

A woman with long dark hair, wearing a black top, is smiling and looking towards the right. She is holding a young child with dark hair, wearing a white shirt. They are standing on an airport tarmac, looking at a large white airplane. The background shows other airport buildings and a clear sky. A white curved line graphic is positioned above the title text.

Sustainable Aviation Fuel - A producer's perspective

Steven Bartholomeusz - Head of Public Affairs Asia Pacific
7 December 2023

Our purpose

Creating a healthier planet for our children



Driven by our purpose



We are

#1

Producer of Sustainable Aviation
Fuel & Renewable Diesel

In 2022, our customers
reduced

11.1 Mt

greenhouse gas emissions with
our renewable products

Our **innovation & engineering**
teams contribute

25%

to Neste's total workforce

Our transformation

From a regional oil refiner to becoming a global leader in renewable and circular solutions.

Founded to secure Finland's oil supply

1948

1996
First Patent for NEXBTL Technology

2000s

2007-2011
Investment in World Scale Renewable Refineries in Singapore & Rotterdam

2019 ~
2021

Strategy: Faster, Bolder & Together and New Climate Targets*

2022

Strategy : Taking Charge of Change & Porvoo Transformation

2030

Help our customers reduce their GHG emissions by up to 20 M tons annually

Process more than 1 M tons of waste plastics annually from 2030 onwards

2035

Reach carbon neutral production by 2035 (Scope 1 & 2)

2040

Reduce Scope 3 emission intensity of products by 50% compared to 2020 levels.

The Top 20 Business Transformations of the Last Decade

Harvard Business Review

Neste's Renewable Businesses

World's largest
Producer of
Renewable Diesel

Renewable
Road
Transportation

Over the life-cycle, Neste MY Renewable Diesel reduces greenhouse gas (GHG) emissions by up to 90% compared to fossil diesel.

World's largest Producer
of Sustainable Aviation
Fuel

Renewable
Aviation

Over the life-cycle, Neste MY Sustainable Aviation Fuel has up to 80% smaller carbon footprint compared to fossil jet fuel.

New Business Unit
Created in 2019

Renewable
Polymers and
Chemicals

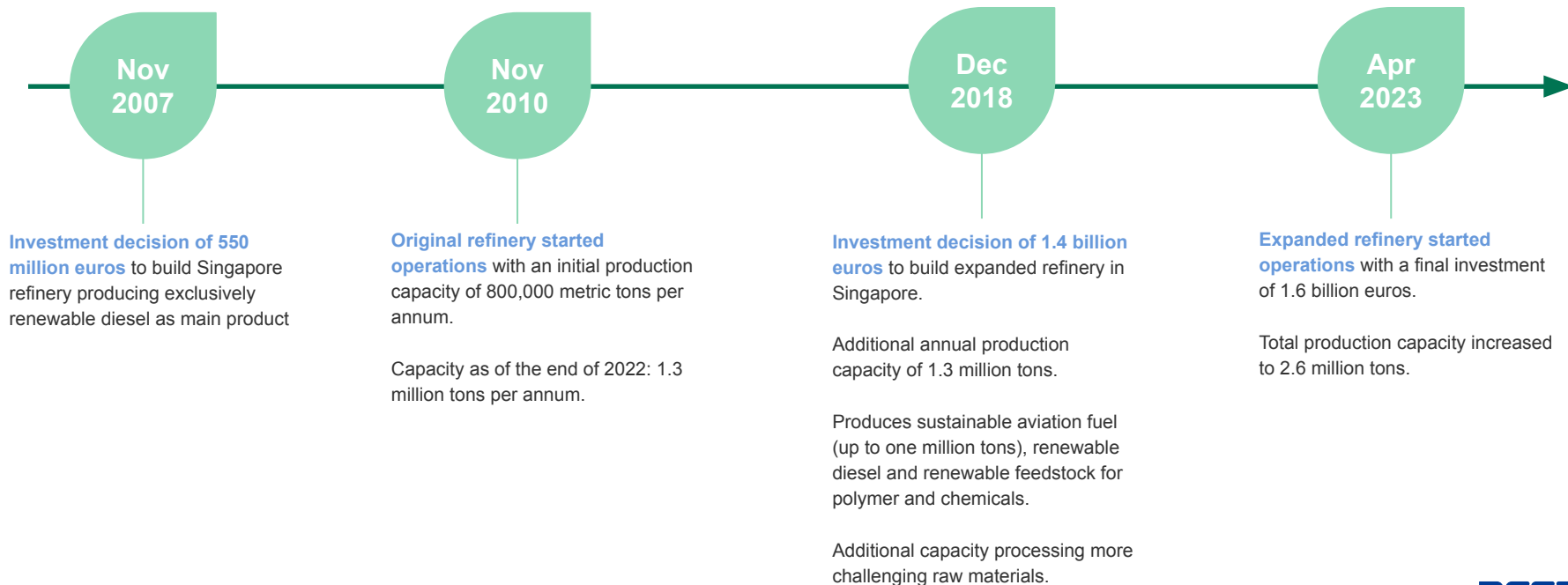
Neste RE Renewable and Recycled is Neste's solution for the plastics and chemicals sectors to help them reduce crude oil dependency while also tackling climate change and plastic waste challenge.

