

Overview of Japan's Sustainable Fuels Policy

May 12, 2026

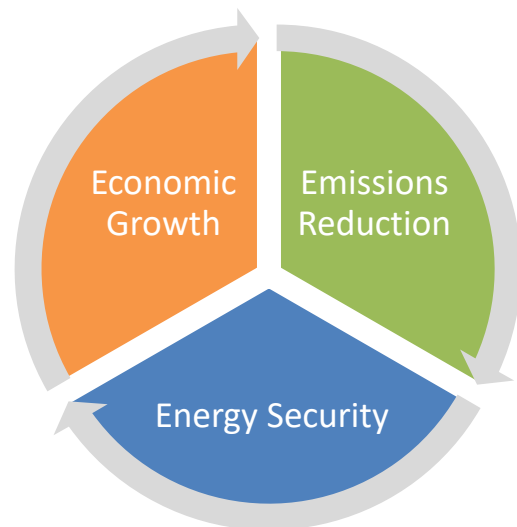
Agency for Natural Resources and Energy

Green Transformation's Three Principles

Triple breakthrough

Japan aims to simultaneously achieve

- Emissions Reduction
- Economic Growth
- Energy Security



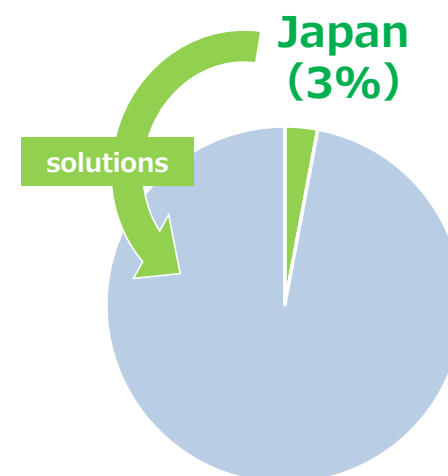
One goal, various pathways

Toward our common goal of achieving net zero, we will make practical energy transitions through various pathways depending on the circumstances of each country.



Solution to the world

Japan will decarbonize it self, but also contribute to global decarbonization by providing solutions outside Japan.

