

Overview of MLIT's Vehicle Environmental Policy

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JAPAN

1. Background

2. Promoting Next-Generation Vehicles

1. Background

Air quality in Japan

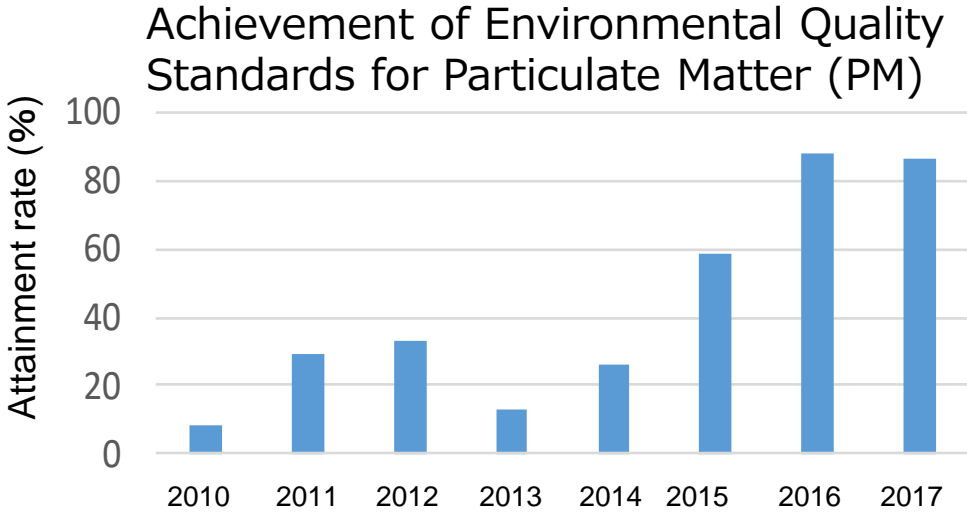
- Air quality has been improved with the gradual enforcement of emissions regulations.



