

Diversity in Carbon Neutrality

-Importance of carbon-neutral energy-


Takao Aiba

Japan Automobile Manufacturers Association (JAMA)

Chair, the International Climate Change Policy Expert Group

Who We Are?

- JAMA (Japan Automobile Manufacturers Association, Inc.) is a non-profit industry association comprising Japan's 14 manufacturers of passenger cars, trucks, buses and motorcycles.

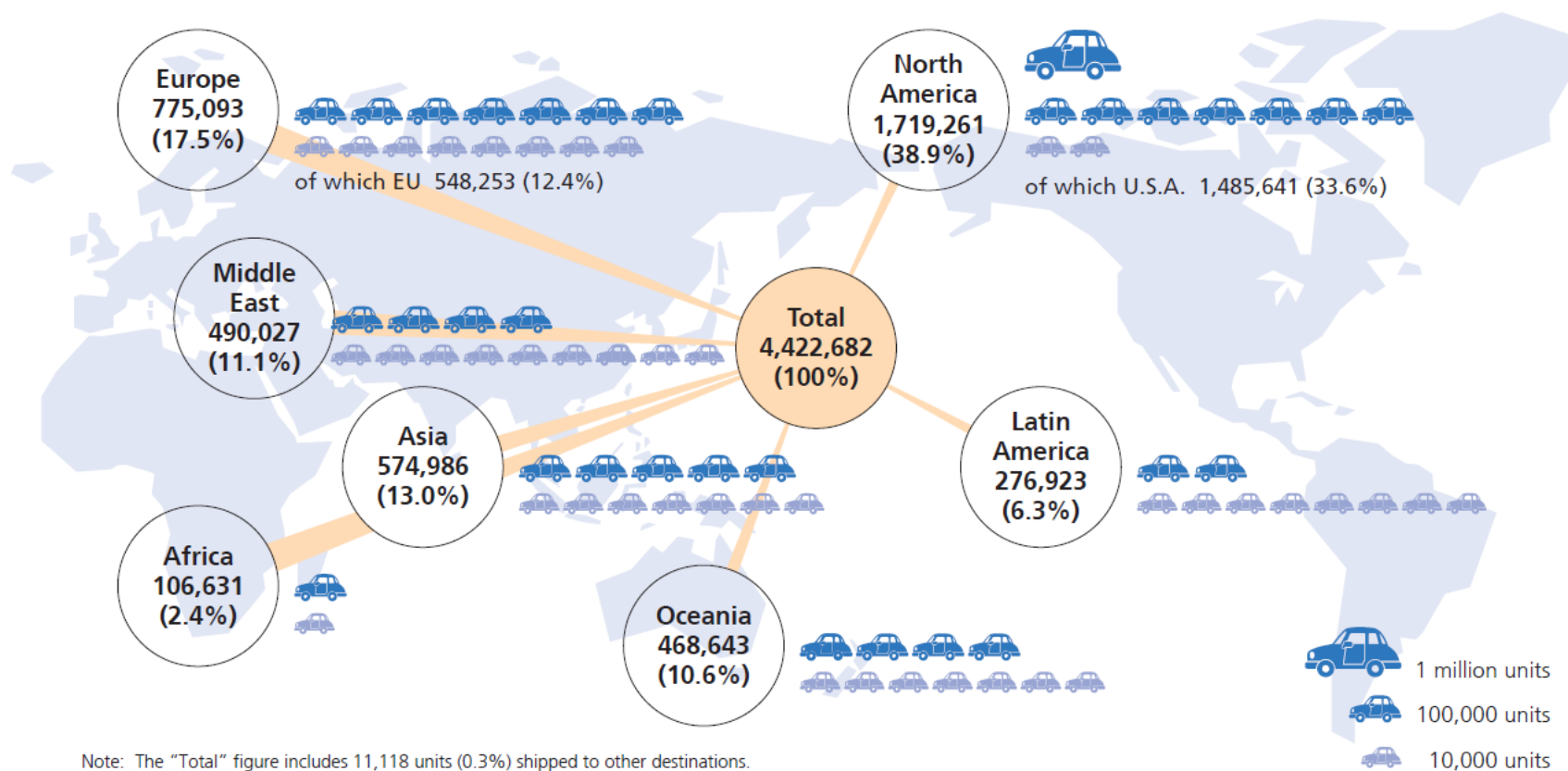
| | |
|-------------------------|---|
| Established | April 3, 1967 |
| Our Objective | <ul style="list-style-type: none"> • To promote the sound development of the automobile industry and contribute to social and economic welfare. |
| Our Activities | <ul style="list-style-type: none"> • Conducts studies and surveys related to automobile production, distribution, trade and use. • Assists in the rationalization of automobile production, and helps establish policy for the development, improvement and promotion of production technology. • Establishes and promotes policies related to automobile trade and international exchange. • Carries out other activities involved in meeting its organizational objectives. |
| Member Companies |  |

Who We Are?