Introduction to Neste Singapore Refinery

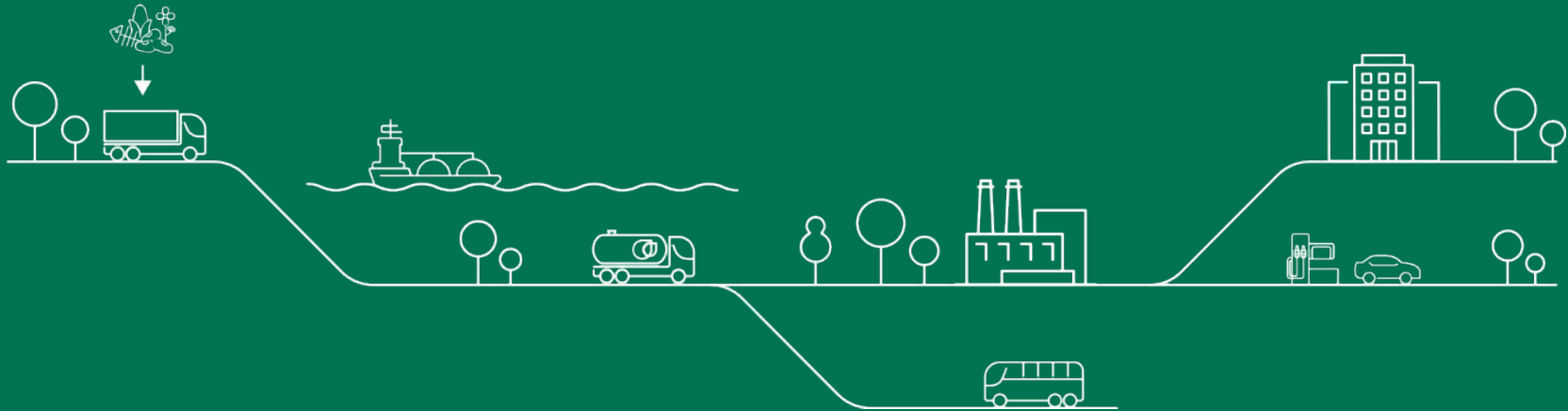


The world's largest renewable fuels refinery & the world's largest SAF production facility

Neste Singapore Refinery



Neste is turning renewable raw materials into a variety of high-quality renewable products with the NEXBTL technology



Raw materials

More than 10 different renewable raw materials are sourced around the world

Neste's renewables refineries technically capable of running on 100% waste and residues

