

Doubling the Global Supply of Sustainable Aviation Fuel (SAF)

A new source of aviation fuel, doubling the global supply of SAF, is to be profitably produced outside the Gulf, from algae, CO₂, and sunlight. We have \$16 billion in offtake contracts already from 5 oil & gas majors, including Shell, Chevron, and BP. Two of the world's biggest energy construction companies, KEPCO and Samsung, are to build 24 plants in Texas and Australia.

An Industry Impact Analysis for the SAF Sector

April 2026

Companion briefings:

Document 1: The Global Aviation Fuel Crisis — A Background Briefing for Journalists

Document 2: Where Aviation Fuel Comes From — Global Jet Fuel Refining & SAF Production Infrastructure

All three documents are available at innovo-net-zero.com/pr-briefing

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1. The Structural Crisis: Why This Matters Now

Willie Walsh, Director General of the International Air Transport Association (IATA), has stated plainly that even if the current conflict were resolved and shipping routes reopened immediately, aviation fuel supplies would take months to return to normal.

“If it were to reopen and remain open, I think it will still take a period of months to get back to where supply needs to be given the disruption to the refining capacity in the Middle East.”

— Willie Walsh, IATA Director General, April 2026

“Even if you have the flow of crude start again, if you’ve had disruptions in refining capacity, then the problem continues for some time.”

— Willie Walsh, IATA Director General, April 2026

Walsh’s assessment identifies a structural reality that persists regardless of the diplomatic outcome:

- Jet fuel has no strategic reserves. Unlike crude oil, there are no government stockpiles to release.
- Refining capacity is the bottleneck, not crude supply. Middle Eastern refineries that produce a significant share of global jet fuel have been disrupted.
- Jet fuel accounts for approximately 27% of airline operating costs. Price spikes feed directly into fares, route cuts, and flight cancellations.
- Recovery after comparable historical shocks has taken 4–12 months. Walsh compared the timeline to post-9/11 (4 months) and 2008–2009 (10–12 months).

This crisis has exposed a dependency that predates the current conflict and will outlast it: the global aviation industry’s fuel supply is structurally concentrated in a small number of geopolitically vulnerable regions.

That is about to change.

2. The Parallel Crisis: SAF Feedstock Is Fracturing

The Strait of Hormuz disruption has dominated headlines, but a second supply crisis is unfolding in parallel that will outlast the first: the feedstock supply chain for sustainable aviation fuel is breaking.

2.1 Concentrated Dependency on a Single Feedstock

Approximately 80% of global SAF production depends on a single feedstock pathway: hydroprocessing used cooking oil (UCO) and animal fats via the HEFA process. This dependency is now being stressed from multiple directions simultaneously:

1. **China’s UCO export rebate eliminated.** China supplies the majority of global UCO exports. The removal of the 13% VAT rebate has made Chinese UCO exports commercially unviable at previous volumes.
2. **U.S.–China tariffs at 125%.** Any remaining UCO trade between China and the U.S. faces prohibitive tariff barriers.
3. **China’s domestic SAF plants absorbing UCO.** China has suspended jet fuel exports to prioritize domestic supply. Its own SAF production program is consuming growing volumes of domestic UCO.
4. **Global UCO supply has a physical ceiling.** Total global availability of waste fats, oils, and greases is estimated at 34–42 million tonnes (IEA/McKinsey). HEFA-based SAF can realistically supply a maximum of approximately 10% of future global SAF demand.

2.2 The Mandate Wall

SAF mandates are not discretionary. Airlines face binding legal obligations that they cannot opt out of and that the current SAF production base cannot meet:

Jurisdiction	Mandate	Trajectory
EU (ReFuelEU)	2% SAF by 2025	6% by 2030, 70% by 2050
United Kingdom	2% SAF by 2025	10% by 2030, 22% by 2040
ICAO CORSIA	Mandatory from 2027	Net-zero aviation by 2050
U.S. SAF Grand Challenge	3 billion gallons by 2030	35 billion gallons by 2050
Japan	10% SAF by 2030	Scaling to 2050
Singapore	1% by 2026	3–5% by 2030

Current global SAF production: approximately 1 million tonnes per year (IATA, December 2024). This is less than 7% of the 15 million tonnes mandated by 2030. The gap is growing, not closing.