1980s in Tokyo



Late 2010s in Tokyo

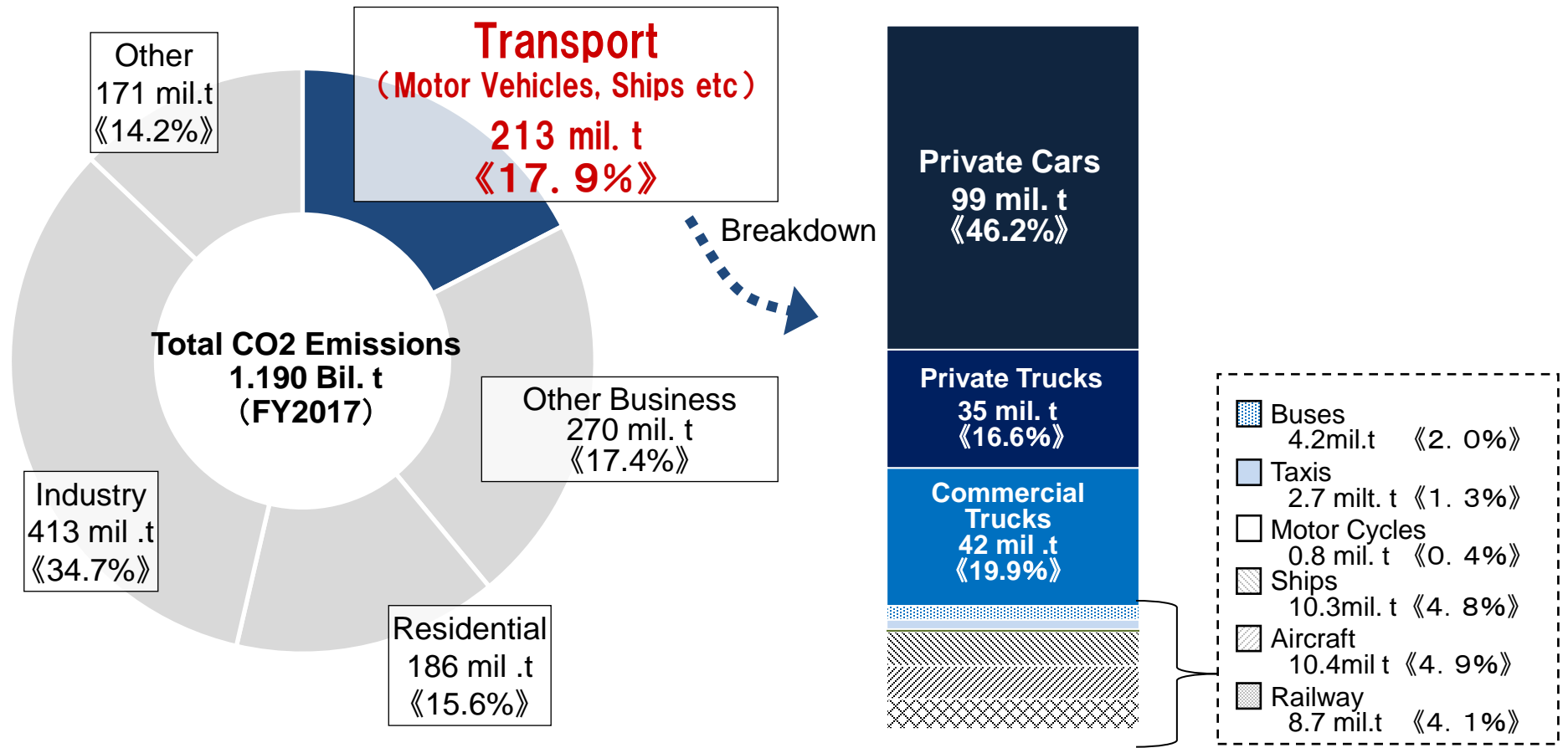


Current Status of Carbon Dioxide Emissions

- Of all CO₂ emissions in Japan (FY2017), **the emissions from the transport sector account for 17.9%.**
- The emissions from all motor vehicles account for **86.2% of the transport sector CO₂ emissions (15.4% of all CO₂ emissions in Japan).**

CO₂ emissions from each sector in Japan

CO₂ emissions from the transport sector (breakdown)

