



# ASAFA

## One Asia, One Sky

### 2025 SAF Outlook: Charting a Sustainable Path for Asia

January 2025

Asia SAF Association Limited (Singapore)



Learn more at [www.asiasaf.org](http://www.asiasaf.org)

# Members & Partners

**KOREAN AIR**



**AIRBUS**

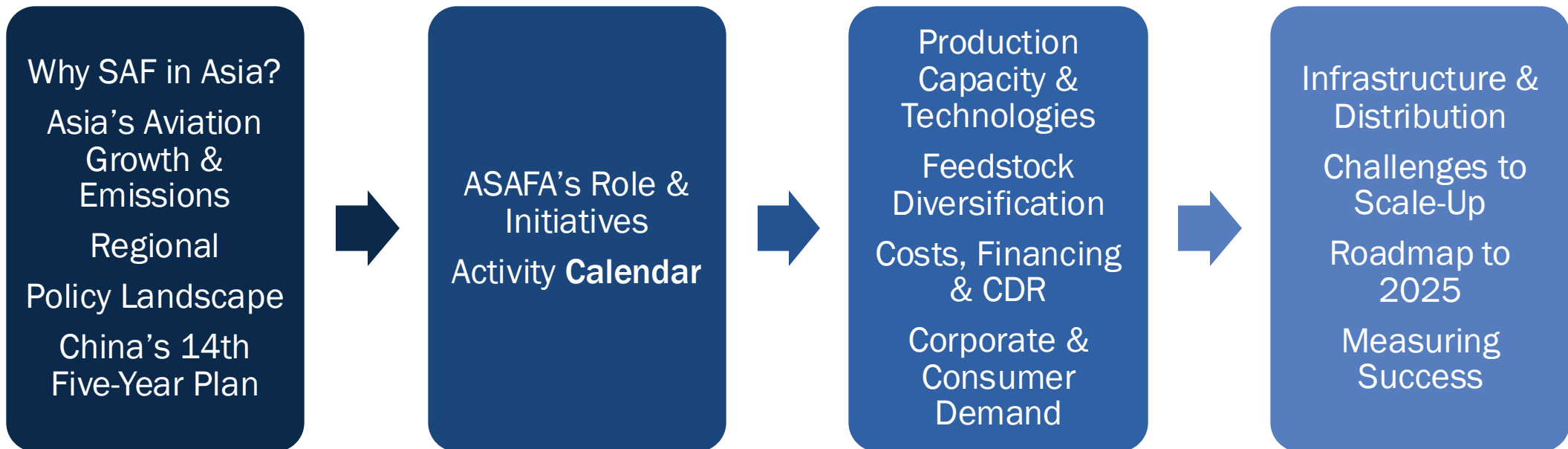
SUSTAINABLE  
AVIATION FUTURES  
APAC



# Executive Summary

- **SAF Mandates Rising:** 1–10% blends targeted in Japan, Singapore, South Korea , ASEAN and India.
- **Production Growth:** Asia could exceed **2-3 million tonnes/yr** SAF capacity by 2028.
- **ASAFA:** Drives policy alignment, project incubation, and knowledge sharing across the region.

# Today's Discussion







# WHY SAF & ASIA'S AVIATION LANDSCAPE

# Why SAF in Asia?

- **Hard-to-Abate Growing Sector:** Aviation is ~2–3% of global CO<sub>2</sub>. Asia's aviation sector is experiencing significant growth. India's domestic passenger traffic is expected to double to 300 million by 2030, necessitating over \$170 billion in investments for aircraft and airport infrastructure. Similarly, China is projected to require 8,830 new aircraft by 2043 to meet increasing demand.
- **Near-Term Decarbonization:** Electrification & hydrogen are still long-term. SAF is drop-in ready today.
- **Global Pressures:**
  - **In 2021**, representatives of the world's major aviation industry associations and largest aircraft and engine makers raised their ambition with a new long-term climate commitment to reach Net-Zero CO<sub>2</sub> emissions by 2050, spurring the aviation industry to invest heavily in Sustainable Aviation Fuel (SAF) and other low-carbon solutions.
  - **ICAO Net-Zero 2050:** in 2022, the International Civil Aviation Organization (ICAO) and its Member States have adopted a long-term global aspirational goal (LTAG) of net zero carbon emissions for international aviation by 2050.
  - **ICAO CORSIA:** Under the ICAO's CORSIA scheme, airlines must cap net CO<sub>2</sub> emissions from international flights at 2019 levels, beginning with a voluntary phase (2021–2026) and shifting to mandatory coverage from 2027. Airlines can use SAF to reduce offset obligations, effectively driving market demand for cleaner jet fuels.
  - **AAPA 5% SAF in 2030:** The Association of Asia Pacific Airlines committed to strive towards a collective target of 5% SAF utilisation in the fuel uplifted by 2030



