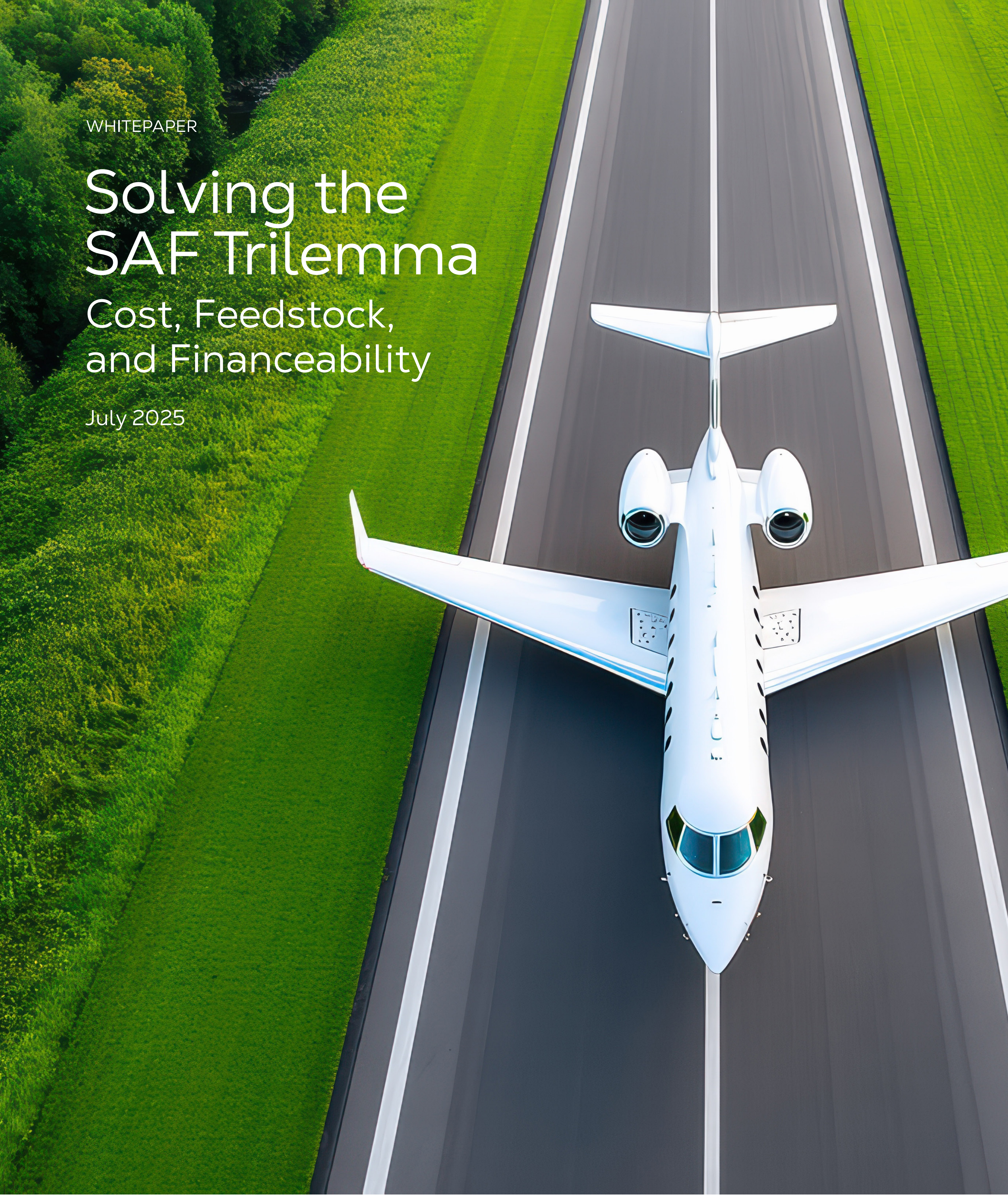
WHITEPAPER

Solving the SAF Trilemma

Cost, Feedstock, and Financeability

July 2025



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SYZYGY PLASMONICS

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Executive Summary

The aviation sector is under increasing regulatory and market pressure to decarbonize while simultaneously facing surging demand for air travel. Sustainable Aviation Fuel (SAF) is widely recognized as the most viable solution for policy and supply market forces. However, adoption remains limited due to three persistent challenges:

1

Cost

SAF is currently two to four times more expensive than fossil jet fuel.

2

Feedstock supply Over 80 % of current global SAF production relies on Hydroprocessed Esters and Fatty Acids (HEFA) pathways, which are constrained by the finite availability of waste oils and fats.[ii]

3

Unfinanceable Projects

Many SAF projects struggle to attract investment due to high capital costs,.[iii]

NovaSAF, an all electric biogas to SAF production pathway developed by Syzygy Plasmonics, overcomes these challenges through a novel integration of biogas and renewable electricity. This white paper introduces NovaSAF, which offers a high return and feedstock unconstrained solution to the SAF Trilemma—one that enables deep decarbonization without compromising economic viability.

NovaSAF is a ~50/50 mixture of eSAF and Advanced BioSAF produced at modular plants built around Syzygy's Rigel™ reactor cell technology co-located with biogas assets. This light-driven system operates at high efficiency and under mild conditions, enabling the use of low-cost materials which reduces CAPEX. These ultimately reduce both capital and operating costs. Most importantly, NovaSAF's modular design enables deployment at distributed biogas sources—landfills, dairies, and wastewater plants— providing thousands of global deployment opportunities while unlocking stranded energy assets that are otherwise flared or vented. The platform's ability to process CO_2-rich gas streams without extensive pretreatment further enhances yield and cost resilience. By converting biogas and renewable electricity into SAF and renewable naphtha, NovaSAF achieves high carbon efficiency and capital productivity. Comparative analysis shows NovaSAF can outperform PtL, HEFA, and AtJ pathways on cost, scalability, and lifecycle emissions.

This white paper outlines the following NovaSAF elements in detail and presents compelling conclusions for the industry:

•Market dynamics – there is immediate need for significant new supply of SAF due to increasing pressure on the aviation industry to decarbonize while at the same time air traffic demand due to increased passenger travel and ecommerce.

•Process overview – How we create NovaSAF from e-reforming biogas to create syngas, then sending this stream to Fischer Tropsch to create liquid, and hydrotreating to create SAF.

•Techno-economic analysis – Showing NovaSAF's potential to out compete other pathways on cost and even achieve Jet-A parity under the right conditions. [4]

•Regulatory positioning – Detailing how NovaSAF achieves RFNBO (PtL) and Advanced BioSAF under both the European Union (EU)'s Renewable Energy Directive III (RED III) and the United Kingdom (UK)'s Renewable Transport Fuel Obligation (RTFO) and is certified as ASTM D1655.

