Where Aviation Fuel Comes From

Global Jet Fuel Refining & SAF Production Infrastructure

A Background Briefing for Journalists

April 11, 2026

This briefing provides journalists with background research on the global infrastructure for producing conventional jet fuel and sustainable aviation fuel (SAF). It explains where aviation fuel is refined, where SAF can be produced, and why the current crisis cannot be resolved quickly. All information is from publicly available sources cited in footnotes.

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1. The Global Jet Fuel Refining Landscape

The world consumes approximately 300–320 million tonnes of jet fuel per year (roughly 7–8 million barrels per day). Jet fuel represents approximately 7% of overall refined product demand, but this proportion is rising and is expected to reach 9% by 2040 as ground transport electrifies while aviation demand continues to grow.[1]

The U.S. has approximately 18 million barrels per day of total refining capacity, making it the world's largest fuel market. U.S. jet fuel production averaged 1.815 million barrels per day over the first 11 months of 2025, with the refinery-rich Gulf Coast (PADD 3) alone producing approximately 958,000 barrels per day — more than half of national output.[2][3]

However, the geographic distribution of refining capacity is shifting. North America and Europe have lost a net 2.4 million barrels per day of refining capacity since 2020, while Asia, the Middle East, and Africa have added 3.4 million barrels per day over the same period. This eastward migration of refining means that Western markets are increasingly dependent on imported refined products transported over longer, more complex, and more geopolitically exposed supply chains.[4]

Major Jet Fuel Refining Regions

REGION	CAPACITY	JET FUEL ROLE	CRISIS IMPACT
U.S. Gulf Coast	~9.5M bpd	958K bpd jet fuel; 53% of U.S. output	Utilization at 95% (vs. 82% 5-yr avg); strong export margins
U.S. West Coast	~1.7M bpd	427K bpd jet fuel	Lost 17% of CA capacity (Phillips 66, Valero closures); reliant on S. Korean imports
Northwest Europe	~10M bpd (declining)	Net importer of jet fuel (~30% imported)	Lost ~400K bpd since early 2024; 5 refinery closures in 2 years
Middle East/Gulf	~10–12M bpd	Key global jet fuel exporter	Severely disrupted; refining capacity damage from conflict
China	~17M bpd	Asia's 3rd-largest fuel exporter	Fuel exports suspended (March 4 NDRC order); prioritizing domestic supply
South Korea	~3.3M bpd	Supplied 85% of U.S. jet fuel imports	Exports capped at 2025 levels; 70% of crude imports via Hormuz
India	~5.5M bpd	Major refiner (Reliance, IOCL)	Capacity to expand output; but EU buyers avoiding Reliance (Russian crude)
Singapore	~1.5M bpd	Key Asia-Pacific hub	Neste SAF facility (1M t/yr); regional distribution center
Nigeria	650K bpd	Dangote refinery (new)	One of few major new non-Gulf alternatives for Europe

[1] IATA, "Conventional Aviation Fuel and the Energy Transition" (In-Depth Report), 2025.
[2] BOE Report / Reuters, "Iran war raises demand for US fuel, boosting Gulf Coast refining margins," April 9, 2026.
[3] OPIS, "2026 Preview: Refinery Issues, Demand and SAF to Guide US Jet Fuel Market," January 12, 2026.

Sources: EIA[4]; BOE Report/Reuters[4]; OPIS[4]; Argus Media[4]; IATA[44]

2. U.S. Gulf Coast: The World's Most Important Refining Hub

The U.S. Gulf Coast is currently the most strategically important refining region in the world for jet fuel. It is largely insulated from the Hormuz crisis because U.S. refineries are not reliant on Middle Eastern crude, drawing instead on domestic shale production, Canadian imports, and Latin American supply.[5]

Gulf Coast refinery utilization climbed to nearly 92% nationally last month, with Gulf Coast-specific utilization averaging above 95% — compared with a five-year seasonal average of approximately 82%. Major independent refiners including Marathon Petroleum, Phillips 66, Valero Energy, and PBF Energy are positioned at the origin point of the Colonial Pipeline and have direct access to marine export terminals.[6]

