METI
Ministry of Economy, Trade and Industry

Decarbonization of Road Transport through Sustainable Fuels

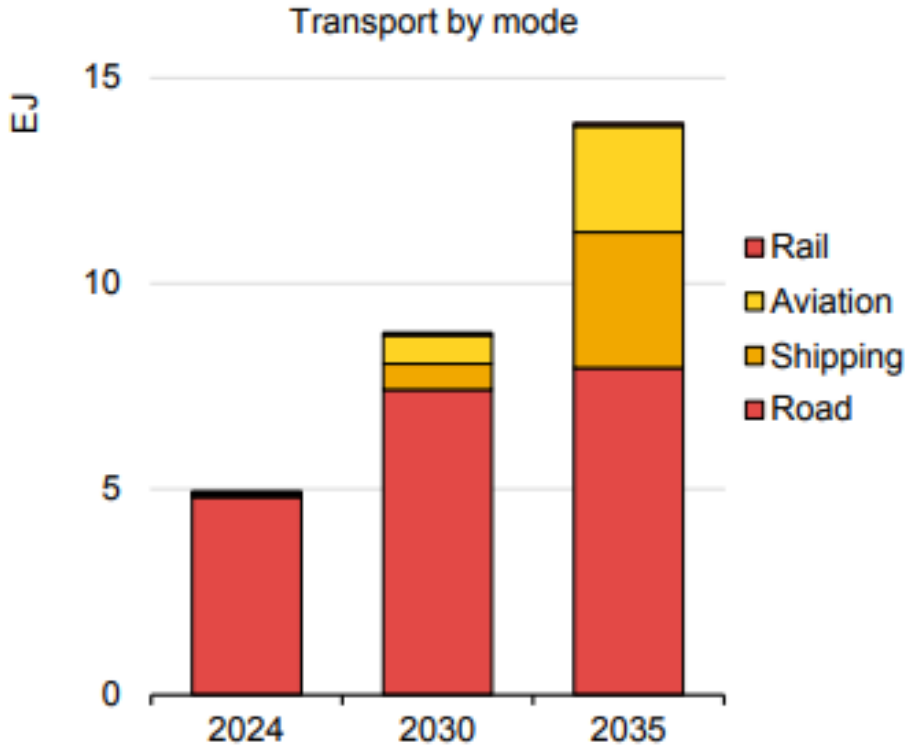
Ministry of Economy, Trade and Industry

JAPAN

November 20th, 2025

Demand of Sustainable fuels

- According to the recent report of International Energy Agency(IEA), **Road transport** today **represents 96% of all transport sector sustainable fuel use** and **70% of overall energy sector use.**
- In accelerate case, **Road transport remains the largest consumer of sustainable fuels among all transport modes in 2035** as well.



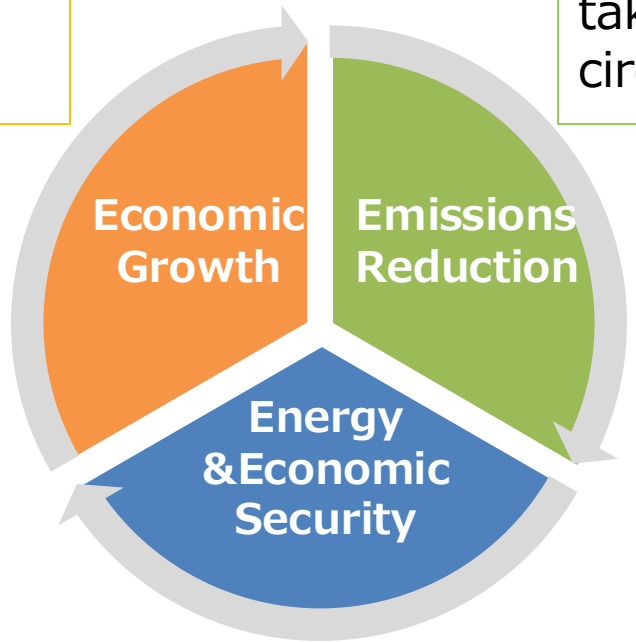
https://iea.blob.core.windows.net/assets/77a8c816-dc61-4668-b501-b1793a3ab2c7/DeliveringSustainab

Transition to Carbon Neutrality

- It is important to achieve **Emissions Reduction**, **Economic Growth** and **Energy Security** (**Triple Breakthrough**) in its energy transition simultaneously.

