

Panorama Normatividad

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International Transport Forum

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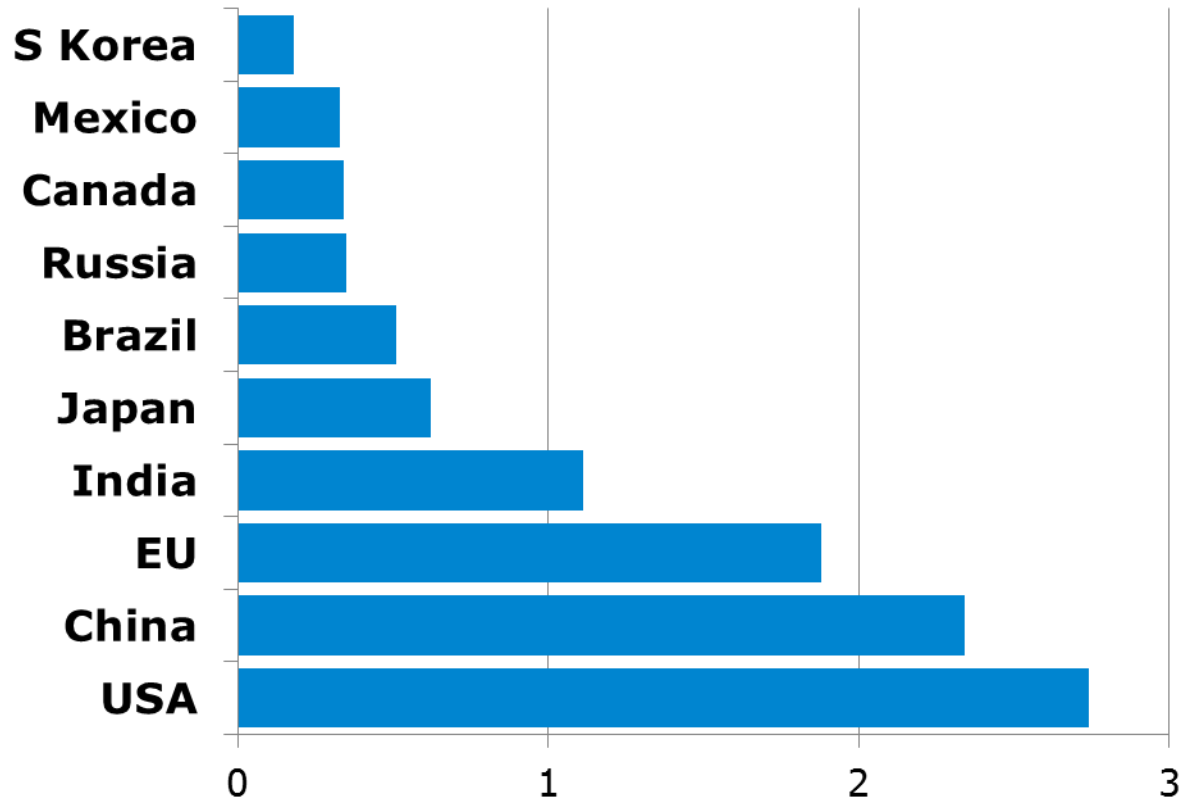
- Panorama
- Why regulate HDV efficiency?
- Priorities in Mexico
- Regulations in other countries
- Considerations for Mexican standards

Efficiency regulations around the world

Regulation
in place Regulation
considered

	X
	X
X	
	X
X	
	X
	X
X	
X	

Heavy duty freight vehicle fuel use
(mboe/day)



Source: ICCT

Scope of regulations

- Engines
- Drive train
- Weight
- Aerodynamics
- Auxilliary power units
- Tyres
- Overall efficiency has to be modelled
- Calibrated with on-road testing

Scope of regulations

- **Engines**
- **Drive train**
- Weight
- Aerodynamics
- Auxilliary power units
- **Tyres** – important after-market

Scope of regulations

- **Engines** Japan
- **Drive train** China
- Weight
- Aerodynamics
- Auxilliary power units
- **Tyres**

Scope of regulations

- **Engines**
- **Drive train**
- Weight
- Aerodynamics
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- Tyres