# Asia's Aviation Growth & Emissions

- **Passenger Growth:** APAC is experiencing a robust passenger traffic growth at a compound annual growth rate (CAGR) of approximately 4–5% between 2022 and 2030, driven by rising middle-class incomes and increasing urbanization. It may become the biggest consumer of SAF.
- **Major Hubs:** Beijing, Shanghai, Singapore, Tokyo, Hong Kong, Seoul are undergoing significant infrastructure upgrades and capacity expansions to accommodate growing passenger volumes and enhance operational efficiency. These expansions present unique opportunities for integrating SAF infrastructure.
- **CO<sub>2</sub> Impact:** The continuous rise in air travel within the Asia-Pacific region directly translates to increased fuel demand, which in turn exacerbates CO<sub>2</sub> emissions from the aviation sector. To mitigate this environmental impact, the adoption of SAF becomes imperative, offering a viable pathway to significantly reduce the carbon footprint of expanding aviation activities.

# Regional Policy Landscape (Japan and South Korea)

## 1. Japan: 10% SAF by 2030

- **Ambition:** Japan aims to achieve a 10% Sustainable Aviation Fuel (SAF) blend in its aviation sector by 2030, supported by significant investments from the Green Innovation Fund.
- **Support Mechanism:** The Green Innovation Fund allocates over JPY 2 trillion (~USD 18 billion) towards research, development, and scaling of future SAF technologies, incentivizing both domestic and international producers to expand capacity.

## 2. South Korea: 1% SAF Blend Mandate from 2027

- **Support:** The Ministry of Trade, Industry and Energy (MOTIE) offers financial incentives, including subsidies and tax breaks, to SAF producers and airlines integrating SAF into their operations.
- **Supply Capability:** SK Energy, HD Hyundai Oilbank and S-Oil now supply co-processed SAF. Aim is to maintain global leadership in jet fuel exports.



# Regional Policy Landscape (ASEAN)

## 3. Singapore: 1% SAF Target from 2026 Onwards with a Passenger Levy

- **Target:** Singapore has set a target to incorporate 1% SAF into its national aviation fuel supply starting in 2026, with plans to raise it to 3-5% by 2030.
- **Incentive:** To facilitate this, Singapore imposes a levy on all passengers, directing the collected funds towards SAF subsidies and infrastructure development, thereby creating a sustainable financial model for SAF adoption.

## 4. ASEAN: Gradual Push for a Unified Approach; Still Fragmented

- **Current Status:** ASEAN is progressively working towards a unified SAF framework, aiming to standardize emissions accounting and mutual recognition of SAF credits across member states.
- **Challenges:** The region remains fragmented with varying levels of policy maturity and infrastructure readiness, necessitating continued collaboration and harmonization efforts spearheaded by initiatives like ASFA.

# Regional Policy Landscape: China

## 5. China's 14th Five-Year Plan (2021-2025)

- **Climate Targets:** Achieve peak carbon emissions by 2030 and net-zero by 2060, driving comprehensive decarbonization across all sectors, including aviation.
- **Green Aviation:** CAAC encouraging SAF & emerging tech (e.g., hydrogen).
- **COMAC:** Rise of a major aircraft maker.
- **Co-Processing and HEFA :** Sinopec & PetroChina and others scaling up SAF production.
  - **Projects:** More than 2 millions tons of HEFA SAF being developed.
- **Future Potential:** A formal SAF policy in the 15th FYP would provide clear regulatory signals, attracting further investment and accelerating SAF adoption across China's aviation sector.