Enhancing industrial competitiveness
through robust manufacturing and secure employment.

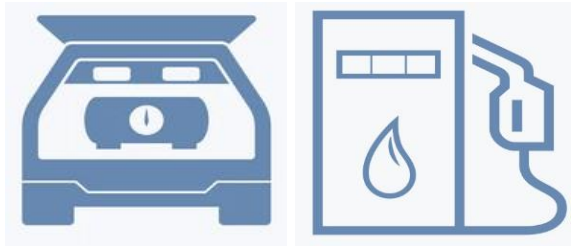
Emission reductions across the entire lifecycle and stock of vehicle,
taking into account national circumstances such as energy mix.



Building resilient supply chains
for critical minerals through risk diversification and multi-country sourcing

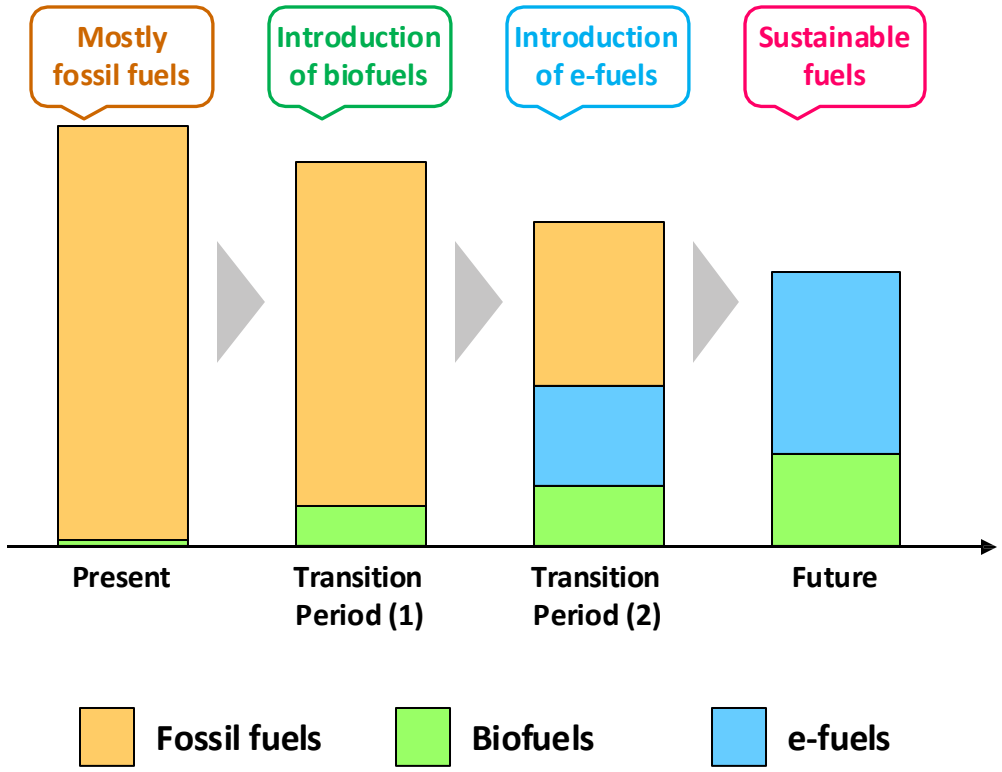
Policy approach to Decarbonization in Road Sector : A Range of Pathways

- **Relying on single solution** for carbon neutrality is **a high-risk strategy**.
- **A range of pathways strategy** is a key solution to achieve emission reductions while ensuring economic growth and security.

