Overview of MLIT's Vehicle Environmental Policy

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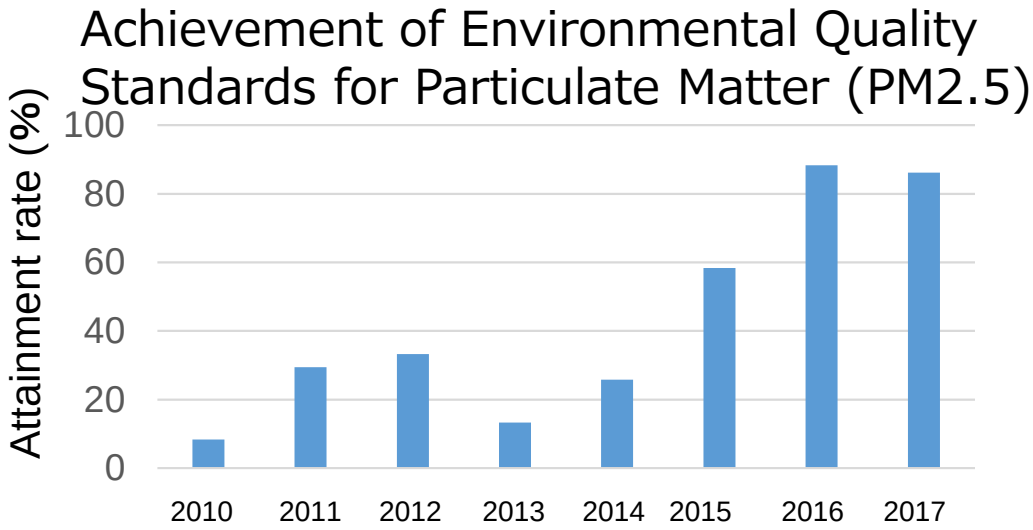
1. Background

Air quality in Japan

- Air quality has been improved with <u>the gradual enforcement of emissions regulations</u>.