Member companies **produce and export motor vehicles worldwide.**

Motor Vehicle Exports By Destination In 2023

In vehicle units

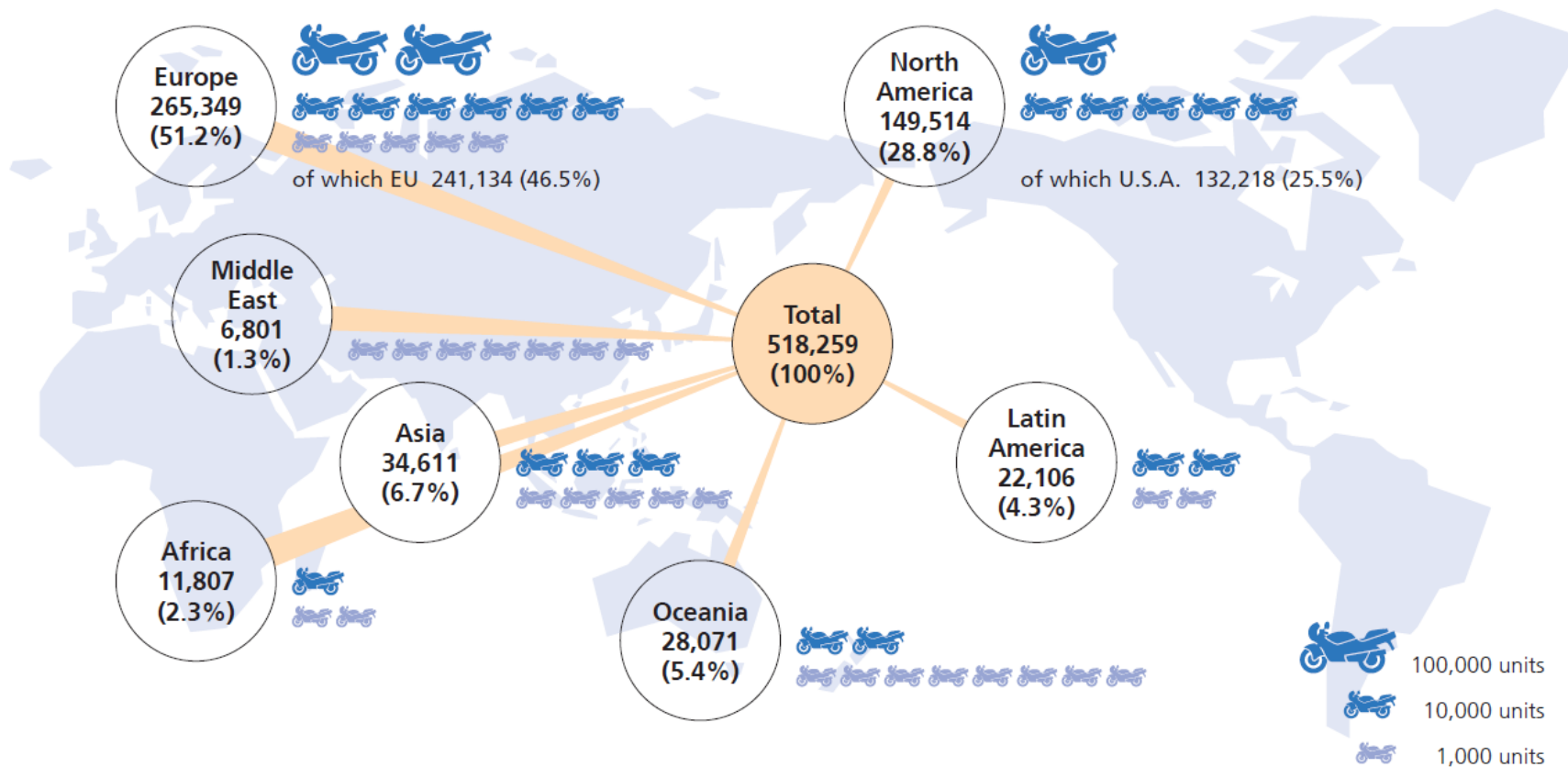


Who We Are?

- Member companies **produce and export motorcycles worldwide.**

Motorcycle Exports By Destination In 2023

In vehicle units

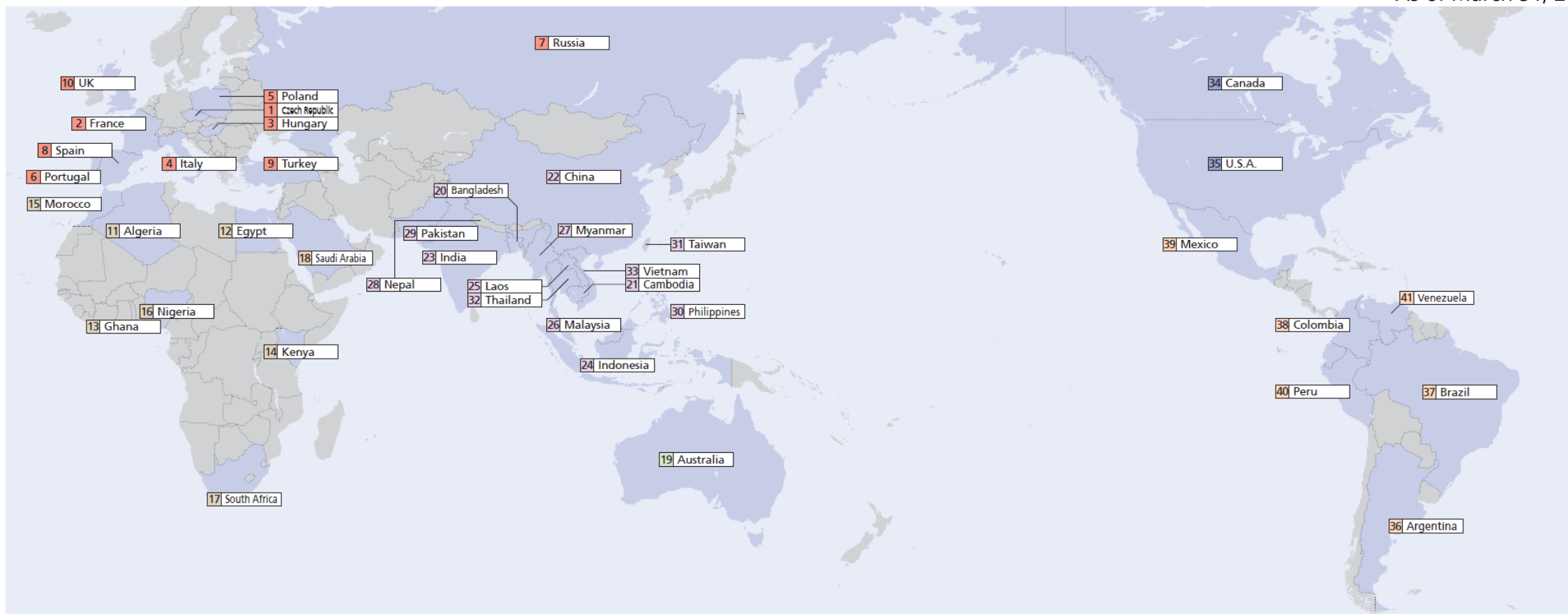


Who We Are?