Energy sources		Powertrain		Infrastructure	
CO2 Free electricity (renewable energy, nuclear power, etc.)	×	BEV、PHEV	×	➢ Charging infra-structure ➢ V2X	
CO2 Free Hydrogen	×	FCV	×	Hydrogen stations	
Sustainable fuels (biofuels, e-fuel)	×	PHEV, HEV Flex-Vehicle	×	Gas Station	

Passenger Vehicle Policy: Expanding Bioethanol use

Transition to sustainable fuels



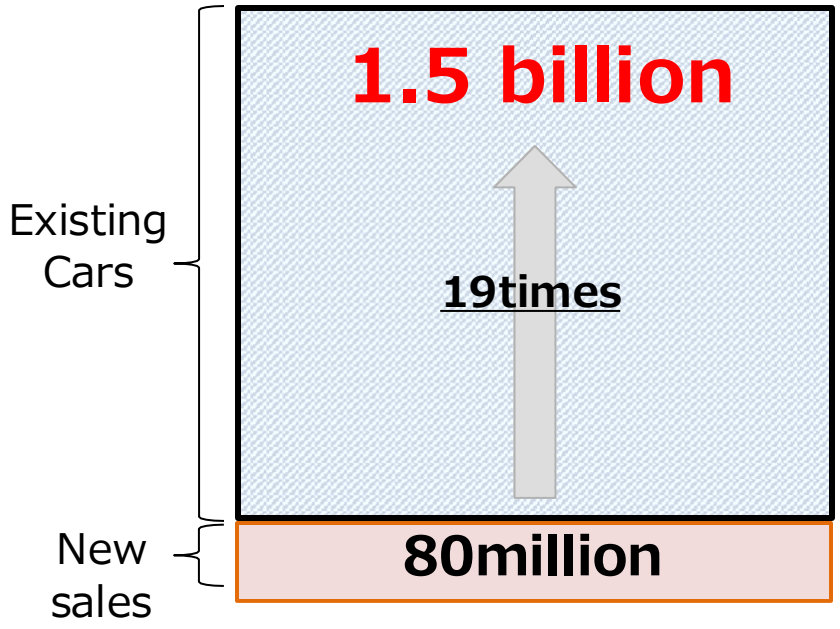
Expansion of Biofuel Adoption

- 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.**

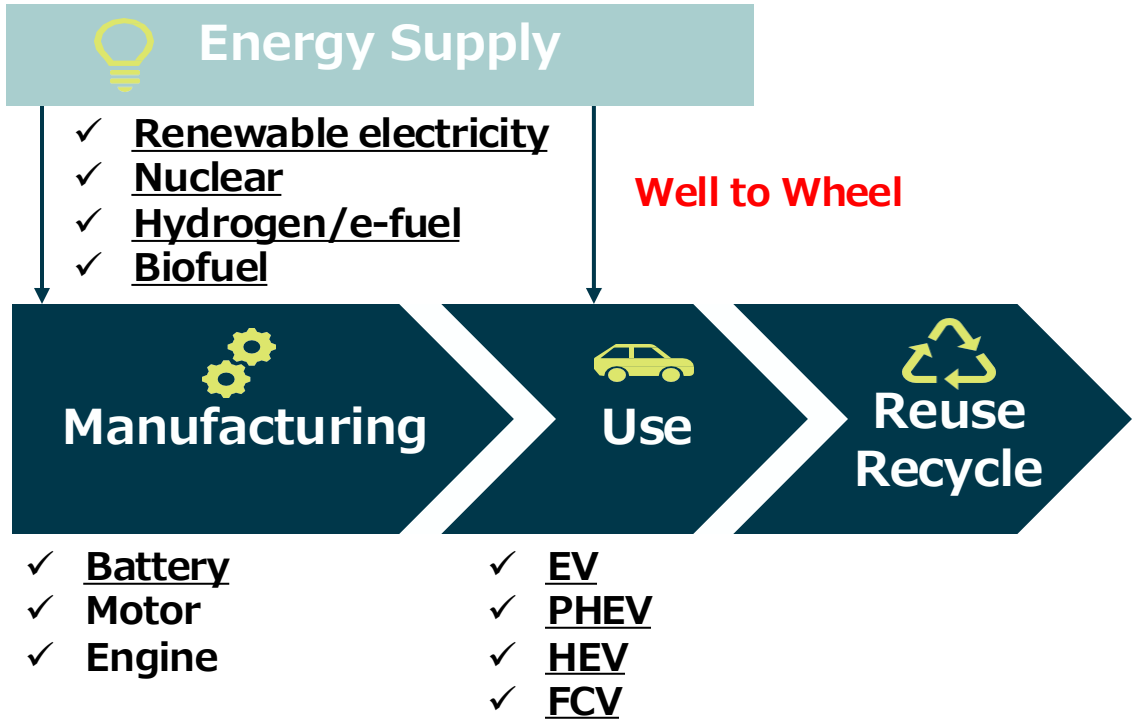
Key factors for Decarbonization

- Focusing on **emissions reduction from the entire vehicle stock, including both new and existing cars**, is essential.