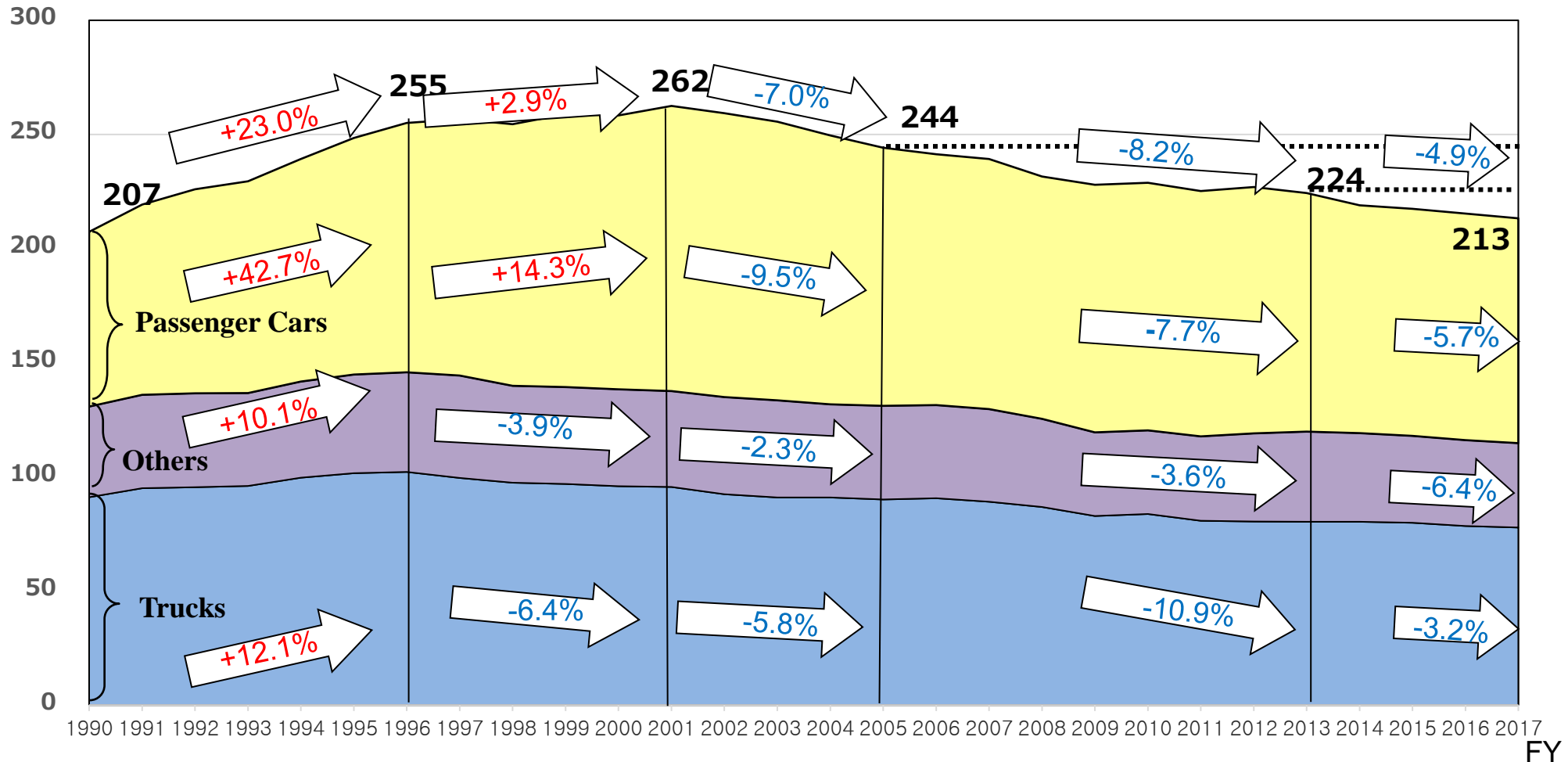


Source: "The GHG Emissions Data of Japan (1990-2017)" (2019)

Historical Trend of CO2 Emissions in Transport Sector

● CO2 emissions from transport sector peaked out in 2001 and have been declining steadily.

(Unit: Million CO2 T)



Others: Buses, Taxis, Railway, Ships, Aircraft and Motor Cycles

Japan's CO₂ Reduction Target

Mid-term target (26% reduction by FY2030 compared to FY2013)

GHG emissions:

To be at the level equal to **26.0% reduction compared to FY2013** (25.4% reduction compared to FY2005) by 2030
(About 1.042 billion t CO₂)

Energy source CO₂ emissions:

To be at the level equal to **24.9% reduction compared to FY2013** (24.0 % reduction compared to FY2005) by 2030
(About 0.927 billion t CO₂)

	Targeted emissions for each sector in FY2030	Compared to the FY2013 result (FY2005 result)
Energy source CO₂	927	24.9% (24.0%) reduction
Industry sector	401	6.5% (12.3%) reduction
Other business sector	168	39.8% (29.7%) reduction
Residential sector	122	39.3% (32.2%) reduction
Transport sector	163	27.6% (32.1%) reduction
Energy conversion sector	73	27.7% (29.8%) reduction

Long-term target (80% reduction by 2050)

Direction to be pursued by Japan under its Global Warming Prevention Plan (excerpt):

In view of the Paris Agreement, under the fair and effective international framework joined by all major countries, Japan will lead the international community in order for the major GHG-emitting countries to reduce their emissions in accordance with their capacities and **aims to reduce its GHG emissions by 80% by 2050 as the long-term target** while concurrently achieving economic growth.

- Next-Generation Vehicles means highly environment-friendly vehicles such as Hybrid vehicle, Electric vehicle, Plug-in Hybrid vehicle and Fuel Cell vehicle in Japan.
- These vehicles are expected to spread widely so as to address Global warming and air pollution.