Pre-treatment

Pre-treatment of the renewable raw materials ensures impurities are removed before refining

NEXBTL process

Pre-treated renewable raw materials are processed with Neste's proprietary NEXBTL technology at 4 production units globally

Hydrogen added to remove oxygen. CO₂ and renewable propane can be recovered for commercial use

Output

3.3 million tons of Neste renewables per year

→ 5.5 million tons in 2023

→ 6.8 million tons in H1 2026

Neste Singapore expanded refinery

West Area

- NEXBTL 2 unit (RD, sustainable aviation fuel & renewable feedstock for RPC)
- Hydrogen Production Unit

Main Area

- Pretreatment (PTU 1) Unit purifying wastes & residues of renewable raw materials
- NEXBTL 1 Unit refining renewable raw materials into Renewable Diesel (RD) and renewable feedstock for Renewable Plastics and Chemicals (RPC)

South Area

- Pretreatment (PTU) 2 Unit
- Wastewater Treatment Plant
- Feedstock tank farm



Neste's expanded Singapore refinery has 1 Mt SAF capability to support airlines in APAC and globally from 2023 onwards

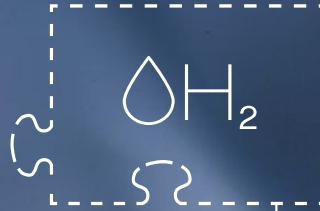


Global SAF market and policy outlook



Sustainable transport requires all low-carbon solutions

Power-to-liquids and hydrogen hold **significant potential** for fossil oil displacement in transportation and other sectors in the long-term



Electric vehicles could replace **1,000 Mtoe** oil consumption (2040)

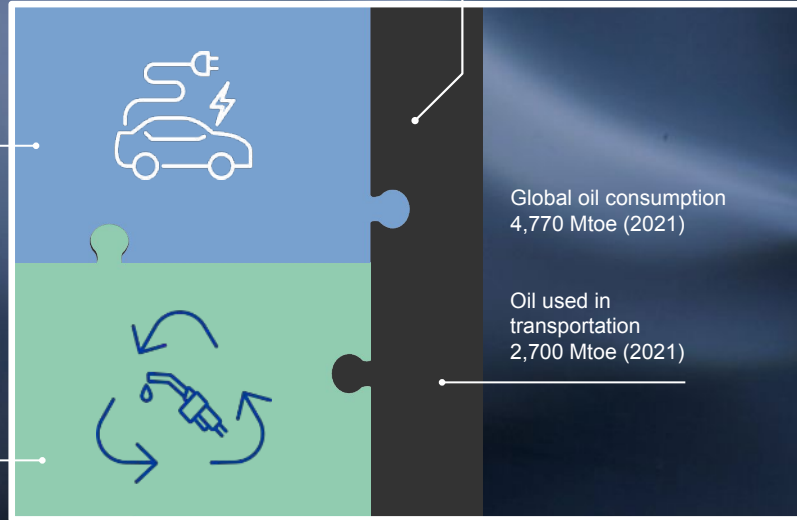


Renewable liquid fuels have the potential to replace up to **1,000 Mtoe** of fossil transport fuels (2040)



Global oil consumption
4,770 Mtoe (2021)