•Feedstock availability – Biogas availability is assessed globally, referencing third party studies that show there is enough biogas to displace the entire global demand for jet fuel.[iv]

•Project returns case studies – Examples are presented of bankable project economics for projects providing fuel in North America, EU/UK, and other geographies.

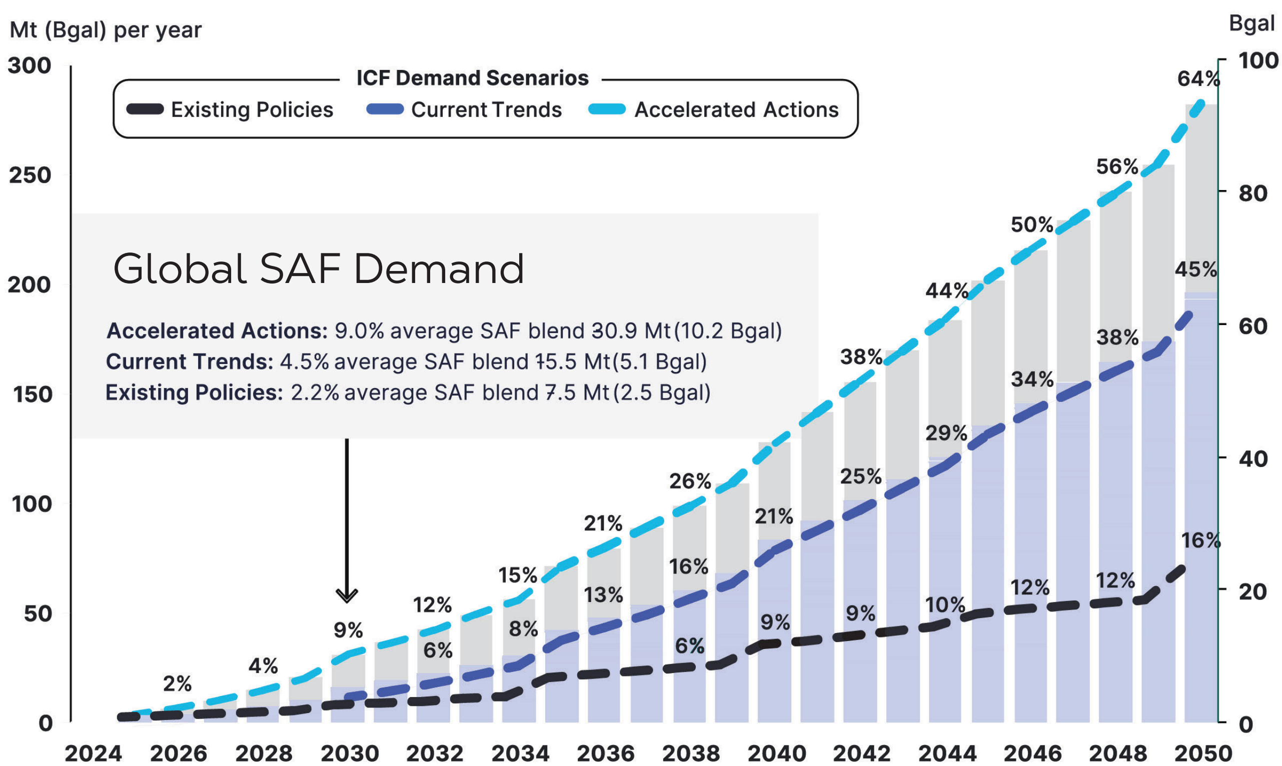
•Project showcase – Syzygy highlights our First of a Kind NovaSAF-1 development in Uruguay which will serve as our showcase project and is predicted to begin operation in 2027.

Introduction

SAF Market Challenges and Why SAF Needs Innovation

Sustainable Aviation Fuel (SAF) is a drop-in replacement for standard Jet-A, offering a viable, near-term solution for decarbonization of airline transportation emissions. Seeing its potential, the EU/UK among others have implemented mandates, and the US has implemented credit schemes to help ensure that SAF successfully supplants Jet-A.v Looking to 2030, demand could rise to over 15 million tonnes, with significant contributions from both mandated and voluntary commitments. Unfortunately, it is also becoming increasingly apparent that current pathways are insufficient to meet the total quantity of SAF needed in the future beyond 2030. This is due to several barriers faced by the SAF industry, primarily driven by high prices and limited supply.

FIGURE 01



Existing policies assumes that SAF demand only scales to meet policies that are currently in place. Current Trends assumes that all announced pledges and national targets are met, including those that do not currently have implementation plans. Accelerated Actions assumes additional policies coming in place to encourage net-zero and meeting of global targets, such as CAAF/3.

Source: SkyNRG 2025 SAF Market Outlook | https://lnkd.in/d9DSzm_E

How NovaSAF Overcomes These Challenges

Syzygy's NovaSAF platform addresses the three primary barriers to SAF adoption– cost, feedstock supply, and project financing—through a novel integration of renewable electricity and biogas. By leveraging inexpensive waste gas and low-cost renewable power, NovaSAF can achieve sales prices to airlines at or below Jet-A parity in the US (approximately $4 per gallon) and around €1,500-€3,000 per ton in the EU and UK. These cost levels are enabled by Syzygy's Rigel photocatalyst reactor, which operates efficiently under mild conditions, reducing both capital and operating expenditures.

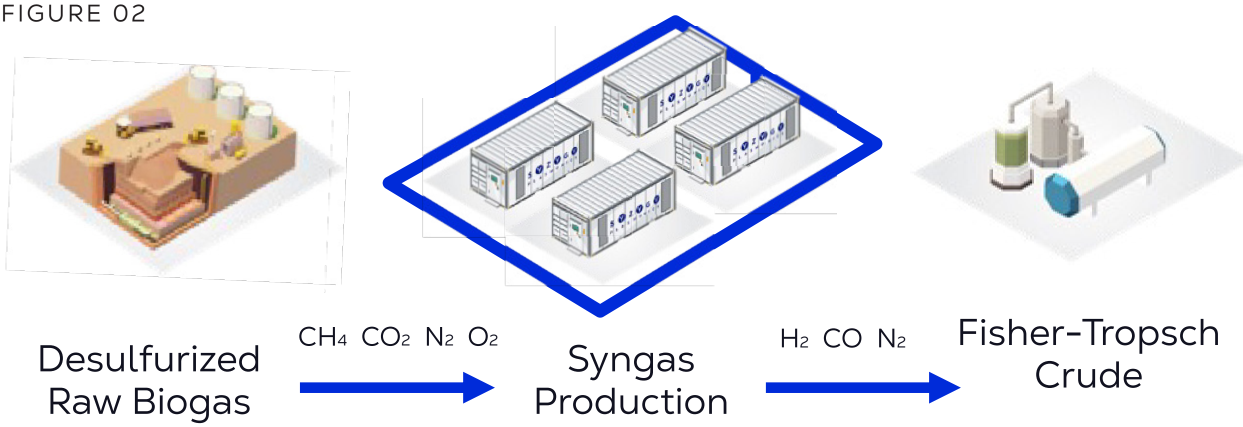
To overcome feedstock constraints, NovaSAF utilizes biogas—a globally abundant and underutilized resource with an estimated aggregate production potential of 420 million gallons (1.36 million tons) per day, exceeding current global jet fuel demand. This approach avoids reliance on limited lipid-based feedstocks and enables scalable deployment across diverse geographies.