# Regional Policy Landscape: India

## 6. India

- **Target:** the Indian government has already announced an indicative target to blend 1% of SAF in jet fuel for international flights from 2027, 2% in 2028 and increasing to 5% by 2030. Waiting to be firmed up.
- **Supply Capability:** UCO is ample in volume but collection is far from frictionless. With the tailwinds of recent bioethanol capacity, India could embark on AtJ SAF plants.



# ASAFA – ROLE & INITIATIVES

# Official Launch 7<sup>th</sup> Nov 2024

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## Asia Sustainable Aviation Fuel Association Launches to Transform Policy, Markets and Investment for Sustainable Aviation Fuel Across Asia

English

Asia Sustainable Aviation Fuel Association

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SINGAPORE, Nov. 7, 2024 /PRNewswire/ -- The Asia Sustainable Aviation Fuel Association (ASAFA) officially launches today in Singapore, with the goal of accelerating the adoption of Sustainable Aviation Fuel (SAF) across Asia. Supported by pioneer members like Korean Air, 1PointFive, DHL Group, Bureau Veritas, Marquis Energy Global, EU-ASEAN Business Council, SkyNRG, PT. Green Energi Utama and Quantum Commodity Intelligence. ASAFA aims to harmonize policies, enhance market frameworks, and boost public awareness of SAF in key regions, including Southeast Asia, South Korea, Japan, India, and China. Pioneer partners include Sustainable Aviation Futures, Korea – Europe & You and General Index.

<https://en.prnasia.com/releases/apac/asia-sustainable-aviation-fuel-association-launches-to-transform-policy-markets-and-investment-for-sustainable-aviation-fuel-across-asia-467784.shtml>





# Strategic MOU with Singapore A\*STAR

- Strategic MoU with Singapore's Agency for Science, Technology, and Research (A\*STAR)
- Connects ASAFA members with A\*STAR Research Institutes
- Enables piloting and implementation of cutting-edge SAF technologies
- Includes business networking initiatives and Operation & Technology Roadmapping
- Promotes A\*STAR Collaborative Commerce Marketplace to drive local enterprise growth
- Supports Singapore's aviation innovation ecosystem



**Prof Yeo Yee Chia** - Deputy Chief Executive  
(Innovation & Enterprise), A\*STAR

# IHI A\*STAR SAF Production Test Rig Launch (15<sup>th</sup> Jan 2025)



# ASAFA Industry Outreach (Jan – Feb 2025)



Our CSO, Gabriel Ho, will be speaking at the ISCC Plus & SAF Conference on 21<sup>st</sup> January in Tokyo.

Our CEO, Fabrice Espinosa will be speaking at the Sustainable Aviation Futures Congress MENA on 10<sup>th</sup> February in Abu Dhabi.

10 - 12 February | Emirates Palace Mandarin Oriental, Abu Dhabi

SUSTAINABLE  
AVIATION FUTURES  
MENA



ASAFA is supporting 2<sup>nd</sup> Low Carbon Fuels Summit in Singapore.

# Members & Partners across the SAF Ecosystem





# ASAFA's Targets for Asia by 2030

01

Promote and achieve 5% average SAF usage\* across Asia

02

Achieve a total production of 8 million tons of SAF in Asia

03

Advance all technological pathways for SAF production

04

Establish an Asian SAF ASTM clearing house for new technologies

05

Harmonize international, regional and national systems for emissions tracking and SAF usage

Disclaimer: The 2030 targets articulated by the Asia SAF Association are intended as guiding objectives and do not impose any legal obligations on the association.



# ASAFA Activities



## Monthly Webinars

Engage public and industry in regular online discussions on key SAF topics and updates.



## Closed-door dialogues

Offer members exclusive opportunities to discuss policy and regulatory needs with officials.



## Working Groups

Drive focused initiatives in SAF research, policy, and technology through specialized expert groups.



## In-person workshops

Facilitate hands-on learning and collaboration within the SAF industry.



## Technical field trips

Provide on-site visits to SAF production and development facilities for practical insights.