Member companies **produce and export vehicles worldwide.**

Geographical Distribution of JAMA Members' Overseas Production Bases

As of March 31, 2024



Moderator and Speakers



Moderator: Prof. Jun Arima

Graduate School of Public Policy (The University of Tokyo)



Speaker: Ms. Liana Gouta

Director General/FuelsEurope



Speaker: Mr. Ricardo Abreu

Consultant for Sustainable Mobility at UNICA
(Brazilian Sugarcane Industry and Bioenergy Association)



Speaker: Dr. Ilkka Hannula

Senior Energy Analyst at International Energy Agency



Speaker: Mr. Toshiyuki Sakamoto

Board Member, Director (In Charge of Climate Change and Energy Efficiency Unit)
The Institute of Energy Economics, Japan

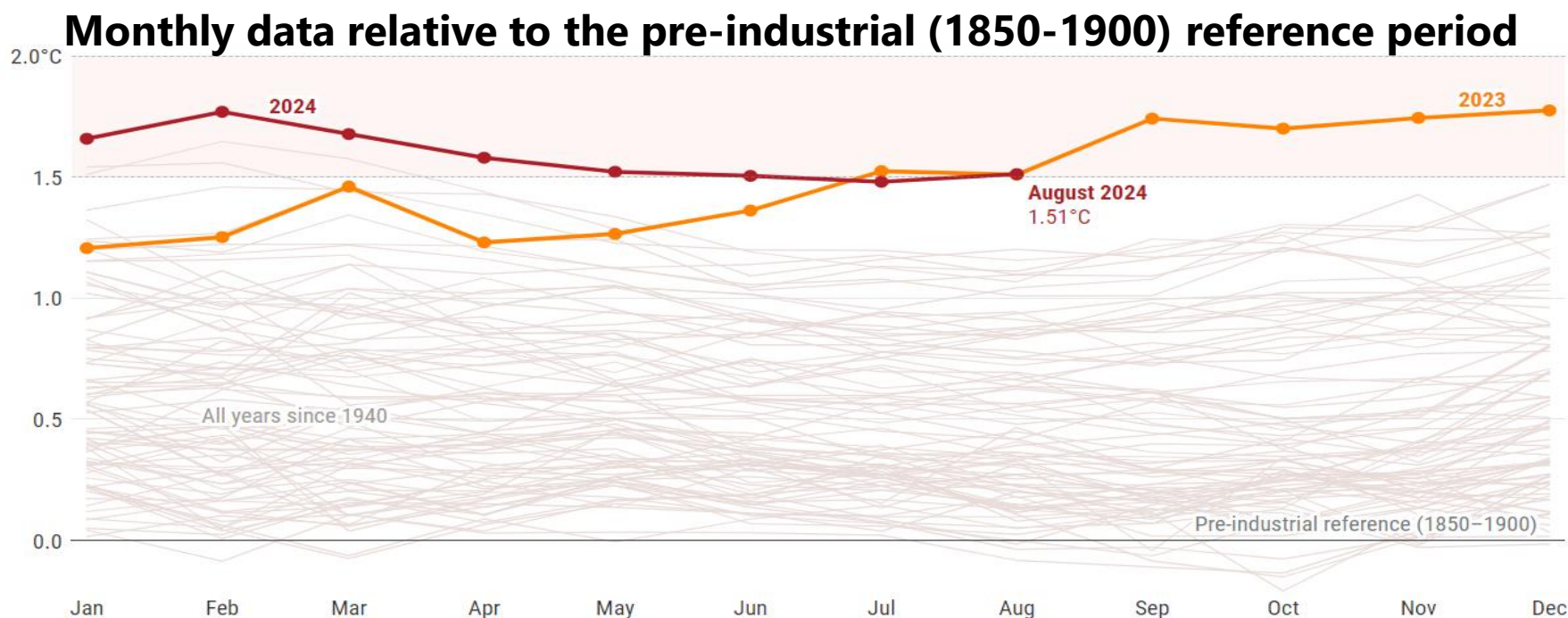


Speaker: Mr. Takao Aiba

Japan Automobile Manufacturers Association (JAMA)
Chairperson of the International Climate Change Policy Sub-committee

Global surface air temperature anomalies

- **The global-average temperature** for the past 12 months (Sep 2023 – Aug 2024) is the highest on record for any 12-month period, at **1.64°C above the 1850–1900 pre-industrial average**.
- It is necessary **to reduce CO2 emissions as quickly as possible and as much as possible**.



Source:
Copernicus Climate
Change Service

Exhibition of diverse options at G7 Hiroshima

■ **Diverse options for pursuing carbon neutrality** were displayed during G7 Hiroshima Summit, 2023.



