APEC Symposium on Promoting Energy Efficiency and Energy Management System

Achievement and potential of multi-pathway approach in road transport sector - Japan's experience -

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Chair, the International Climate Change Policy Expert Group

Who We Are?

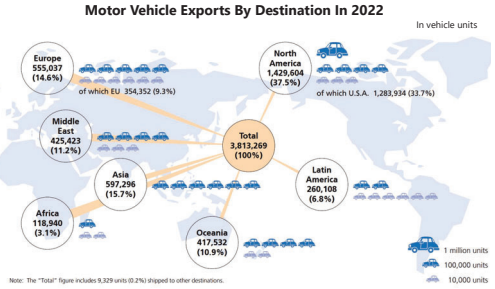
■JAMA (Japan Automobile Manufacturers Association, Inc.) is a non-profit industry **association comprising Japan's 14 manufacturers** of passenger cars, trucks, buses and motorcycles.

Established	April 3, 1967
Our Objective	• To promote the sound development of the automobile industry and contribute to social and economic welfare.
Our Activities	• 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 worldwide exchange. • Carries out other activities involved in meeting its organizational objectives.
Member Companies	• Daihatsu Motor Co., Ltd. • Honda Motor Co., Ltd. • Kawasaki Motors, Ltd. • Mitsubishi Motors Corporation • Nissan Motor Co., Ltd. • Suzuki Motor Corporation • UD Trucks Corporation • Hino Motors, Ltd. • Isuzu Motors Limited • Mazda Motor Corporation • Mitsubishi Fuso Truck & Bus Corporation • Subaru Corporation • Toyota Motor Corporation • Yamaha Motor Co., Ltd.

Who We Are?

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

Motor Vehicle Exports By Destination In 2022



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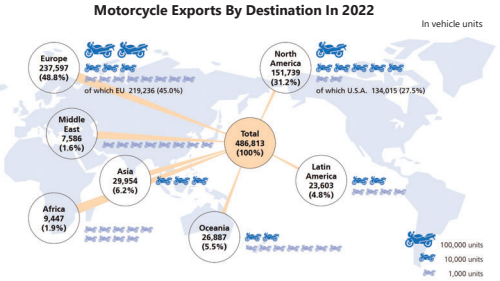
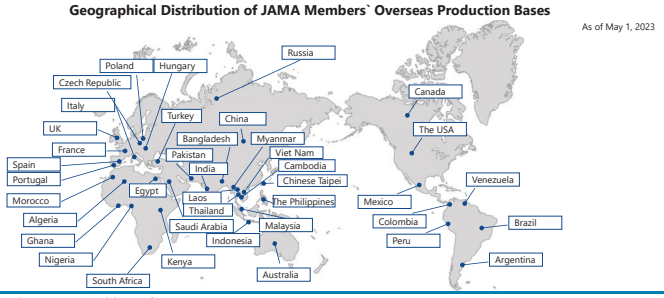


Who We Are?

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

Geographical Distribution of JAMA Members` Overseas Production Bases



JAMA stance on Carbon Neutrality

JAMA member companies are making maximum efforts towards Carbon Neutrality by 2050.

JAMA Stance

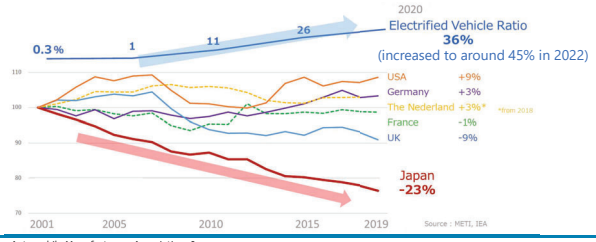
JAMA member companies, together with their global stakeholders, are **making maximum efforts towards carbon neutrality by 2050 by developing technologies to further reduce automotive CO_2 emissions** so that they can provide optimal choices for consumers in economies/regions worldwide.

■ The goal is carbon neutrality (CN).
Approaches to achieving CN should be technology-neutral.
➡ A diversity of options is crucial to achieving our goals.

■ There are optimal pathways to CN for individual economies.

CO_2 emissions from road transport sector in Japan

- Japanese auto makers has been contributing in reducing CO_2 emissions from road transport sector mainly through its **effort to improve fuel efficiency by expanding lineup of electrified vehicles.**



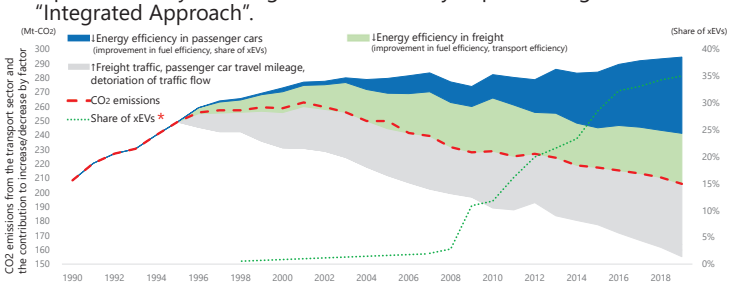
Concept of an "Integrated Approach"

Integrated Approach with 4 pillars

1. ① Increasing Fuel-Efficient vehicles by Automobile Manufacturers
2. ② Diversified Fuel Supply by Fuel Suppliers
3. ③ Efficient Vehicle Use by Vehicle Users
4. ④ Traffic Flow Improvement by Governments

CO_2 emissions reduction by "Integrated Approach"

- Japan is steadily reducing CO_2 emissions by implementing an "Integrated Approach".