Nissan LEAF (EV)



TOYOTA PRIUS (HV)



BMW i3 (EV)



HONDA CLARITY FUEL CELL (FCV)



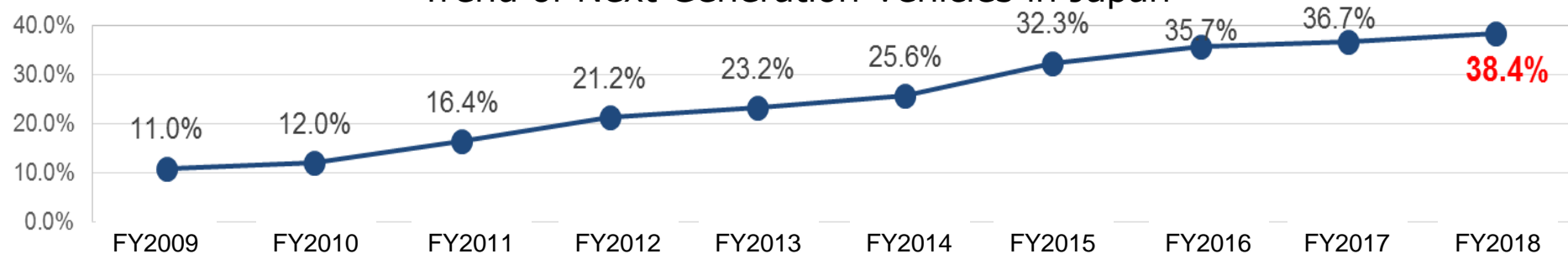
TOYOTA MIRAI (FCV)

Target and trend of Next-Generation Vehicles

Target units and the Current Situation of Next Generation Vehicles in Japan
 <<Reference>> New passenger car sales: 4.36 million units (2018)