1980s in Tokyo

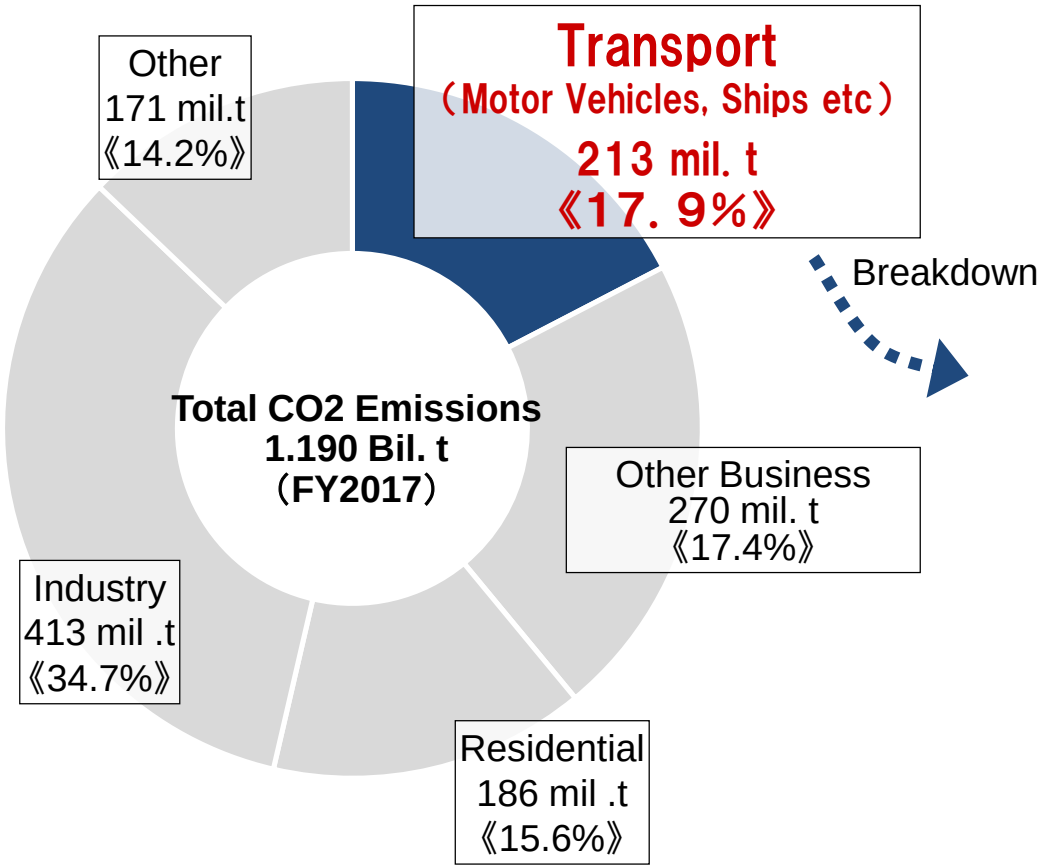
Late 2010s in Tokyo



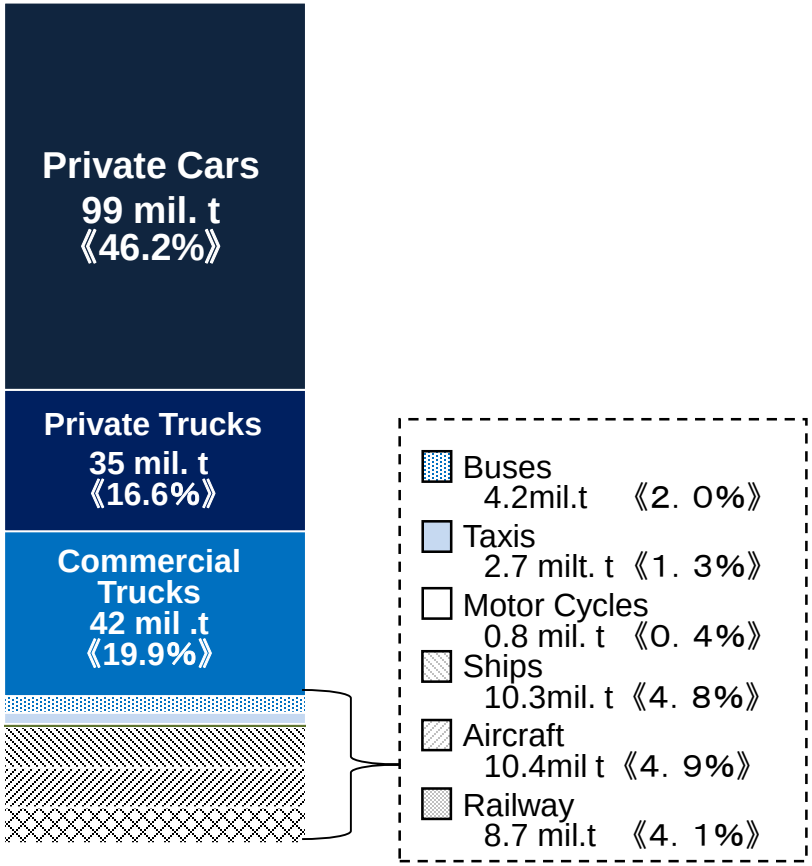
Current Status of Carbon Dioxide Emissions

- Of all CO_2 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 CO_2 emissions** (**15.4% of all CO_2 emissions in Japan**).