USA

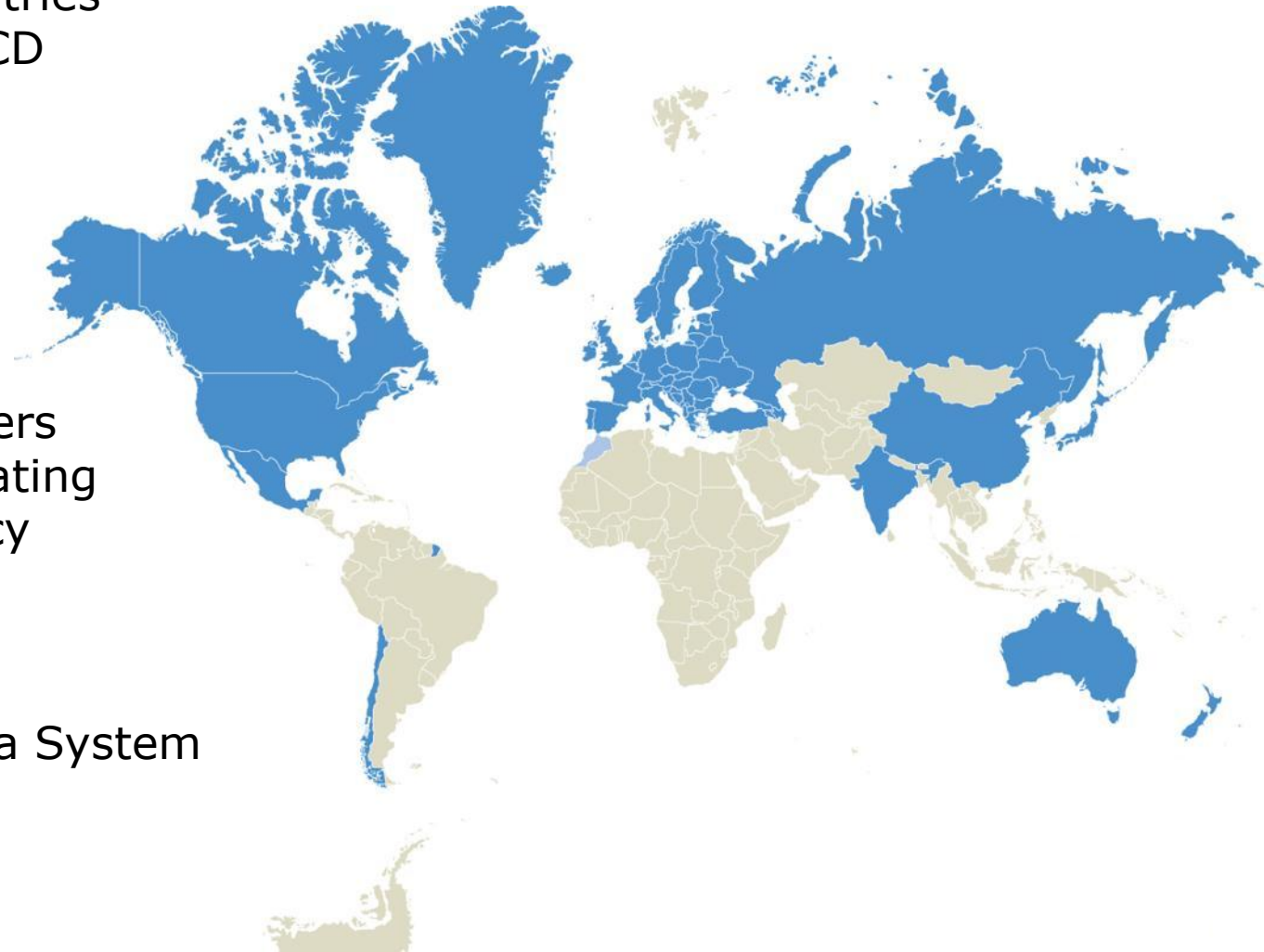
Intergovernmental Organisation

57 member countries
Including 34 OECD

Housed by OECD

Council of Ministers
of Transport, rotating
Annual presidency

Legal instrument
European
Multilateral Quota System
For Road Freight



Annual Summit

Think Tank





- LDV targets
- challenging
 - realistic
 - stabilise emissions

Collaboration on fuel economy with partners

THE GFEI FUEL ECONOMY TARGETS

From 2005 baseline:

30%

reduction in L/100km by 2020 in
all new cars in OECD countries

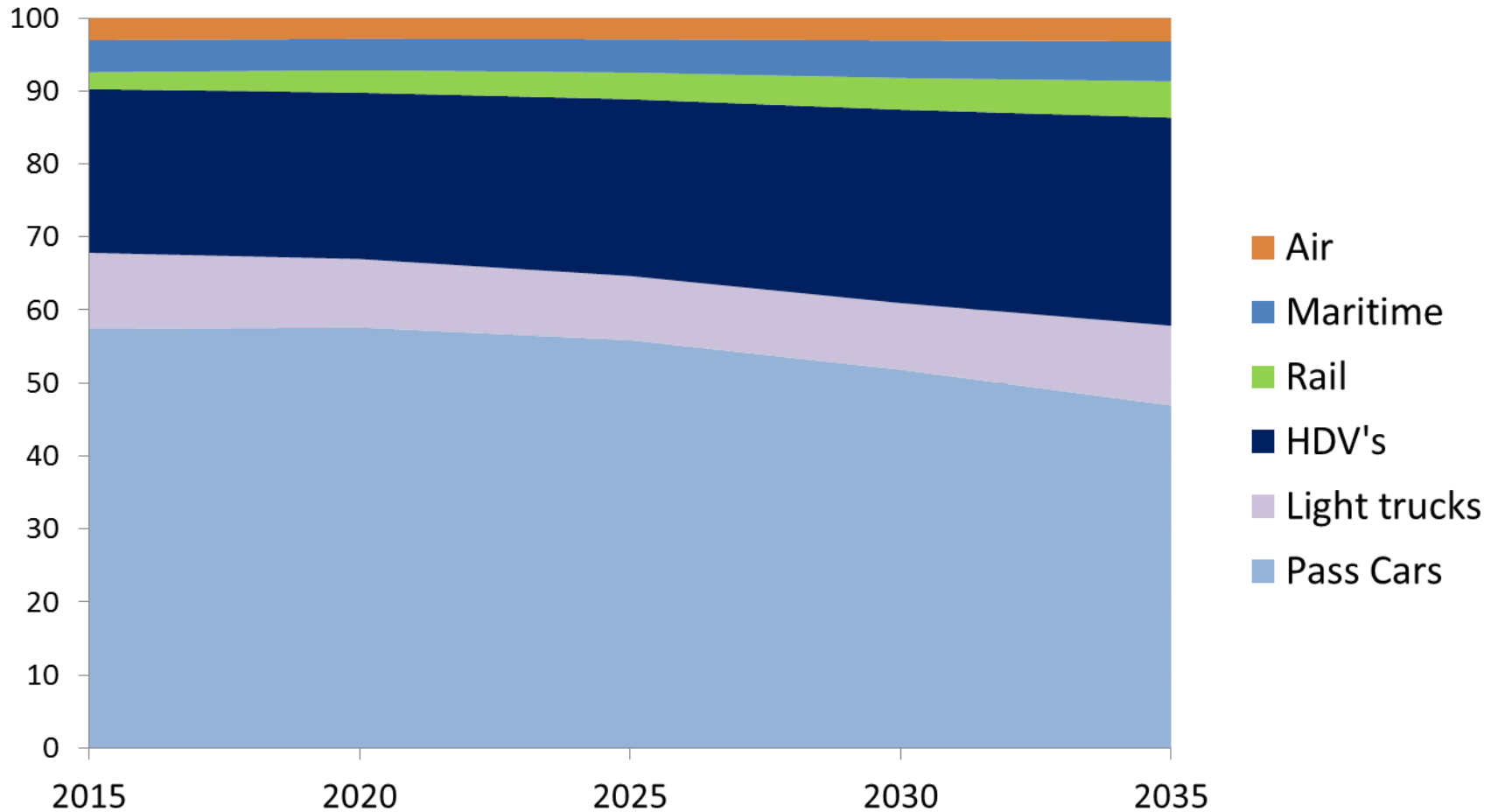
50%

by 2030 in all new cars globally

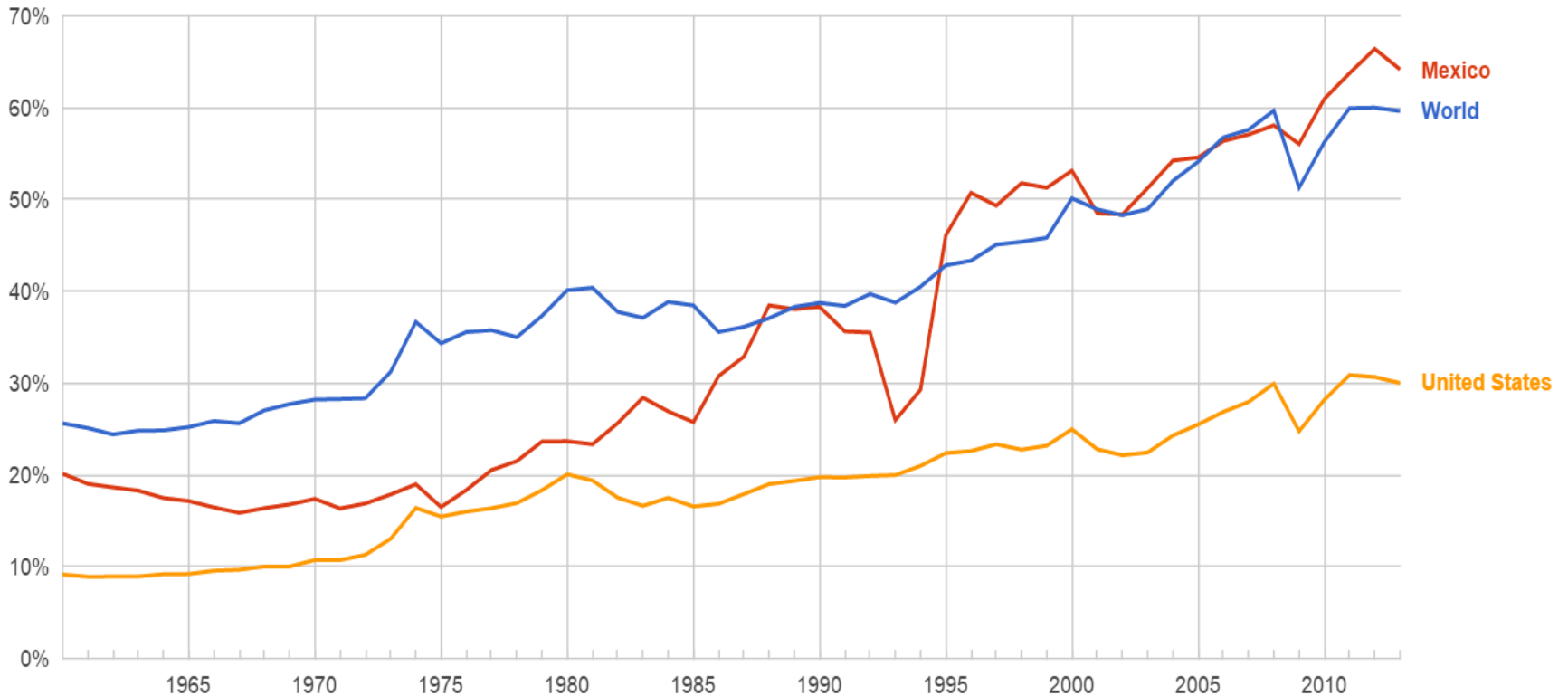
50%

by 2050 in all cars globally

Share of HDVs in total transport CO2 emissions in Mexico



Trade as a percentage of GDP



Source: Google Public Data based on World Bank