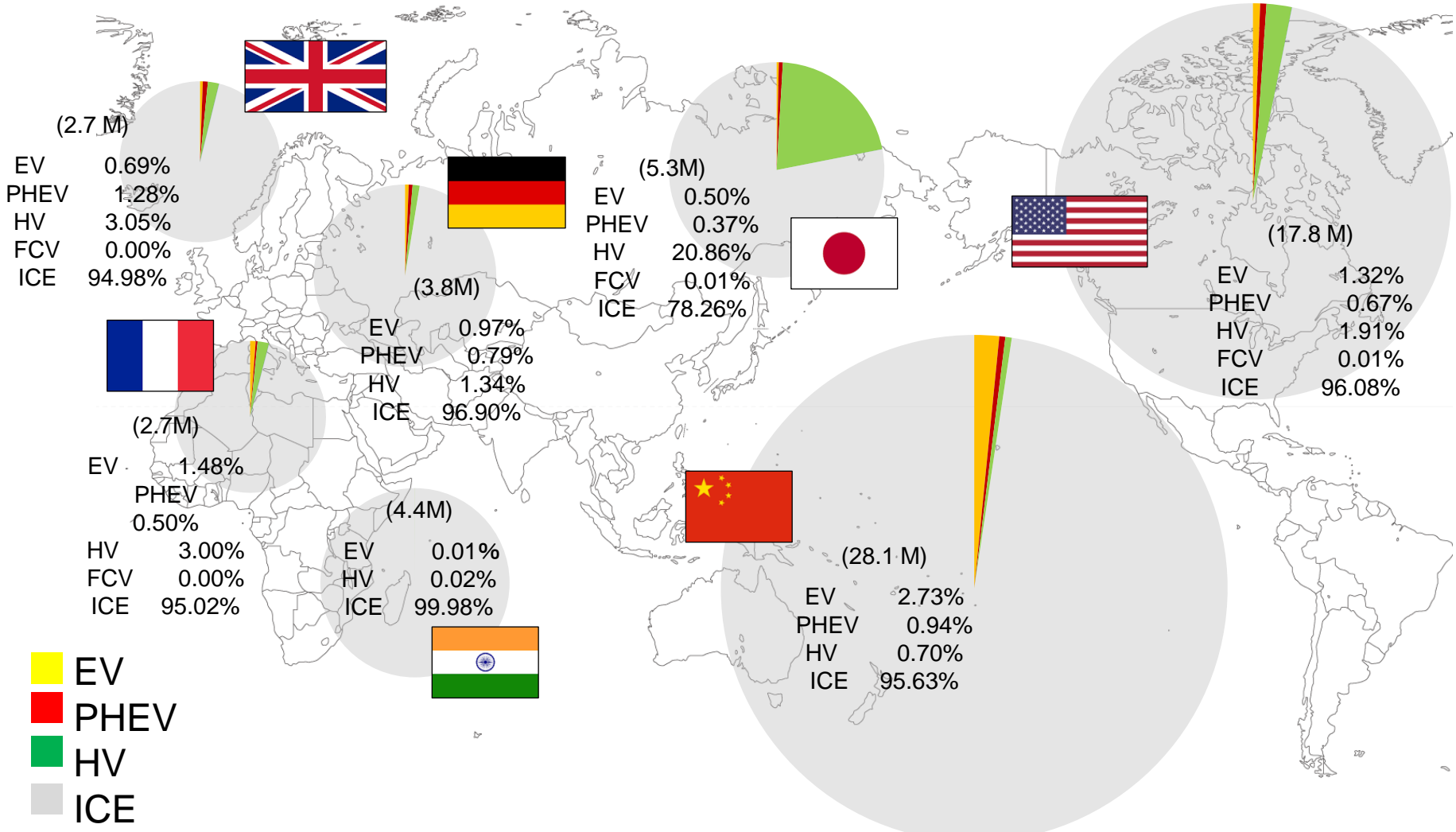
	FY2018	2030年
Conventional Vehicle	61.6% (2.69 mil. units)	30~50%
Next-generation vehicle	38.4% (1.67 mil. units)	50~70%
Hybrid Vehicle	33.2% (1.45 mil. units)	30~40%*
Battery Electric Vehicle	0.53% (0.023 mil. units)	20~30%*
Plug in Hybrid Vehicle	0.48% (0.021 mil. units)	
Fuel Cell Electric Vehicle	0.01% (600 units)	~3%*
Clean Diesel Vehicle	4.1% (0.178 mil. units)	5~10%*

Trend of Next Generation Vehicles in Japan



New Vehicles Sold by Powertrain in Major Countries (2018)

○ In Japan, next-generation vehicle (mostly HVs*) account for about 22% of all new vehicles sold. This percentage is far higher than the percentages recorded in other major countries. * Mild hybrid vehicles are excluded.



2. Promoting NEXT-GENERATION VEHICLES

1. Establishment of standards

- ✓ Fuel efficiency standard and Emission regulation are stipulated for each type of motor vehicles.



2. Tax incentives & subsidies

- ✓ next-generation vehicles is promoted through tax incentives and subsidies.





3. International harmonization of regulations (WP.29)

- ✓ International harmonization of regulations related to FCVs and EVs.



Emission Regulation in Japan (Gasoline&LPG)

- Gasoline-fueled or LPG- fueled Motor Vehicles

			2016	2017	2018	2019	2020	2021	2022	2023
	Passenger Motor Vehicles	New type	JC08			2018/10/1				WLTC
		Existing type							2020/9/1	
	Light-duty Motor vehicles (GVW= \leq 1.7t)	New type				2018/10/1				
		Existing type							2020/9/1	
	Medium-duty Motor vehicles (1.7t<GVW= \leq 3.5t)	New type					2019/10/1			
		Existing type								2021/9/1
	Mini-sized Motor vehicles	New type					2019/10/1			
		Existing type								2021/9/1
Heavy-duty Motor Vehicles (3.5t<GVW)	New type	JE05								
	Existing type									

Emission Regulation in Japan (Diesel)

