



2024 ICAO LTAG STOCKTAKING

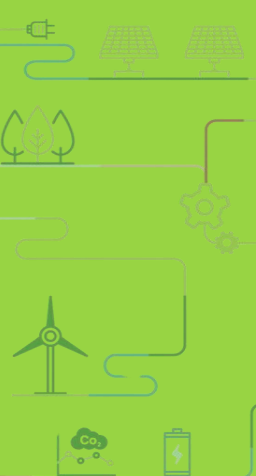
7 — 10 OCTOBER 2024

ICAO HEADQUARTERS, MONTREAL, CANADA



2024 ICAO LTAG STOCKTAKING

7 ——— 10 OCTOBER 2024



Sayuta Senobua

Indonesia State Action Plan Focal Point
DGCA Indonesia

Session 7
Indonesia's Action Plan – The New SAF Roadmap




Decarbonization Policy and State Action Plan



National Commitments

- Enhanced NDC Target: 31,89% unconditionally and 43.20% conditionally
- The national action plan for reducing greenhouse gas emissions; and the implementation of national greenhouse gas inventory – Presidential Regulation 2011
- The implementation of carbon economic value for achieving the NDC targets – Presidential Regulation 2011
- Climate change mitigation actions in the transportation sector – MOT Decree 2023
- Environmental Task Force for Aviation Sector – DGCA Decree
- Net-zero emissions by 2060
- The New SAF Roadmap – Sept 2024



Indonesia's Action Plan to Reduce Greenhouse Gas Emissions from Aviation Sector


This document provides a summary of Indonesia's action plan in order to support the global policy proposed by the ICAO in reducing the greenhouse gas emissions from the aviation sector.

The action plan is dedicated for reducing the impact of aviation activities upon climate change while taking into account the current capacity as well as the increase demand of aviation services, enabling this sector to develop in a sustainable manner.

This is the updated document after its second submission in 2015.

**Directorate General of Civil Aviation of Indonesia
Ministry of Transportation**

December 2021



Indonesia's Action Plan – Measures



Main program



AIRCRAFT FLEET RENEWAL

Replacement of the old transport-category aircraft with new technology aircraft



SUSTAINABLE AVIATION FUEL

SAF development using local feedstocks



AIRCRAFT OPERATIONAL EFFICIENCY

Single engine taxi, Idle reverse thrust on landing, etc



ECO-AIRPORT

Utilization of renewable energy, energy-saving equipment, electrification and airport greening



AIR NAVIGATION EFFICIENCY

Performance Based Navigation (PBN) & User Preferred Routes (UPR)