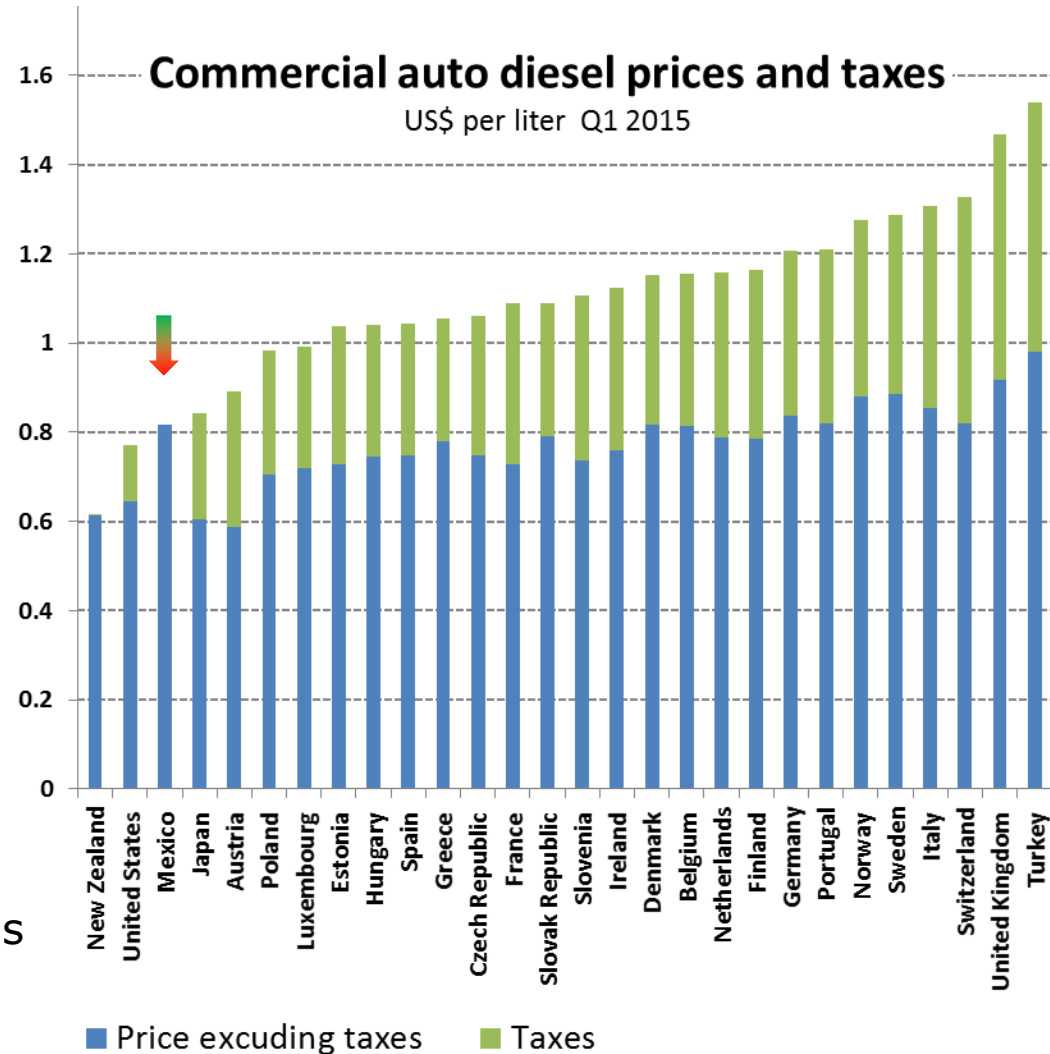
Intervention in the market for new HDVs

Imperfect Markets

- Fuel prices
- Vehicle prices
- Small companies
- Competitive advantage

Options

- Higher fuel taxes
- Vehicle regulations
- Vehicle tax differentiation
- Tyre regulations
- Ecodriving
- Smartways voluntary programs