Initiative in G7 countries

- **G7 Leaders recognized the importance** of reducing GHG emissions from the global fleet and **“the range of pathways”** for **keeping a limit of 1.5°C within reach.**

other entities through decarbonization solutions. We welcome the progress of the Industrial Decarbonization Agenda (IDA) that decided to start working on implementation of the new Global Data Collection Framework for steel production and product emissions. We reaffirm our commitment to a highly decarbonized road sector by 2030, and recognize the importance of reducing GHG emissions from the global fleet and the range of pathways to approach this goal in line with trajectories required for keeping a limit of 1.5°C within reach. We are committed to the goal of achieving net-zero emissions in the road sector by 2050. In this context, we highlight the various actions that each of us is taking to decarbonize our vehicle fleet, including such domestic policies that are designed to achieve 100 percent or the overwhelming penetration of sales of light duty vehicles (LDVs) as zero emission vehicles (ZEV) by 2035 and beyond; to achieve 100 percent electrified vehicles in new passenger car sales by 2035; to promote associated infrastructure and sustainable carbon-neutral fuels including sustainable bio- and synthetic fuels. We note the opportunities that these policies offer to contribute to a highly decarbonized road sector, including progressing towards a share of over 50 percent of zero emission LDVs sold globally by 2030. Considering the findings of the International Energy Agency (IEA)'s Energy

Source: “G7 Hiroshima Leaders’ Communiqué”, Ministry of Foreign Affairs of Japan

JAMA seminar at COP28 -Diversity in Carbon Neutrality-

- We discussed **potential of diverse solutions, co-benefits** in respective fields of **“Production”, “Transport”, and “Utilization”** which covers life-cycle of the vehicle.
- We shared the message shared at the G7 Hiroshima that **it is important to respect domestic and regional diversity** and **being technology open and “multi-pathway approaches” toward the 2050 Carbon Neutrality**, with leading figures from Brazil, host of the G20 in 2024 and COP30 in 2025, as well as with the audience.



The Global Stocktake at COP28, Dubai

- The first **“Global Stocktake”** on how countries can accelerate action to meet the goals of the **Paris Agreement** was conducted.
- In the agreement document, the importance of **“Utilizing zero-and low-carbon fuels,” “a range of pathways,”** and **“zero-and low-emission vehicles,”** were mentioned.

28. Further recognizes the need for deep, rapid and sustained reductions in greenhouse gas emissions in line with 1.5 °C pathways and calls on Parties to contribute to the following global efforts, in a nationally determined manner, taking into account the Paris Agreement and their different national circumstances, pathways and approaches:

- (c) Accelerating efforts globally towards net zero emission energy systems, utilizing zero- and low-carbon fuels well before or by around mid-century;
- (g) 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;

https://unfccc.int/sites/default/files/resource/cma5_auv_4_gst.pdf

G7 Italy 2024:

- On April 13th, **G7 Transport Ministers** adopted the joint Declaration “The Future of Mobility: Ensuring Global Connectivity in an Uncertain World,” which includes “the adoption of **zero- and low-emission vehicles**, and **sustainable alternative fuels**.”

Recalling the 2023 G7 Transport Ministerial Declaration, we reaffirm our commitment to a highly decarbonized road sector by 2030 and reiterate the importance to accelerate the reduction of emissions from road transport via a range of pathways, including accelerating the adoption of zero – and low-emission vehicles, the need to deploy supplies of sustainable alternative fuels, ensuring zero-emission transport infrastructure meets demand, and

fuels, such as sustainable bio-fuels and e-fuels. We recognize that it is important that the transition be socially and economically just and affordable, efficient, outcome-based and technology-neutral. We also recognize the importance of investment in zero – and low-emission vehicle, charging and alternative fuel infrastructures and supply of sufficient and affordable renewable, and sustainable zero – and low-carbon fuels. We note the importance of continuing a constructive and positive interaction with private operators.

<https://www.g7italy.it/wp-content/uploads/G7I-Transport-Ministers-Declaration.pdf>

- On April 30th, **G7 Climate, Energy and Environment Ministers** adopted the communiqué, which recalled **2023 G7 Leaders’ Hiroshima Communiqué** to reduce emissions from road transport through **a range of pathways** and from **vehicle stock** and noted the role of sustainably produced **net-zero and low GHG emissions fuels**.

decarbonizing road transport and fuel switching also plays a role. In this context, we recognize the need to keep on accelerating the reduction of emissions from road transport, and note the IEA analysis of tracking the progress on our efforts and emission reduction from vehicle stock, and the opportunity that sustainable zero-emission vehicles and sustainably produced net-zero and low GHG emissions fuels as part of an efficient decarbonization of the transport sector, provide for supporting a transition towards net-zero emissions by 2050. We encourage all countries to reflect a range of actions on road

https://www.g7italy.it/wp-content/uploads/G7-Climate-Energy-Environment-Ministerial-Communique_Final.pdf

Transitioning to Carbon Neutrality by 2050 (A Scenario-Based Analysis)

1. Purpose of using scenarios

- To understand based on quantitative assessments, **possible pathways towards carbon neutrality** in automotive transport by 2050, JAMA commissioned the **Institute of Energy Economics, Japan** to analyze **three scenarios** (CNF, BEV75, and NZE scenario) which took into account different circumstances between **developed and emerging economies**.