● Diesel-Powered Motor Vehicles




			2016	2017	2018	2019	2020	2021	2022	2023	
Passenger Motor Vehicles	New type	JC08				2018/10/1				WLTC	
	Existing type						2020/9/1				
Trucks Buses	Light-duty Motor vehicles (GVW= \leq 1.7t)	New type				2018/10/1					
		Existing type					2020/9/1				
	Medium-duty Motor vehicles (1.7t<GVW= \leq 3.5t)	New type					2019/10/1				
		Existing type							2021/9/1		
	Heavy-duty Motor Vehicles (other than tractors with 7.5t<GVW)	New type	JE05	2016/10/1							WHDC
		Existing type						2017/9/1			
	Heavy-duty Motor Vehicles (Tractors with 7.5t<GVW)	New type						2017/10/1			
		Existing type							2018.9.1		
	Heavy-duty Motor Vehicles (3.5t<GVW= \leq 7.5t)	New type							2018.10.1		
		Existing type								2019/9/1	




Vehicle Fuel Efficiency Standards

- Vehicle Fuel efficiency standards are mandated to vehicle manufacturers by Act on the Rational Use of Energy.





Passenger Vehicle(Target year FY2030)

	Prospected Average [FY2020 Record → FY2030]
	17.6 km/L → 25.4 km/L +44.3%

Light Duty Commercial Vehicle (Target year FY2022)

	Prospected Average [FY2015 Record → FY2022]
	14.5km/L → 17.9km/L +23.4%

Heavy Duty Vehicle(Target year FY2025)

	Prospected Average [FY2015 Record → FY2025]
Route Bus 	4.77 km/L → 5.01 km/L +5.1%
General Bus 	6.07 km/L → 7.18 km/L +18.3%
Truck 	7.10 km/L → 8.13 km/L +14.5%
Tractor 	2.84 km/L → 2.94 km/L +3.7%

FE: Fuel Efficiency PV: Passenger Vehicle
HDV: Heavy Duty Vehicle (GVW > 3.5t)

LDCV: Light Duty Commercial Vehicle (GVW ≤3.5t)

- ◆ Target Year : FY 2030
- ◆ Scope : Gasoline Vehicles, Diesel Vehicles, LPG Vehicles, EVs and PHEVs
- ◆ Fuel Efficiency Standards :

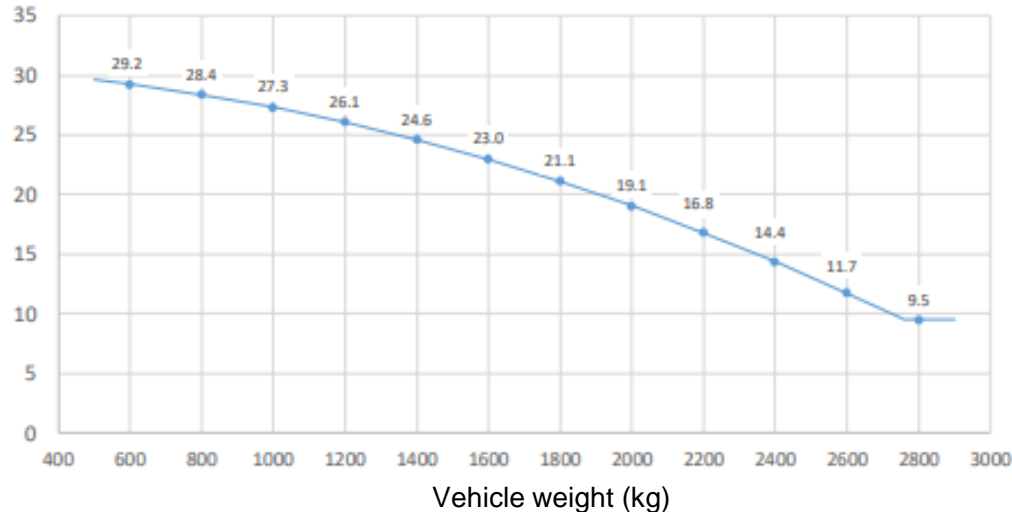
- M(Vehicle Weight) : Less than 2,759kg

$$FE = -2.47 \times 10^{-6} \times M^2 - 8.52 \times 10^{-4} \times M + 30.65$$

- M(Vehicle Weight) : 2,759kg and over

$$FE = 9.5$$

Regulation target (km/L)



Target Values※	Increase from the actual value in FY2016
25.4km/L	+32.4%

※ Calculated by using the weighted harmonic mean of the sales figures of FY2016

- ◆ Assessment of Fuel Efficiency: The concept of Well to Wheel efficiencies is introduced in the next fuel efficiency standards.
- ◆ Schedule : MLIT and METI plan to amend the related regulations in FY2019.