USA



US Federal EPA Phase 1 Standards

- Overall vehicle emissions and design standards
- Engine emissions standards
- Start with model year 2014
- Several classes of vehicle, HGVs to heavy pickups
- 10-23% improvement 2010 to 2018
- Gasoline as well as diesel engines
- Based on 'off-the-shelf' technology
- Advanced technology early compliance credits
- Averaging, banking and trading for manufacturers

US Federal Vehicle Emissions Standards

- Grams CO₂ per ton-mile

HD Combination Tractor Vehicle Standards (gCO ₂ /ton-mile)						
	2014-2016 MY			2017 MY and beyond		
	Class 7	Class 8		Class 7	Class 8	
		Day Cab	Sleeper Berth		Day Cab	Sleeper Berth
Low Roof	107	81	68	104	80	66
Mid Roof	119	88	76	115	86	73
High Roof	124	92	75	120	89	72

Source: Kim Heroy-Rogalski, CARB

<http://www.iea.org/workshops/heavy-duty-vehicle-fuel-efficiency-regulations.html>

US Federal Vehicle Design Standards

- Compliance with GEM emissions model, covering:
- Aerodynamic drag coefficient
- Tyre rolling resistance coefficient
- Weight
- Speed limiter
- Extended idling reduction systems

Specialised (vocational) vehicles

- Vehicle emissions standards – 10% improvement
- Specific GEM vehicle model compliance

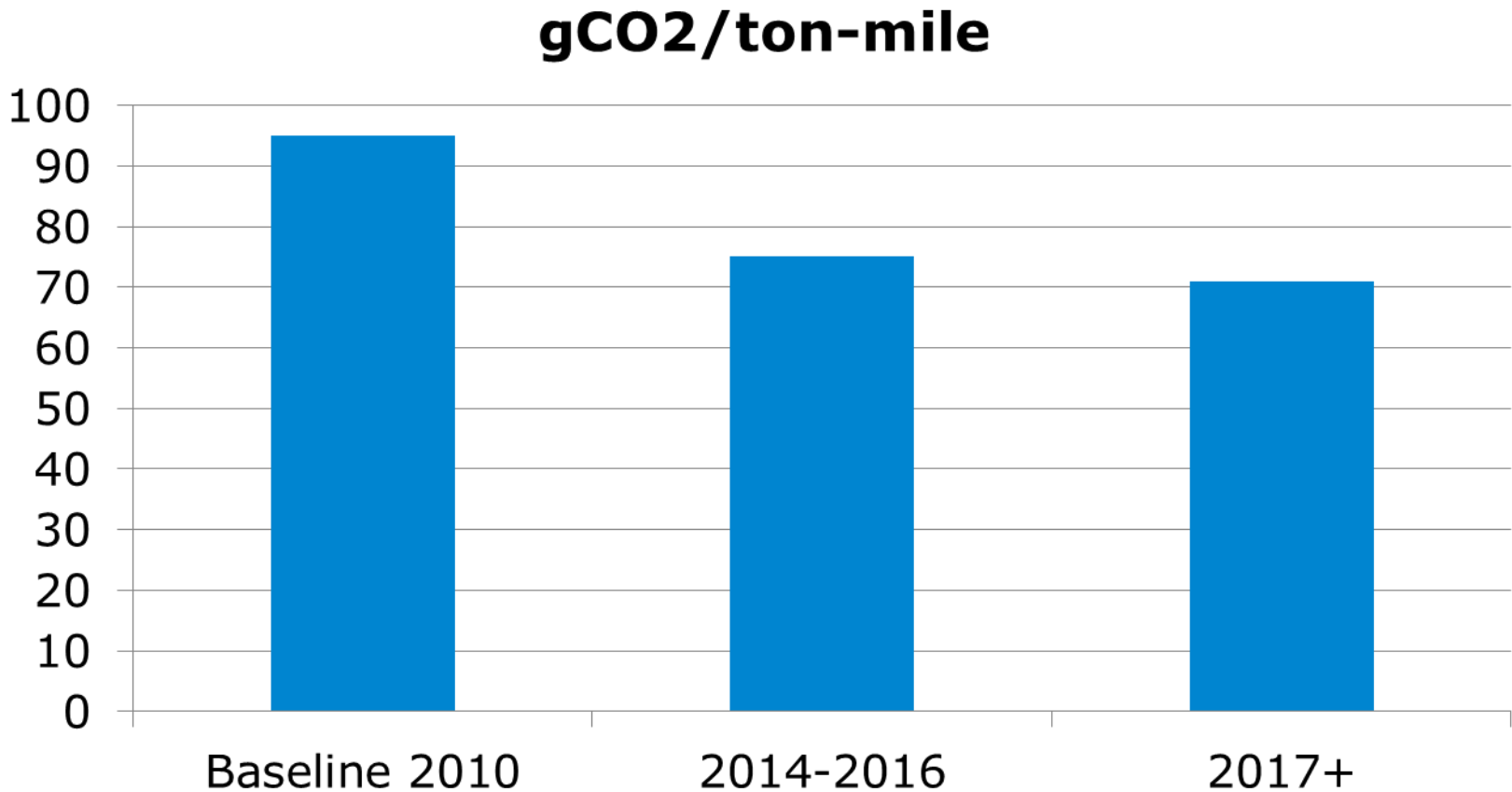
- Pickups – similar with differentiation by model and load

US EPA Phase 1 HD Engine Standards

- Gasoline: 627 grams CO₂ per bhp-hour applies to model year 2016 and beyond
- Diesel gCO₂/bhp-hr :

	Light HDVs	Medium HDVs		Heavy HDVs	
		Vocational	Tractors	Vocational	Tractors
2014-2016 models	600	600	502	567	475
2017 models and later	576	576	487	555	460
Change	4%	4%	3%	2%	3%