Finally, NovaSAF projects are designed to meet the financial return thresholds required by developers and investors. IRRs are expected to exceed 20% due to the platform's favorable cost structure and modular design. This positions NovaSAF as a commercially viable and technically robust solution for accelerating SAF deployment on a commercial scale.

How NovaSAF Succeeds Using a Difficult Feedstock

The NovaSAF solution starts with a biogas source such as a landfill, dairy farm, or wastewater treatment plant, among others. Syzygy will then build a modular NovaSAF plant located at the same site.

FIGURE 02

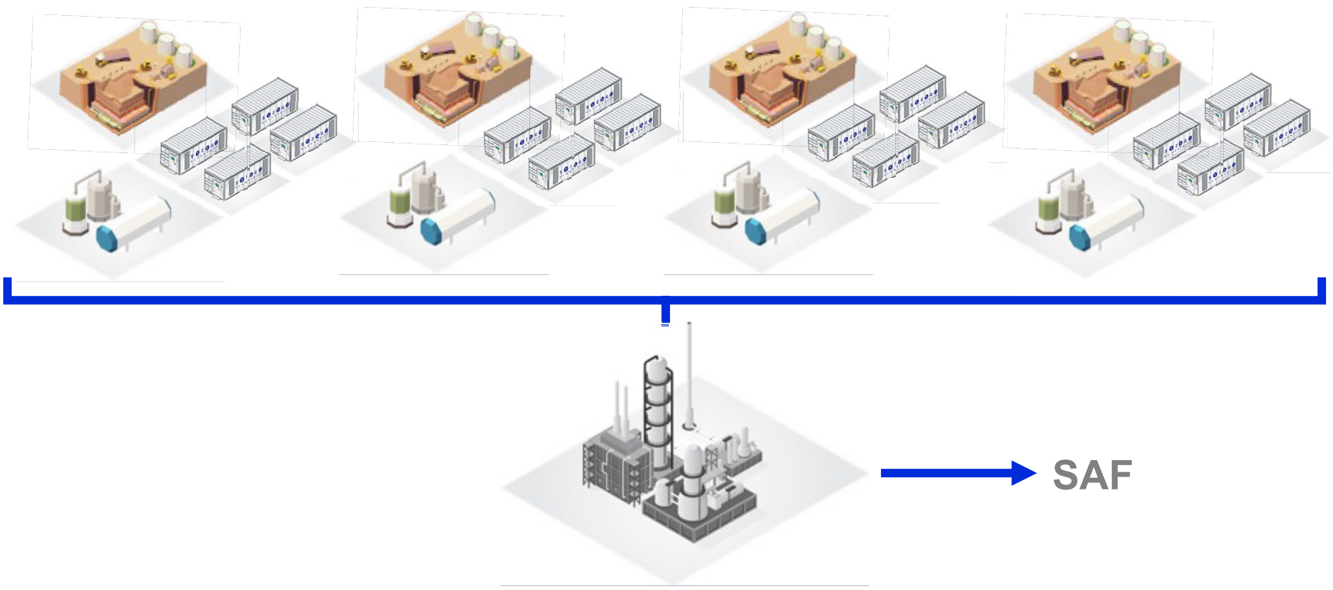


The NovaSAF process starts with desulfurizing the biogas and removing trace contaminants from landfill gas sources. Syzygy's cutting-edge e-reforming syngas unit takes the biogas stream which consists mainly of CH_4 and CO_2, and processes alongside steam using renewable electricity to produce syngas (a mixture of H_2 and CO) with a 2:1 ratio, the exact ratio needed by downstream equipment. This conditioned syngas steam is then sent into a Fischer Tropsch (FT) unit, which transforms it from gas to liquid hydrocarbon chains. The synthetic crude is then sent to a downstream unit where it is processed into the final product. The FT crude from multiple sites is then aggregated by road, rail, or ocean transport into a single upgrading site.

FIGURE 03

Aggregated Project Deployments

(Hub & Spoke Model for efficient operations)



Processing the syncrude into SAF uses hydrocracking and hydrotreating, a technology that is deployed 1,000s of times globally. The final product mix is ~80-85% SAF and ~15 -20% renewable naphtha. SAF will be used by airlines while the renewable naphtha will decarbonize plastics and chemical production. Syzygy envisions that the FT crude from multiple sites will be then aggregated by road, rail, or ocean transport to a single upgrading site.

Why NovaSAF is the Best Option for Feedstock Owners

Despite the abundance of biogas globally, established technologies have struggled to economically convert this biogenic feedstock into liquid fuels on a commercial scale. These failures stem from three fundamental limitations:

1. Poor Scalability: Traditional systems cannot be economically scaled down to match the distributed nature of biogas sources (e.g., landfills, farms, wastewater plants). This results in high capital expenditure (CAPEX) on small-scale deployments. 8

2. Low Operational Resilience: Biogas composition varies widely by source and over time. Competing technologies struggle to maintain efficiency and uptime under these conditions, leading to high operating costs (OPEX) and low system availability.

3. CO_2 Rejection and Yield Loss: Most technologies require costly CO_2 removal upstream of the SAF production process. This not only increases CAPEX but also reduces SAF yield per cubic foot of biogas, undermining project economics.

Syzygy's NovaSAF platform is the first to turn these site-specific challenges into advantages. Its modular design enables cost-effective deployment at distributed sites, accessing smaller sites and removing the need for pipelines. The Rigel reactor and proprietary photocatalyst operates efficiently across a wide range of gas compositions, eliminating the need for extensive gas cleanup. And finally, unlike conventional systems, NovaSAF utilizes CO_2 as a feedstock, increasing carbon efficiency and SAF output.