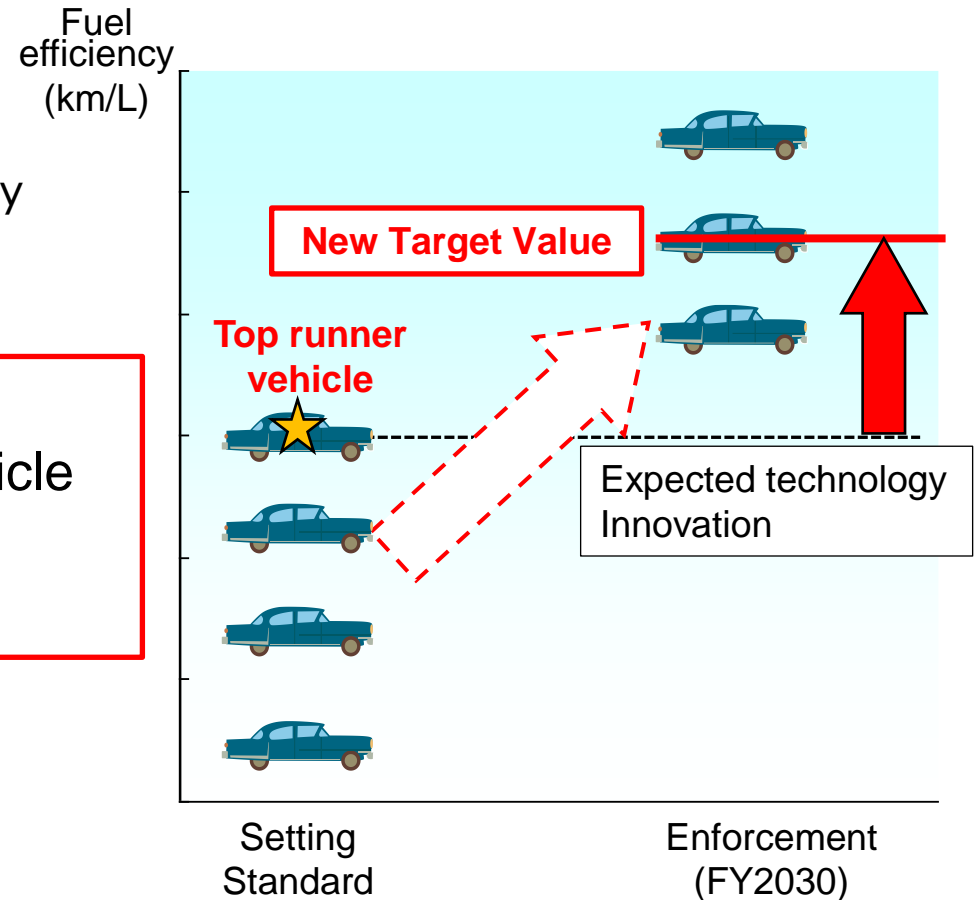
Setting Fuel Efficiency Standard

- The standards are developed based on the “Top-Runner” vehicle at that time as well as the prospect of future technical improvement by the targeted year.

Top Runner Approach

- ① Choose top runner vehicles
- ② Assess technologies affecting fuel efficiency

$$\begin{aligned} \text{New Target Value} = & \\ & \text{Fuel efficiency value of top runner vehicle} \\ & + \\ & \text{Expected technology innovation} \end{aligned}$$



- Based on the Act on the Rational Use of Energy, Japan set the heavy duty fuel efficiency standards (target FY2015) for the first time in the world.
- To address global warming further, the next heavy duty fuel efficiency standards (target FY2025) is 13.5 % higher than the current standards.