Result for large HGV - class 8 high roof sleeper cab tractor – 25% reduction



Japan



Japan

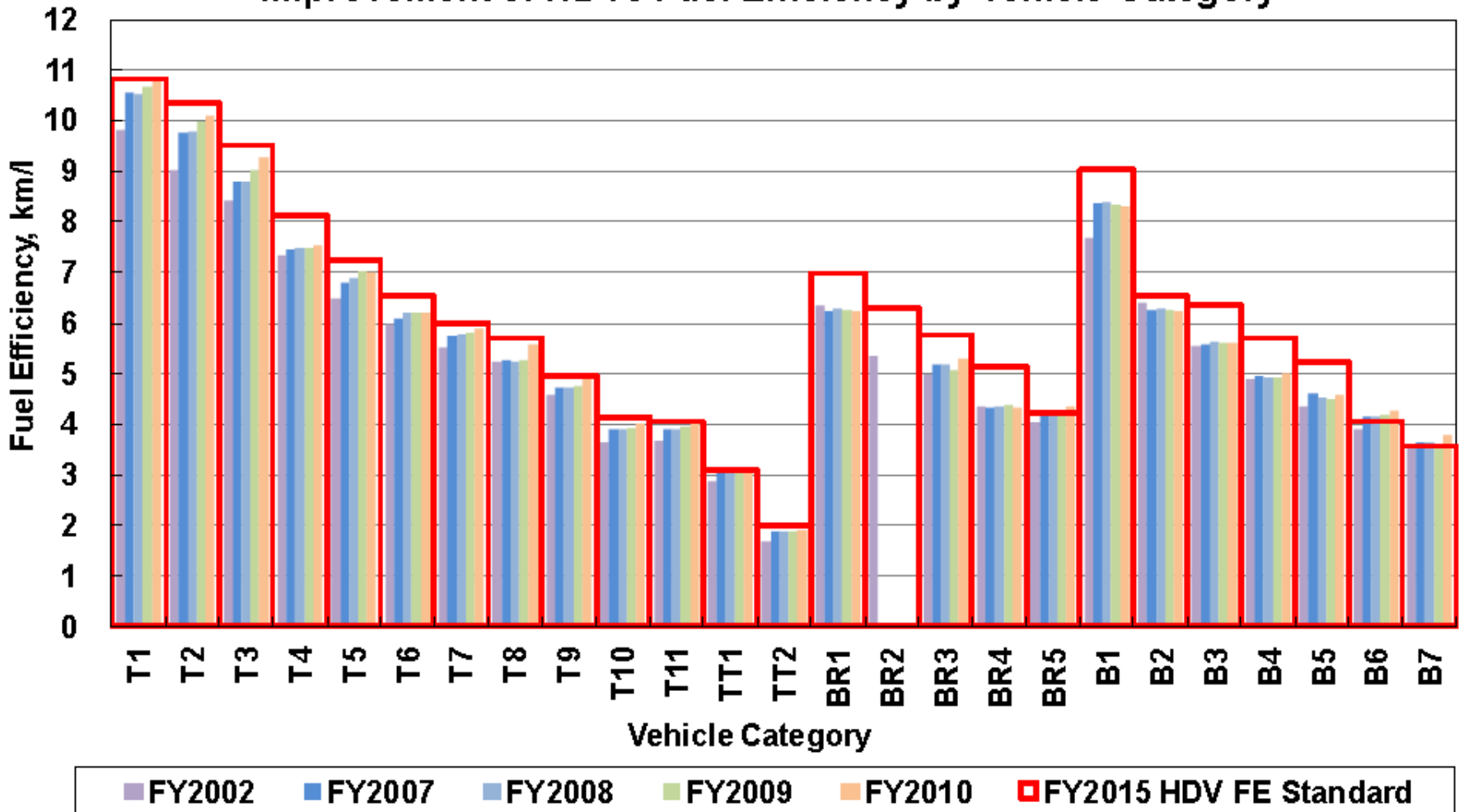
- World's first fuel efficiency standards, km/l
- Applied from 2006 to 2015
- Penalties from 2015
- New standards to be proposed 2015
- Top Runner approach:
 - By target year average fuel efficiency must be higher than for the best model in the base year
 - Standard reachable as best models already there
 - Government considers the standards challenging

Phase-in and complementary measures

- 2015 chosen for penalties to apply to allow time for new model design and for
- 2009 NO_x and PM emissions standards
- Vehicle taxes differentiated by weight
- Tax reductions for exceeding standard

Results – trucks improved, some buses not

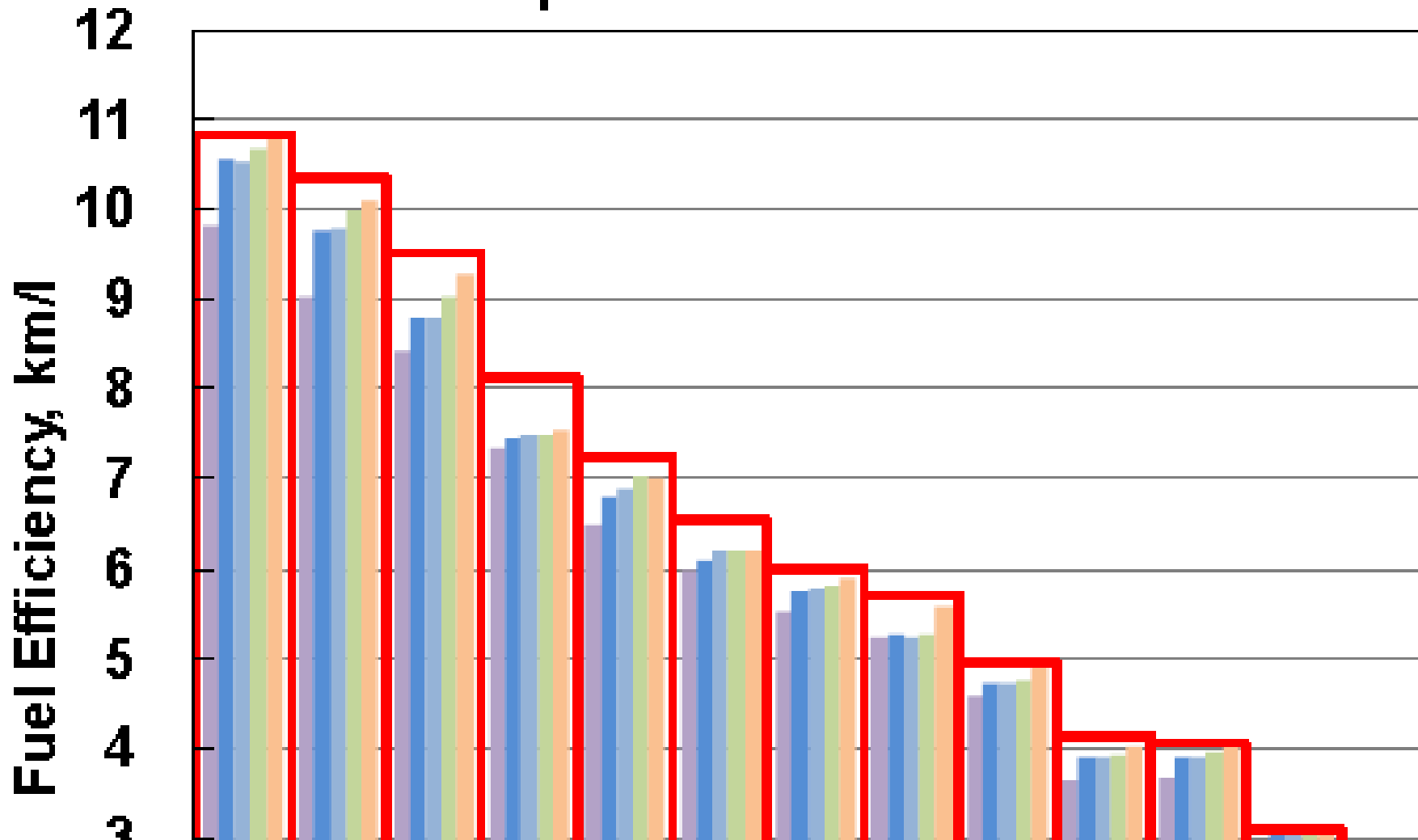
Improvement of HDVs Fuel Efficiency by Vehicle Category