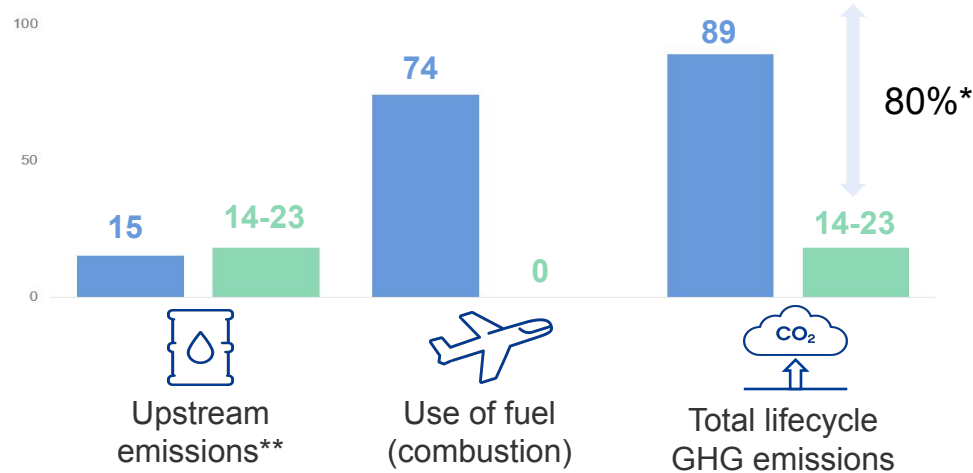
Oil used in
transportation
2,700 Mtoe (2021)



SAF can reduce GHG lifecycle emissions up to 80%* compared to fossil jet fuel

GHG emissions of fossil jet fuel vs Neste My SAF

[gCO₂eq/MJ]



● Fossil jet fuel ● Neste MY SAF from waste and residues

The fuel lifecycle extends from raw material extraction to the consumption of the fuel.