TABLE 01

Technology	CAPEX	Efficiency at Biogas Scale	Yield per ft^3 of Biogas	Levelized Cost
NovaSAF	Low	High	High	Lowest
Steam Methane Reforming (SMR)	Medium	Low	Low	High
Auto-Thermal Reforming (ATR)	High	Low	Low	High
MSW Gasification	Very High	Low	Very Low	Very High

Municipal Solid Waste (MSW) gasification, for example, suffers from extremely high CAPEX and inconsistent feedstock quality, making it technically and economically challenging. SMR and ATR technologies, while proven at large scale, fail to scale down and require CO_2 removal and CH4 combustion, which further reduces SAF yield and increases cost.

FIGURE 04

Low CAPEX

Light driven chemistry results in mild reactor conditions. Our Rigel Cells are built from low-cost materials like aluminum and glass, where competing reactor technology must be built from nickel and chrome alloy.

Low OPEX

Highly efficient technology (achieved above 80% energy efficiency at Lotte Field Trial).

Anti-Coking Catalyst Enables CO2 use in Feed System

Other technology are not able to co-process the CO2 without coking or using extreme conditions like plasma.

MODULAR

Able to scale up or down easily without losing efficiency or suffering negative economies of scale, based on the size of the biogas development.

NovaSAF is uniquely positioned to unlock the value of stranded biogas assets—turning what was once a liability into a scalable, low-cost, and carbon-efficient SAF solution. Syzygy's technology not only overcomes these challenges but actively takes advantage of these conditions in a way no other technology can do.

Under the NovaSAF Hood

NovaSAF is powered by the Rigel reactor technology which has consistently exceeded exceptations during development and is now poised to disrupt the industry. At the heart of this innovation is a light-driven chemical process that operates under mild conditions, allowing the reactors to be built from low-cost materials like aluminum and glass—unlike conventional systems that rely on expensive nickel- and chrome-based alloys. This translates into significantly lower capital expenditure (CAPEX), making the technology more accessible and scalable.

Operationally, the system experiences high efficiencies. In field trials, including one conducted with Lotte Chemical, the Rigel platform achieved energy efficiencies exceeding 80%, dramatically reducing operating costs (OPEX) and improving project viability.[vi] But for NovaSAF, what truly sets the technology apart is its ability to process CO_2-rich biogas streams without coking—a common failure point for other reforming technologies. This is made possible by Syzygy's proprietary anti-coking photocatalyst, which enables the direct use of CO_2 in the feedstock, increasing carbon utilization and SAF yield.[vii]

Finally, the modular design of the Rigel system allows it to scale up or down without sacrificing efficiency or encountering negative economies of scale. This flexibility makes it ideal for deployment at distributed biogas sites, from small dairy farms to large landfills, unlocking SAF production in regions previously considered uneconomical.

Together, these features position Syzygy's technology as a breakthrough in the race to produce affordable, scalable, and carbon-efficient SAF.

NovaSAF Techno-Economics Demonstrate Low Costs

TABLE 02 | NovaSAF Levelized Cost (€/ton)

		Electricity Cost (€ / kWh)					
Biogas Feedstock Cost		€ 0.02	€ 0.04	€ 0.06	€ 0.08	€ 0.10	€ 0.12
	€ 3	€ 1,317	€ 1,571	€ 1,826	€ 2,081	€ 2,336	€ 2,590
	€ 5	€ 1,437	€ 1,692	€ 1,946	€ 2,201	€ 2,456	€ 2,711
	€ 7	€ 1,557	€ 1,812	€ 2,067	€ 2,321	€ 2,576	€ 2,831
	€ 9	€ 1,678	€ 1,932	€ 2,187	€ 2,442	€ 2,696	€ 2,951
	€ 11	€ 1,798	€ 2,053	€ 2,307	€ 2,562	€ 2,817	€ 3,071

TABLE 03 | Electrolysis Based PtL Levelized Cost (€/ton SAF)

		Electricity Cost (€ / kWh)					
Biogas Feedstock Cost		€ 0.02	€ 0.04	€ 0.06	€ 0.08	€ 0.10	€ 0.12
	€ 3	€ 2,205	€ 2,862	€ 3,520	€ 4,177	€ 4,835	€ 5,492
	€ 5	€ 2,205	€ 2,862	€ 3,520	€ 4,177	€ 4,835	€ 5,492
	€ 7	€ 2,205	€ 2,862	€ 3,520	€ 4,177	€ 4,835	€ 5,492
	€ 9	€ 2,205	€ 2,862	€ 3,520	€ 4,177	€ 4,835	€ 5,492
	€ 11	€ 2,205	€ 2,862	€ 3,520	€ 4,177	€ 4,835	€ 5,492

TABLE 04 | NovaSAF Cost Difference vs. HEFA

Biogas Feedstock Cost	Electricity Cost (€ / kWh)						
		€ 0.02	€ 0.04	€ 0.06	€ 0.08	€ 0.10	€ 0.12
	€ 3	-46%	-37%	-29%	-22%	-15%	-8%
	€ 5	-41%	-33%	-25%	-18%	-11%	-4%
	€ 7	-36%	-28%	-20%	-13%	-6%	0%
	€ 9	-31%	-23%	-16%	-8%	-2%	4%
	€ 11	-26%	-18%	-11%	-4%	3%	9%

TABLE 05 | Electrolysis Based PtL Cost Difference vs. HEFA

Biogas Feedstock Cost (€ / MMBTU)		Electricity Cost (€ / kWh)					
		€ 0.02	€ 0.04	€ 0.06	€ 0.08	€ 0.10	€ 0.12
	€ 3	-9%	14% 36% 57% 14% 36%			76%	94%
	€ 5	-9%	57% 14% 36% 57% 14%			76%	94%
	€ 7	-9%	36% 57%			76%	94%
	€ 9	-9%				76%	94%
	€ 11	-9%	14%	36%	57%	76%	94%

Syzygy's techno-economic models are based on results from Syzygy's three demonstration plants. When benchmarked at realistic deployment scales, NovaSAF consistently delivers the lowest levelized cost of SAF:

- NovaSAF: At a 30 million gallon (100,000 tons) per cluster, NovaSAF achieves production costs near $6 per gallon in the U.S. and below €2,000 per ton in the EU/UK. These costs are based on conservative assumptions of $0.05/kWh electricity and $6/MMBtu biogas assuming 10,800kWh of electricity and 51 mmbtu of biogas per tonne of SAF.
- PtL: Requires 10,000+ bpd scale to approach economic viability but remains above $13 per gallon ($4,200 per ton) due to high electrolyzer capex and biogenic CO_2 sourcing costs assuming 27,900kWh of electricity per tonne of SAF.
- HEFA: While mature, HEFA is constrained by feedstock availability and rising prices for waste oils. Even at scale, costs remain above $9 per gallon ($2,950 per ton).
- AtJ: Faces high feedstock and processing costs, with levelized costs typically exceeding $10 per gallon ($3,250 per ton).