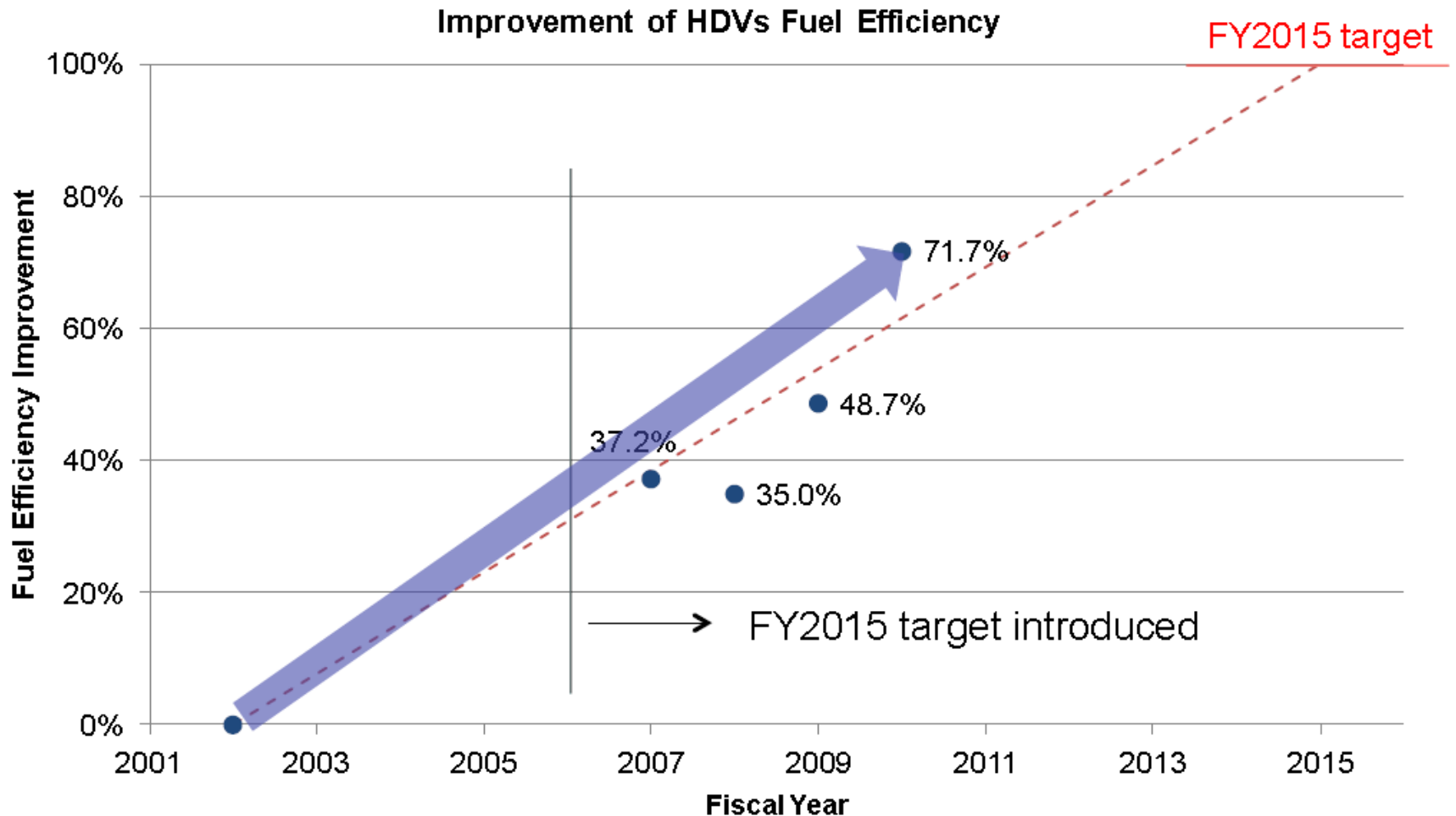
Source: Atsuto Kajiwara, MLIT

Results – trucks improved

Improvement of HDVs Fuel Effi



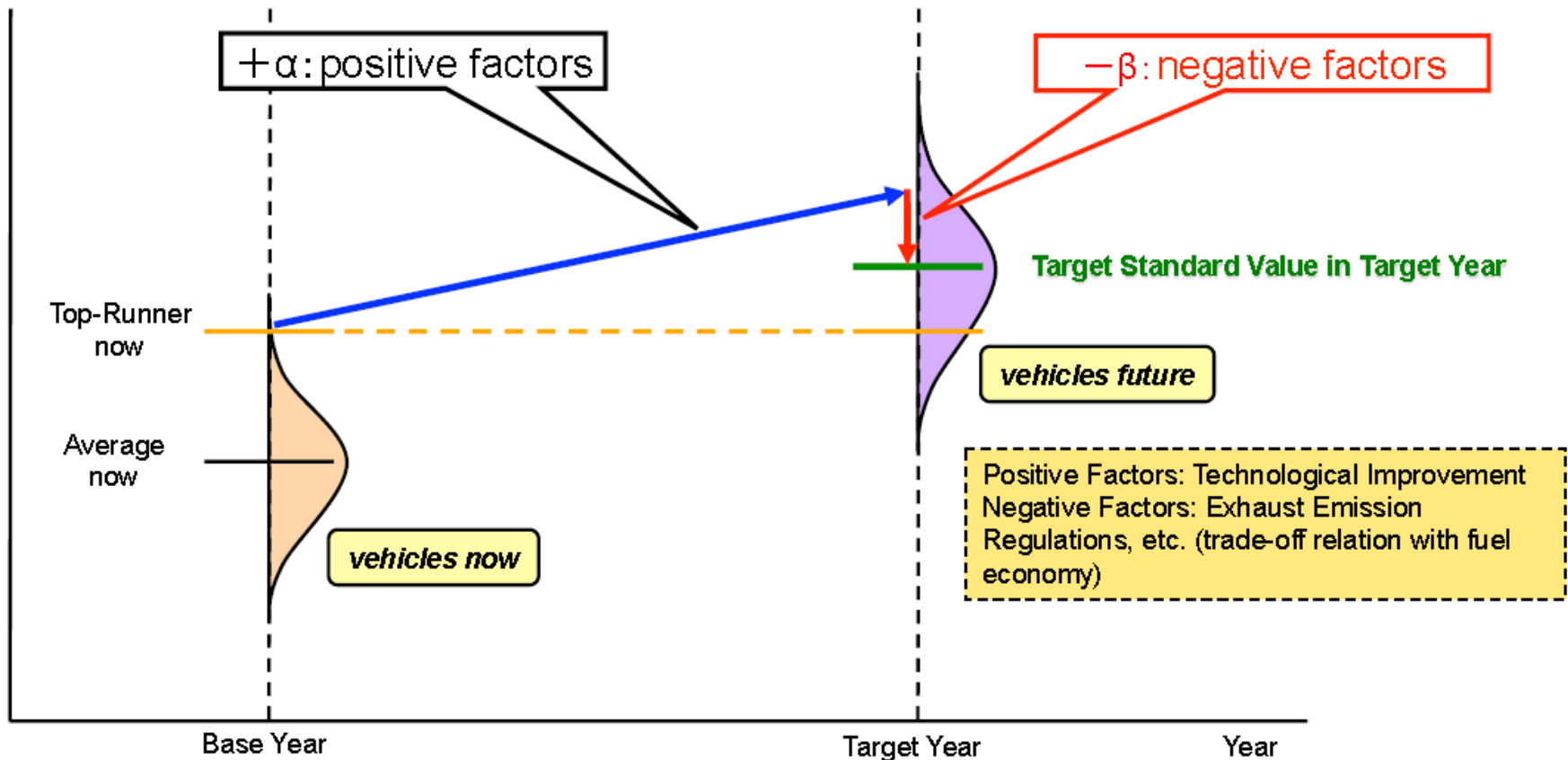
Improvement in average fuel efficiency



Fleet Average Fuel Economy Standards

	Trucks	Buses
2015	7.09 km/L 369.6 g CO ₂ /km	6.30 km/L 416.0 g CO ₂ /km
2002	6.32 km/L 414.6 g CO ₂ /km	5.62 km/L 466.3 g CO ₂ /km
Improvement	12.2%	12.1%