Next Fuel Efficiency Standards

- ◆ Target Year: FY 2025
- ◆ Scope: Diesel Vehicles including Hybrid Vehicles
- ◆ Fuel Efficiency Standards:

	Target Values※	Increase from the current 2015 Standards
Trucks	7.63km/L	13.4%
Buses	6.52km/L	14.3%

※ Calculated by using the weighted harmonic mean of the sales figures of FY2014



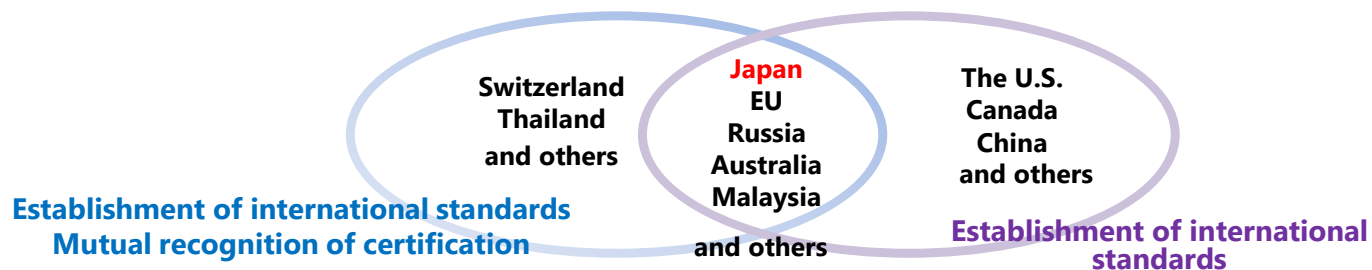
	Hybrid vehicle (HV) 	Plug-in hybrid electric vehicle (PHEV) 	Electric vehicle (EV) 	Fuel cell vehicle (FCV) 
Tax incentives	Tax incentives available			
Subsidies (private vehicles)		Subsidy by METI 16.0 billion yen for FY2019 (METI)		
Subsidies (commercial vehicles)	Subsidy by MLIT 0.53 billion yen for FY2019 (MLIT)			Subsidy for FC buses by MOE 2.57 billion yen for FY2019
	Subsidy for EV trucks and HV trucks by MOE 1.0 billion yen for FY2019			
Subsidies (others)		Subsidy for Charging infrastructure by METI 1.1 billion yen for FY2019		Subsidy for projects to build hydrogen supply facilities by METI 10 billion yen for FY2019

➤ Participation in Activities for Harmonization of Vehicle Regulations at UN-WP29



1958 Agreement

1998 Agreement



- Japan promotes international harmonization of standards wherever possible while ensuring Japan's environmental preservation.

UN Regulation No.100 (Electric Safety)
UN Regulation No.134 (Hydrogen fuelled vehicles)
UN Regulation No.136 (Electric powered 2&3 wheelers)
UN GTR No.14 (Hydrogen and Fuel Cell Vehicle Safety)



- International harmonization of standards offers the following advantages:
 - For automobile manufacturers, promotion of environmental technology by more efficient research and development, and reduced development and production costs through unifying specifications.
 - Reduced purchase prices of Next-generation vehicles for motor vehicle users.



Nissan LEAF (EV)



TOYOTA MIRAI (FCV)

- Japan has established mid and long term policy target in view of the Paris Agreement, which stipulates its objective to hold that while holding the increase in the global average temperature to below 2°C above pre-industrial level.
- It is important to tackle the emission issue of automobiles, in view of both air pollutant and global warming, all over the world.
- MLIT promotes
 1. Establishment of fuel efficiency standard and emission regulation
 2. Tax incentives & subsidies
 3. International harmonization of regulations (WP.29)
- MLIT will contribute to address the environmental problem, not only in Japan but globally, by making best use of its experience and technology gained thus far.

Thank you for your attention