3. The Answer: Aviation Fuel from Algae, CO₂ and Sunlight

A new source of aviation fuel feedstock is set to be profitably produced outside the Gulf, entirely independent of the Strait of Hormuz and free from dependence on imported petroleum or waste cooking oil.

INNOVO's Smoke2Value bio-farms will grow microalgae in seawater on arid coastal land using sunlight and CO₂. The algae are harvested and fractionated to yield crude algal oil — a premium SAF feedstock — and animal feed. The crude algal oil is sold to oil and gas majors, who will refine it into finished SAF using existing HEFA hydroprocessing infrastructure. This is a drop-in feedstock compatible with existing refinery operations, requiring no new capital investment by the oil and gas major for feedstock processing.

3.1 How Bio-farms Work

The technology uses MYKO Global's patented photobioreactor system, proven at industrial scale. Each bio-farm comprises 99,840 transparent tanks on 205 acres. Algae grow through natural photosynthesis in bright sunlight, just as they do in the sea. The algal biomass is harvested continuously and processed to extract crude algal oil and algal cake (animal feed).

The core technology operates on ambient atmospheric CO₂ — the original MYKO facility was built on agricultural land with no industrial emissions source. INNOVO has added the capability to digest concentrated CO₂ from industrial smoke emissions as a strategic enhancement, for three reasons in order of importance:

5. **Financing:** Eligibility for U.S. Section 45Q Production Tax Credits (\$51.5M/year per bio-farm) and a share of Australian CO₂ emissions tax savings.
6. **Net zero proposition:** Enabling the industrial partner to achieve net zero at nil capital expenditure in return for PR promotion through the INNOVO Profitable Net Zero Alliance.
7. **Faster growth:** Higher CO₂ concentrations from smoke emissions accelerate algal growth rates.

Crucially, this means bio-farms can be located anywhere with suitable climate within 50 miles of the coast or above saline aquifers. They can be co-located with heavy emitters, to profitably digest their CO₂ emissions. This also yields significant financial benefits in US 45Q tax credits. Sites are selected for port proximity (for shipping crude algal oil) and climate suitability, not for proximity to emissions sources.

3.2 Validation: \$16 Billion in Offtake Contracts

Five of the world's top 10 oil and gas companies, including BP, Chevron, and Shell, each performed two years of full due diligence on the technology at an industrial-scale facility. Between them, they placed \$16 billion in offtake contracts for the crude algal oil feedstock. The technology has been independently certified by the U.S. EPA and under the EU's ISCC sustainability framework.

3.3 EPC Consortium

The first 24 bio-farms are being built by an EPC consortium comprising KEPCO Engineering & Construction (primary global EPC contractor), Samsung C&T, Samsung E&A, and ARCO Group (U.S. subcontractor). The consortium's combined annual revenue exceeds \$83 billion. Deployment: 14 bio-farms in Corpus Christi, Texas; 10 in Gladstone, Queensland, Australia. Both sites were selected for port proximity to ship crude algal oil.

3.4 \$122B of Future SAF Feedstock Available Over 30-Years

The 24 bio-farms in Corpus Christi, Texas and Gladstone, Queensland generate \$122B (24 x \$169.4M p,a, x 30 years) of SAF feedstock over 30 years. This is now being offered to one of more oil & gas majors as 30-year offtake contracts.