CO_2 emissions from each sector in Japan



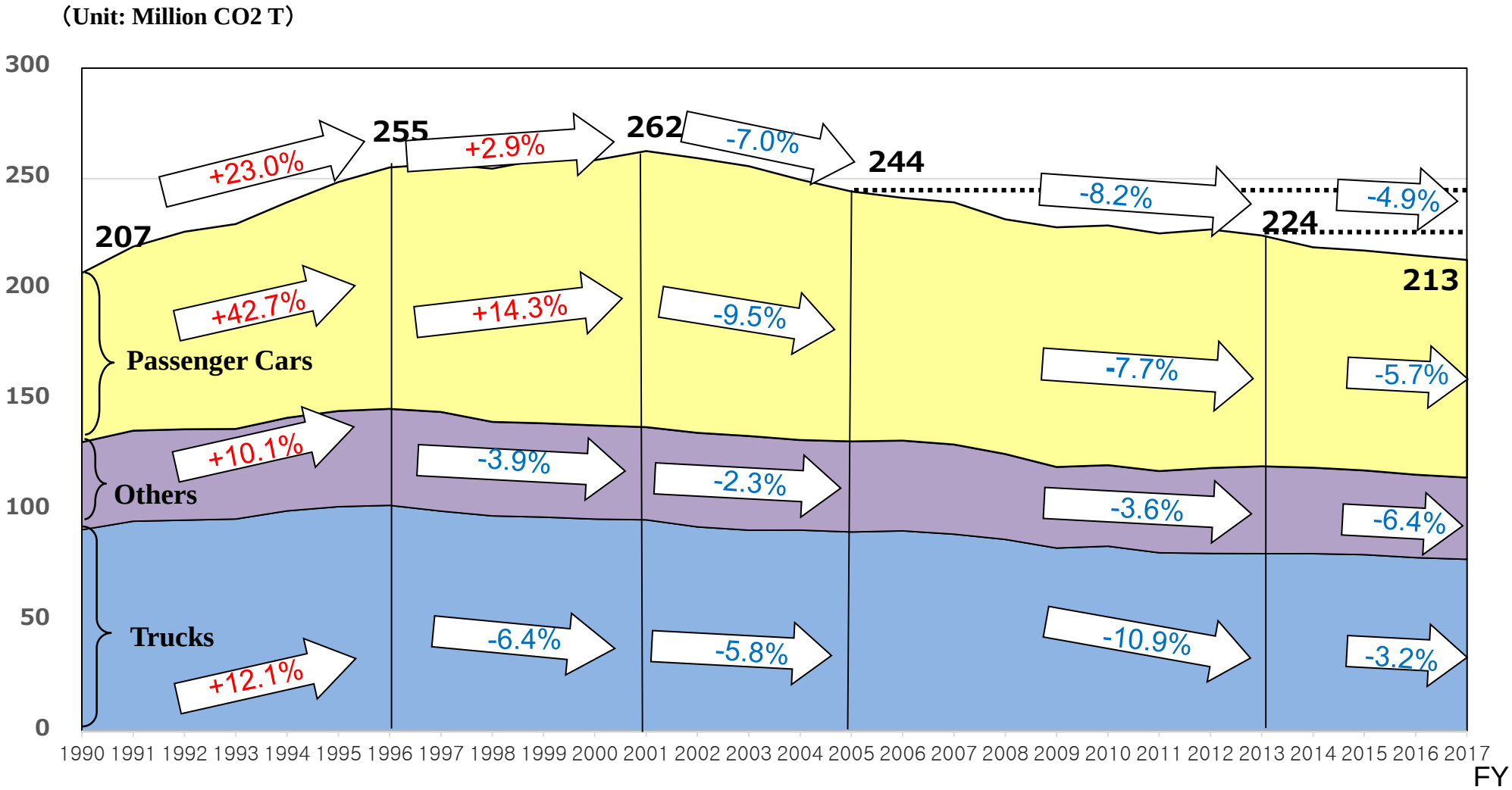
CO_2 emissions from the transport sector (breakdown)



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

Historical Trend of CO2 Emissions in Transport Sector

- CO2 emissions form transport sector peaked out in 2001 and have been declining steadily.



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

Japan's CO_2 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 CO_2)

Energy source CO_2 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 CO_2)

	Targeted emissions for each sector in FY2030	Compared to the FY2013 result (FY2005 result)
Energy source CO_2	**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

- 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)

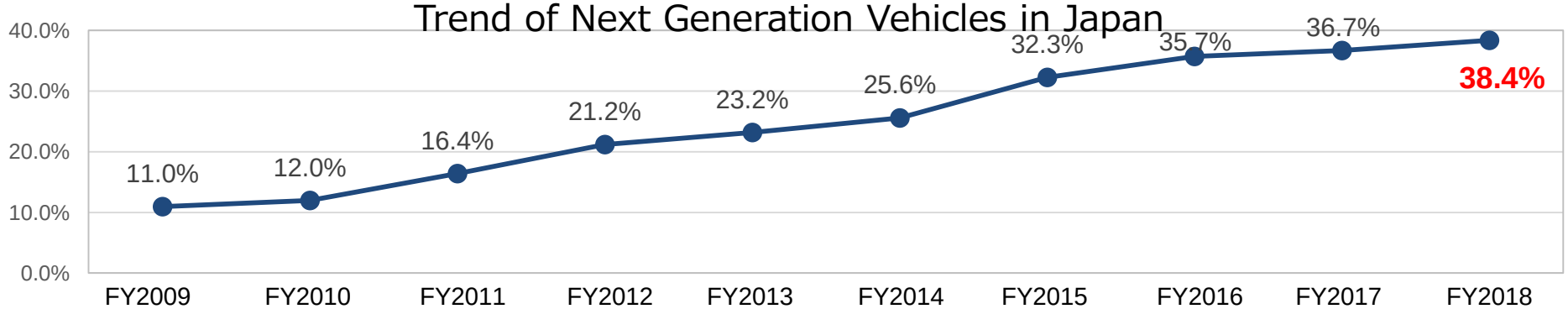
Target and trend of Next-Generation Vehicles