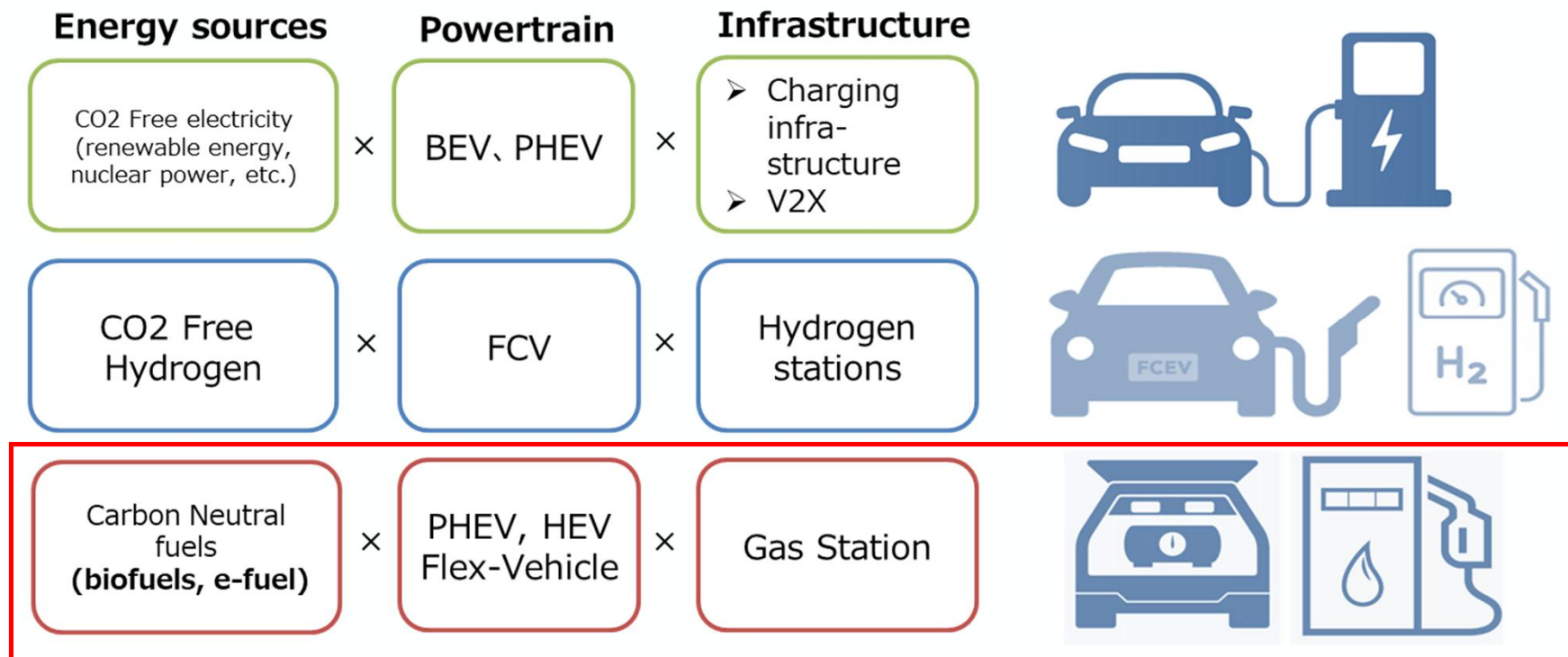




1. Bioethanol for Automobile

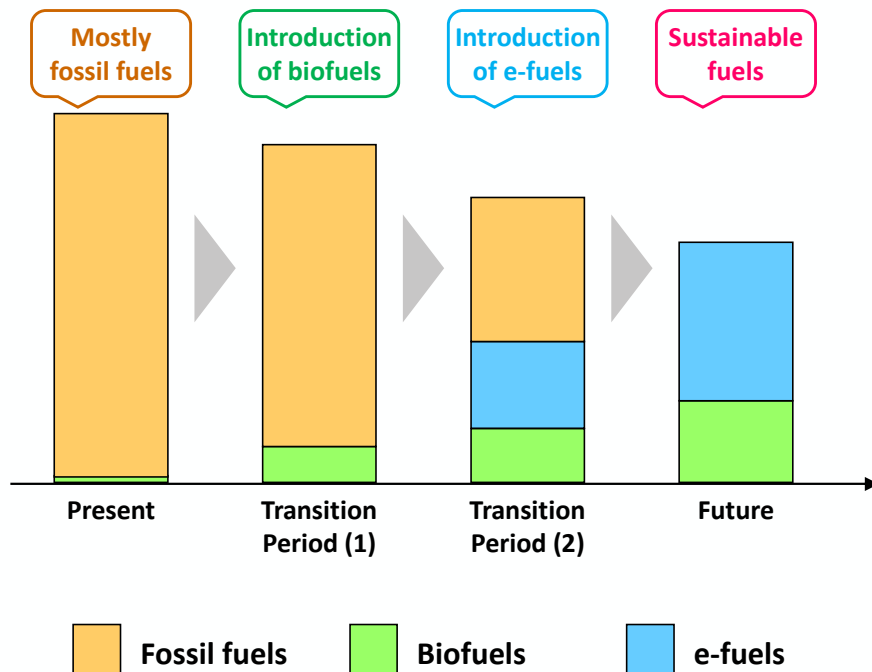
Decarbonization of Road sector through a range of pathways

- To achieve carbon neutrality in the road sector, it is important to pursue **a range of pathways**
- It is necessary to advance **the combination of high-performance various equipment and sustainable fuels such as biofuels and e-fuels as well as electrification**, depending on the circumstances of each country and region.



Passenger Vehicle Policy: Expanding Bioethanol use

Transition to sustainable fuels



Expansion of Biofuel Adoption

- In the 7th Strategic Energy Plan (February 2025), Japan set a new target to expand biofuel use.
 - **Start 10% direct bioethanol blending (E10) by 2030**
 - **Start 20% direct bioethanol blending (E20) by 2040**
- To complement these targets, Japan will aim to start supplying **100% E20-compatible vehicles in new passenger car sales by the early 2030s.**

Main Issues for Consideration toward Expanding the Introduction of Bioethanol

- The main issues for consideration in expanding the introduction include: ① **stable and affordable procurement**, ② establishment of new standards, ③ **development of supply infrastructure (including service station facilities)**, and ④ **introduction** of E10/E20-**compatible vehicles**.