- It is crucial to reduce emissions across **the entire life cycle**, including the **Well to Wheel approach of the energy supply.**

Vehicle Stock



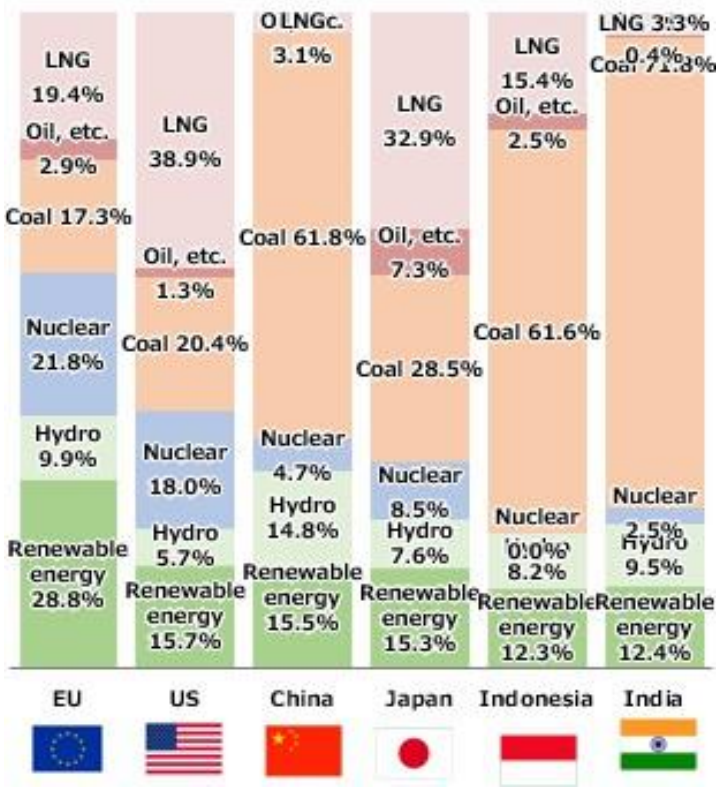
Automobile Life Cycle



Key factors for Decarbonization

- The optimal powertrain of each countries **depends on the energy mixes**.
- To achieve carbon neutrality in the road sector, it is important to take into account **each country's circumstances.**

Power Generation Mixes

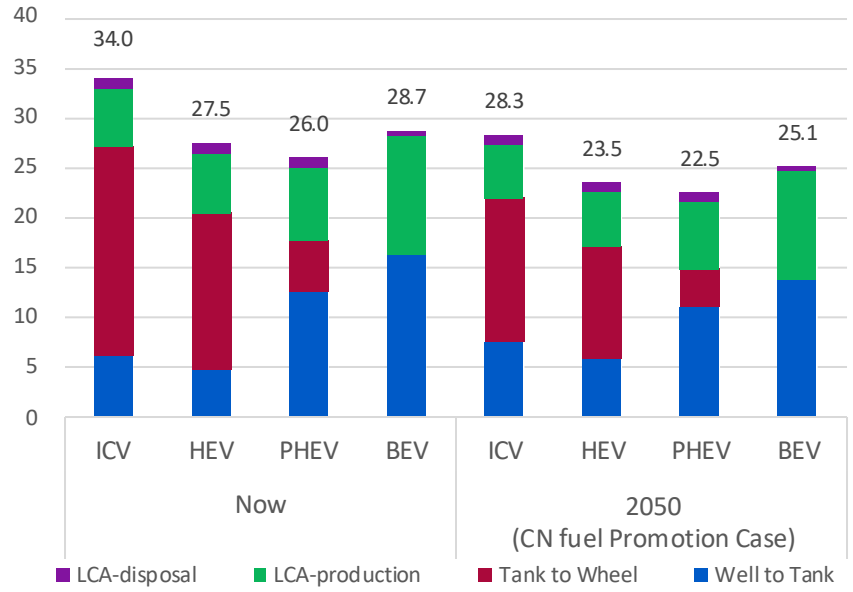


(Source) IEA World Energy Balances (electricity generation by country in 2022) and the Comprehensive Energy Statistics (preliminary figures for FY 2023)