Target units and the Current Situation of Next Generation Vehicles in Japan

<<Reference>> New passenger car sales: 4.36 million units (2018)

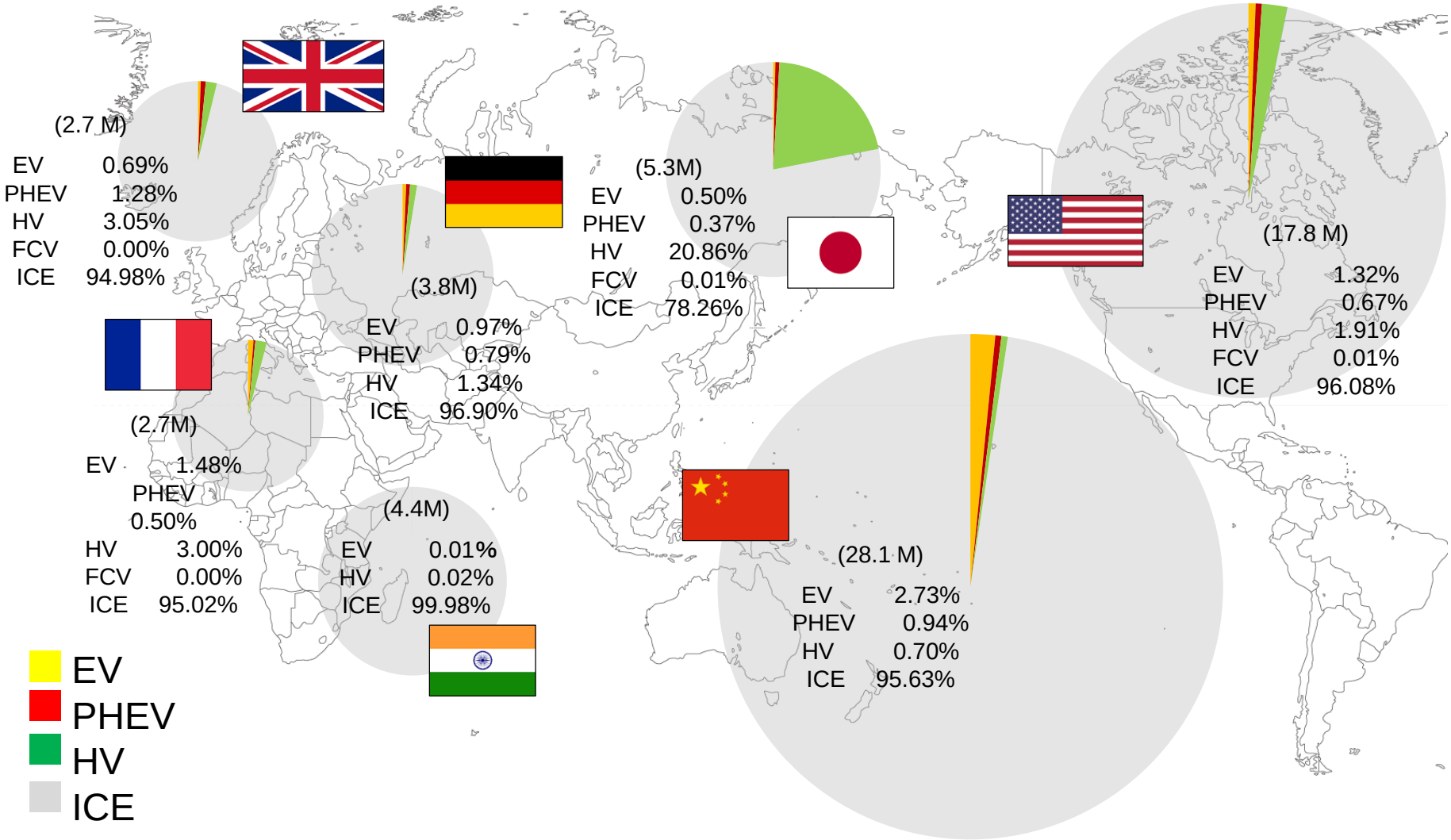
		FY2018	**2030**
Conventional Vehicle		61.6% (2.69 mil. units)	30～50%
Next-generation vehicle		**38.4%** **(1.67 mil. units)**	**50～70%**
	Hybrid Vehicle	33.2% (1.45 mil. units)	30～40%※
	Battery Electric Vehicle Plug in Hybrid Vehicle	0.53% (0.023 mil. units) 0.48% (0.021 mil. units)	20～30%※
	Fuel Cell 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 which also includes trucks. This percentage is far higher than the percentages recorded in other major countries.
* Mild hybrid vehicles are excluded.