NovaSAF's advantage is not just in baseline cost—it is in resilience across scenarios. Even under higher power or feedstock prices, NovaSAF remains cost-competitive due to its efficient conversion process and ability to use raw, CO_2-rich biogas without pretreatment. The heat map analysis in Tables 5 and 6 above shows that NovaSAF outperforms all other pathways across a wide range of input cost scenarios.

This cost leadership is critical. Without a pathway that can deliver SAF at or near Jet-A parity, the aviation industry will face unsustainable fuel costs, limited adoption, and missed climate targets. NovaSAF offers a credible, financeable, and scalable solution—one that enables deep decarbonization without compromising economic viability.

NovaSAF Overcomes Cost and Scalability Issues

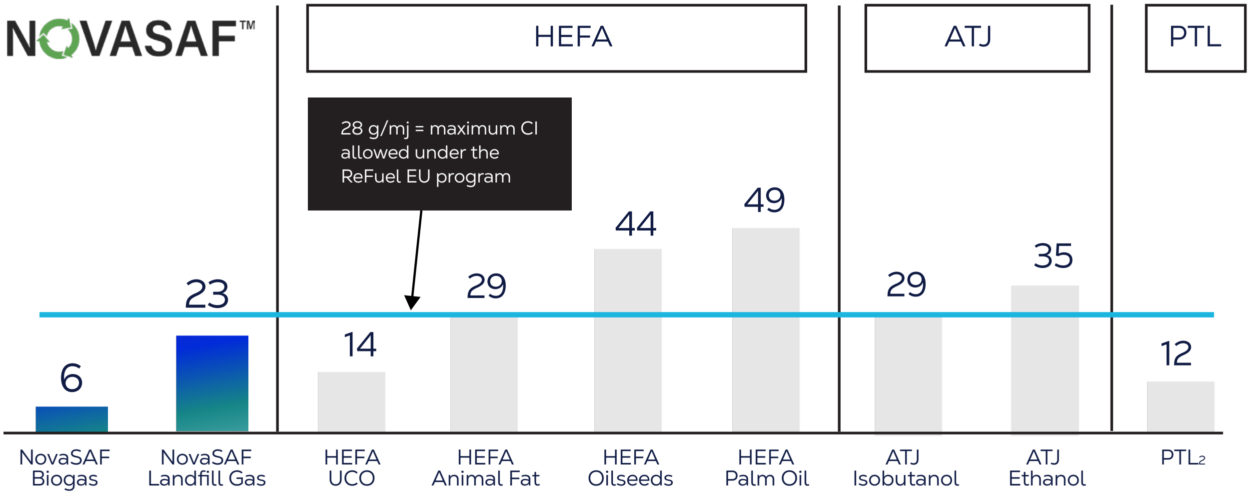
TABLE 06

Factors	NOVASAF™	HEFA	Alcohol to Jet	Power-to-Liquid
Production Cost	$4-$6/gal	$6-$9/gal	$10/gal	+$13/gal
Capex Requirements	Low	Moderate	High	High (electrolyzers)
Feedstock Availability	Abundant (Biogas)	Restricted (UCO/tallow)	Restricted (food competition)	Restricted (Biogenic CO_2)
Feedstock Prices	Low	Rising (high demand for waste oils)	High (feedstock and processing)	High (Biogenic CO_2)
Scale needed for viability	<2,000 bpd	3,000 – 5,000 bpd	5,000 – 10,000 bpd	> 10,000 bpd
Electricity use	Low	Low	Moderate	High

NovaSAF consistently delivers a low cost across a wide range of input scenarios, maintaining costs near $6 per gallon ($2,000 per ton) at baseline ($0.05/kWh and $6/MMBtu).

Carbon Intensity Impacts SAF Value

FIGURE 05



1 Adapted from CORSIA Default Life Cycle Emissions Values for CORSIA Eligible Fuels
2 Adapted from IATA SAF Handbook 2024

Note: NovaSAF Biogas and NovaSAF Landfill Gas CI calculations completed using Syzygy internal models under CORSIA frameworks. Subject to verification and audit at each specific site.

A lot has been said about the price, feedstock availability, and profitability SAF projects, but it is also important to remember that the overall purpose of SAF is to prevent emissions versus Jet-A, and NovaSAF shines here again. The carbon intensity (CI) of NovaSAF is a key additional differentiator vs SAF from other production pathways. In addition to being calculated in grams per Megajoule, the CI of NovaSAF is also accessed as a function of how much it reduces the emissions versus baseline (Jet-A) which is important when considering access and value from schemes like LCFS/RFS in the USA and RFTO/ReFuel in Europe.

As seen in Figure 5 above, NovaSAF – when produced from biogas sources like dairy gas or gas from agricultural wastes – has the lowest CI vs alternatives. NovaSAF produced from landfill gas also comfortably falls underneath the EU threshold.

A typical flight from London to New York emits ~425 tons of CO_2. When using a 50% HEFA (at 28 g/mj) blend, the emissions savings are 150 tons. When using NovaSAF (6 g/mj) the savings are 200 tons – a 33% increase vs a standard HEFA plant. NovaSAF's value includes being able to provide SAF at the same or lower prices than HEFA but with a even larger impact for the SAF consumer.

A NovaSAF project also produces fuel that qualifies as an RFNBO under Commission Delegated Regulation (EU) 2023/1184, which defines the conditions under which electricity used in RFNBO production is considered renewable. Approximately 45% of a NovaSAF plant's energy input comes from renewable electricity such as solar or wind. Each project must assess its power source independently, but when the right considerations are observed then the % of energy from renewable electricity will generate an equal portion of RFNBO compliant fuel.

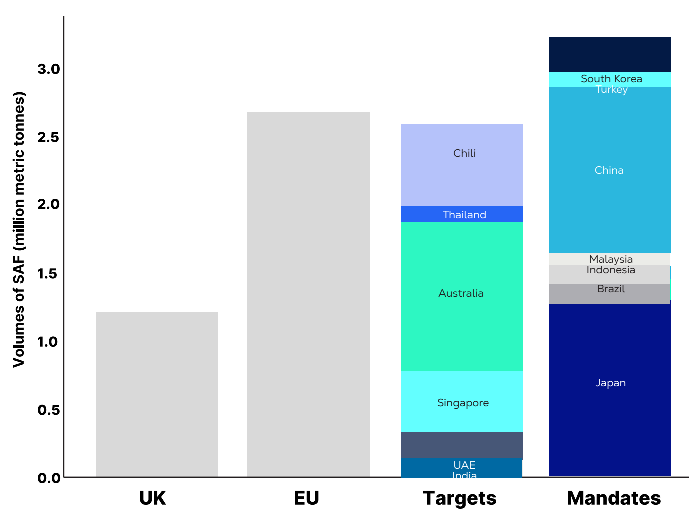
The remaining 55% of the energy input is from biogas, for example biogas from animal manure as listed in Annex IX Part A of Directive (EU) 2018/2001, and qualifies as an advanced biofuel (bioSAF). This hybrid model enables compliance with both RFNBO and advanced biofuel pathways, using LHV-based energy accounting. Lifecycle emissions and sustainability criteria are aligned with the second Delegated Act on GHG methodology for RFNBOs and recycled carbon fuels, ensuring full regulatory alignment.