4. Production at Scale: Doubling Global SAF Supply

4.1 Per Bio-farm Output (V86 Financial Model)

Parameter	Value
Facility size	205 acres, 99,840 tanks
Capital expenditure	\$392 million
Crude algal oil output (for sale)	154,409 tonnes/year
SAF equivalent output (~40% HEFA yield)	~62,500 tonnes/year (~1,340 barrels/day)
SAF-designated blended fuel (at 50% ASTM D7566)	~2,680 barrels/day
CO ₂ digested annually	~605,594 tonnes
Project IRR (8-year)	~56%
Payback period	2.8 years
U.S. 45Q Tax Credits (12 years)	\$612 million (\$51.5M/year)
Construction period	20 months
Revenue at full capacity (Year 5)	\$1.4 billion

4.2 Aggregate: 24 Bio-farms

At full capacity across 24 bio-farms, INNOVO will produce crude algal oil sufficient to yield approximately 1.5 million tonnes of SAF annually — effectively doubling current global SAF production. Total SAF feedstock contracts over 30 years: \$122 billion.

Each bio-farm will produce approximately 1,340 barrels per day of neat SAF equivalent. Across 24 bio-farms at maturity, total output will be approximately 32,000 barrels per day of neat SAF, or approximately 64,000 barrels per day of SAF-designated blended aviation fuel.

4.3 Profitability Without Subsidy

At a project IRR of approximately 56% and a 2.8-year payback, each bio-farm is seven times more profitable than solar energy. The economics are driven by the commercial value of the algal oil and animal feed, not by government incentives. U.S. 45Q tax credits and Australian CO₂ tax savings provide additional financing but are not required for profitability.

5. Why Algal Oil Is Strategically Different

The current crisis has exposed four structural vulnerabilities in the conventional SAF feedstock supply chain. INNOVO's algal oil pathway eliminates all four:

1. No dependence on the Strait of Hormuz

Bio-farms will produce feedstock on-site from CO₂ and sunlight. There is no imported crude oil, no tanker traffic, no exposure to maritime chokepoints. The feedstock supply chain is entirely self-contained and domestically located.

2. No dependence on used cooking oil

Unlike HEFA producers competing for a finite and shrinking pool of waste fats and UCO, INNOVO's bio-farms generate their own feedstock. There is no exposure to China's UCO export policies, U.S.–China tariffs, or the global waste oil supply ceiling of 34–42 million tonnes.

3. Physically scalable beyond HEFA's ceiling

Conventional HEFA SAF has a physical feedstock ceiling. Even if every available tonne of waste oil globally were converted to SAF, maximum output would be approximately 300,000–400,000 barrels per day — a fraction of the 7 million barrels per day of jet fuel consumed globally. One million barrels per day of conventional HEFA SAF is physically impossible. INNOVO bio-farms face no such constraint because each facility grows its own feedstock from CO₂ and sunlight. The limiting factors are land, EPC capacity, and capital — all of which are scalable.

4. Profitable at scale without ongoing feedstock cost volatility

Conventional HEFA producers spend 60–80% of operating costs on feedstock procurement, and those costs fluctuate with commodity markets, trade policy, and supply competition. INNOVO's feedstock cost is sunlight and CO₂ to sustain algal growth — effectively zero marginal feedstock cost. This delivers structural margin stability that no UCO-dependent producer can match.

6. First Mover vs. Followers

INNOVO will grant first-mover status to one oil and gas major in return for either (a) the purchase of \$300M of U.S. 45Q Tax Credits for \$200M cash, generating \$100M immediate profit, or (b) generation of \$200M cash from \$300M in Australian CO₂ tax mitigation obligations.

6.1 First-Mover Advantages

- Priority access to the world's largest new source of SAF feedstock — 1.5 million tonnes of crude algal oil annually from 24 bio-farms, produced independently of the Gulf.
- SAF production revenue from 24 bio-farms: \$1.5B–\$3.6B annually at maturity.
- U.S. 45Z Clean Fuel Tax Credits on SAF produced from INNOVO feedstock: up to \$0.80–\$0.90 per gallon.
- Net-zero oil and gas premium pricing of \$30–\$50 per barrel across production.
- Dominant positioning in a SAF market projected to reach \$40–\$360 billion by the mid-2030s.
- Share price revaluation: 20–30% uplift estimated from transition from “stranded asset risk” to “energy transition leader.”
- Total 10-year value creation: \$20B–\$50B+.