Potential tightening



Source: Atsuto Kajiwara, MLIT

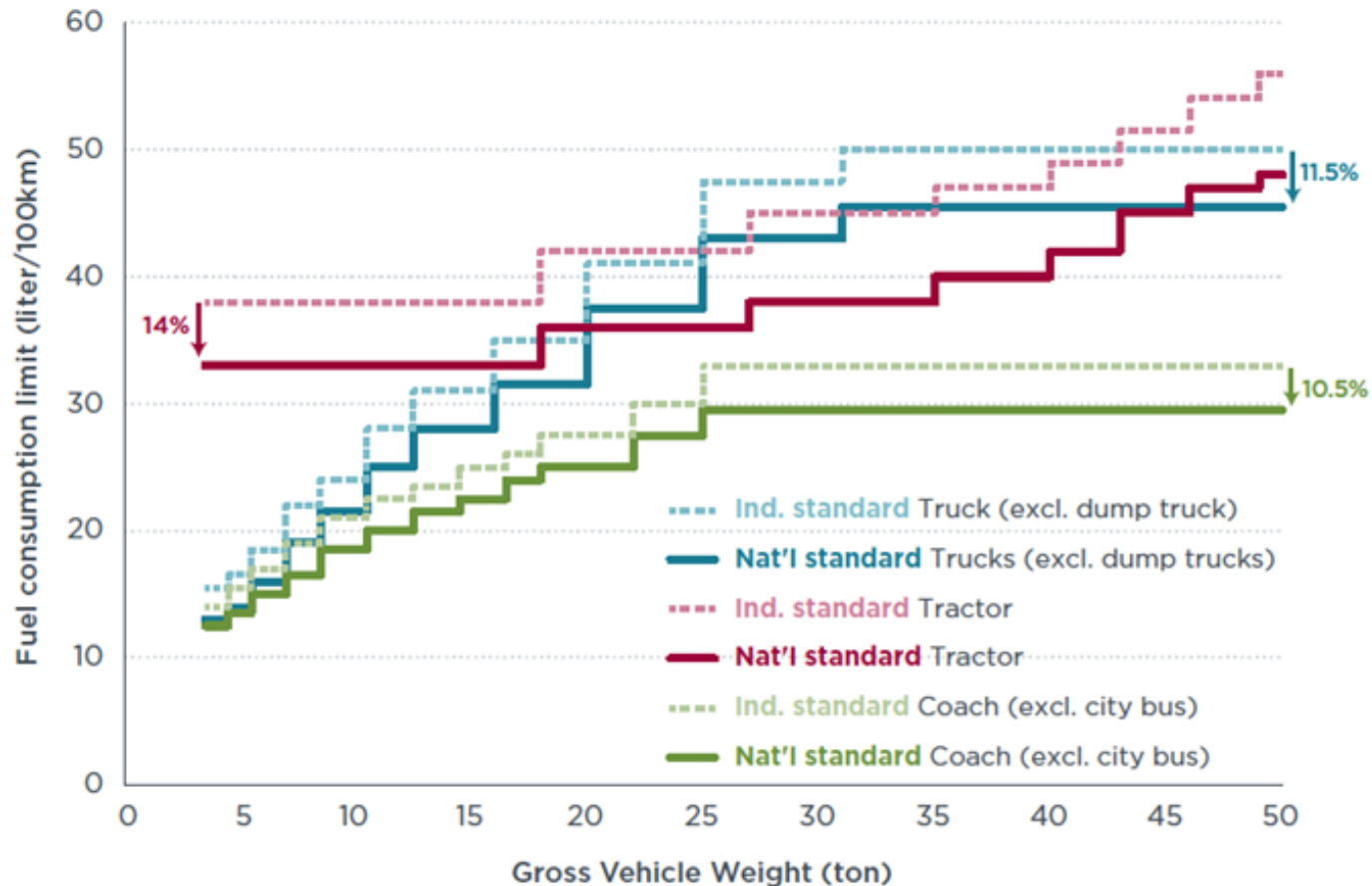
China



China

- Weight-based fuel consumption standard, L/100km
- 2008 intention to regulate announced, test cycle – chassis dynamometer + simulation – developed
- 2010-11 current models tested – top runner type approach adopted
- 2012 Phase I (Industry) standard applied to new type approvals
- 2014 Phase 1 standards applied to all new heavy trucks
- 2014 Phase II (National) standard applied to new type approvals
- 2015 Phase II standard applies to all new vehicles - five vehicle types – tractors, straight trucks, dump truck, city trucks, buses
- Phase II tightens vehicle consumption limits by an average of 10.5% - 14.5% compared to Phase I

Phase I (Industry) & Phase II (National) Standards



Source: ICCT



Comparison and Conversation of Standards

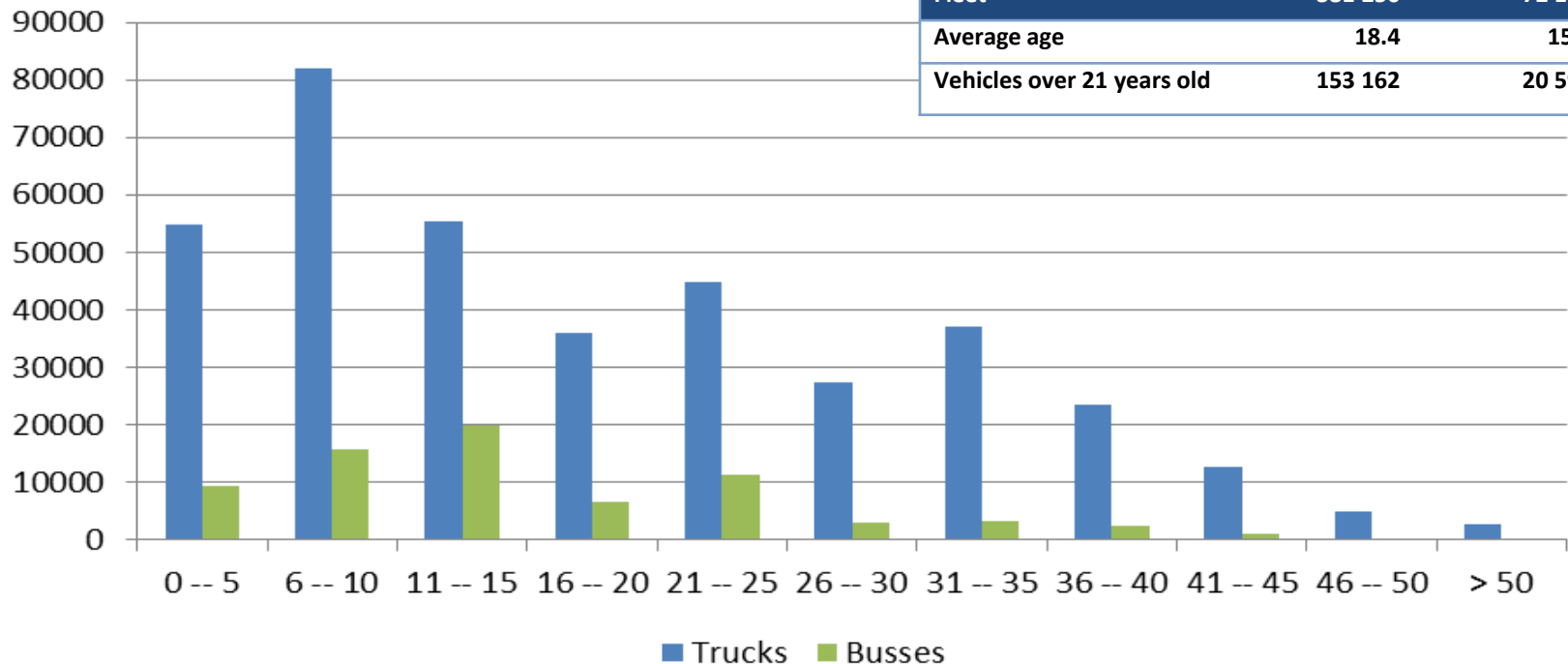
HDV Fuel Economy Standards (Heaviest Vehicle Category)

	Trucks	Bus
US (2027)	7.8mpg	
Japan	4.04 km/L	4.23 km/L
China (Phase I)	50 L/100km	33 L/100km
China (Phase II)	45.5 L/100km	29.5 L/100km
Conversions (km/L)		
USA (2017)	3.32	-
Japan (2015)	4.04	4.23
China (2014)	2.20	3.39

Mexican market

HDV Fleet 2013 by Age of Vehicle

Age (years)	Trucks	Busses
0 -- 5	54 757	9 402
6 -- 10	82 042	15 572
11 -- 15	55 348	19 989
16 -- 20	35 941	6 623
21 -- 25	44 946	11 399
26 -- 30	27 431	2 831
31 -- 35	37 132	3 092
36 -- 40	23 377	2 299
41 -- 45	12 527	969
46 -- 50	5 018	0
> 50	2 731	0
Fleet	381 250	72 176
Average age	18.4	15.3
Vehicles over 21 years old	153 162	20 590



Thoughts on Mexican market

- EuroVI-EPA2010 NOx/PM regulation from 2018
- Full on-board diagnostics with NOx exhaust monitoring critical
- Peso depreciated 25% against dollar in last year
- Costs.....
- CO2 / fuel efficiency standard needed to overcome market imperfections – level field for manufacturers
- Set and tighten later
- Following Japanese example?
- But with view to harmonization with US market?

Gracias!



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