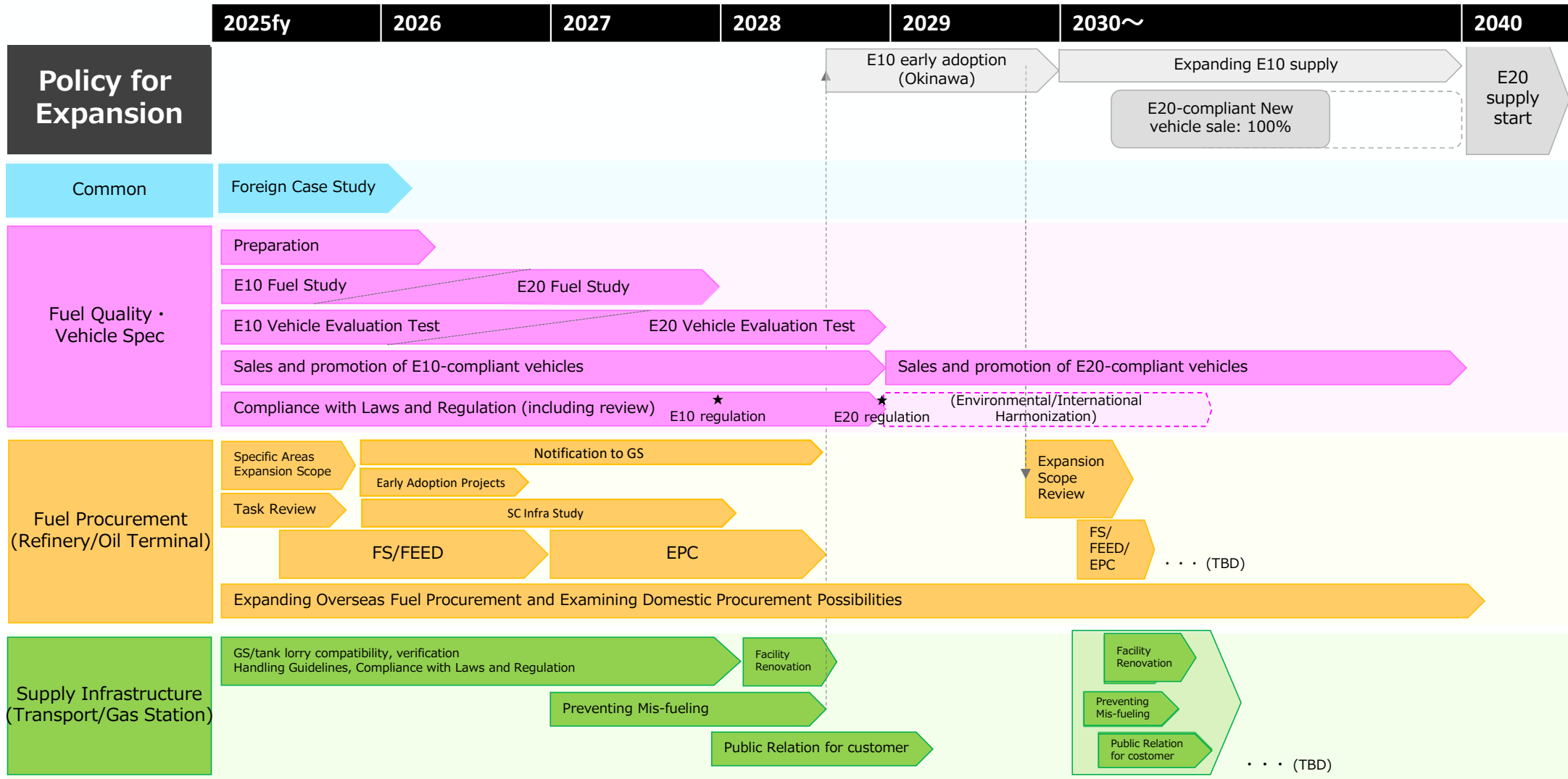
	Issues for Consideration
① Bioethanol Procurement Potential	<ul style="list-style-type: none"> ➤ Bioethanol procurement is expected to rely mainly on imports, and <u>it is necessary to build a stable supply chain.</u> ➤ In order to improve the self-sufficiency rate, it is necessary to pursue the potential of domestically produced bioethanol.
② Fuel Quality (Environmental and Safety Measures)	<ul style="list-style-type: none"> ➤ If bioethanol blends exceeding the E10-equivalent level are introduced, <u>new standards will need to be formulated.</u>
③ Supply Infrastructure	<ul style="list-style-type: none"> ➤ <u>Expanding the introduction of bioethanol will require new investment in infrastructure facilities.</u> For example, this includes installation of new blending equipment, measures against tank corrosion, and measures to prevent water contamination in the supply chain.
④ Vehicle Compatibility	<ul style="list-style-type: none"> ➤ At present, vehicles compatible with E10-equivalent gasoline already exist on the market, but there are also non-compatible vehicles. <u>Early market penetration of compatible vehicles is necessary.</u> ➤ For vehicles compatible with fuel exceeding the E10 level, <u>formulation of new standards and type approval registration based on those standards will be necessary.</u>