## Industry White Papers

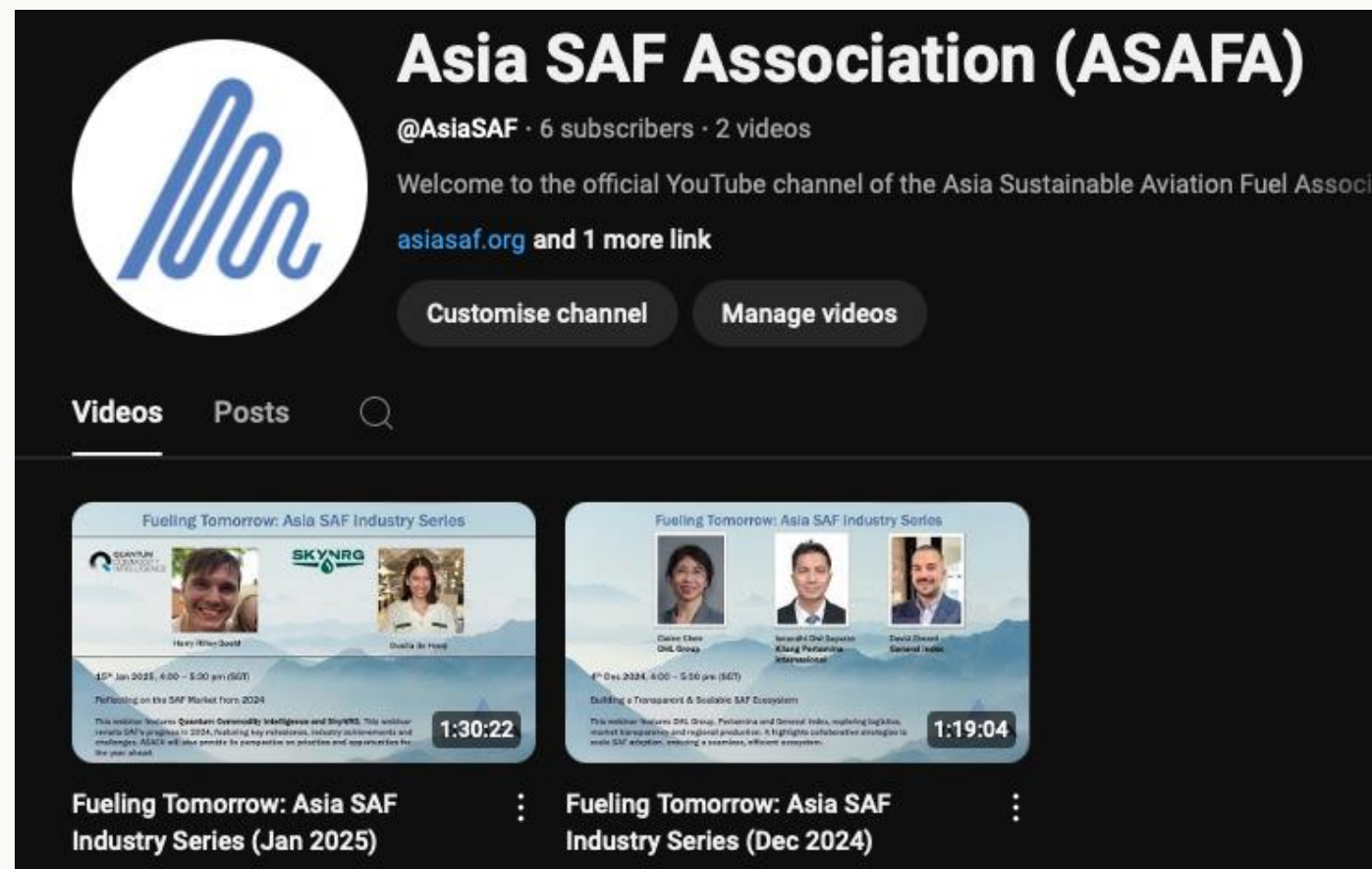
Publish authoritative reports to advance industry knowledge and thought leadership in SAF.