* According CORSIA LCA methodology

**Production of feedstock, transports, refining

NESTE MY

Sustainable Aviation Fuel

Made from

100%

waste and residues,
such as used cooking oil

Drop-in solution
requiring

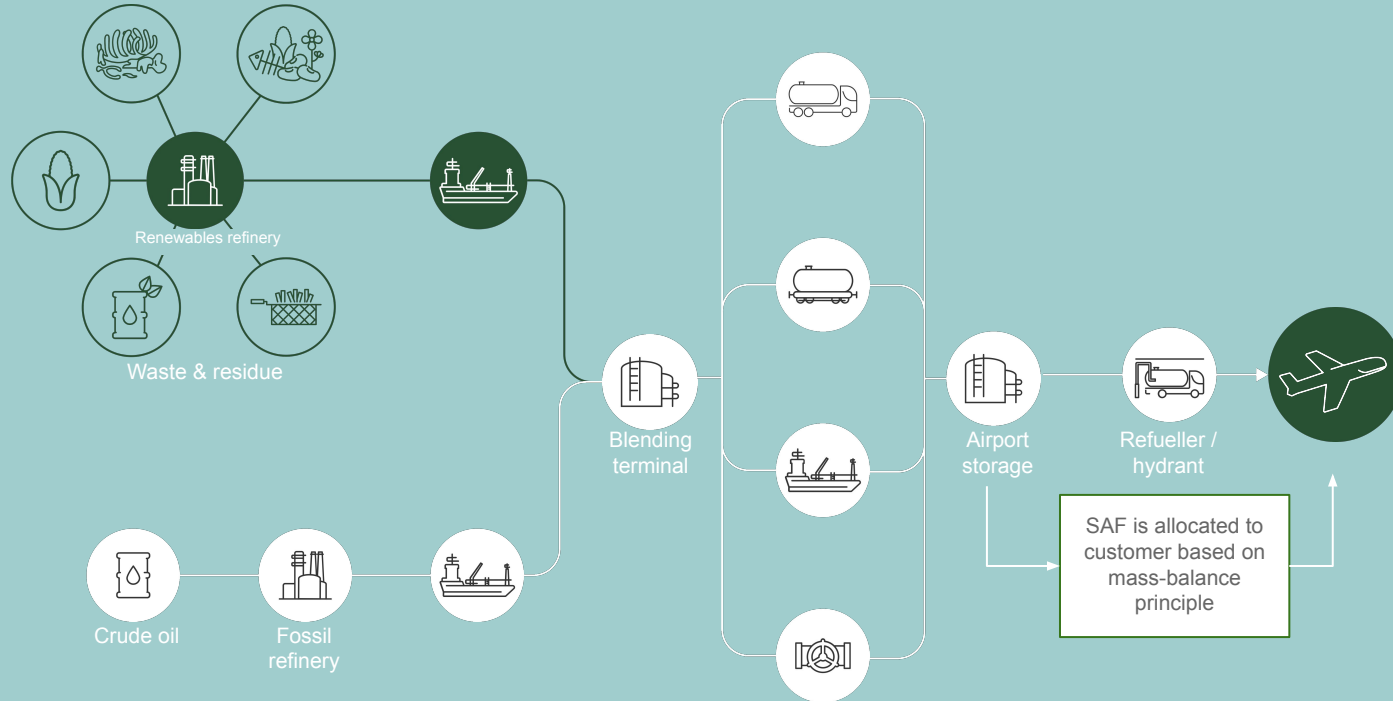
zero

additional investment
in infrastructure

Available Today

NESTE

SAF is a drop-in solution, requiring no investments or modifications to aircraft or fuel supply infrastructure



SAF production capacity is increasing significantly through investments from Neste and others

2019

100 kton SAF

Neste's total global production capacity

2024

1.5 Mton SAF

total global capacity through investments in Rotterdam and Singapore

2026

2.2 Mton SAF

total global capacity through further investments in Rotterdam

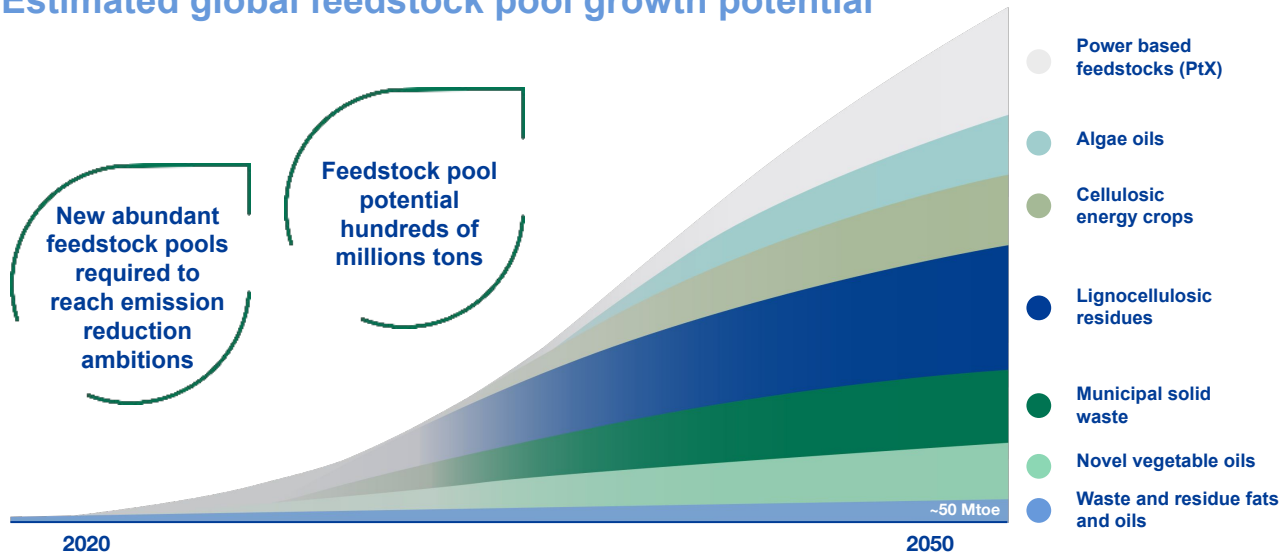
2030

>3 Mton SAF

aspiration with increasing renewable and circular capacity and product optionality

Long-term SAF production scale up is based on continuing expansion of global feedstock pool via new technologies