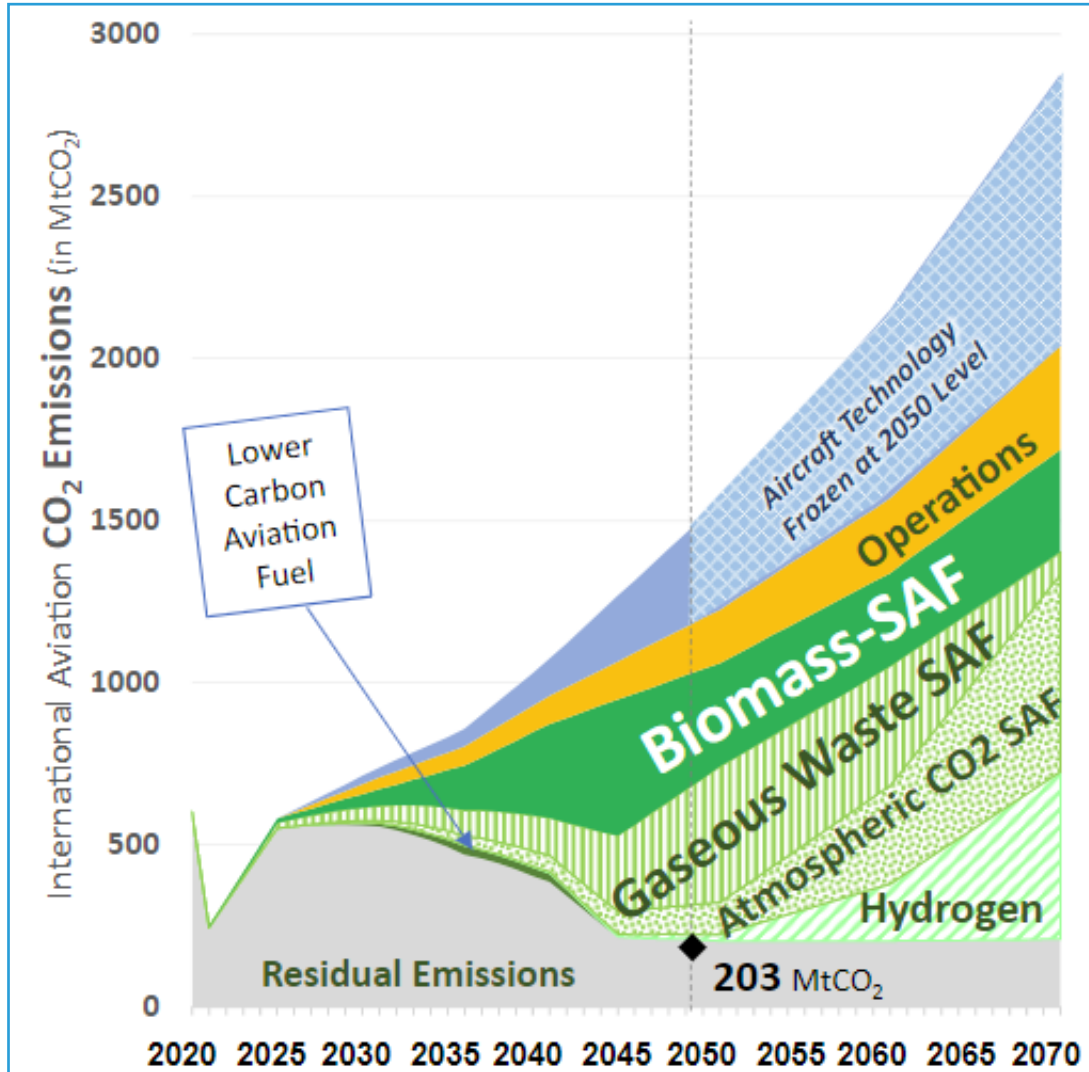
CORSIA IMPLEMENTATION

Voluntarily participation in CORSIA since Pilot Phase

Supporting program



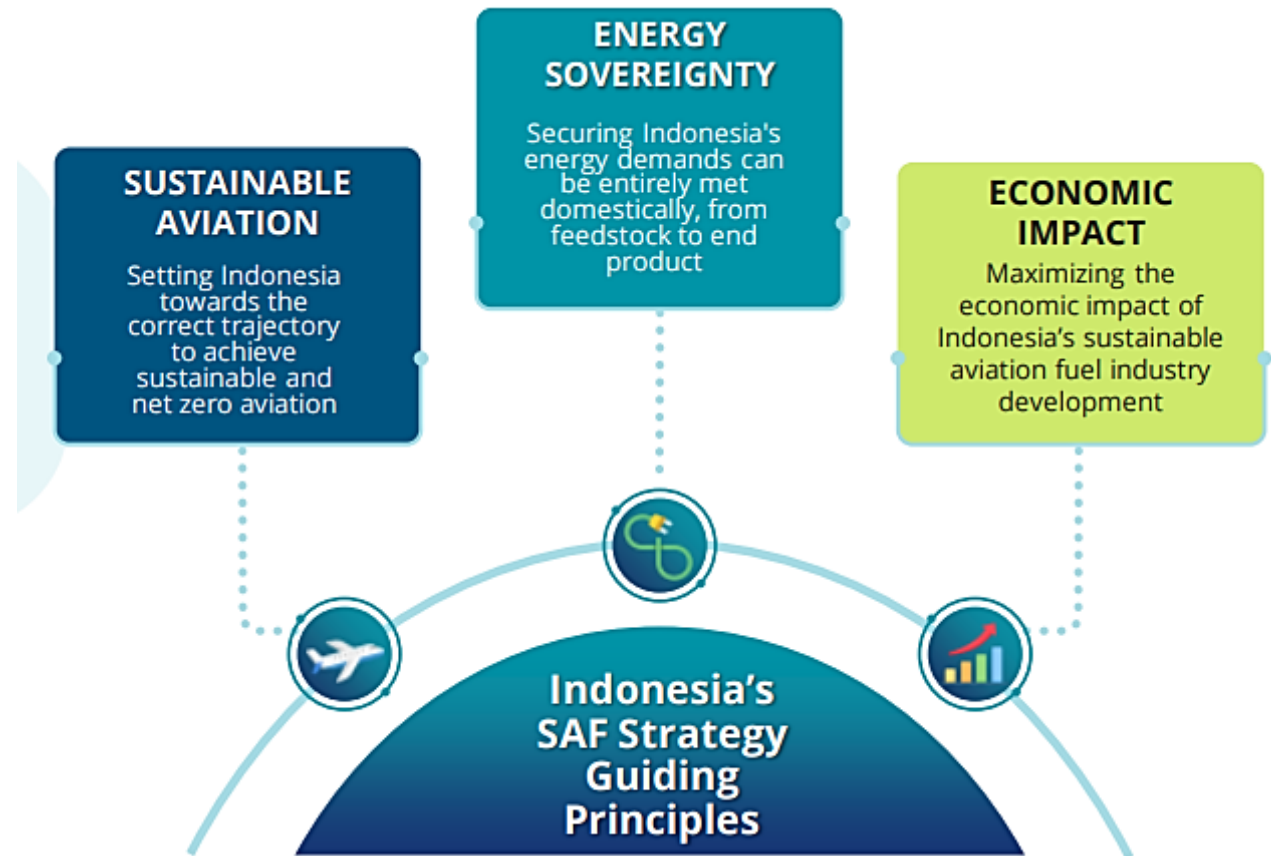
SAF as the Key Contributor



The LTAG report shows that SAF has the greatest potential to reduce CO₂ emissions from International Aviation

Indonesia is well-positioned to develop a SAF ecosystem, owing to its substantial aviation market and abundant natural resource endowment

Indonesia SAF Roadmap





...that was designed in-line with ICAO's guidance and standards to ensure international alignment and market access