Nuances in Regulatory Compliance

In major aviation markets, regulatory mandates for SAF use are enforceable, escalating, and reshaping the economics of jet fuel. The European Union's ReFuelEU Aviation Regulation and the UK's Renewable Transport Fuel Obligation (RTFO) require increasing volumes of SAF, creating a guaranteed demand pool for producers. Starting in 2025, EU airports must blend 2% SAF, rising to 6% by 2030 and 70% by 2050. Globally, SAF mandates are also taking off. In addition to ICAO's CORSIA program, more than 13 countries have implemented mandatory targets or mandates for SAF use. These mandates are designed not only to reduce emissions but also to catalyze investment in low-carbon technologies like eSAF, with sub targets that prioritize synthetic fuels and reward early movers with premium pricing.[viii] The presence of sub targets further complicates compliance as regulated entities need to have access to two different products. NovaSAF's dual regulatory qualification unlocks access to high-value credits and compliance flexibility. NovaSAF qualifies as both an Advanced Biofuel and a Renewable Fuel of Non-Biological Origin (RFNBO), meeting the strictest criteria under RED III and RTFO.This dual compliance positions NovaSAF to capture the most lucrative credit multipliers and certificate markets, making it one of the few SAF platforms capable of delivering strong returns even in the absence of subsidies.

Pre-certification efforts are already underway for NovaSAF 1. Syzygy has engaged a compliant consulting firm to validate compliance with regulatory pathways leveraging ISCC methodologies for audit.[ix] This positions NovaSAF to access premium SAF markets in Europe and the UK, where regulatory mandates are driving long-term demand and price premiums.

FIGURE 06



Source: Beyond the transatlantic core: Emerging SAF mandates in global mark
https://www.carbon-direct.com/insights/beyond-the-transatlantic-core-emer

Biogas: A Stable Feedstock for SAF

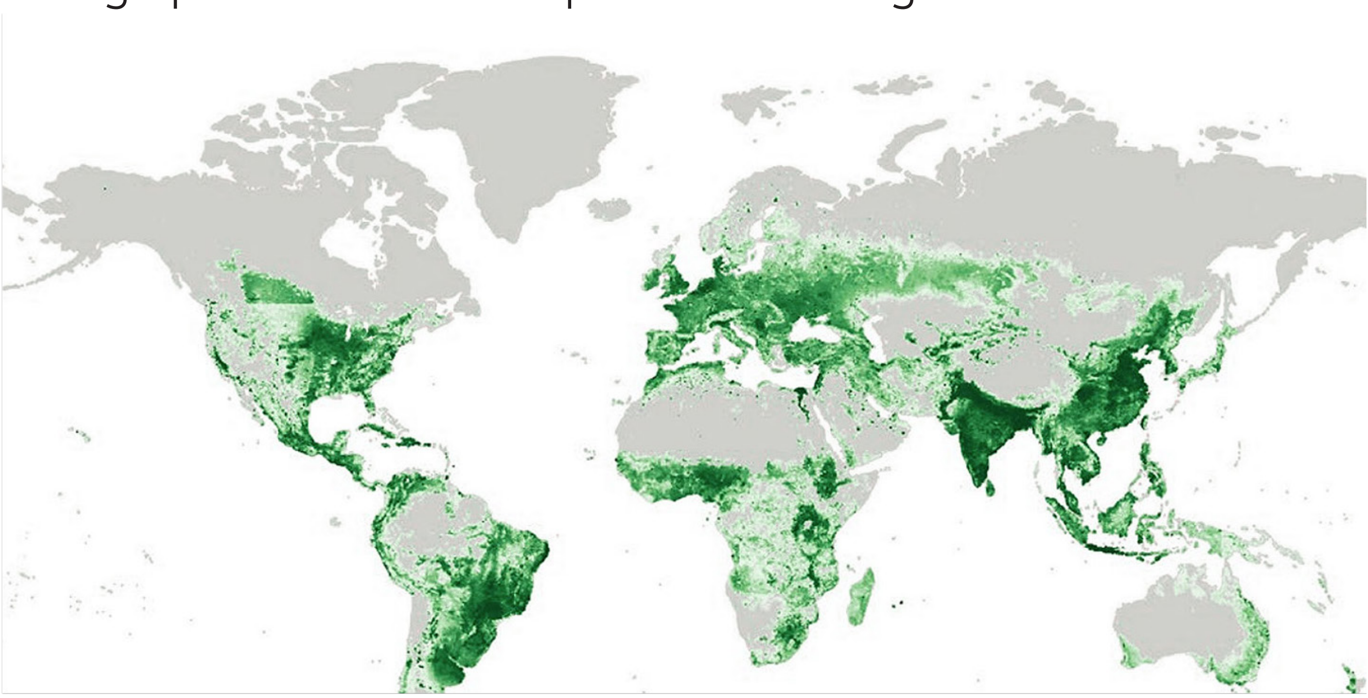
Sources, Quantities, and Geographic Distribution

Biogas is the keystone of the NovaSAF solution. Unlike other SAF feedstocks constrained by geography, seasonality, or supply chain complexity (e.g., used cooking oil or tallow), biogas is both abundant and distributed. It is generated continuously in nearly every region of the world from predictable, scalable sources. Each of these categories offers different methane yields per dry ton or m^3 processed. When aggregated globally, they represent a massive and largely stranded energy source.

IEA estimates that global biogas potential is approximately 795 Billion Cubic Meter Equivalent.[x] This equates to 587 million tons of jet fuel per year, sufficient to displace the entirety of the ~380 million ton per year global jet fuel demand. The table below breaks this down by region and feedstock.