2. Scenario parameters

*FC: Fuel consumption

| 2050 Scenario Designation & Definition | BEV/FCEV Share of New Passenger Vehicle Sales | | | 2050 Projected CNF Share in Automotive Fuel Mix [2020 FC*-Based] |
|---|---|-----------------------------------|--------------------|--|
| | Worldwide | Japan, North America, Europe etc. | Emerging economies | |
| 0 BAU ¹ | BAU | ← | ← | ← |
| 1 CNF (Wide use of CNF) | 40% | 50% | 25% | 30% approx. |
| 2 BEV75 (Wide EV adoption) | 75% | 100% | 50% | 20% approx. |
| 3 NZE (100% BEVs/FCEVs) from IEA ² NZE ³ scenario | 100% | 100% | 100% | 7% (biofuel only) |

¹ BAU: Business as usual ² IEA: International Energy Agency ³ NZE: Net Zero Emissions by 2050

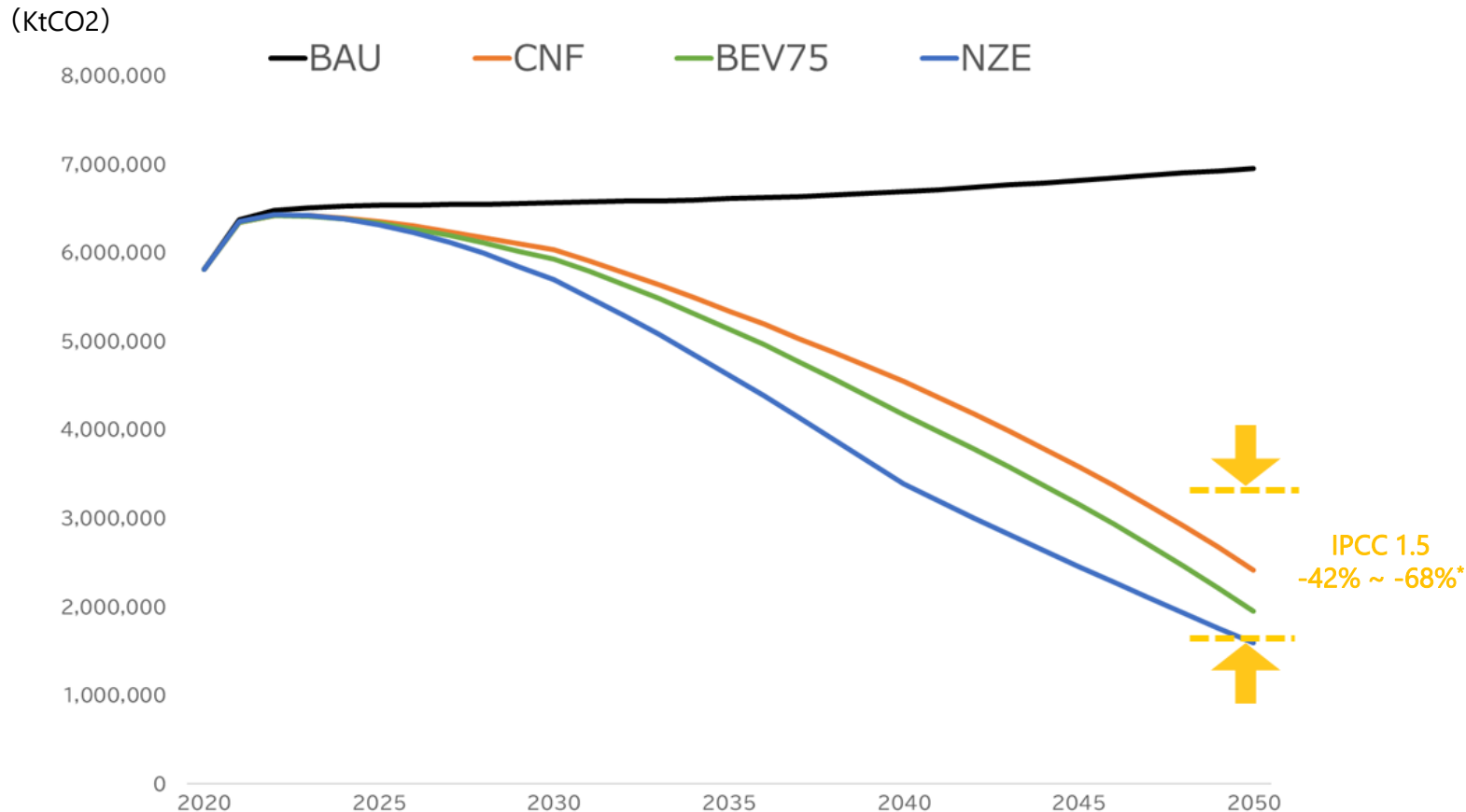
Transitioning to Carbon Neutrality by 2050 (A Scenario-Based Analysis)

3. Outcome of the analysis

- Global CO₂ emissions reductions in automotive transport can be **in line with the IPCC 1.5°C scenarios** for 2050 with not only a **rapid BEV conversion scenario**, but also a scenario premised on the **wide use of HEVs, PHEVs, and carbon-neutral fuels**.
- In advanced economies, reductions to close to carbon neutrality by 2050 are **possible under the three non-BAU scenarios**. In emerging economies, where significant increases in new passenger car sales and in in-use vehicle fleets are anticipated, **reductions in line with IPCC 1.5°C/2.0°C scenarios are possible** when **CNF supply** is increased within the extent of reasonable estimate.