Overview and References from ICAO



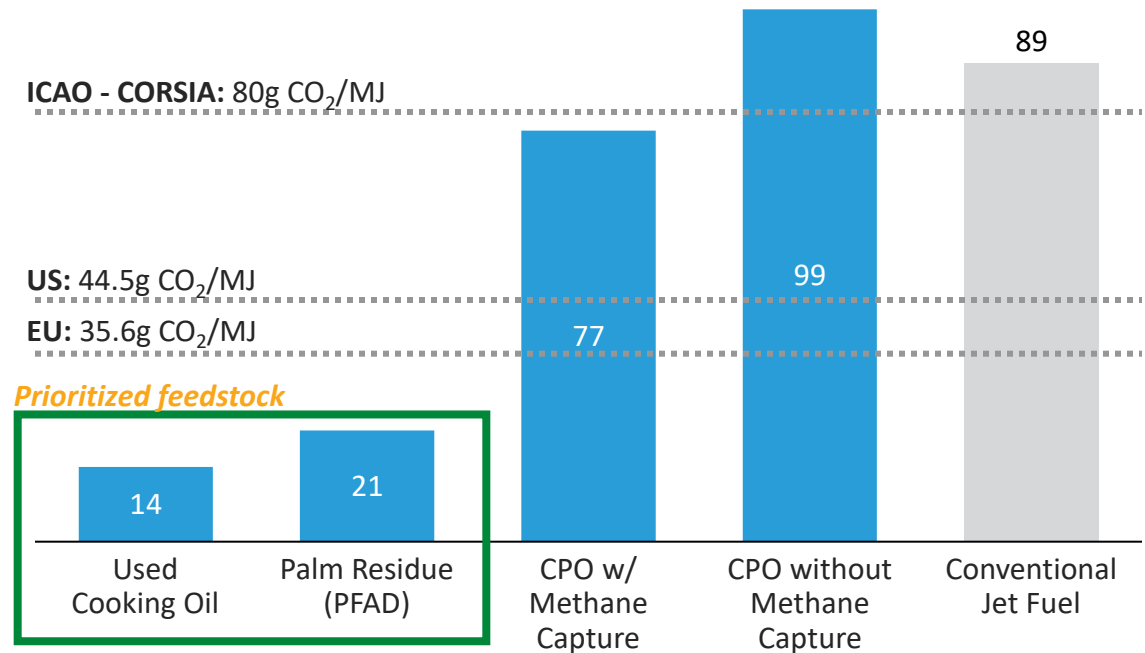
International Civil Aviation Organization (ICAO), a UN agency encompassing 193 countries, sets the international standards guiding the development of Indonesia's SAF Roadmap...



The SAF Roadmap adheres to ICAO's international guidelines and focuses on SAF feedstock with the best alignment with global standards for seamless market access

Initial Feedstock on SAF Roadmap

SAF Life Cycle Emission based on Feedstock and Minimum Emission Reduction on Key Markets (gCO₂/MJ)



Indonesia will enhance its cooperation with ICAO and strategic partners in exploring further potential feedstocks to ensure its alignment with CORSIA, including palm oil-based products, coconut, seaweed, and more.

