides **a strong hedge against electricity price volatility and improves project resilience**. This superior electrical efficiency can deliver notable OPEX savings, but the overall Levelized Cost of eSAF (LCOSAF) also depends on plant CAPEX and load factor.

The SOEC solution

	Methanol-To-Jet (Bio CO_2)				
	SOEC co-electrolysis	←	SOEC electrolysis	→	Alkaline electrolysis
Plant CAPEX	**1 913** M€	+5% CAPEX	**1 830** M€	-15% CAPEX	**1 562** M€
Plant OPEX	**335** M€/year	-2% OPEX	**342** M€/year	+23% OPEX	**420** M€/year
LCOL	**3 534 €/ton**		**3 523 €/ton**	→ +10% LOCL	**3 860 €/ton**

Key assumptions: WACC 8%, lifetime 20 years, electricity price (baseload) 63,9 €/MWh, biogenic CO2 cost 91 €/ton (76 €/ton capture cost + 20% margin), efficiency of stack + BoP: 39 kWh/kg H2 for SOEC and 55 kWh/kg H2 for ALK, optimal internal heat recycling for plant's operation, 150 kton/year of liquid products, electrolyser load factor of 79%, start of operation: 2035.

	Fischer-Tropsch (Bio CO_2)				
	SOEC co-electrolysis	←	SOEC electrolysis	→	Alkaline electrolysis
Plant CAPEX	**1 315** M€	+3% CAPEX	**1 282** M€	-19% CAPEX	**1 042** M€
Plant OPEX	**309** M€/year	-4% OPEX	**323** M€/year	+26% OPEX	**408** M€/year
LCOL	**2 957 €/ton**		**3 025 €/ton**	→ +13% LOCL	**3 432 €/ton**

Figure 7: Example of economic performance (LCOL[5]) comparison for a MtJ based plant and a FT based 150 ktpa eFuel plant with baseload electricity

Given that SOEC CAPEX is expected to remain higher than low-temperature technologies until maturity and industrialisation progress, SOEC competitiveness versus low temperature electrolysis has been assessed across multiple configurations. Our study mapped competitiveness using two key parameters: SOEC CAPEX per MW and SOEC electrical efficiency at system level, each measured against a reference ALK case.

This mapping covers FT and MtJ pathways, grid/baseload vs. variable-renewables power profiles, and biogenic CO_2 vs. DAC. Results highlight where SOEC is favored – notably in high-load and high electricity price zones where electricity cost dominates—and zones where ALK retains an edge, such as lower-load, renewables-only contexts, or where CAPEX constraints prevail and thermal integration is limited.

Overall, these modelling results — grounded in conservative assumptions — show that SOEC offers a key pathway to reduce eSAF costs and improve project viability.

[5] LCOL: Levelized Cost of Liquid —expressing the average cost per tonne of liquid fuel produced over the lifetime of the plant, accounting for CAPEX, OPEX, and financing. "Liquid fuel" refers to the total liquid output of the plant (e.g., e-kerosene, diesel, naphtha), with costs allocated proportionally by weight across all liquid products

The SOEC solution

Further opportunities to optimize costs

Finally, while the choice of electrolyzer is a primary lever, the design of the fuel synthesis process itself is another powerful tool for cost optimization.

An example from our modelling illustrates this: improving single-pass kerosene selectivity through optimized internal product recycling can yield a significant reduction in the levelized cost of eSAF, lowering it by ~15% in the MtJ configurations studied. In practice, this involved routing C8 olefins back into the oligomerization step, eliminating the need for an energy- and CAPEX-intensive autothermal reforming (ATR) unit for external recycling of unwanted co-products (see Figure 8). This approach improves energy efficiency, reduces CAPEX, and contrasts sharply with plant designs that either yield a large share of less-valuable co-products like diesel and naphtha, or rely on external recycling loops that introduce energy inefficiencies and require costly additional equipment.