CO2 Emissions Worldwide 2020-2050, by Scenario

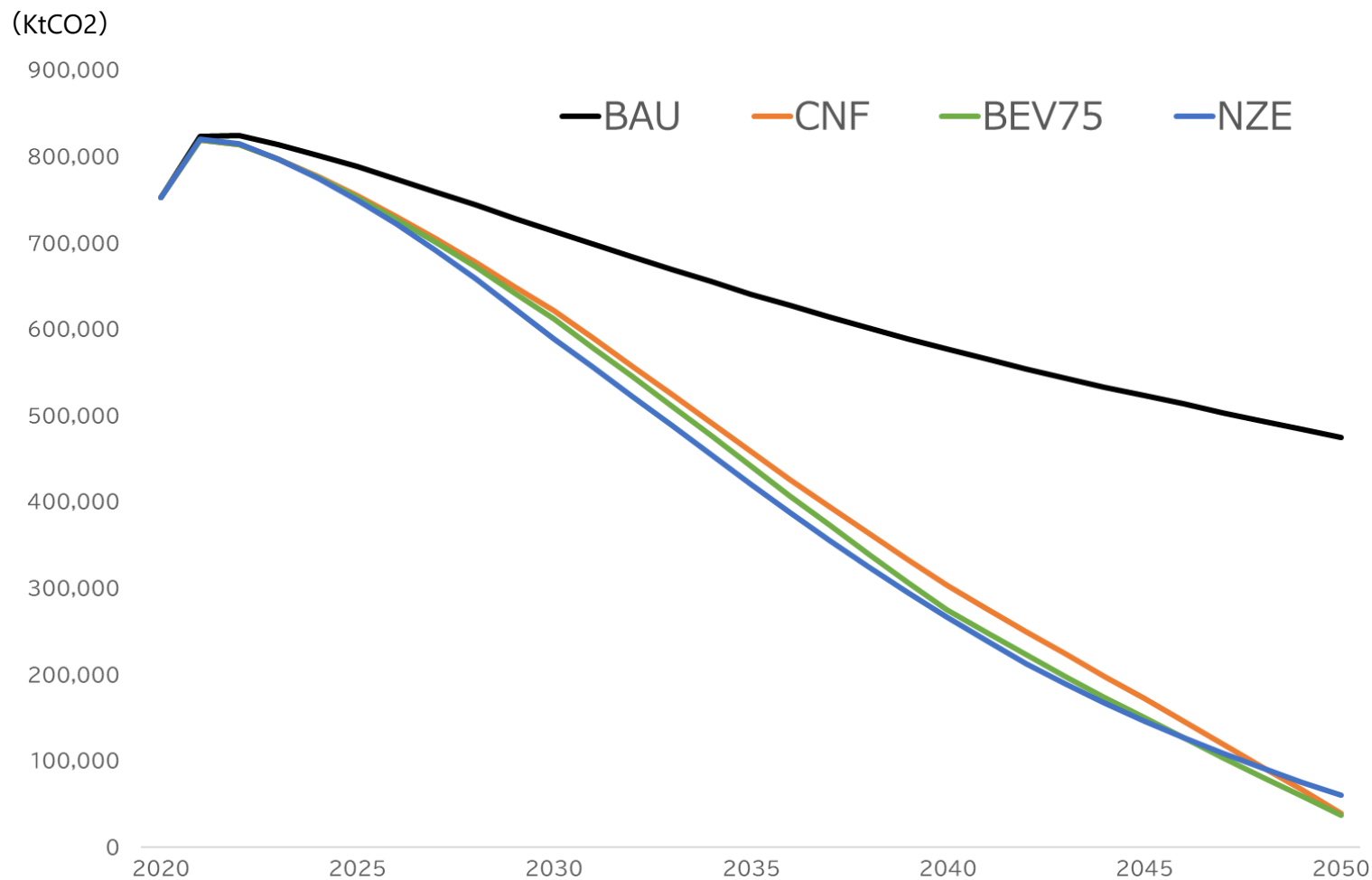
- In all three scenarios, CO2 emissions worldwide are in line with the IPCC's 2050 1.5°C climate scenarios.



*The range of -42% to -68% shown in this describes the upper and lower limits of a number of 1.5°C scenarios based on the scientific findings used by the IPCCAR6.

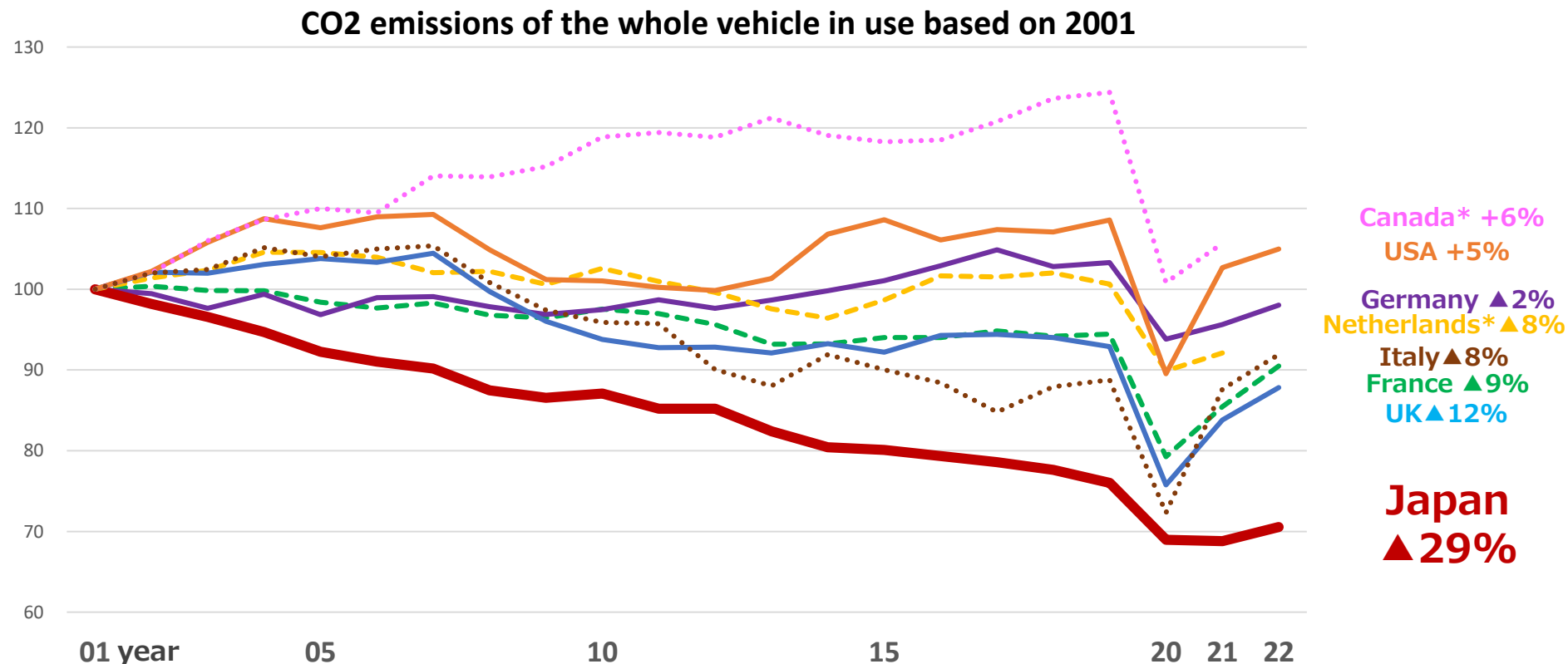
CO2 Emissions (Advanced Economies Europe)