■ Initiatives for Action Plan implementation

- The policy to expand the bioethanol use for automobiles within the 7th Strategic Energy Plan made by the government
- Aiming to pursue the supply of low-carbon gasoline with a maximum concentration of 20% (E20) starting in FY2040
- Begin supplying low-carbon gasoline with a maximum concentration of 10% (E10) by FY2030 through the initial direct blending in specific area
- Pilot introduction in specific area (Target: Okinawa) in FY2028 and identification of challenges for full-scale introduction toward early expansion considering the E10-E20 compliant vehicles.
- Aiming E20-compliant vehicle to start early FY2040's, considering manufacturers' development and investment.
- Based on the Action Plan, public and private sectors will jointly promote efforts to expand introduction and regularly confirm progress on actions.

Action Plan for Expanding Bioethanol Introduction into Gasoline



※The schedule may shift depending on progress. Proceed with preparations in anticipation of meeting E20 standards. Proactively advance labor-saving measures where feasible, based on overseas experience. The government will also consider support for implementation.
 ※This action plan will be refined through ongoing investigation and review, including early implementation regions and adoption volumes. We aim to identify challenges and expand supply scale promptly, while considering the deployment status of compatible vehicles.

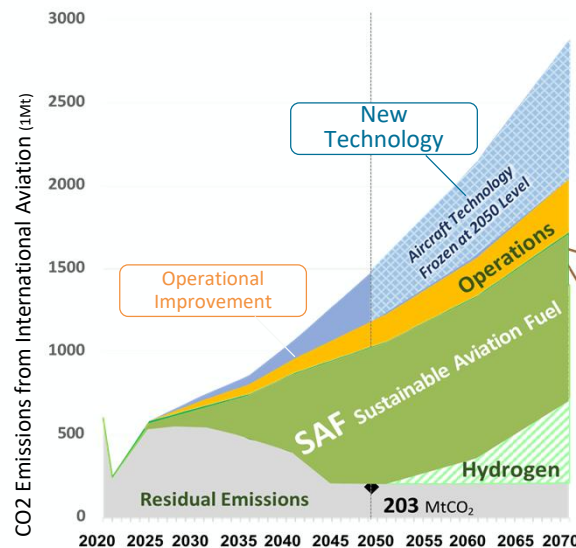


2. SAF

Behind the Need for SAF: ICAO's Regulations in International Aviation Sector

- At **ICAO***¹, the target was set to **limit CO2 emissions** in the international air transportation sector **after 2021 to the 2019 CO2 emissions level** (as base line).
 - At the subsequent ICAO General Assembly meeting, a more stringent target was adopted to **limit CO2 emissions after 2024 to no more than 85% of 2019 CO2 emissions**.
- Airlines are required to reduce their CO2 emissions to meet these targets. Introduction of **Sustainable Aviation Fuel (SAF)** has become one of the means to achieve the targets.