2. Promoting NEXT-GENERATION VEHICLES

Measures to Promote Widespread Use of Next-Generation Vehicles

1. Establishment of standards

- ✓ Emission regulation and Fuel efficiency standard 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

			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=<1.7t)	New type			2018/10/1					
		Existing type					2020/9/1			
	Medium-duty Motor vehicles (1.7t<GVW=<3.5t)	New type				2019/10/1				
		Existing type						2021/9/1		
	Heavy-duty Motor Vehicles(diesel) (other than tractors with 7.5t<GVW)	New type	JE05	2016/10/1						WHDC
		Existing type			2017/9/1					
	Heavy-duty Motor Vehicles(diesel) (Tractors with 7.5t<GVW)	New type			2017/10/1					
		Existing type			2018.9.1					
	Heavy-duty Motor Vehicles(diesel) (3.5t<GVW=<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 LDCV: Light Duty Commercial Vehicle (GVW ≤3.5t)
HDV: Heavy Duty Vehicle (GVW > 3.5t)

Setting Fuel Efficiency Standard

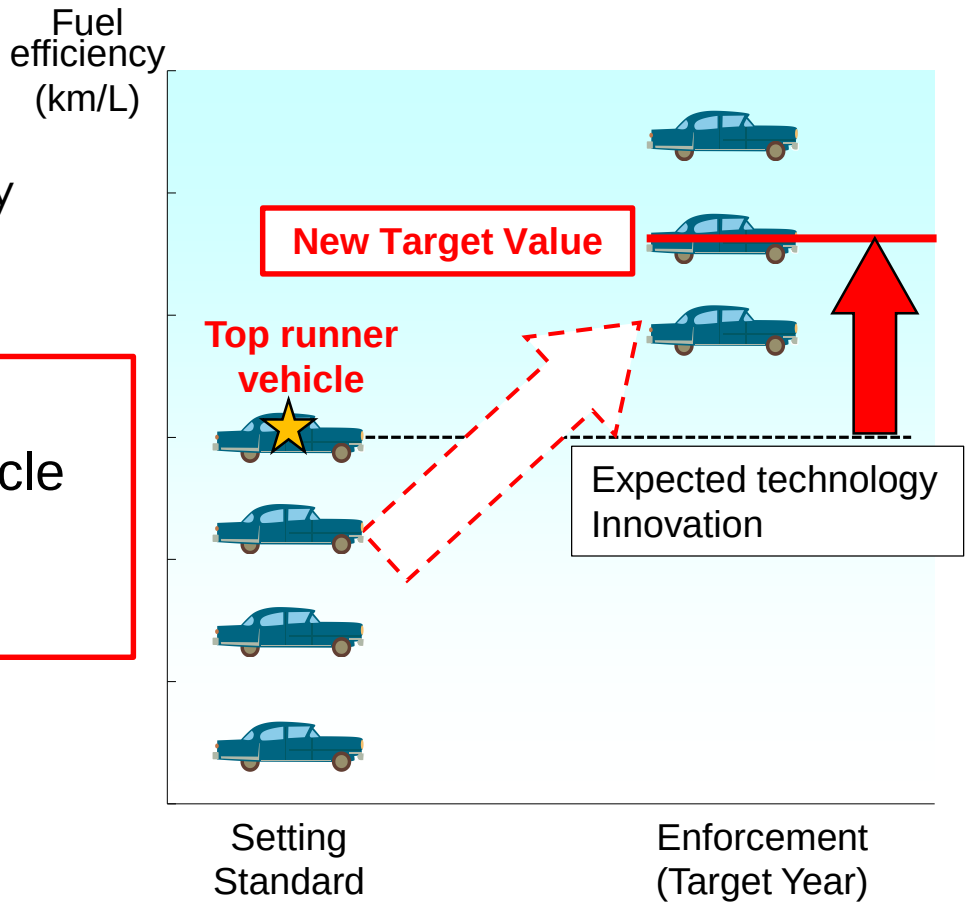
- The standards are developed based on the “Top-Runner” vehicle at that time and the prospect of future technical improvement by the targeted year.