■ In all the scenarios, CO2 emission levels are close to carbon neutrality.



CO2 emissions from road transport sector in Japan

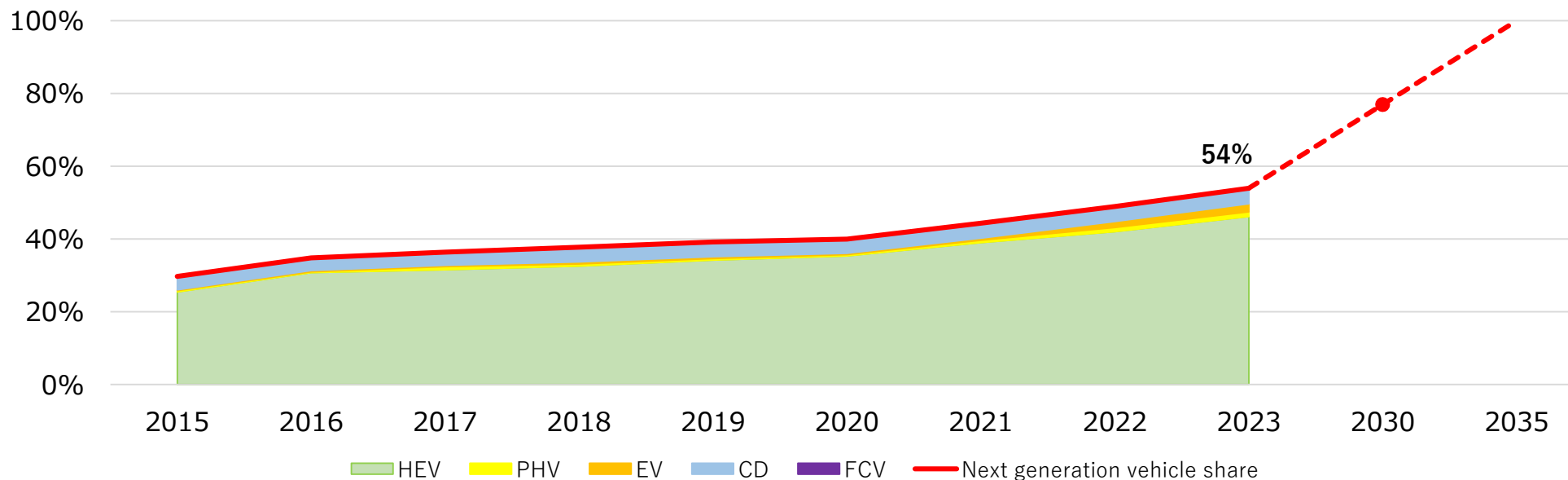
- CO2 emissions in Japan's road transport sector have declined significantly (-31%) since the early 2000s.
- Limited rebound after the COVID-19 pandemic.






Road map for next generation vehicle

- The Japanese government has set the goal of achieving a ratio of **next-generation vehicles** (HEV, PHV, EV, Clean Diesel, and FCV) among new vehicle sales to **50-70% by 2030**.
- The current share of next generation vehicle is **54%**.

Trends in next-generation vehicle share in new passenger car registrations and trends in CO2 emission volumes in Japan's transport sector