The Houston metropolitan area alone houses 10 refineries processing 2.6 million barrels per day — 14.3% of national production. The entire Gulf Coast region (including Corpus Christi, Port Arthur, and Beaumont) accounts for over 87% of Texas's refining output and more than a quarter of total U.S. production.[7]

U.S. monthly jet fuel exports to Europe reached their highest level in March 2026, approaching 400,000 tonnes. However, this remains far below the 1.4 million tonnes normally imported by the EU-27 and UK in a single month. The U.S. can partially offset European shortfalls but cannot replace Middle Eastern supply at scale.[8]

U.S. West Coast: A Separate Vulnerability

The U.S. West Coast faces its own supply constraints. Phillips 66 ceased production at its 139,000 barrel/day Los Angeles refining complex by the end of 2025, and Valero is set to idle process units at its 150,000 barrel/day Benicia refinery. Combined, these two closures represent roughly 17% of California's crude processing capacity.[9]

The West Coast is heavily reliant on imports from South Korea, which supplied 85% of total U.S. jet fuel imports last month and 87% of West Coast imports in 2025. South Korea's mandatory cap on refined product exports has left this region with limited room to supplement supply after the refinery shutdowns.[10]

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[7] Houston.org, "Gulf Coast Refining Capacity." https://d9.houston.org/houston-data/gulf-coast-refining-capacity

[8] Euronews, "How serious will the jet fuel crisis in Europe become?" April 7, 2026.

3. Europe: Declining Capacity, Rising Dependence

Europe has been a net importer of jet fuel for years, with imports accounting for roughly 30% of regional demand. The Middle East Gulf alone accounts for more than half of Europe's jet fuel imports, and at least 42% of total seaborne jet fuel imports passed through the Strait of Hormuz before the crisis.[11][12]

Since early 2024, Europe has lost approximately 400,000 barrels per day of refining capacity, with five refinery closures in two years. The IEA has forecast that 1–1.5 million barrels per day of European refining capacity could be at risk of closure by 2030 — far above the historical average of 220,000 barrels per day of closures annually.[13][14]

Recent European Refinery Closures and Reductions

REFINERY	CAPACITY	STATUS	NOTES
Shell Wesseling (Germany)	~130K bpd	Ending crude processing by 2025	Converting to base oils
BP Gelsenkirchen (Germany)	~260K bpd	Cutting capacity by one-third	Reducing footprint
Eni Livorno (Italy)	88,400 bpd	Suspended crude processing	Converting to HVO biofuel plant
Grangemouth (UK)	~150K bpd	Closure announced	Scotland's only refinery
BP Rotterdam (Netherlands)	N/A	SAF plant canceled	$600M project scrapped
Shell Rotterdam (Netherlands)	820K t/yr SAF	SAF project canceled	Dropped in Sept 2025

The structural problem is a mismatch between what European refineries produce and what the European market consumes. The continent's "dieselization" (decades of tax policy favoring diesel) means refineries are optimized for diesel production, and when diesel markets tighten, refiners prioritize diesel over jet fuel due to wider margins. This further constrains jet fuel availability during periods of stress.[15]

Countries with greater domestic refining capacity — Germany, Italy, Spain, and the Netherlands — are expected to experience less severe disruption. Landlocked and island markets (Malta, Cyprus, Latvia, and smaller Nordic airports) are disproportionately vulnerable.[16][17]

[13] S&P Global Commodity Insights, "Europe's refining sector braces for major downsizing as margins stall," July 2024.
[14] Insights Global, "European refining margins lagging, more closures expected?" April 2025.
[15] Economic Scenarios, "Fuel shortages: why Europe isn't short of gasoline, but risks running out of flights and trucks," March 2026.