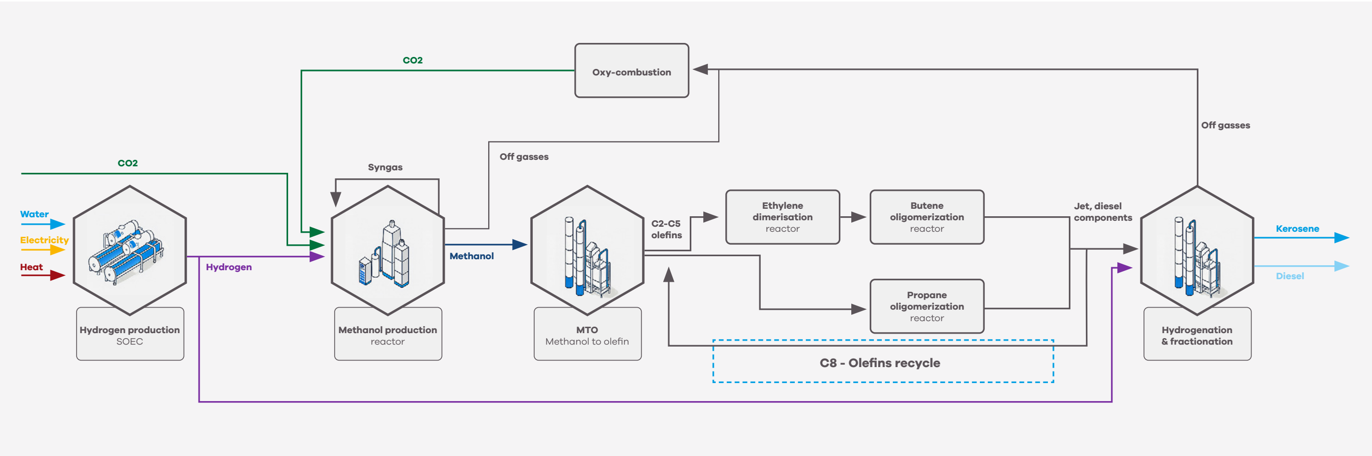


Figure 8: Studied MtJ configuration with internal products recycling

This underscores the **critical role that technology developers of synthesis pathways, such as FT and MtJ, have to play in the collective effort to lower eSAF production costs**.

The SOEC solution

Achieving the €2,000 per ton price point

Beyond these initial findings, process modelling also charts a clear, but ambitious, **pathway to a production cost of approximately €2,000 per ton**. This price point is considered a long-term target at which eSAF could effectively compete with advanced biofuels, making it a critical milestone for mass adoption. **Achieving this target with an SOEC-based plant depends on a combination of synergistic factors**.

For example, in the case of a grid-connected SOEC-based MtJ eFuel plant as presented in Figure 9, this requires mostly:

- securing world-class low-carbon baseload electricity at a cost below €40/MWh — achievable today mainly in regions with abundant hydro or geothermal resources and, in the future, in projects combining high shares of renewables with large-scale storage as costs continue to fall.
- achieving a 30% reduction in plant CAPEX compared to expected 2035 levels through industrial scale-up, driven by larger plant sizes, standardization of layouts, and learning effects from high-volume manufacturing. In the near term, this gap can also be partially bridged by public CAPEX subsidies for early projects.
- further improving SOEC performance to 37 kWh/kg of hydrogen while ensuring longer stack lifetime.
- obtaining better financing conditions (corresponding to a WACC of 6%) made possible by public loans and through performance guarantees that de-risk the project.

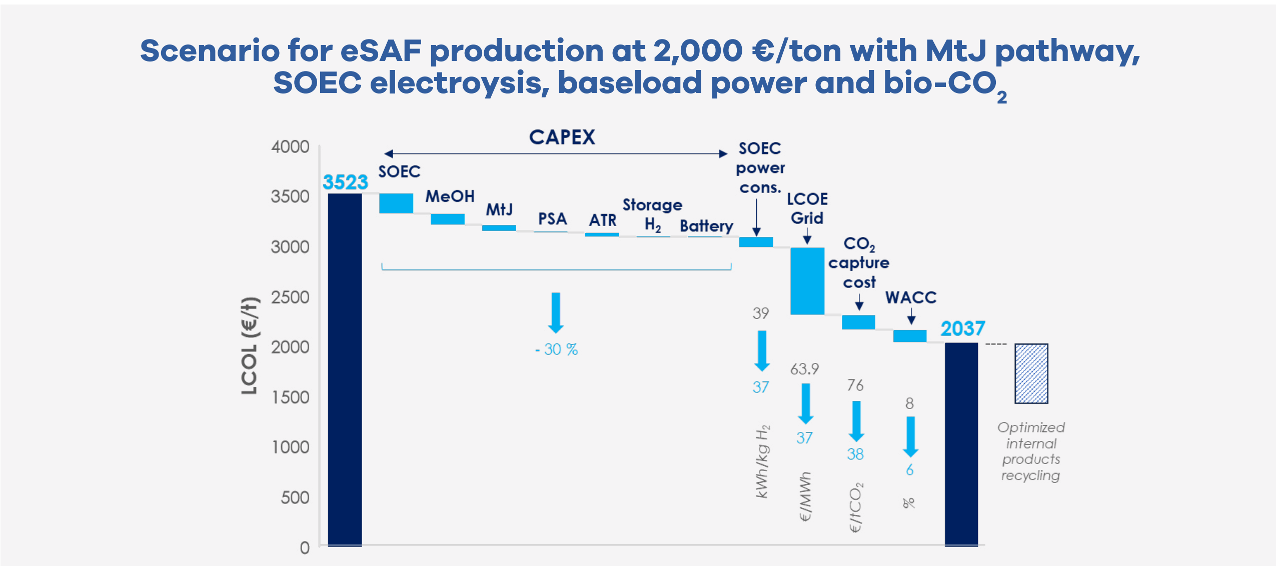


Figure 9: Scenario for reaching 2 000 €/tonne LCOL

The SOEC solution

Achieving the €2,000 per ton price point

Beyond these quantified levers, additional process innovations can further accelerate cost reduction.