Life cycle CO2 emissions

tCO2eq/Vehicle Lifetime

ASEAN



Note: CN fuel Promotion Case assumes more wide-spread CN fuels (biofuels and synthetic fuels), based upon the Reference case in the IEEJ outlook 2025; The GHG emissions for production and disposal of vehicle are referred to the GREET Model (The Greenhouse gases, Regulated Emissions, and Energy use in Technologies Model) 2021 version, developed by Argonne National Laboratory.

Key to success

✓ Awareness of the Importance of a Holistic Approach

- Vehicle stock/Life Cycle/ Well to Weel perspective
- Cross-industry benefits (Economic growth, Energy security)

✓ Collaboration Among All Stakeholders

- Supply side - Demand side
- Public sector – Private sector

✓ International Partnership

- Bilateral: ISFM, Indonesia-Japan Biofuels Co-creation Task Force
- Multilateral :AZEC, Ministerial Meeting on Sustainable Fuels, COP30

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 has been working together with to **create momentum towards COP30** and **mainstream sustainable fuels** with like-minded countries and international organization.

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)

March
Brazil-Japan Summit

August
CEM 16

September
Ministerial Meeting on Sustainable Fuels in Osaka

October
AZEC Ministerial Meeting

October
G20 Energy Transition Ministerial Meeting

November
COP30

Ministerial Meeting on Sustainable Fuels

- The meeting was held for the first time **on September 15th in Osaka**, Japan, **co-hosted by Japan and Brazil** based on the **"Initiative for Sustainable Fuels and Mobility (ISFM)“** .
- Participants from **34 countries and organizations** discussed **the importance of expanding the production and utilization of sustainable fuels** as well as **the necessity of international and public-private cooperations**. The Co-hosts issued **a Chairs’ Summary** as an outcome, which will lead to **COP30**.

Major Outcomes

- **Discussed necessary efforts and cooperation towards the expansion of sustainable fuels**, based on an outlook presented by the IEA that **the production and use of sustainable fuels will expand by at least four times** by 2035 from 2024 levels
- **Shared the importance of sustainable fuels** such as biofuels, e-fuels and e-methane in a “multi-pathway” approach towards carbon neutrality and **recognized the necessity of international and public-private cooperation**
- Recognized the importance of **the decarbonization in road transport sector by combining sustainable fuels and high-performance mobility equipment** such as hybrid engines

Joint statement from Automotive Industry

- **The Japan Automobile Manufacturers Association, Inc. (JAMA)** has issued and introduced a joint statement with the Brazilian Association of Automotive Vehicle Manufacturers (ANFAVEA), titled **“Pragmatic and successful decarbonization of road transport -The Strategic Role of Sustainable Fuels including Biofuels and Technological Diversity-”**