# Working Groups to fulfill our 5 Targets

Working Groups	Promote and achieve 5% average SAF usage across Asia	Achieve a total production of 8 million tons of SAF in Asia	Advance all technological pathways for SAF production	Establish an Asian SAF ASTM clearing house for new technologies Harmonize	international, regional, and national systems for emissions tracking and SAF usage
Market Structures	✓	✓			✓
Finance & Investments		✓	✓		✓
Sustainable Oils		✓	✓	✓	
Sustainable Alcohols		✓	✓	✓	
Communications and reporting	✓				✓
National & Regional SAF Standards and Certification					✓
HEFA & Co-Processing		✓	✓	✓	
AtJ SAF		✓	✓	✓	
Biomass FT		✓	✓	✓	
PtL/eSAF		✓	✓	✓	
Future Technologies		✓	✓	✓	
Safety and Operations	✓	✓		✓	

# Fueling Tomorrow: Asia SAF Industry Monthly Series

- Monthly Series provides insights and analyses on SAF in Asia
- Targets fuel producers, policymakers, investors, technology licensors, and key SAF stakeholders
- Covers technical topics on SAF production, regulations, market trends, and investments
- Sessions use evidence-based approaches with expert presentations, case studies, and panels
- Aims to inform stakeholders' decision-making and strategic development in SAF
- Rewatch on YouTube



<http://www.youtube.com/@AsiaSAF>

# 2025 ASAFA Calendar of Events

Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Webinars	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
1 <sup>st</sup> In-person workshop in ASEAN				▲								
2 <sup>nd</sup> In-person workshop in ASEAN						▲						
3 <sup>rd</sup> In-person workshop in ASEAN								▲				
Working Groups – Market Structures – Communications	1/1/25 - 12/31/25											
Asia Outlook Paper					5/1/25 - 10/31/25							

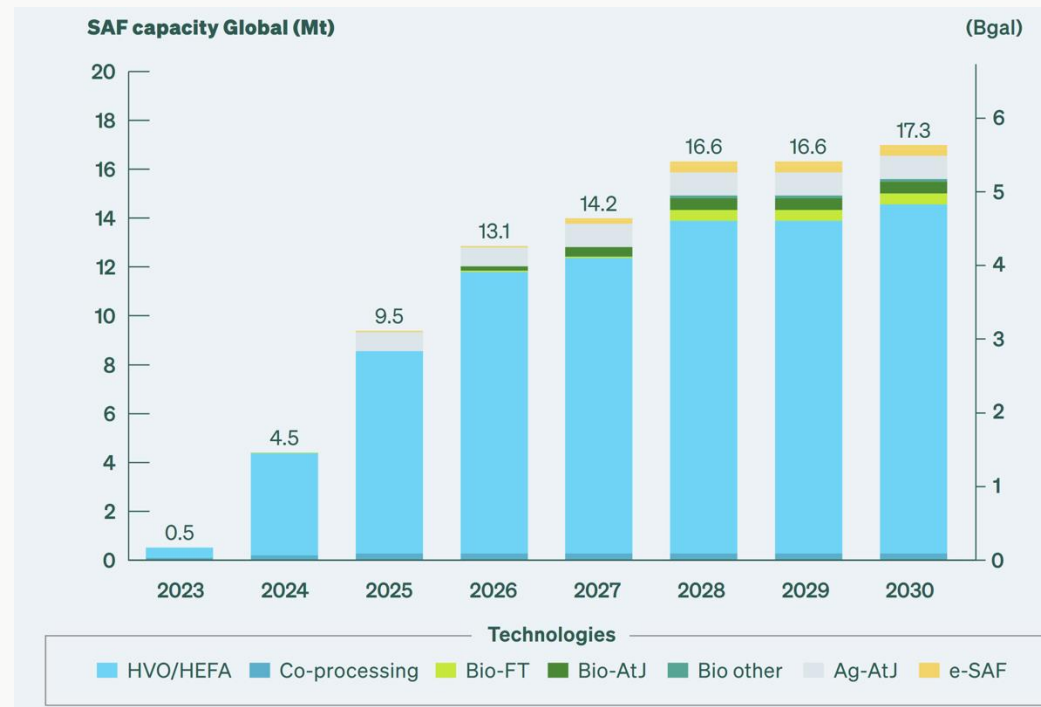


# TECHNICAL & MARKET ASPECTS







# Production Capacity & Outlook in Asia

- **2024 Estimate:** >1 million tonnes/year of SAF in Asia (Neste, EcoCeres, co-processed SAF).
- **2025 Target:** Could exceed **2 million tonnes/year** capacity.
- **2030 Vision:** 5–10% SAF usage regionally = 10–15+ million tonnes/year needed.
- **Beyond: ...**