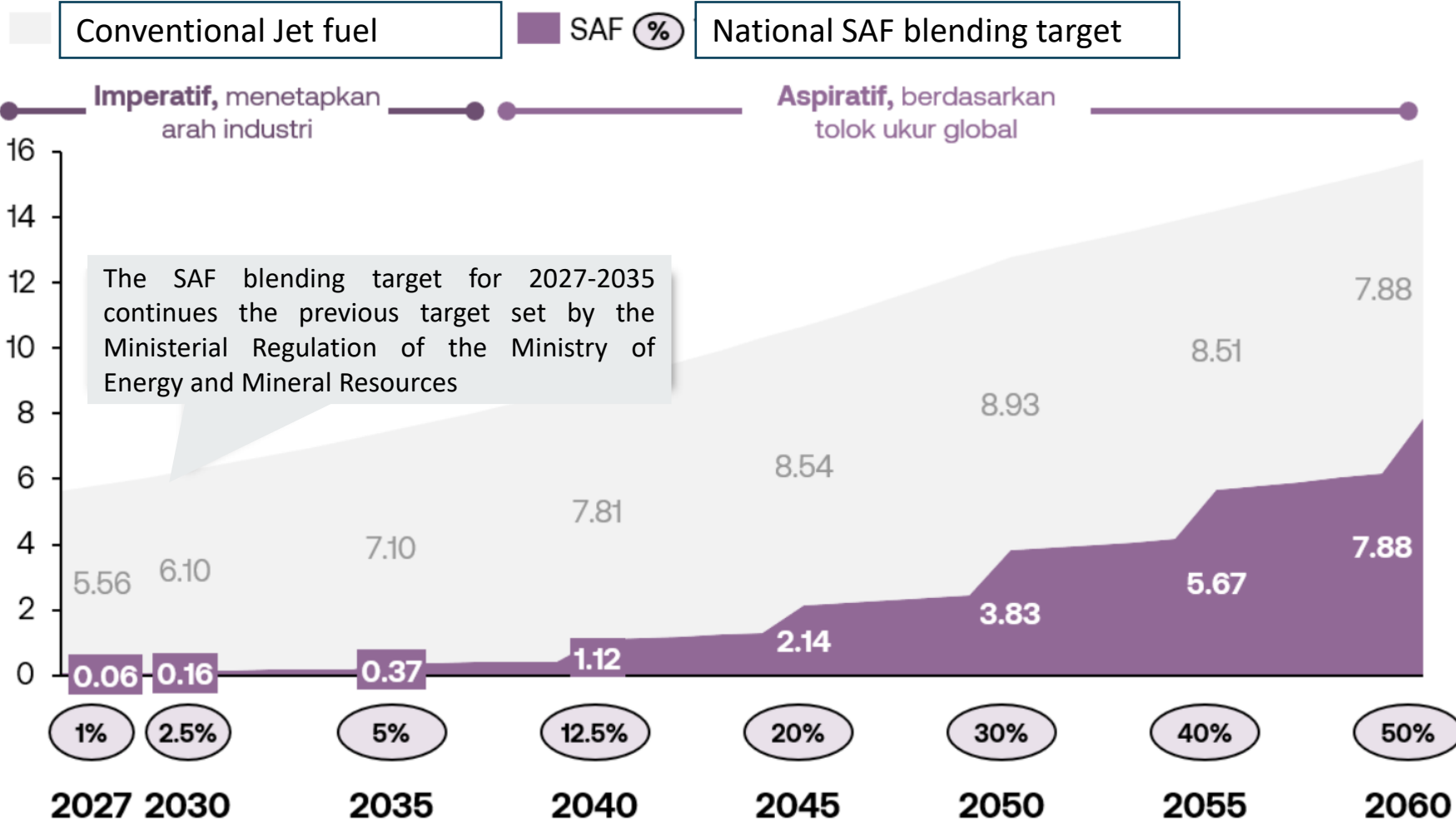


Indonesia's SAF National Target



SAF Demand based on Baseline Forecast Scenario (Million kilolitres)

SAF Target Benchmark



- 100%** SAF mixture target by 2050
- 63%** SAF mixture target by 2060
- 60%** SAF mixture target by 2060
- 50%** SAF mixture target by 2050
- 47%** SAF mixture target by 2043

Based on the Roadmap, we have developed the 2025-2029 Action Plan, outlining tactical steps for all stakeholders to unlock SAF potential



	Policy Pillar	Program	# Activities, Key & Related Institution
Demand	Pillar 1 Ensure steady demand for initial commercial incubation of SAF	Pilot SAF off-take agreement for intl. flights from DPS	7
		Provision of voluntary SAF usage options	7
	Pillar 2 Increase domestic demand to meet higher blending targets	Incubation SAF mandate, intl. flights DPS & CGK	5
		SAF usage mandate for corporate and government travellers	4
Supply	Pillar 1 Securing domestic SAF feedstock for HEFA production	Increased SAF mandate for intl. flights from major airports DPS & CGK and all flight mandate from major airports	4
		Domestic market obligation (DMO) for PFAD ¹	4
		Export quota and/or tariff for UCO ²	4
		Establishment of UCO collection system	9
	Pillar 2 Scale-up SAF production with Alcohol-to-Jet, Fischer-Tropsch, and Power-to-Liquid technologies	UCO classification reaffirmation	2
		Inclusion of next-gen <i>biorefinery</i> into PSN ³	2
		Emission-based incentives for SAF	6
Pillar 3 Ensure availability of SAF through existing and new distribution channels	Initiate the development of next-gen SAF production	3	
	SAF distribution channel prioritization strategy to ensure universal availability	3	
Enablers	Pillar 1 Ensure steady demand for initial commercial incubation of SAF	Incubation SAF mandate, intl. flights DPS & CGK	4
		Provision of voluntary SAF usage options	6

1. Palm Fatty Acid Distillate (PFAD); 2. Used Cooking Oil (UCO); 3. Proyek Strategis Nasional (PSN)

Source: TBI analysis





SAF Initiative – Testing and Commercial Flight



Bioavtur J2.4

2.4% blending of local feedstock Palm Kernel Oil (PKO) by co-processing method.