<Emissions Forecast from International Aviation & Emissions Reduction Targets>



Contribution to CO2 Reduction as of 2050

1. New Technology: 21%
2. Operational Improvement: 11%
3. SAF: 55%

Reference : Excerpted from ICAO LTAG Report (IS3: Ambitious Scenario by ICAO)

*1 International Civil Aviation Organization (ICAO)

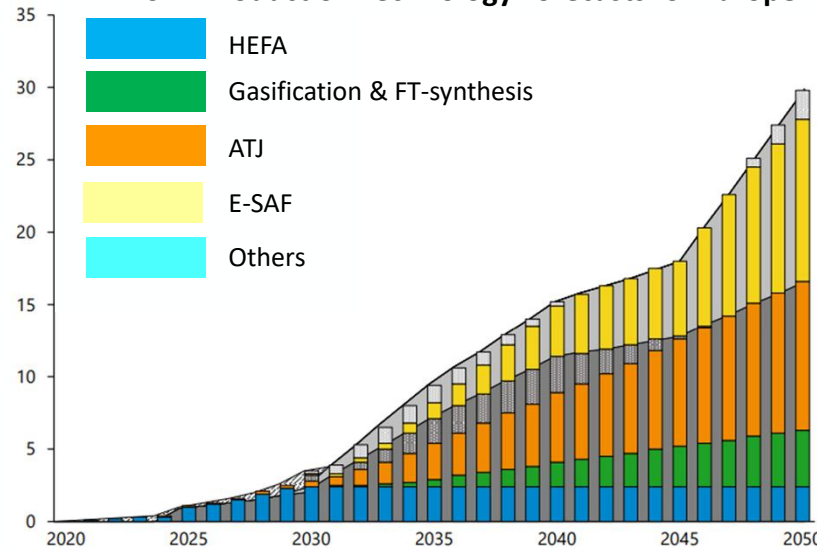
Outlook of SAF Feedstocks and Technologies

- **HEFA technology to produce SAF from UCO and other feedstocks has been established**, but due to increasing global demand, UCO is in short supply and the prices have skyrocketed.
- **Establishment of ATJ technology to produce SAF from bioethanol**, produced in the US and Brazil where the feedstock is of abundant supply, is expected in the future, but the use of food crops as feedstock is restricted in Europe. **Diversification of feedstocks**, including the **development of non-food feedstocks (i.e. cellulosic feedstock)**, **will also be necessary**.
- **By 2050, SAF produced by synthesizing CO2 and hydrogen**, is expected to account for 1/2 of SAF feedstock.

<Type of Feedstocks & Technologies of SAF>

Production Technology	Main Feedstocks
HEFA Hydroprocessed Esters and Fatty Acids	UCO, Tallow, Pongamia, Microalgae, etc.
ATJ Alcohol to JET	<ul style="list-style-type: none"> •The 1st-Generation Bioethanol (sugarcane, corn, etc.) •The 2nd-Generation Bioethanol (non-food lignocellulosic material, waste papers, etc.)
Gasification & FT-synthesis	Waste (waste plastics, etc.)
E-SAF	CO2, Hydrogen

<SAF Production Technology Forecasts for Europe>



Japan's SAF Policy: Combining "Carrot and Stick"

- Japan set a target of **10% SAF adoption by 2030**.
- **"Carrot (support)" and "Stick (regulations)"** to incentivize SAF deployment.

Support Measures

- **Capital investment support for installation of large-scale SAF production facilities (approx. 300 billion yen)**, using GX Economic Transition Bonds.
- **30 yen/L of SAF tax credit** for domestic production and sales through "Taxation for Promoting Domestic Production in Strategic Areas".
- Support for the establishment of a secure and stable feedstocks supply chain.
- Support for technological development, demonstration, and certification of non-food derived SAF.

Regulations/Legislations

- In "the Act on Sophistication of Energy Supply Structure," a **5% carbon reduction (=10% SAF mix*50% CI reduction) supply target for jet fuels in 2030 will be established**. (Supply side)
- **Japanese airlines are required to set the target volume of SAF use in 2030** via "Decarbonization Promotion Plan," to be submitted under the Civil Aeronautics Act. (Demand side)
- "Visualize" Scope 3 efforts for passengers and cargo users (shippers) of aviation.

SAF Projects in Japan

- First commercial SAF plant started operation in April 2025.
- Several projects in the pipeline.



