

SAF : Fry to Fly Sustainable Aviation Fuel (SAF)

Innovations that simultaneously enhance economic benefits, societal well-being, and environmental sustainability

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Where can used cooking oil go?



Source: Article "The Danger of Used Cooking Oil" Rajavithi Hospital www.rajavithi.go.th / Department of Science Service/

Academic development plan and health consumer protection mechanism / Faculty of Pharmaceutical Sciences Chulalongkorn University/ www.thaihealthconsumer.org /Thai Health



The current situation

- Thai people consume the oil 1,000 million liters per year.
- 250–300 million liters of oil left over from frying per year.
- The remaining oil is the source of "Reused cooking oil"
- "Reused cooking oil" has undergone physical and chemical changes.
- Transforms into harmful compounds, posing hidden dangers to consumers.
- Disposing of used cooking oil thrown out of the drain without proper management negatively affects water sources



Reused frying oil is oil that has been subjected to high heat repeatedly until it deteriorates. The generation of harmful compounds includes: Polar compounds, Polycyclic Aromatic



Dumping used oil into the sewer will cause blockage, Causing anaerobic fermentation in the water source and microorganisms cannot exchange nutrients. These things cause water pollution.

What is Sustainable Aviation Fuel (SAF)?

Sustainable Aviation Fuel (SAF)

- Sustainable Aviation Fuel (SAF) is a sustainable alternative energy source that helps reduce carbon dioxide emissions in the aviation industry.
- SAF can be immediately used by the global aviation industry without affecting engine performance.
- Compared to current aviation fuels, SAF produced from used cooking oil can reduce carbon dioxide emissions by 80%.
- SAF production helps to raise environmental awareness and prevent improper dumping in public areas or drainage systems and water sources. Including health issues caused by repeated use of frying oil.
- SAF made by Used Cooking Oil: UCO benefits the economy, society, and environment and completely conforms to BCG economic model.







ICAO (International Civil Aviation Organization) defines carbon dioxide emission reduction targets and provides international airlines with carbon dioxide compensation and emission reduction mechanisms or Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA). Sustainable Aviation Fuels (SAF) is the main factor following certifications must be obtained:

" International Sustainability and Carbon Certification (ISCC) "









Thailand's

SAF Producer

Flying Sustainably with BCP Group

Bangchak, National Research Council of Thailand (NRCT), and Rajamangala University of Technology Isan (RMUTI) signed a Memorandum of Understanding on Green Innovation for the Development of Low Carbon (Bio-jet) Fuel with the Royal Thai Air Force (RTAF)



Bangchak and Royal Thai Air Force (RTAF) expand Sustainable Aircraft Fuel (SAF) for military aircraft using bio jet fuels. The aircraft mixes low-carbon aircraft fuel with Air Force JP-8 aircraft fuel in a 2% ratio and is tested on the entire engine. Jet start and engine testing on May 19, 2023



1st in Sustainable Aviation Fuel (SAF) Production in Thailand







Sustainable Aviation Fuel (SAF): a BCG Case Study ONE FTILLS Key to Achieving Net-Zero Aviation

USA

Reduce GHG emissions by 20% in 2030 3 billion gallons SAF by 2030

UK (RTFO)

Proposed mandate of 10% SAF in 2030 and 75% in 2050

EU (ReFuelEU Aviation)*

2% SAF in 2025 5% SAF in 2030 (incl. 0.7% eJet) 20% SAF in 2035 (incl. 5% eJet) 32% SAF in 2040 (incl. 8% eJet) 38% in 2045 (incl. 11% eJet) 63% in 2050 (incl. 28% eJet) (Note: amendments from EU Parliament target more ambitious blending mandates targeting 100% SAF in 2050)

JAPAN 10% SAF mandate in 2030 being discussed

*Proposed by the EU Commission on July 14 2021 as part of "Fit for 55"

GLOBAL

Airlines: Some airlines are committing to using SAF (10% SAF in 2030 for OneWorld alliance e.g.)

CORSIA initiative: Carbon-neutral growth from 2020



nable Aviation Fuel[®]

Contract Signing Ceremony for The Construction of a Sustainable Aviation Fuel Plant



Fry to Fly : "Net Zero" target ecosystem





Used Cooking Oil (UCO)

Collect used cooking oil from the community to produce fuel through the project:



Pretreatment Section Remove dirt, sticky rubber and heavy metals.



construction agreement in June 2023.





Production capacity: 1 million liters/day Starting operation in 2024



Product Sustainable Aviation Fuel (SAF)



ASTM (American Society for Testing and Materials) SAF certification, can be mixed with 10-50% aviation oil, depending on the production method.

Participate in community development

or sustainably address social issues through business processes.







Information : 30 April 2024



Quantity of used oil purchased from household network (retail)



The benefits of using waste cooking oil to produce sustainable aviation fuel



Reduce greenhouse gas emissions from the aviation industry by approximately 80% of CO₂ equivalent annually. **Reduce environmental** Emphasize the use of pollution caused by biological resources **Additional income** incorrect handling of to create value by by selling edible oil waste cooking oil. developing high to produce SAF value-added products. Prevent reuse that could cause chemical reactions resulting in hazardous substances harmful to health.



Quantitative social benefits or returns to the community and society.

	Benefits to the community/society.		Result (statistics)
1.	Income from selling of used cooking oil.	•	The network increased by 510 points in 2023. The value of cooking oil used in 2023 purchased from the network is 1,613,618 THB.
2.	Collect and recycle used cooking oil to reduce environmental impact.	•	By 2023, the amount of used cooking oil collected from the whole network will be 110,279 kilograms, which will help mitigate the blockage of sewers and reduce the occurrence of community flood. According to the used cooking oil collected in 2023, carbon dioxide emissions have been reduced by 36,215.62 kgCO ₂ e Reduce the oil pollution in public area.
3.	Reduce the impact of health	•	Reduce the reuse of frying oil by household and restaurant operators.

Follow up actions for sustainable community

support projects or contributions to addressing social issues





Expand UCO buying branches in Bangchak service stations to 162 branches.



Expand the knowledge of waste cooking oil management to the private sector/schools/Subdistrict Administrative Organization.



Expand the customer network of restaurant operators.



Cooperation with the Department of Health of the Ministry of Health: "No Refry" Campaign.



Cooperation with Bangkok: Carry out a campaign to make restaurant operators stop using reused oil and properly manage waste cooking oil.



Benefits received by the organization.

Benefits received by the organization.			Economic value (statistics)
1.	Can provide raw materials (used cooking oil) for production/distribution.	•	Income is generated from exporting SAF to continental Europe for production. Preferred SAF products in the region.
2.	Reduce the risk of raw material procurement.	•	Increase raw material stability to support a production process capable of processing used cooking oil up to 1 million liters/day.
3.	Reduce imports and transportation of waste oil from CLMV countries.	•	Reduce the import of edible oil from CLMV countries by 110,279 kg by 2023.
4.	Supporting corporate green innovation business goals.	•	According to the goals of the BCG economic model, promote a sustainable environment and society. Promote Thailand's image aiming to achieve net-zero greenhouse gas emissions by the year 2050.
5.	Promote the corporate image and support a low- carbon society.	•	The media value in news content related to the project In 2022, the total value was 20.45 million baht. In 2023, the total value was 29.67 million baht.

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Crafting a Sustainable World with **Evolving Greenovation**