Sources: S&P Global[15]; Insights Global[15]; Industrial Info Resources[15]

4. Asia-Pacific: The New Center of Refining — and New Vulnerabilities

Asia now accounts for the largest share of global refining capacity, with China, India, South Korea, Japan, and Singapore as the dominant players. The region has added significant new capacity in recent years, but the Hormuz crisis has exposed its dependence on Middle Eastern crude feedstock.[18]

Asian refinery utilization has slipped to the low-to-mid 80% range after visible run cuts through March and April, as refiners struggled to source crude. South Korea, which routes approximately 70% of its crude oil imports through the Strait of Hormuz, is among the worst-affected non-combatant countries. China's suspension of fuel exports on March 4 removed Asia's third-largest fuel exporter from the international market.[19]

IATA Director General Willie Walsh has pointed to India and Nigeria as countries with potential to increase refined fuel output to help offset global shortages, and has expressed hope that China and South Korea will resume exports once crude flows normalize. However, the timeline for recovery remains months, not weeks.[20]

5. Sustainable Aviation Fuel: Where SAF Is Produced Today

Global SAF production reached approximately 1 million tonnes in 2024 (1.3 billion liters) — double the 0.5 million tonnes produced in 2023, but still representing just 0.3% of total jet fuel production. The HEFA pathway (hydroprocessing used cooking oil, animal fats, and waste oils) accounts for approximately 80% of current production.[21]

[20] Manila Times / Reuters, "IATA chief says jet fuel supply could take months to recover," April 9, 2026.

[21] IATA, "Disappointingly Slow Growth in SAF Production," December 10, 2024. *Sources: IATA*[2121]*; TotalEnergies*[21]*; Fortune*[21]*; ICAO*[21]

Major SAF Production Facilities (Operating or Under Construction)

FACILITY	LOCATION	CAPACITY	FEEDSTOCK	STATUS
Neste Singapore	Singapore	1M tonnes/yr	UCO, animal fats	Operating (world's largest)
EcoCeres Tanjung Langsat	Malaysia	420K tonnes/yr	UCO, waste oils	Opened Jan 2026
TotalEnergies Grandpuits	France	230K tonnes/yr	Organic waste	Starting 2026
TotalEnergies Normandie	France	160K tonnes/yr	Co-processing	Operating
TotalEnergies Antwerp	Belgium	50–80K tonnes/yr	Co-processing	Ramping up 2025–2026
TotalEnergies Leuna	Germany	50K tonnes/yr	Co-processing	Planned 2026
World Energy Paramount	California, U.S.	~40M gal/yr	UCO, fats	Operating
Montana Renewables	Montana, U.S.	~300M gal/yr	Soy, UCO, tallow	Operating
ExxonMobil Baytown	Texas, U.S.	Planned large-scale	Multiple	Under development
Zhejiang Jiaao + others	China	Growing rapidly	UCO	Multiple plants starting 2025–2026

6. SAF Capacity Outlook: The Scale of the Gap

By 2030, global SAF production capacity is expected to reach approximately 20 million tonnes (with a project success factor applied). HEFA refineries are projected to still dominate, accounting for about 95% of total volume.[22]

Projected Regional SAF Capacity (2030)

REGION	SHARE OF PROJECTED 2030 SAF CAPACITY
North America	~36%
Europe	~23%
South America	~15%
China	~13%
East Asia & Pacific	~12%
Middle East / South Asia	<1%

Source: IATA Global Feedstock Assessment for SAF Production, 2025.[23]

For Europe specifically, EASA's "realistic" scenario estimates that 3.2 million tonnes of SAF will be produced and distributed by facilities already operating, under construction, or with pilot plants activated or being built — sufficient to meet the 2% ReFuelEU mandate through approximately 2028–2029. However, the "optimistic" case of 5.5 million tonnes relies on facilities that have not yet reached final investment decision.[24]

The longer-term picture is daunting. IATA's core forecast estimates that global SAF production could potentially reach 400 million tonnes by 2050, but this would still leave a shortfall of approximately 100 million tonnes against projected demand. Reaching even this level would require deployment of over 250 new SAF refineries in the U.S. alone and over 150 in Europe, representing cumulative investment opportunities of approximately $400 billion and €250 billion respectively.[25][26]

7. The Feedstock Bottleneck: Why SAF Cannot Scale Fast on UCO Alone

The single greatest constraint on SAF production is feedstock. Approximately 80% of current SAF production uses the HEFA pathway, which depends on used cooking oil (UCO), animal fats, and waste greases. These feedstocks are finite, geographically concentrated, and subject to increasing competition from other biofuel sectors.[27]

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[24] EASA, "State of the EU SAF market in 2023" (Status Report), via GreenAir News, February 2025.

[26] SkyNRG, "SAF Market Outlook," May 2023.