③ ENEOS

- Wakayama
- HEFA
- 400k KL/yr



① Cosmo

- Osaka
- HEFA
- 30k KL/yr
- ✂ In operation



⑤ Cosmo

- Kagawa
- ATJ
- 150k KL/yr



② Idemitsu

- Chiba
- ATJ
- 100k KL/yr



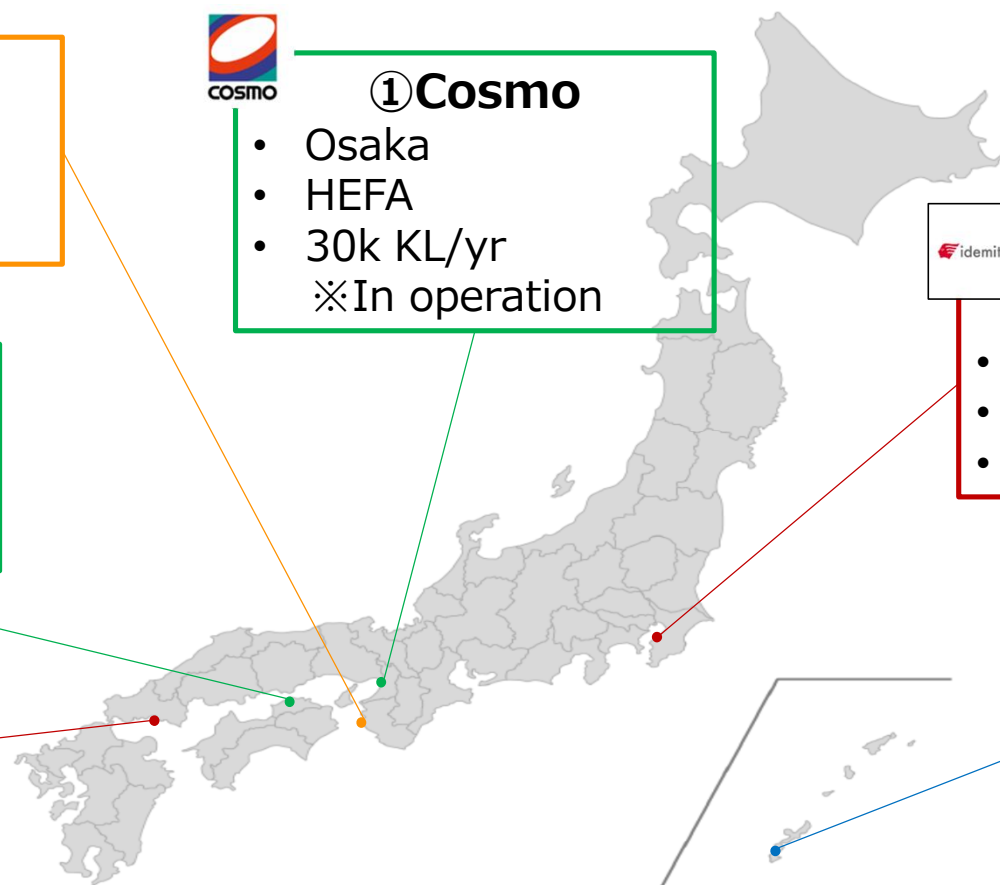
④ Idemitsu

- Yamaguchi
- HEFA
- 250k KL/yr



⑥ Taiyo

- Okinawa
- ATJ
- 200k KL/yr



Basic Policy for Further Promotion of SAF Introduction (Overview)

Basic Approach

- The introduction of SAF, particularly domestically produced SAF, is important from the perspectives of decarbonization, industrial competitiveness, and energy security.
- How the additional costs associated with SAF introduction should be shared, as well as how to create SAF demand and supply, are common challenges around the world.
- To further promote SAF introduction, it is important to implement integrated regulatory and support measures that help enhance the international competitiveness of private-sector businesses.
- In doing so, it is important to avoid imposing an excessive burden on society as a whole or on any specific stakeholder.