*xEVs are electrified vehicle (HEVs, BEVs, PHEVs, FCEVs)

Source: KEIDANREN (Japan Business Federation) carbon neutrality action plan

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

1. Purpose of using scenarios

   To understand, based on quantitative assessments, possible pathways to be pursued towards carbon neutrality in automotive transport by 2050.

2. Data applied

   New-vehicle sales data, in-use vehicle fleet data, energy/fuel mix data, vehicle fuel efficiency data, vehicle kilometers travelled annually, etc.

3. 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.	ASEAN 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)

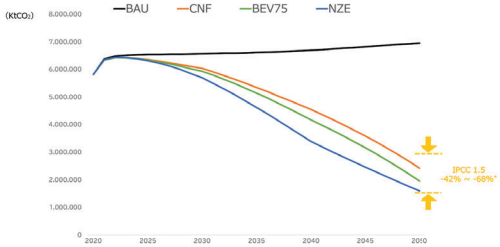
[1] BAU: Business as usual
[2] IEA : International Energy Agency
[3] NZE : Net Zero Emissions by 2050

Summary of Study Findings

Context	CO_2 Emission Levels in 2050
Worldwide	• **Findings show that the study's three scenarios (excluding the BAU scenario) demonstrate the potential for global CO_2 emissions reduction in automotive transport to be in line with the IPCC*'s 2050 1.5°C climate scenarios**. *IPCC: Intergovernmental Panel on Climate Change • The IEA's NZE scenario is premised on one pathway towards carbon neutrality, but the JAMA study confirms that there are **other pathways, comprising a wide variety of electrified vehicles including HEVs and PHEVs and** the use of **carbon-neutral fuel (CNF).**
ASEAN	• **In many ASEAN economies**, vehicle sales volumes are expected to rise significantly. • If the amount of CNF in the automotive fuel mix in 2050 can be increased to a level equivalent to 40% (approx.) of global automotive fuel consumption in 2020, it will be **possible for CO_2 emissions** in ASEAN economies **to be in line with the IPCC's 1.5 climate scenarios for 2050.**
Japan	• The study's three scenarios demonstrate the **potential** in Japan **for carbon neutrality in automotive transport by 2050.** • **To that end**, however, **in addition to decarbonized electricity**, the supply of **carbon-neutral fuels for in-use vehicle fleets will be necessary**.

CO_2 Emissions Worldwide 2020-2050, by Scenario

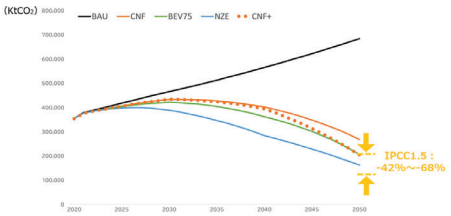
- In all three scenarios, CO_2 emissions worldwide are **in line with the IPCC's 1.5℃@2050 scenarios**.



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

CO_2 Emissions ASEAN 2020-2050, by Scenario

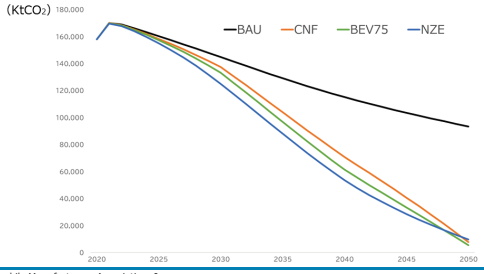
- **1.25 increase in carbon-neutral fuel supply** compared to the CNF scenario will make it possible for CO_2 emissions **in ASEAN economies to be in line with the IPCC's 1.5 scenarios for 2050.**



Note: The CNF+ scenario assumes that CNF supply is 1.25 times greater than in the CNF scenario, has a 40% (approx.) instead of 30% share (approx.) in the fuel mix and that most of the increase will be supplied to Africa, the Middle East, India, and ASEAN where the supply of decarbonized energy is a major challenge.

CO_2 Emissions Japan 2020-2050, by Scenario

- In all the scenarios, **CO_2 emission levels are close to carbon neutrality**.



Initiative in G7 members

- **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℃ 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

The Global Stocktake at COP28, Dubai

- The first **"Global Stocktake"** on how economies can accelerate action to meet the goals of the **Paris Agreement** was conducted.
- In the agreement document, the importance of **"range of pathways"** was 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:

(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

Summary of our presentation

- ✓ Japan **has been a leader of CO_2 emission reduction in road transport sector among G7 members** through
  - **"Integrated Approach"** consist of **4 pillars.**
  - **Expanding lineup** of electrified vehicles **suitable for regional circumstances**, which is in line with **"the range of pathways," key concept of G7 and COP28 agreement**.
- ✓ Based on the quantitative scenario analysis, JAMA believe that there is potential **not only for 100% BEVs**, but also for **a wide variety of electrified vehicles including HEVs and PHEVs and the use of carbon-neutral fuel (CNF)** for global CO_2 emissions reduction in road transport **to be in line with the IPCC's 2050 1.5℃ climate scenarios**.