# Technology Pathways for Asia

					
	HEFA	Alcohol-to-jet <sup>i</sup>	Gasification/FT	Power-to-liquid	
Opportunity description	Safe, proven, and scalable technology	_____	Potential in the mid-term, however significant techno-economical uncertainty	_____	Proof of concept 2025+, primarily where cheap high-volume electricity is available
Technology maturity	Mature	_____	Commercial pilot	_____	In development
Feedstock	Waste and residue lipids, purposely grown oil energy plants <sup>i</sup> Transportable and with existing supply chains Potential to cover 5%-10% of total jet fuel demand	_____	Agricultural and forestry residues, municipal solid waste <sup>v</sup> , purposely grown cellulosic energy crops <sup>v</sup> High availability of cheap feedstock, but fragmented collection	_____	CO <sub>2</sub> and green electricity Unlimited potential via direct air capture Point source capture as bridging technology

Source: Clean Skies for Tomorrow, World Economic Forum

In Asia:

- **HEFA:** Dominant; uses UCO, animal fats.
- **Fischer-Tropsch (FT):** Converts solid waste/ag residues; pilot plants in Japan, Australia.
- **Alcohol-to-Jet (AtJ):** Potential in India & China (ethanol surplus).
- **Power-to-Liquid (PtL):** Early-stage demos with synthetic H<sub>2</sub> & CO<sub>2</sub>.

# Feedstock Diversification

- **Base Crops:** oil, sugar and starch grown for fuels.
- **Lipids:** 80% of current SAF feedstock; supply constraints.
- **Agricultural Residues:** India, China, Indonesia collectively produce >700M tonnes/year in theory.
- **Municipal Solid Waste (MSW):** Large metropolitan areas can leverage waste-to-fuel.
- **Advanced R&D:** Algae, lignocellulosic, CO<sub>2</sub>-based fuels.

## Feedstocks suitable for SAF production:



Oil seed plants and  
energy grasses



Algae



Municipal solid  
waste



Fats, oils, and  
greases from  
cooking waste and  
meat production



Agricultural and  
forestry residue

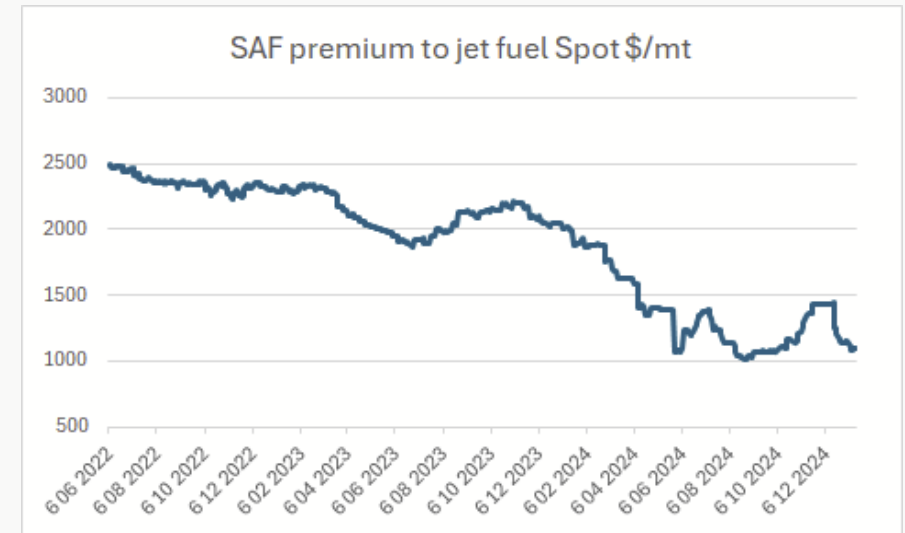


Industrial carbon  
monoxide waste gas

Graphic by Emma Johnson, EESI

# Costs, Financing & Carbon Dioxide Removals (CDRs)

- **Price Premium:** SAF costs more than fossil jet fuel.  
Premium is fluctuating over time, with a decreasing trend
- **Policy Tools:** Blending mandates, tax credits, carbon pricing (e.g., Singapore).
- **Blended Finance:** Public grants + private equity + carbon credits to de-risk SAF projects.
- **Estimated Need:** USD 3–5 bil in dedicated SAF funding by 2025 across Asia.
- **Role of CDRs:** Direct Air Capture (DAC) or other negative emissions can generate carbon credits that offset SAF's higher costs.
  - **Corporate CDR Investments:** Airlines or corporate buyers can purchase carbon removals, bundling them with SAF to reduce net emissions and mitigate premium.
  - **Potential Synergy:** If CDR projects are integrated with PtL or biogenic CO<sub>2</sub> sources, SAF producers can sell negative-emission “bundles,” creating more robust revenue streams.