Estimated global feedstock pool growth potential



Neste innovation on several fronts



Chemical recycling



Power-to-X solutions



Renewable hydrogen



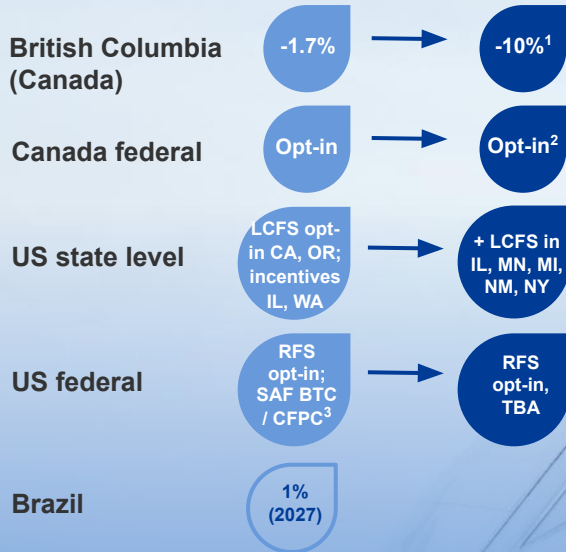
Lignocellulosic feedstocks



Algae oils

Continuing growth of the SAF market will require policy support to create demand certainty for investments

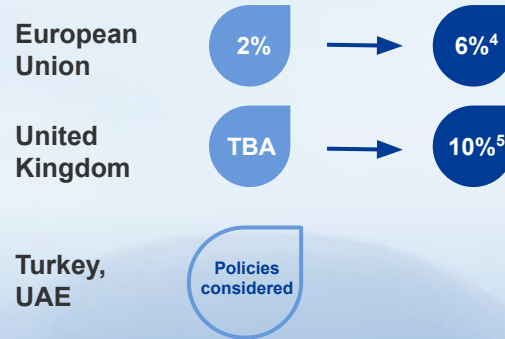
Americas



- Market growth in the US driven by a mix of federal and state level incentives (opt-ins and tax credits)
- British Columbia plans to implement an aviation specific emission reduction target
- First LatAm SAF mandate expected for Brazil

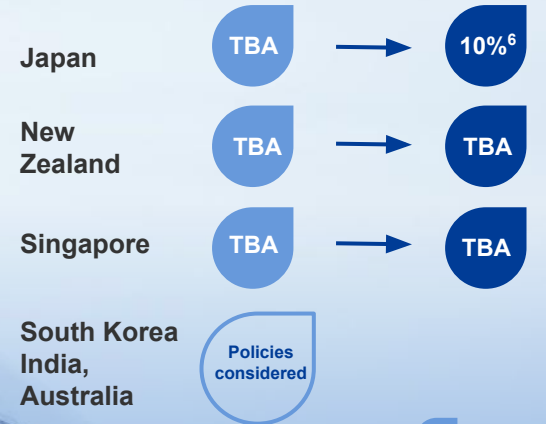
1) Intentions Paper proposal to introduce a carbon intensity reduction target for jet fuel starting in 2024, with -10% CI target in 2030; 2) Canada federal Clean Fuel Standard 3) BTC (Blenders Tax Credit) expected to change to a CFPC (Clean Fuel Production Credit) in 2025; 4) Provisional agreement on ReFuelEU Aviation with 2030 level of 6% including 1.2% RFNBO sub-mandate; 5) UK Net Zero Strategy; 6) METI proposal on May 26, 2023.