The feedstock supply chain is under unprecedented stress from multiple directions simultaneously:

- **China's UCO export tax rebate elimination (December 2024):** Exports dropped 60% month-on-month. China's record 2024 UCO exports of nearly 3 million metric tonnes ($2.64 billion) are expected to decline significantly.[28]
- **U.S.–China tariffs (125% on Chinese UCO):** The last UCO cargoes from China to the U.S. sailed in late March/early April 2026. China supplied roughly 60–70% of U.S. UCO imports, and the U.S. was the destination for 1.27 million tonnes ($1.2 billion) in 2024.[29]
- **China's domestic SAF production absorbing UCO:** Chinese SAF plants are currently using 100,000–120,000 tonnes of UCO per month, with new plants from Zhejiang Jiaao, Haixin Energy, Haike Chemical, and Blue Whale Bioenergy starting up in 2025–2026.[30]
- **Fraud and traceability concerns:** Transport & Environment has documented cases where reported UCO export volumes exceed credible collection estimates, suggesting some exported material may come from mislabeled sources. Europe has identified hundreds of suspicious shipments, prompting tightened customs scrutiny.[31]

There are 11 certified pathways to produce SAF, but diversification beyond HEFA has been slow. Alcohol-to-Jet (AtJ) and Fischer-Tropsch (FT) pathways, which use agricultural waste, municipal waste, and captured CO_2, represent the most promising alternatives for scaling SAF production beyond UCO dependency, but neither has yet achieved commercial-scale deployment.[32]

This feedstock bottleneck is the central structural vulnerability of the global SAF supply chain. Any technology that can produce SAF feedstock at scale without depending on UCO, animal fats, or the traditional waste oil supply chain represents a fundamentally different proposition for an industry facing binding regulatory mandates and constrained supply.

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[28] USDA Foreign Agricultural Service, "China: UCO Export Tax Rebate Terminated," November 2024.

[29] Reuters via Advanced BioFuels USA, "China Pivots to Europe for Used Cooking Oil Exports," 2026.

8. The Mandate Wall: Regulatory Demand That Cannot Be Delayed

The supply constraints described above are colliding with a wall of binding regulatory mandates that are creating non-discretionary demand for SAF. Airlines cannot opt out of compliance, and the mandates are accelerating:

MANDATE	CURRENT	2030 TARGET	2050 TARGET
EU ReFuelEU	2% (2025)	6%	70%
UK SAF Mandate	2% (2025)	10%	22% (2040)
ICAO CORSIA	Voluntary	Mandatory (2027)	Long-term aspirational
U.S. SAF Grand Challenge	Tax credits	3B gal/yr	35B gal/yr (2050)
Japan	Pilot phase	10% target	TBD
Singapore	1% (2026)	3–5%	TBD
India	Roadmap	Targets from 2027	TBD

Airlines face a $3.6 billion SAF-related cost burden in 2025 alone due to supply scarcity premiums. Demand is projected to reach 15 million tonnes by 2030 and 40 million tonnes by 2035. Current production of approximately 1 million tonnes per year is less than 7% of 2030 mandated demand. The gap between regulatory requirements and physical production capacity is the defining challenge of the global SAF market.[33]

9. The Infrastructure Question

The current aviation fuel crisis has exposed two structural realities that will persist regardless of how the Strait of Hormuz situation resolves:

First, the global conventional jet fuel supply chain is fragile, geographically concentrated, and dependent on a single maritime chokepoint for over 20% of its seaborne supply. Western markets are becoming more dependent on imported refined products as domestic refining capacity declines, creating longer and more vulnerable supply chains.

Second, the sustainable aviation fuel industry — the only scalable alternative — faces its own structural bottleneck: overwhelming dependence on a single feedstock category (UCO and waste fats) that is itself under supply chain stress from tariffs, policy changes, and growing competition for the same raw materials. There are 11 certified pathways to produce SAF, but 80% of production uses just one. The industry needs feedstock diversification at industrial scale, not incremental expansion of the existing UCO supply chain.

The question is not whether alternative SAF feedstocks are needed. It is where they will come from, at what scale, and how quickly they can be deployed.

[33] Fortune Business Insights, "Sustainable Aviation Fuel Market Size, Share & Forecast, 2034."

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