Measures for Consideration



① Regulatory measures that take social acceptability into account



③ Mechanisms for demand creation and user cost-sharing



② A stable supply system at competitive prices



④ Building momentum

Future Direction

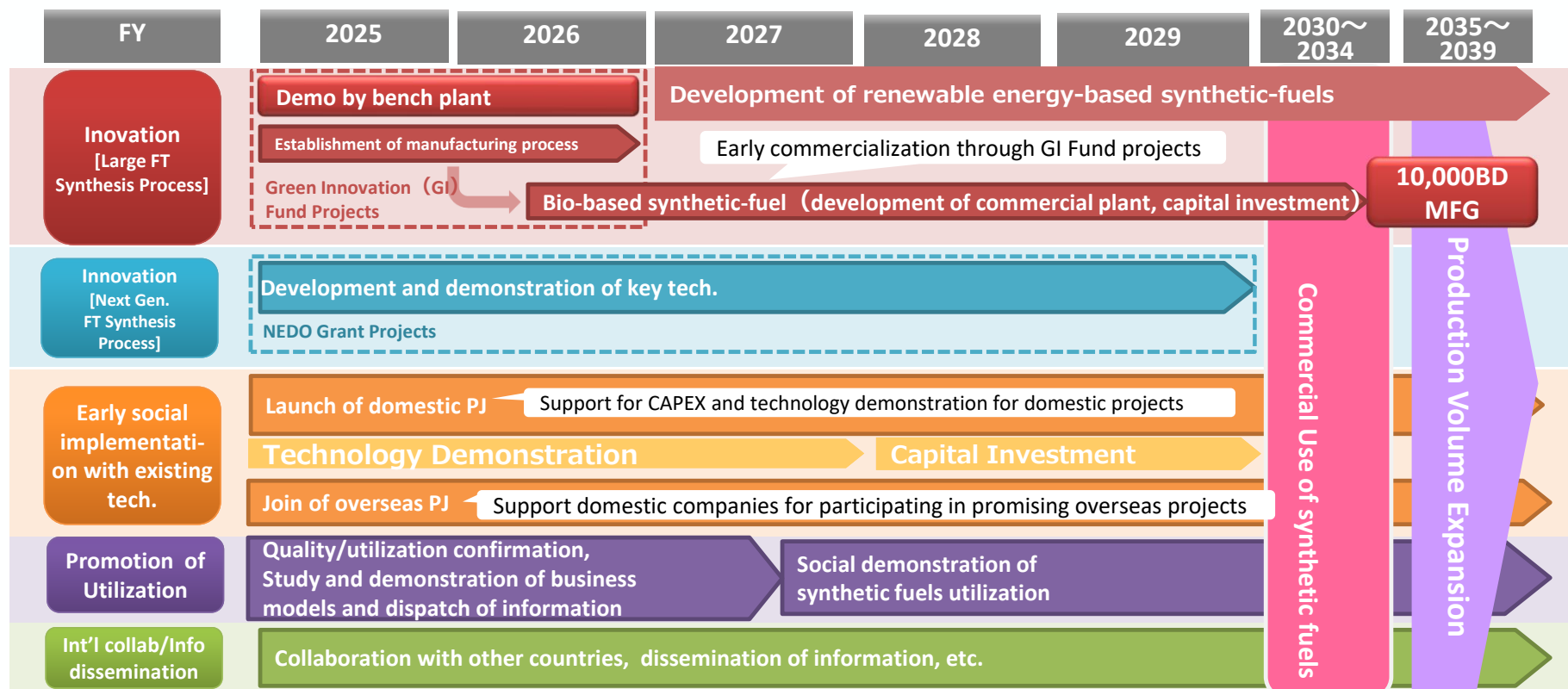
- Each stakeholder will make the utmost efforts, based on this basic policy, to further promote the introduction of SAF.
- Private-sector businesses will conduct individual negotiations on SAF sales and purchases toward final investment decisions on SAF plant construction.



3. synthetic-fuels

Japan's Roadmap towards Commercialization of synthetic fuels

- Support the development of large-scaled and high-efficient synthesis process including through Green Innovation (GI) Fund projects.
- Support capital investment to initiate supply of synthetic-fuels using existing technologies (e.g. MTG process) , and pilot projects to establish business models.