EMEA



- SAF mandates in place (NOR, SWE, FRA) to be superseded by an EU-wide SAF mandate in 2025
- UK plans to follow similar timeline
- Policy discussion starting in the Middle East

Asia Pacific



- Frontrunner countries such as Japan and New Zealand setting comparable targets and timelines for SAF adoption as Western peers
- SAF policy discussion spreading to an increasing number of countries

2025
2030

Frontrunners in APAC are shaping policies for SAF, with ambitions aligned to those in Europe and North America

SAF regulatory and market developments in APAC

SINGAPORE

Green Plan published in 2021 established first holistic approach for Singapore's climate agenda

International Advisory Panel (set up by CAAS) proposed in Sep 2022 a structural offtake mechanism for SAF; **Blueprint for Sustainable Aviation Hub** to be published in 2023

Singapore Airlines, Temasek, CAAS SAF pilot launched in July 2022

International collaborations with US, UK, Japan, New Zealand and Australia on aviation sustainability

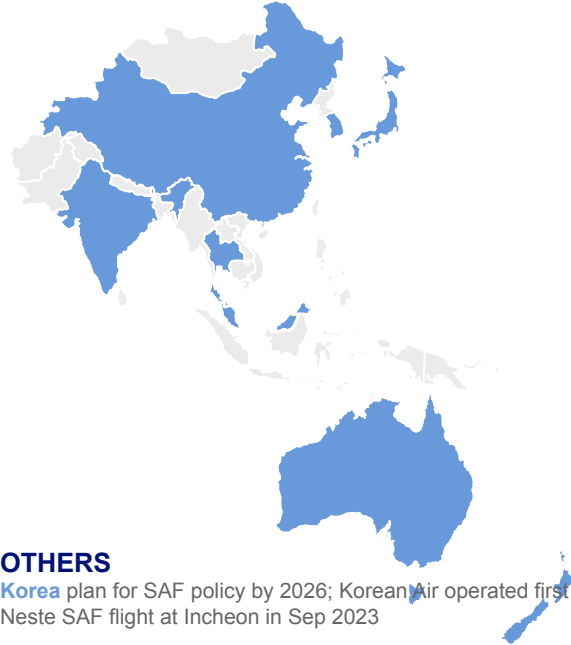
AUSTRALIA

Government **Bioenergy Roadmap** published in November 2021 established SAF as key focus area (1 of 3 hard to abate sectors).

Jet Zero Council to advise government on required policies for aviation decarbonization launched at the Avalon Airshow in February 2023

SAF Partnership of Qantas Airbus to invest US\$200 million in the SAF industry in Australia

Boeing and CSIRO revealed **SAF Roadmap** for Australia's sustainable jet fuel future



OTHERS

Korea plan for SAF policy by 2026; Korean Air operated first Neste SAF flight at Incheon in Sep 2023

Thailand civil aviation authority (CAAT) has set up a SAF working group

India exploring development of a SAF mandate by 2025

China aims to outline a SAF roadmap by end 2023

JAPAN

Agency for Natural Resources and Energy (ANRE) has announced its plan to introduce a **10% SAF mandate in 2030 for all international flights**.

Ministry of Land, Infrastructure, Transport and Tourism (MLIT) has set the **target of 10% for SAF in 2030**

Basic Policy on Aviation Decarbonisation of MLIT features SAF as one of five key elements

MALAYSIA

National Energy Transition Roadmap targets a SAF mandate of 1% in the short term, rising to 47% by 2050

Ministry of International Trade and Industry (MITI) established **Sustainable Aviation Energy Task Force**.

Malaysia Airlines operated first flight using Neste MY SAF from Kuala Lumpur to Singapore in June 2022

NEW ZEALAND

Government announced intention to implement a **dedicated SAF mandate**, coming into force in 2025

Sustainable Aviation Aotearoa Public-Private partnership launched in November 2022

First shipment of SAF delivered to Auckland airport for **Air New Zealand** in September 2022

A photograph of an airplane cabin interior. In the foreground, the back of a passenger's head and shoulders is visible. In the background, a flight attendant in a dark vest and white shirt is standing near the aisle. The cabin lights are dim, and the overall atmosphere is calm. The text "Thank you" is overlaid in the center of the image in a white, sans-serif font. A white curved line graphic is positioned above the text.

Thank you