Source: Quantum Commodity Intelligence

# Green Taxonomy – Enabling Sustainable Finance for SAF

- **Definition & Purpose:** A **Green Taxonomy** is a classification system defining which economic activities qualify as environmentally sustainable. Examples include the EU Taxonomy, China's Green Bond Catalogue, and ASEAN Taxonomy for Sustainable Finance.
- **Impact on SAF:**
  - **Clear Eligibility Criteria:** Projects that meet specified emissions thresholds, lifecycle assessments, or feedstock standards can access “green” funding pools.
  - **Reduced Risk Perception:** Investors gain confidence that SAF projects align with recognized environmental benchmarks, unlocking lower-cost capital or green bonds.
  - **Alignment With National Policies:** Countries in Asia (e.g., Singapore, Malaysia) are tailoring taxonomies to local contexts, possibly incorporating SAF as a recognized green activity.
- **Challenges & Opportunities:**
  - **Harmonization Gaps:** Different national or regional taxonomies can lead to confusion if criteria diverge (e.g., feedstock sustainability definitions).
  - **Lifecycle Emissions Data:** SAF producers must provide robust, verifiable GHG accounting to qualify under green frameworks.
  - **Broader Market Signaling:** Adoption of a green taxonomy can spur demand for low-carbon fuels, influencing airline procurement decisions and corporate ESG pledges.



# Infrastructure & Distribution

- **Airport Upgrades:** Changi, Narita, Incheon investing in SAF storage/blending.
- **Logistics:** Pipeline vs. truck transport; on-site blending vs. centralized refineries.
- **Green Airports:** Net-zero airport ops with integrated SAF fueling systems.



# Corporate & Consumer Demand

- **Corporate Travel:** 30% of premium tickets from business flyers.
- **Book-and-Claim:** Airlines, corporates purchase SAF “attributes” separate from actual fueling location.
- **Green Fares:** Airlines bundling SAF surcharges; rising acceptance among eco-conscious flyers.
- **Demand Potential:** MNC net-zero pledges (e.g., Microsoft, DHL) driving SAF procurement.

# CHALLENGES, ROADMAP & CONCLUSION



# Challenges to Scale-Up in Asia

- **Regulatory Fragmentation:** Different mandates, definitions and carbon accounting rules.
- **Feedstock Competition:** Biodiesel, renewable diesel also seeking limited lipids.
- **CAPEX-Intensive:** Advanced pathways (FT, AtJ, PtL) require significant investments.

# Roadmap for 2025-2030: signposts to watch

- **Policy Goals:** 5 major Asian economies with enforceable 1–5% blending requirements.
- **Production Milestone:** At least **2–3 million tonnes** of verified, operational SAF capacity for domestic demand and exports
- **Feedstock Mix:** 10% from advanced sources (e.g., ag/forestry residues, MSW).
- **Cost Gap:** Aim to reduce SAF premium to 2x fossil jet by leveraging carbon credits/tax breaks.



# Measuring Success as a renewed industry

- **Mandate Fulfilment:** Actual blending vs. official targets.
- **Real Output:** Operational vs. nameplate capacity across new facilities.
- **GHG Reductions:** Verified under CORSIA or new national targets.
- **Corporate & Public Engagement:** Number of airlines using SAF, corporate offtake agreements.

# Conclusion & Next Steps

- **ASAFA's mission:** Central coordinator for policy, financing and technology alignment.
- **2025 Tipping Point:** Critical year for mandated blends, cost reduction, feedstock diversification.
- **Call to Action:** Unified efforts among governments, industry, financiers to achieve scale.



Thank you

ありがとうございます

Gabriel Ho, CSO

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