FIGURE 07

Geographic distribution of potential for biogases



Source: IEA Outlook for Biogas and Biomethane: A global geospatial assessment | https://www.iea.org /reports/outlook-for-biogas-and-biomethane

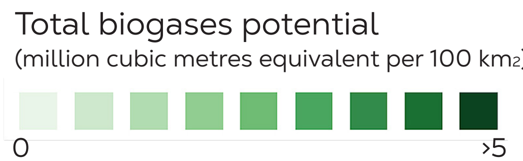
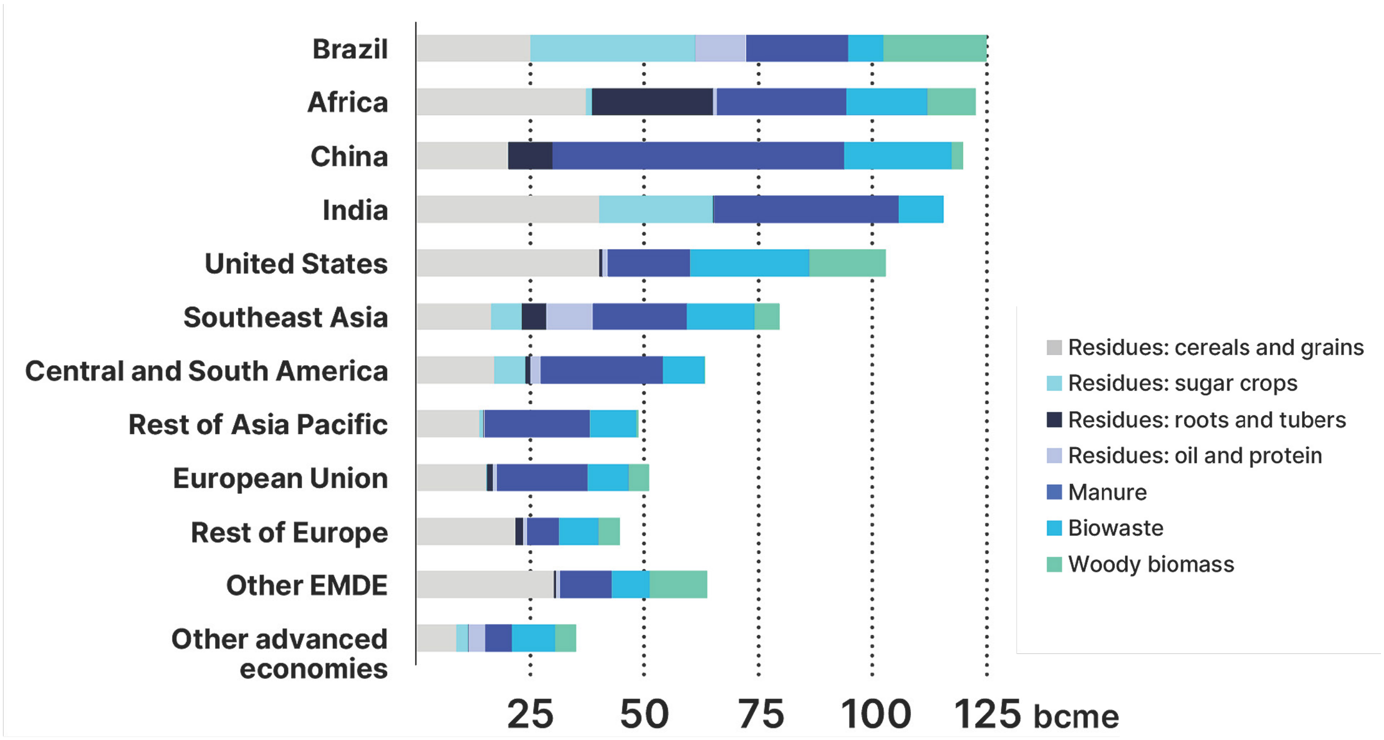


FIGURE 08

Potential for biogases by region and by feedstock type, 2024[xi]



Source: IEA Outlook for Biogas and Biomethane: A global geospatial assessment https://www.iea.org/reports/outlook-for-biogas-and-biomethane

Stranded Assets

Most of the global biogas potential remains untapped due to infrastructure and economic constraints—these are known as stranded biogas assets. These sites are either too small to justify investment in large-scale gas upgrading and compression systems or too far from natural gas pipeline infrastructure to economically transport the gas to market. As a result, the biogas is often flared, vented, or simply never collected.

This is not a marginal issue: according to the International Energy Agency (IEA) and World Biogas Association, over 95% of the world's technically sustainable biogas and biomethane potential remains unutilized, primarily due to the limitations above. The stranded nature of these resources suppresses their commercial value—creating a vast, low-cost, and underexploited energy reserve ready for conversion to SAF. By co-locating our technology directly at the source, we can unlock stranded energy at a cost far below conventional gas or feedstock input, turning what was once a compliance liability into a revenue-generating clean fuel stream.

NovaSAF Project Returns

Future Project Spotlight: Domestically Produced SAF Provided to US Airlines at Jet Parity

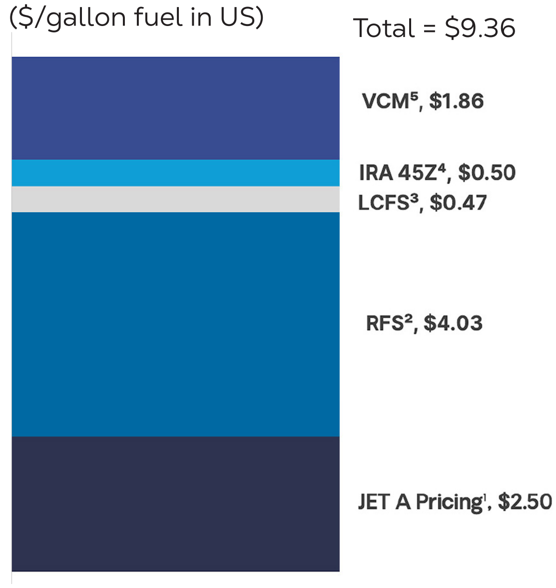
Within the US, Syzygy will deliver SAF to airlines at Jet-A pricing – a critical threshold for airline adoption – while still generating IRRs above 20% for project backers. We achieve this by leveraging well established and well supported credit markets – the U.S. Renewable Fuel Standard (RFS) and California's Low Carbon Fuel Standard (LCFS) – because our SAF qualifies for a stack of incentives directly tied to its emissions reduction.

For a typical project size in the US we expect to recognize revenues of ~$10 per gallon of fuel (Figure 9) and EBITDA margins of almost $5.6 per gallon. These cash flows combined with low capex for this scale contribute to nearly 30% unlevered returns. Plants built around our technology are resilient to changes in policy as well. If the only credit available was RFS on average, plants would return ~15%.