For example, optimizing internal product recycling loops in the MtJ processes can enhance kerosene yield and minimize energy-intensive external recycling. Similarly, developing more selective catalysts for FT reactors reduces by-product formation, while novel reactor designs can improve conversion rates and thermal management. These critical advances, though not quantified in our current study, represent additional opportunities for technology developers to complement the gains of SOEC integration and push eSAF production closer to long-term competitiveness.

The modeling results deliver a clear conclusion: that together, technology choices and heat integration drive efficiency.

Early SOEC integration in pilot and commercial plants is critical to de-risk adoption and prepare for full-scale deployment by 2035 — enabling lower costs and affordable eSAF at scale.”.

Time to act

Project Developers: Seize your first-mover opportunities

Integrating SOEC into eFuel plants today offers a rare opportunity for developers to position themselves at the forefront of the eSAF market. While the technology's application in Power-to-Liquid (PtL) is new, it builds on **decades of solid oxide development**. Demonstrators such as Genvia's are currently validating their performance for hydrogen production.

The barrier is no longer technical feasibility but timing: at present, SOEC CAPEX is higher than low-temperature electrolysis — partly because manufacturing is not yet industrialised — but this is expected to decline sharply as production scales. As the technology continues to **mature, hybrid plants that combine SOEC with lower-CAPEX ALK electrolysers could provide a pragmatic bridge to full SOEC integration; with SOEC being used for high-efficiency baseload operation, while the ALK captures renewable peaks**. In today's variable energy landscape this approach allows developers to optimize plant performance and de-risk investment while designs build the bridge to a fully SOEC-based future.

For developers willing to adopt SOEC early, the benefits go beyond immediate efficiency gains.

Technical leadership

Early movers gain privileged access to the learning curve. They master system integration, operational optimisation, and maintenance before the technology hits the mainstream, securing a technical lead that later entrants will struggle to match. This operational expertise, built years ahead of competitors, can be monetised in future projects, partnerships, or licensing agreements.

Policy and funding leverage

Early adoption can unlock tailored funding and policy support. Pilot and first-of-a-kind plants often qualify for higher levels of public co-financing, risk-sharing instruments, or innovation-linked incentives — reducing the effective cost premium of SOEC today. Participation in these pioneering projects also increases visibility with offtakers, policymakers, and investors looking for credible pathways to lower-cost eSAF. At the same time, SOEC's lower power demand translates into practical process-level advantages: less electrical interconnection capacity is required, and fewer renewable assets and land resources are required to achieve the same fuel output. This not only strengthens the competitiveness of projects in resource-constrained environments, but can also be a differentiating factor in national or European calls for projects, where evaluators increasingly prioritise efficient use of electricity and land. By joining the first commercial deployments, early movers also gain a seat at the table in shaping technical standards, supply chains, and policy frameworks for SOEC-based eSAF — ensuring that the technology evolves in line with real-world project economics.

Market positioning

Early movers can secure long-term offtake agreements based on projected cost advantages once SOEC CAPEX approaches, and potentially achieves parity with the CAPEX of low-temperature electrolysis. By locking in technology choices now, developers position themselves to deliver more competitive fuel when the market reaches scale — without the delays that late adopters will face in redesigning plants for SOEC integration.

While upfront investment may be higher today, early movers stand to gain technical leadership, policy leverage, and commercial positioning that will be difficult to replicate once SOEC is fully mature, and the competitive field is crowded.

Julien Manhes
Head of Sustainable Aviation Fuels
and Carbon Dioxide Removal, Airbus

“The major risk isn’t the technical novelty of SOEC and Methanol-to-Jet blocks. The biggest risk is in investing today in less efficient technologies that would compromise long-term competitiveness. Energy efficiency is THE fundamental strategic asset to de-risk eSAF. Only through optimised and fully integrated process can the eFuel become a technical reality.”

Florence Lambert-Hognon
CEO, Genvia

GENVIA

“We, at Genvia, are committed to deliver the cost-efficient SOEC technology the eFuel industry calls for. Accelerating scale-up will be enabled through introducing SOEC into hybrid systems combining the most advantageous features of high and low temperature electrolyzers. We are looking forward to work hand-in-hand with eFuel developers to decarbonize the aviation sector.”

The underlying study supporting this whitepaper has received financial support of France's region Occitanie under its Innovation Projects program.

La Région Occitanie Pyrénées · Méditerranée

The clock is ticking.

Developers must integrate SOEC now to secure cost and efficiency gains. eFuel OEMs should optimize plant designs based on solid oxide to unlock its full benefits and move toward the 2,000 €/ton eSAF cost target. Policymakers must reward efficiency and help de-risk first projects.

The opportunity is clear: act now, deploy SOEC, and make cost-competitive sustainable aviation fuel a reality. And the alternative is equally clear: lock-in less efficient technologies for decades of higher fuel costs and wasted resources.

Hinicio
www.hinicio.com

Contributors
Arthur Listwan
Frédéric Barth
Louis Lammertyn
Martin Chapuis

GENVIA
www.genvia.com

Contributors
Joseph Wilding-Steele
Nicolas Valayé
Patrice Tochon
Romuald Coupan

AIRBUS
www.airbus.com

Contributors
Jean Sperandei
Nicolas Laumet

Whitepaper issued
November 2025