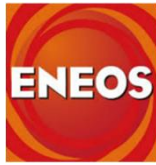


➡ **Aim to commercialize synthetic-fuels by the early 2030s**

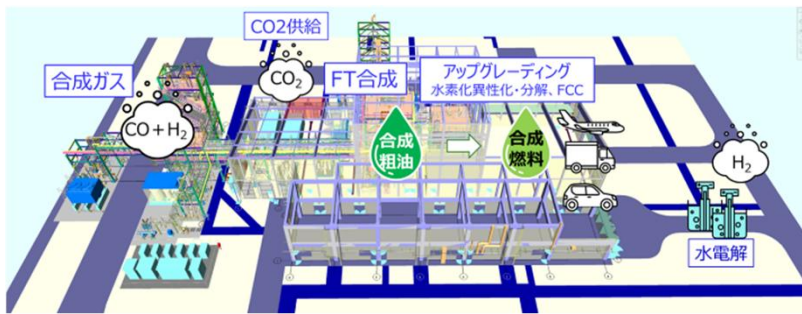
Trends in e-fuel projects in Japan

FT Synthesis

ENEOS (Yokohama City, Kanagawa Prefecture)



- Selected as a GI Fund project in 2022; developing highly efficient and large-scale synthetic fuel production technology using FT synthesis process.
- In 2024, a **1BPD (58KL/year, equivalent to one drum of fuel per day) class bench plant launched to demonstrate small-scale synthetic fuel production (e-Gasoline, e-Diesel, and jet fuel oil (eSAF) production).**



(Source: ENEOS Corporation)

Methanol synthesis (under consideration)

Idemitsu Kosan (Tomakomai City, Hokkaido)



- 2023, together with Hokkaido Electric Power Company and Japan Petroleum Exploration Co. (JAPEX), commissioned to conduct a study on the implementation of an advanced CCS project. Aiming to launch a CCUS project in the Tomakomai area, we are currently conducting surveys and studies, including technical studies related to CO2 emission points, collection facilities, and transportation pipelines.
- In conjunction with this study, the company **aims to start production of several tens of thousands of KL of synthetic fuel early 2030s** by combining CO2 utilization, which is related to the CCUS project, with the latest renewable energy technologies.

FT Synthesis

ENEOS (Synthetic Fuel Demonstration Run at Expo 2025 Osaka, Kansai)

- Using synthetic fuel produced at a demonstration plant, a large-vehicle demonstration was conducted at Expo 2025 Osaka, Kansai, which opened in April 2025.



Initiative for Sustainable Fuels and Mobility (ISFM)

- To reduce emissions and encourage just and inclusive energy transitions by expanding the use of sustainable fuels and high-performance mobility equipment, Brazil and Japan launched a new collaborative framework called the Initiative for Sustainable Fuels and Mobility (ISFM) at the summit meeting in May 2024.
- Through mutual collaboration and leadership, both countries will work together to create momentum towards COP30 and mainstream sustainable fuels.

Key Concept of ISFM



Sustainable Fuels
(e.g. Biofuels, E-fuels)

- ✓ Increase supply and demand of sustainable fuels



High-performance Mobility
(e.g. Hybrids, Flex-fuel engines, Next-generation aircraft)

- ✓ Improve energy efficiency



Key Events (2025)



Belém 4x Pledge on Sustainable Fuels in COP30

- A pledge on sustainable fuels, such as biofuels, e-fuels and e-methane, was launched by Brazil in COP30, co-sponsored by Japan and Italy.
- It aims at the goal to “expand sustainable fuels use globally by at least FOUR times* by 2035 from 2024 levels” and commits to necessary efforts and international cooperation toward the goal. Especially, this text emphasizes the importance of promoting de-carbonization in road transport sector by combining sustainable fuels and high-quality mobility equipment such as hybrid engine.
- This pledge was launched at the pre-COP on Oct. 14 and endorsed by Brazil’s President Lula at COP30 Leaders’ Summit on Nov. 7. A ministerial event was held regarding this pledge on Nov 14, with the supports by 23 countries.
- We continue to call on further endorsement by more countries even after COP30.

* “Delivering sustainable fuels – Pathways to 2035” (IEA, 2025)



Nov 7 Endorsement by President Lula at COP30 Leaders’ Summit
<https://cop30.br/en/news-about-cop30/lula-at-climate-summit-brazil-is-not-afraid-to-discuss-the-energy-transition>



Supporting Statement by Japan at the Leaders’ Summit



Nov 14 Panel Discussion at the ministerial event in COP30