6.2 Follower Disadvantages

Once the first mover secures INNOVO's crude algal oil output, all competitors become followers:

- Structural feedstock scarcity: the first mover controls INNOVO's 24 bio-farms' output. Competitors cannot replicate this volume for years.
- Lost SAF pricing window: the first mover locks in multi-year airline contracts at peak premium margins before followers can access alternative feedstock.
- Continued \$700–\$900 billion revenue erosion from market share decline since 2020 accelerates for companies unable to offer net-zero products.
- Intensifying stranded asset risk: without nil-capex decarbonization, competitors must invest billions in their own solutions with uncertain returns.

7. Competitive Landscape

No competing technology simultaneously provides all four of the following: industrial-scale volume, proven technology validation, a profitable carbon capture mechanism, and nil capital expenditure to the oil and gas partner.

Pathway	Current Status	Feedstock Constraint	INNOVO Advantage
HEFA (UCO/fats)	~80% of current SAF	Physical ceiling: 34–42Mt global waste oil	Algal oil is self-generating; no UCO dependency
Fischer-Tropsch	Internationally operational	Ample supplies of used tires and waste plastics available globally	INNOVO is also deploying this technology: Waste2Value
Alcohol-to-Jet	Scaling (8% by 2030)	Ethanol supply competition	No agricultural land competition
Power-to-Liquid	Pre-commercial	Massive renewable electricity required	No electricity dependency for feedstock

8. Sources

- ¹ Willie Walsh, IATA Director General, public statements April 2026 (aol.com, rfi.fr, rte.ie, wsau.com).
- ² IATA, “Disappointingly Slow Growth in SAF Production” (December 10, 2024) — 1 million tonnes SAF produced 2024.
- ³ IATA / Worley, Global Feedstock Assessment for SAF Production (2025) — HEFA standalone 3–5 year build, feedstock ceiling.
- ⁴ IATA SAF Handbook (May 2024) — HEFA SAF fraction 15–50%.
- ⁵ ACI Europe letter to EU Commissioners (April 9, 2026) — 3-week shortage warning, reported by Euronews, FT, Corriere della Sera.
- ⁶ IEA / McKinsey — global waste fats and oils estimated at 34–42 million tonnes.
- ⁷ NREL, Sustainable Aviation Fuel State-of-Industry Report (NREL/TP-5100-87803, 2024) — HEFA construction 2–5 years.
- ⁸ WEF, Financing Sustainable Aviation Fuels: Case Studies and Implications (2025).
- ⁹ Energy Capital Ventures, SAF Technology Pathways (2025) — HEFA limited to ~10% of future SAF.
- ¹⁰ ASTM D7566-24a — SAF blending limits, HEFA-SPK 50% maximum.
- ¹¹ SkyNRG, “The Basics of SAF Technology” — HEFA pathway description.
- ¹² Baker & O’Brien, “It’s Not Enough, Part 2” (November 2024) — SAF economics and incentive analysis.
- ¹³ Sustainable Aviation Futures / BioVeritas (August 2025) — HEFA feedstock ceiling at 6 billion gallons by 2030.

INNOVO Project Knowledge (for corroboration):

- ¹⁴ INNOVO 05.1.1 Smoke2Value01 CC 205 Financial Model V86 RdeM 20260124 — authoritative production and financial data.
- ¹⁵ INNOVO Net Zero Nil Capex for the Oil & Gas Industry v2025-12-19 MK — SAF market opportunity.
- ¹⁶ INNOVO’s US Federal Tax Credits — S2V Bio-farm Eligibility & Monetization Strategy v2026-1-25 MK.
- ¹⁷ INNOVO Algae Tech Stack Venture Information Memorandum v2025-5-15 MK — \$16B offtake contracts, \$645M EBITDA.
- ¹⁸ innovo-net-zero.com — company website, SAF page, PR briefing page.

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