Anfavea jama

September 12, 2025

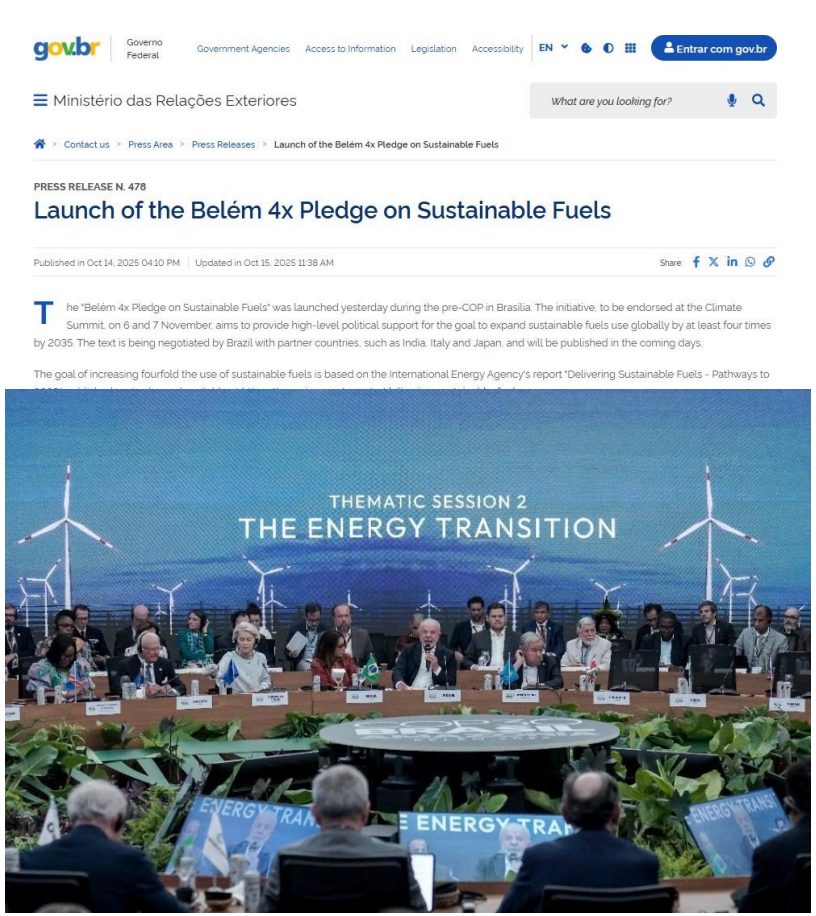
Pragmatic and successful decarbonization of road transport

The Strategic Role of Sustainable Fuels including Biofuels and Technological Diversity

The global challenge of climate change demands urgent and coordinated action. Achieving carbon neutrality by 2050 is not only an imperative, but also a strategic goal that requires inclusive, science-based solutions across all sectors. For automakers worldwide, the decarbonization of road transport is a common goal, and we continue to advance our efforts towards its achievement.

Global Pledge at COP30

- "**Belém 4X Pledge on Sustainable Fuels**" ,which has been announced at Pre-COP on Oct. 14 **by Brazil, the Chair of COP30** with supports from **Japan and Italy,** was released **at COP30 Leaders Summit on 7th Nov by the President**. **19 countries has supported** as of 7th Nov.



- *Recalling* "accelerating **the reduction of emissions from road transport on a range of pathways, including through development of infrastructure and rapid deployment of zero and low-emission vehicles,"…**

・*Underscoring* that, while there are other useful international initiatives that promote sustainable fuels, **there is a need for high-level political and collective action to accelerate the scaling up of sustainable fuels**…, in sectors such as aviation, maritime, **road transport** and industry,

・*Recognizing* that it is important to **adopt a multi-pathway approach** towards achieving carbon neutrality and that ambitious actions should be taken by every country, **taking into consideration different economic, cultural and social circumstances,**

・Commit our intent to work collaboratively and expeditiously to pursue the following objectives:
- **Sustainable fuels use globally by at least FOUR times by 2035 from 2024 levels, taking into consideration different starting points and national circumstances;**
- ***Strengthen*** **international collaboration** on sustainable fuels, for which the following cooperative actions are key:
  - **・Accelerate the adoption of drop-in solutions such as increased fuel blends, and expand associated infrastructure and end-use equipment needed for sustainable fuels, including high-performance mobility equipment such as flex fuel and hybrid engines;**

https://cop30.br/en/news-about-cop30/lula-at-climate-summit-brazil-is-not-afraid-to-discuss-the-energy-transition
https://www.gov.br/mre/en/contact-us/press-area/press-releases/launch-of-the-belem-4x-pledge-on-sustainable-fuels

AZEC (Asia Zero Emission Community)

- **AZEC** is a platform for cooperation towards carbon neutrality/net-zero emissions in the Asia region, involving partner 11 countries including AZEAN countries.
- **2nd AZEC Ministerial Meeting** held in Indonesia last August adopted the **Sectoral Initiatives,** including **creation of sustainable fuel markets.**
- The initiative was deepened with this year's **AZEC Leading Action Forum (AZEC LEAF)** in May, **the Third Ministerial and Leaders Meeting** in October.