FIGURE 09

Potential Revenue

($/gallon fuel in US)



1 Based on typical delivered jet fuel prices in the US
2 1.7 D3 RIN per gallon of fuel valued at $2.50 per RIN
3 Based on assumed carbon intensity of 22 g/mj resulting in ~9kg CO_2 reduction per gallon; $50/ton LCFS credit price
4 45Z credit of $0.50 based on nearly 50% reduction vs benchmark of 47g/mj given in IRA and OBBB legislation
5 Aviation emissions credits $200 per ton paid by third parties for scope

FIGURE 10

Illustrative US Volume Project Economics

- Nameplate Capacity: 2,000 bpd
- Annual Production: 29 mmgpy
- Capex: ~$450mm
- CI: 22 g/mj
- Revenue per gallon (incl. Credits): $9.56
- EBITDA Margin (Including Credits): $5.62
- Unlevered IRR: 28%

Global Projects Selling into the EU/UK

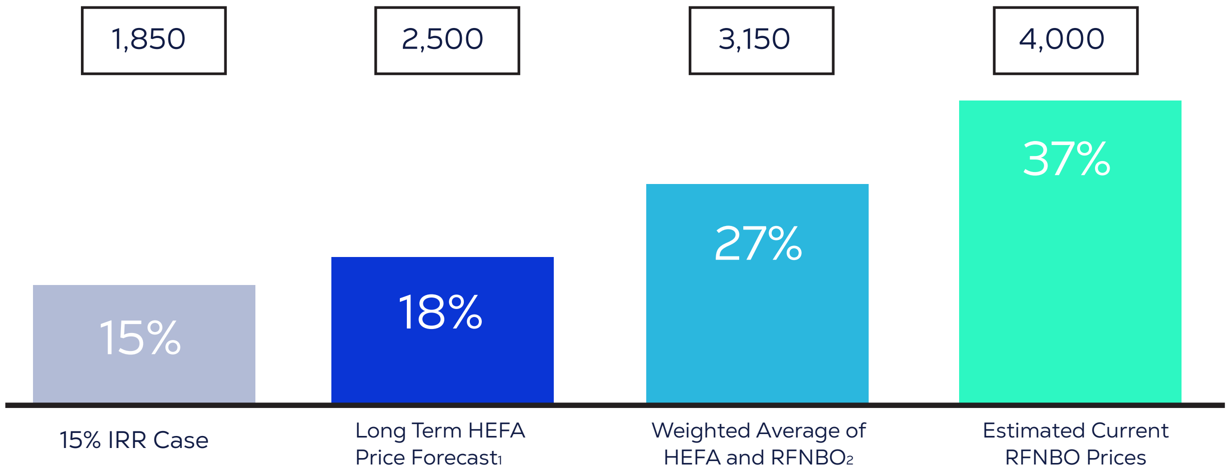
In the European Union and United Kingdom, the regulatory focus is shifting toward compliance with SAF mandates – specifically fuels that qualify as Advanced Biofuels (Annex IX Part A) or RFNBOs (Renewable Fuels of Non-Biological Origin) under RED III and the UK's RTFO. As discussed, NovaSAF produces fuel streams for both RFNBO and bioSAF.

While the pricing environment in these regions is not at Jet-A parity, the mandates create durable, premium markets for qualifying fuels. Our cost structure allows us to sell at a lower cost than many other pathways, even HEFA, under a number of scenarios –especially in regions with favorable logistics or existing biogas collection infrastructure.

For a typical NovaSAF plant to return 15%, the required sales price is around €1,850 euro per tonne which represents a 26% discount to the long term expected pricing for HEFA. The advantage is even more stark when compared to required prices for RFNBO producers. NovaSAF presents cost savings of ~55% vs current RFNBO pricing, providing extreme value to the end customers.

FIGURE 11

NovaSAF IRR Under Various Sales Prices (Euro per Tonne)



1. Per Bloomberg Europe Annex 9-A SAF Price Outlook dated 2 December 2024
2. Assumes $6,000/ton long term RFNBO Pricing and $3,000/ton Advanced biofuel; 42% RFNBO and 58% Advanced biofuel per ton of NovaSAF

Project Spotlight: NovaSAF 1 (Uruguay)

NovaSAF 1 marks a major milestone in Syzygy's mission to decarbonize aviation fuel at scale. Located in Durazno, Uruguay, this first-of-its-kind commercial facility will transform manure from approximately 14,000 cows into nearly 400,000 gallons (1,100 tons) of SAF annually. By co-locating the plant at the Estancias del Lago (EDL) dairy operations, Syzygy is turning agricultural waste into a high-value, low-carbon fuel while creating a replicable model for distributed SAF production.

The project's energy input comes from Uruguay's national grid, which exceeds 90% renewable generation—qualifying for exemption from additionality and correlation requirements under Article 5. The project also meets the 70% GHG reduction threshold outlined in Article 4, with a carbon intensity of 18 gCO_2e/MJ. The CO_2 feedstock is biogenic, sourced from anaerobic digestion, and is permitted under the regulation.

What sets NovaSAF 1 apart is its integration of cutting-edge technology and world-class partnerships. Syzygy's proprietary Rigel™ reactor uses light-driven chemistry to convert biogas—including CO_2—into syngas with unmatched efficiency. That syngas is then processed through Velocys's compact Fischer-Tropsch (FT) microchannel reactor, and upgraded into SAF and naphtha using well established hydrotreating technology. This end-to-end process is engineered for modularity, scalability, and regulatory compliance.

Engineering for the project is being led by Kent, a global EPC firm, which is currently advancing the front-end engineering design (FEED). With environmental permitting underway and a final investment decision expected in late 2025,

Source: Estancias del Lago SRL

Conclusion

As aviation fuel policy mandates tighten conventional supply, yet worldwide demand for aviation services accelerates, NovaSAF stands ready to lead the next generation of sustainable aviation fuel. NovaSAF offers a credible, scalable, and financeable solution to one of aviation's most urgent challenges: decarbonizing without compromising economic viability. By combining abundant biogas with renewable electricity in a modular, electrified platform, NovaSAF delivers SAF at a competitive cost and carbon intensity—without relying on scarce feedstocks or subsidies. Its dual regulatory compliance and ability to unlock stranded energy assets make it uniquely suited to thrive in a policy-driven market and in a world where technology change is needed to truly combat climate change.

Resources

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iv World Energy Outlook Special Report Outlook for Biogas and Bio-Methane A global geospatial assessment | IEA

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vii Steam methane reforming using a regenerable antenna–reactor plasmonic photocatalyst | Nature

viii Beyond the transatlantic core: Emerging SAF mandates in global markets | Carbon Direct

ix Sustainability Certification for the Transport and Energy Sector in the European Union https://www.iscc-system.org/certification/iscc-eu/

x World Energy Outlook Special Report Outlook for Biogas and Bio-Methane A global geospatial assessment | IEA

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xii International Energy Agency (IEA) 2020 Outlook for Biogas and Biomethane: Prospects for Organic Growth https://www.iea.org/reports/outlook-for-biogas-and-biomethane-prospects-for-organic-growth

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