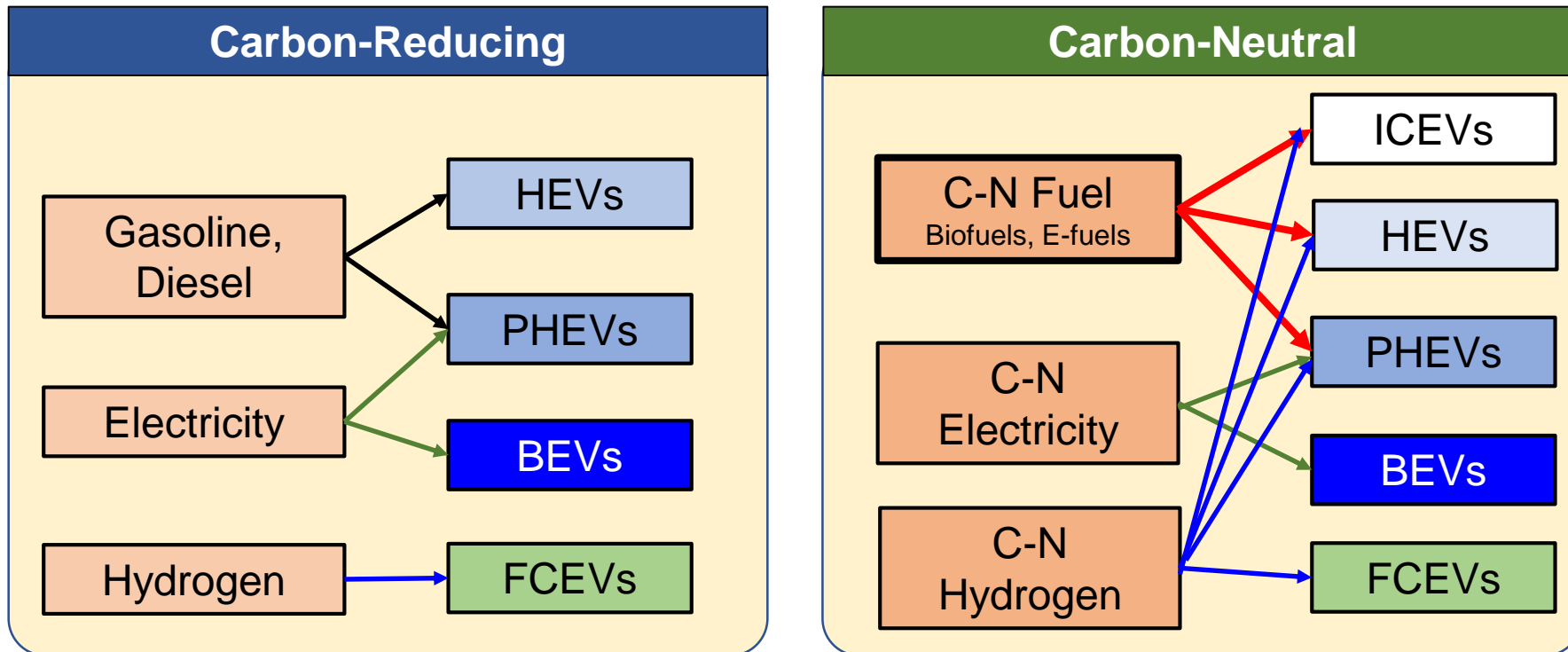


Acceleration of the competition to develop electrified vehicles.

| | Investment amount | Target production units | Number of vehicle models (by 2030) | Sales ratio | Battery development |
|--|--|---|--|---|---|
| Toyota  | 5 trillion yen for BEVs thru 2023-2030. | EVs and FCVs: 3.5 million units per year by 2030 | 30 models | By 2035, 100% BEV globally as Lexus | Aiming to commercialize All-solid-state batteries in 2027-2028 |
| Nissan  | 2 trillion yen over 5 years for electrification technology, etc. | - | 34 models | By 2030, Passenger car line-up in Europe to be 100% EV. Electrified models 60% (EV40%, HEV and PHEV 20%). | Launching all-solid-state batteries on the market in 2028 |
| Honda  | Approximately 10 trillion yen over the 10 years to FY2030 | (Automobile) Over 2 million units per year (Motorcycle) Over 4 million units | (Automobile) 30 models (Motorcycle) 30 models | (Automobile) By 2040, 100% EV and FCV globally (Motorcycle) By 2040, 15% EV globally | A demonstration line for all-solid-state batteries to be launched in spring 2024. |

Initiative for Sustainable Fuel and Mobility: ISFM

- It is **important to use carbon-neutral energy**, Not only type of vehicle.
- **CNF** is one of the **promising options** for achieving carbon neutrality automotive transport and a carbon-neutral society.



ICE: internal combustion engine

Turin Joint Statement on Sustainable Biofuels

- At the **Sustainable Biofuels International Forum** held in Turin on April 28, private companies, associations, and R&D organizations in the biofuels industry signed and issued the "**Turin Joint Statement on Sustainable Biofuels**" to the G7 ministers.
- In the statement, they ask G7 Ministers to:
 - **Recognise the contribution that sustainable biofuels can bring as part of systematic solutions to de-fossilize aviation, maritime and road transport,**
 - **Design and implement predictable and long-term oriented policies,**
 - **Support technology-agnostic, evidence-based policies, etc.,**

Turin Joint Statement on Sustainable Biofuels

To Ministers of Canada, France, Germany, Italy, Japan, UK, USA

Torino, Italy
28 April 2024

We the undersigned,

Noting that, despite efforts to diversify energy sources, fossil fuels still meet 95% of the overall energy needs of the transport sector, which currently accounts for 26% of global final energy consumption and for 21% of CO₂ emissions, with road transport being responsible for more than three-quarters of these emissions, we

<https://www.mase.gov.it/sites/default/files/Turin%20Joint%20Statement%20on%20Sustainable%20Biofuels%20w%20Signatories%2020240428.pdf>

Initiative for Sustainable Fuel and Mobility: ISFM

- On May 2024, In the Japan-Brazil Summit Statement, the two countries agreed to launch the new international framework, **the Sustainable Fuels and Mobility Initiative (ISFM)**.
- It is aiming at **achieving carbon neutrality** along with partners around the world by combining **Brazil's high potential in decarbonized fuels such as biofuels and e-fuels** with Japan's high-performance mobility equipment such as hybrid engines.



https://japan.kantei.go.jp/101_kishida/diplomatic/202405/03brazil.html#:~:text=The%20two%20leaders%20also%20launched%20a%20new%20international

Summary of our presentation

- JAMA is making maximum efforts towards carbon neutrality by 2050 and promoting multi-pathway approaches in line with the IPCC's 1.5°C goals, taking into account different national circumstances.
- In the COP28 GST agreement and Communiqué of G7-2024 minister's meeting, the importance of emission reduction through a range of pathways, reduction from vehicle stock and Use of zero-and low-carbon fuels was recognized. We are now at the implementation stage.
- Japanese automakers are contributing to CO2 reduction in Japan, which leads the world in reducing emissions from the road transport sector through various electrification reflecting regional situations, including notable investment for BEVs.
- In order to be side-by-side with diverse regions of the world and act toward CN as soon as possible, we also cooperate in steady emission reduction by utilizing sustainable CN fuel, which is highlighted in "ISFM" and the Turin Joint Statement.