AZEC LEAF

Working-level officials from AZEC partner countries **shared their energy transition policies, the current state of decarbonization efforts with the sustainable fuels in the transport sector.**

3rd Ministerial Meeting/Cleaner Energy Future Initiative for ASEAN(CEFIA)

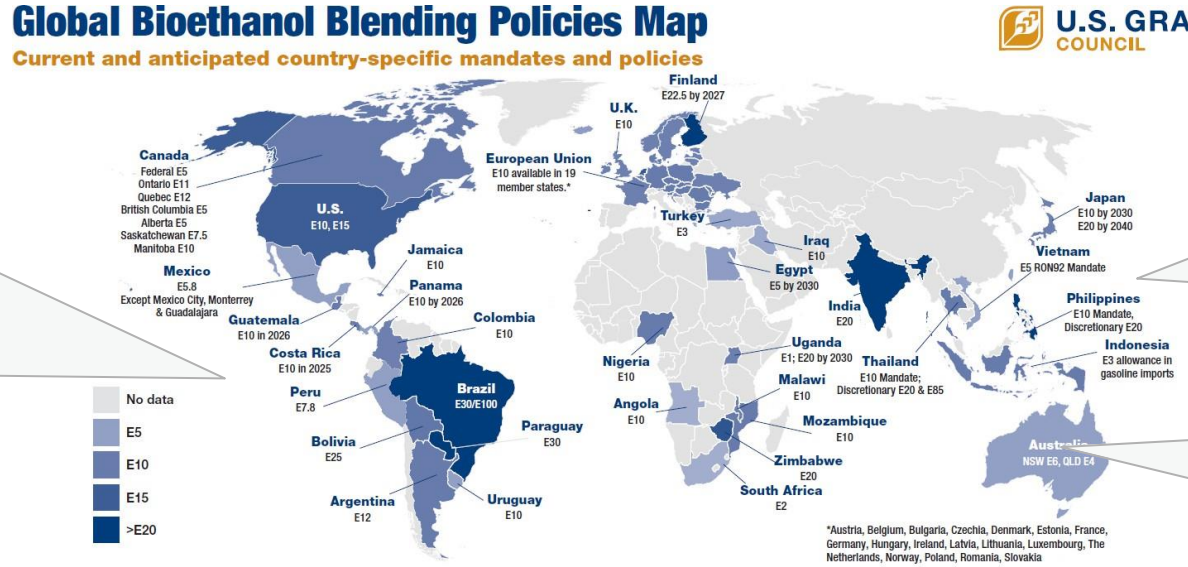
Ministers embraced the concept of "one goal, various pathways" and **welcomed the progress** made this year, including the **AZEC LEAF as part of the implementation of sectoral initiatives**. Also, the **8th CEFIA Public-Private Forum** was held, where Japan showcased its advanced decarbonizatin technologies and initiatives including **biofuels**, leading active discussions on the public-private collaboration.

AZEC
Asia Zero Emission Community

(Reference)https://www.meti.go.jp/english/policy/energy_environment/global_warming/azec/azec_en.html, METI Hosts AZEC Leading Action Forum (AZEC LEAF)

Expanding Biofuels Use in Various Countries

- The blending of bioethanol with gasoline is being adopted in many countries, including the **Global South such as ASEAN counties.**
- **Automakers also provide a wide range of technologies for sustainable fuels worldwide, contributing to the efficient utilization of sustainable fuels.**
- To continue and expand this momentum, **collaboration among all stakeholders is essential.**



Prototypes of plug-in hybrid ethanol vehicles and biomethane vehicles at G20 /Toyota

Hydrogen made from biogas generated at poultry farm/ Toyota

Biogas made from cow dung / Suzuki

Sourse :U.S. Grains Council : USGC https://grains.org/bioethanol/
https://global.toyota/pages/global_toyota/ir/library/annual/2024_001_integrated_en.pdf /https://www.globalsuzuki.com/ir/library/financialpresentation/pdf/2023/jmc2023.pdf / https://global.toyota/jp/newsroom/corporate/39033192.html