Collaboration

With Ministry of Energy, Fuel Provider, Researcher, Associations, Airlines, MRO



Production tests

Production using existing facilities in 2020. New facility will be built to increase the capacity



Laboratory test

chemical and physical characteristic comply the Jet-A1 specifications in ASTM 1655



Static test

engine test cells using CFM56-3B engine in 2020 and CFM56-7B in 2021 – good performance



Ground test & flight test

Test on CN235 military registration aircraft in 2021 and Boeing 737-800 in 2023 – good performance



First Commercial Flight

Domestic flight Jakarta-Surakarta vv in Oct 2023 using Boeing 737-800

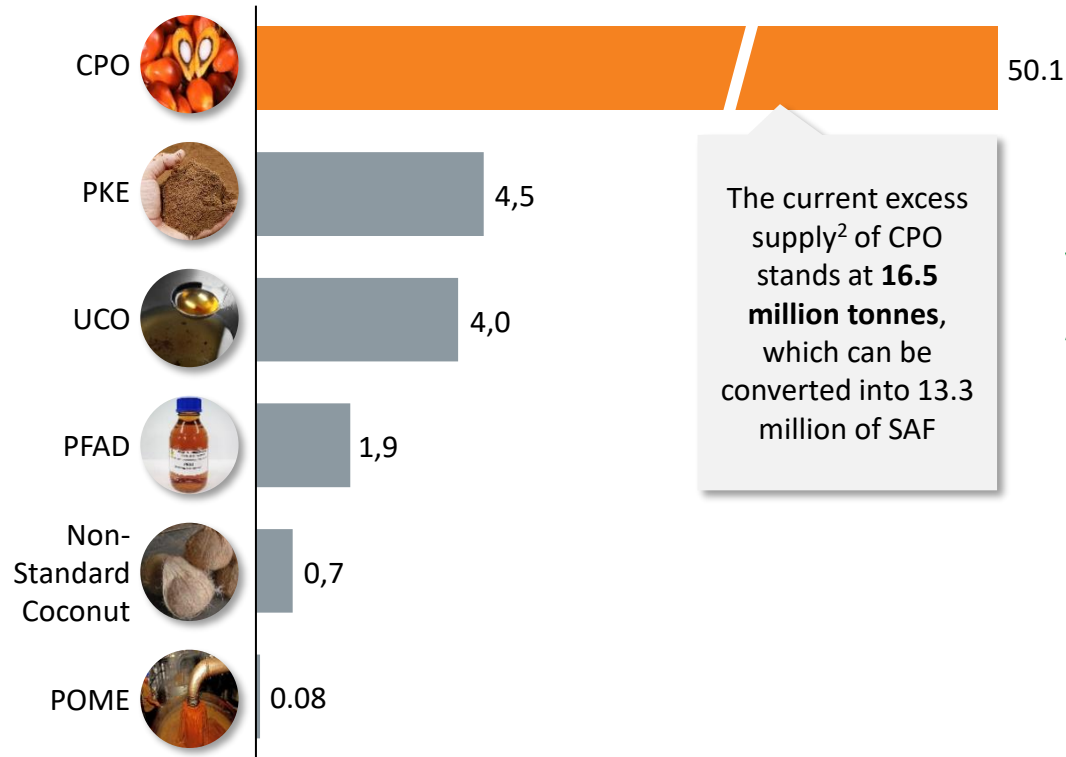




Possibilities to Explore Available Feedstocks

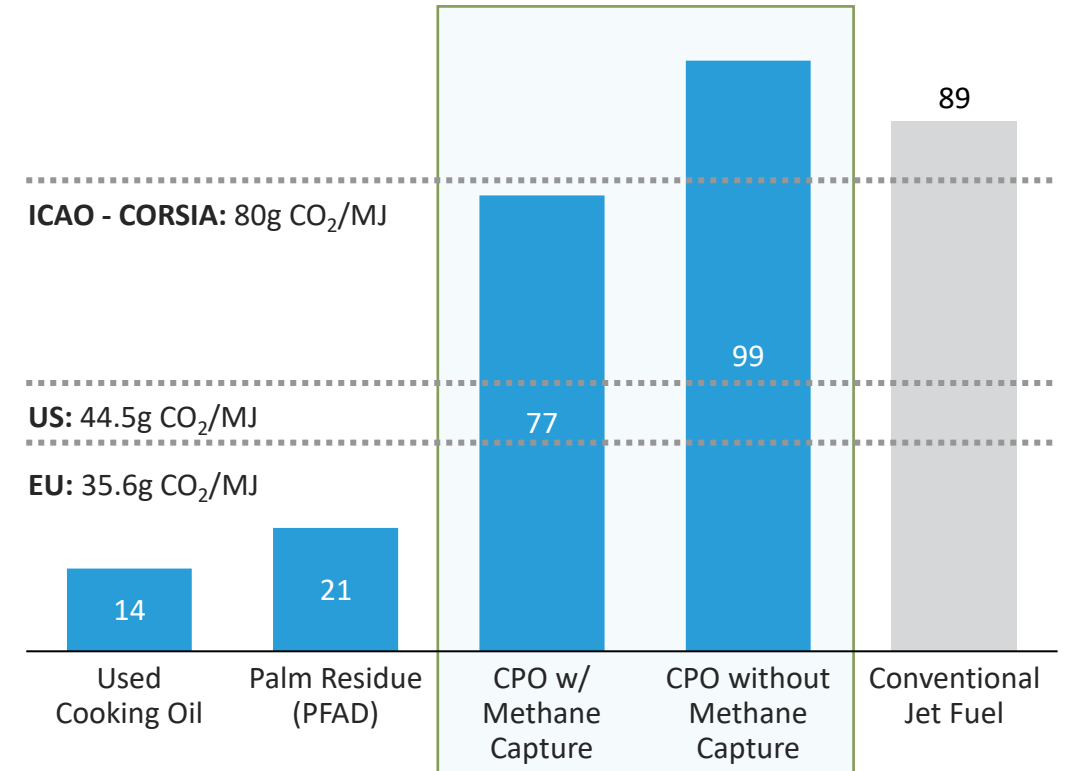
Among the leading SAF feedstock alternatives, CPO has the highest availability within Indonesia...

Domestic Production of ID SAF Feedstock Alternatives, 2023¹ (Million Tonnes)



...but its life cycle emissions exceed ICAO and key markets standards, limiting its global marketability

SAF Life Cycle Emission based on Feedstock and Minimum Emission Reduction on Key Markets (gCO₂/MJ)



1.CPO production is actual data from The Indonesian Palm Oil Association (GAPKI), while Used Cooking Oil, Palm Residue, and Non-standard Coconut figures are estimated using several assumptions from various studies. 2. Excess supply refers to the quantity remaining after its allocation for energy and food needs
Source: International Civil Aviation Organization (ICAO), GAPKI, TBI Analysis

Way Forward



SEPTEMBER 2024 – ONWARDS



SAP UPDATE

Updating SAP to incorporate the LTAG – the new SAF roadmap



NATIONAL SAF POLICY IMPLEMENTATION

The National Task Force, will ensure the effective **implementation of the policy action**

The lead ministries will maintain close coordination with public and private stakeholders to ensure the successful implementation of Indonesia's SAF policy



Thank You