Top Runner Approach

① Choose top runner vehicles

② Assess technologies affecting fuel efficiency

New Target Value ＝
Fuel efficiency value of top runner vehicle
＋
Expected technology innovation



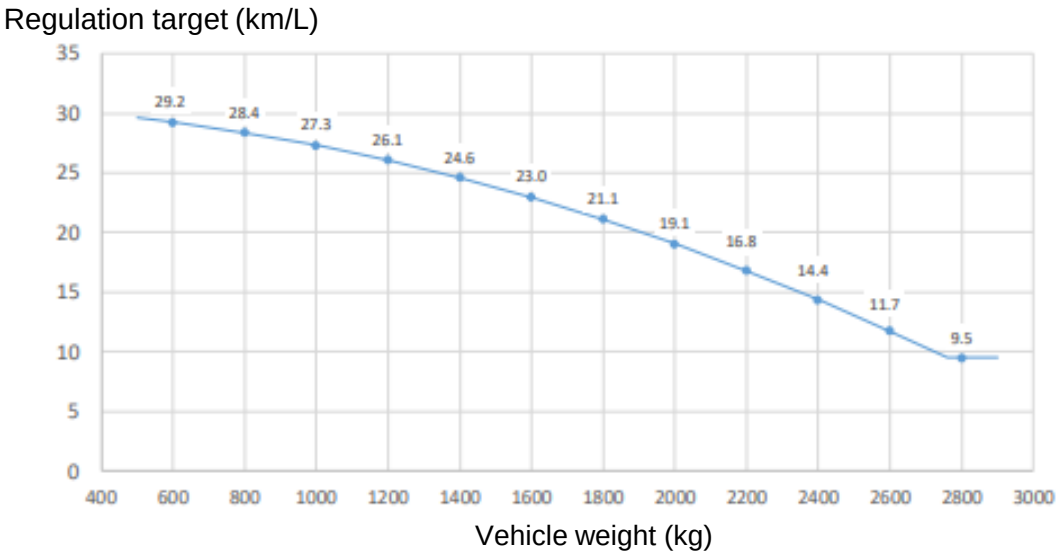
FY2030 Fuel Efficiency Standards for Passenger Cars

- ◆ 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

$$FE = 9.5$$



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.

FY2025 Fuel Efficiency Standards for Heavy-duty Vehicles

- 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

Financial Support for Next-Generation Vehicles

	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 EV trucks and HV trucks by MOE 1.0 billion yen for FY2019			Subsidy for FC buses by MOE 2.57 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

Actions to disseminate EV/PHEV

- Incentive schemes such as tax breaks and subsidies to boost initial potential demand.

Tax breaks and subsidies

Tax breaks (Eco-car tax breaks)

Tax breaks for NGAs like EV stimulate consumer demand for EV.

※ The amount of tax breaks on HV depend on performance of fuel efficiency.

Project to promote dissemination of next-generation vehicles to reduce environmental impact of regional transportation

Supports measures in cooperation with the region's plan, as well as achieves full-scale dissemination of next-generation environmental-friendly vehicles in stages.

	[Stage I]	[Stage II]	[Stage III]
Outline	Initial stage where products are first introduced in the market with a high price. Requires active support.	Expansive model lineup creates competition. The price difference from conventional vehicles is reduced.	The price difference from conventional vehicles is further reduced. Arrives at initial stage of full-scale dissemination (final stage of support).
Max. subsidy	**1/3 of price for vehicles / charging facilities**	**1/4 to 1/5 of price for vehicles / charging facilities**	**1/3 of difference from conventional vehicles**
Applicable vehicles	**Fuel cell taxis, electric buses, plug-in hybrid buses, ultra-compact mobility, etc.**	**Electric taxis, electric trucks, plug-in hybrid taxis**	**Hybrid buses, CNG buses, hybrid trucks, CNG trucks**

International harmonization of vehicle regulations（WP29）

- Japan promotes international harmonization of standards.

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)

3. Conclusion

Conclusion

- Japan has established mid and long term policy target in view of the Paris Agreement, which stipulates its objective to hold the increase in the global average temperature to below 2℃ 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 emission regulation and fuel efficiency standard
  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