

Vehicle Emissions Regulations and Global Environmental Impacts

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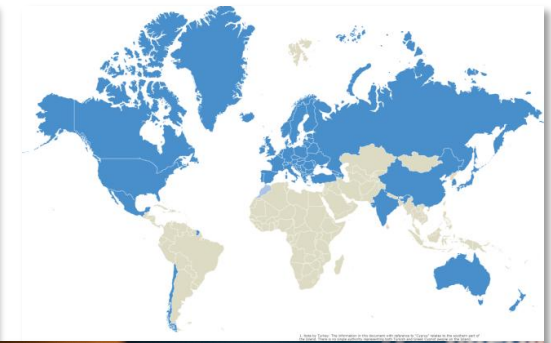
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The International Transport Forum at the OECD

Think Tank

Annual
Summit

Intergovernmental
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Emissions and Regulation

- Criteria pollutants – NO_x, PM
- Fuel Quality – Sulphur
- CO₂ / fuel consumption

Cost of criteria pollutant emissions

- The cost of air pollution: health impacts of road transport, OECD 2014
- Cost to major economies \$3.5 trillion a year in premature deaths and illness (½ OECD ½ China/India)
- Cancer, heart disease, respiratory problems
- Half from road emissions especially diesel



Criteria Emissions Standards & Fuel Sulphur Linkage

Gasoline	S<150ppm	S<50ppm	S<10ppm
LDV Standards	Euro3, US Tier 1	Euro4, US Tier 2	Euro5, Euro6

Diesel	S<500ppm	S<50ppm	S<15ppm
LDV Standards	Euro3, US Tier 1	Euro4, US Tier 2	Euro5, Euro6

Diesel	S<500ppm	S<50ppm	S<10ppm
HDV Standards	EuroIII, US 1998/2004	EuroIV, US 2004	EuroV, EuroVI, US 2007, 2010



Fuel sulphur limits ppm

Gasoline	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Mexico	1500	300			150 (30)*											Proposal: 30 (avg) / 80 (cap)
Brazil**	1000								50							
China**	500				150				50					10		
EU-28	50			10												
India**	500				150 (50)											
Japan	50		10													
Russia	500							150		50	10					
Thailand	150						50									
USA	30/90/300	30 (avg) / 80 (cap)												10		
S. Africa	1000	500												10		

Diesel	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Mexico	5000		500		500 (15)*											Proposal: 15
Brazil**	3500	2000						1800-500 transition (10)		500 (10)						
China**	2000							350 (50)			50			10		
EU-28	50			10												
India**	500				350 (50)											
Japan	50		10													
Russia	500							350		50	10					
Thailand	150						50									
USA	500	15														
S. Africa	3000	500 (50 in some markets)														10

*While adopted regulations limit diesel sulfur to 15ppm and gasoline sulfur to 30ppm as of 2009, 500ppm diesel and 150ppm gasoline is still sold in many areas of the country.

**Brazil, India, and China have sub-national regulations requiring higher quality fuels in key cities and regions. For more information, see transportpolicy.net

National Criteria Emissions Standards in 2014 Relative to EU Standards, LDVs

	<Euro3	Euro3	Euro4	Euro5	Euro6
EU enforcement date:		2000	2005	2010	2015
	Indonesia Malaysia Philippines Vietnam	Mexico Chile China India Russia Thailand	Argentina Brazil S. Africa Taiwan Major cities: China India	EU 28	USA

Criteria Emissions Regulation Issues

- Equal treatment of SUVs
- Equal taxation of diesel fuel and cars
- Two stroke motorcycles and scooters
- NOx off-engine map emissions – cars and especially HDVs
- On-Board Diagnostics
- Mexico Nom 044 EuroVI/EPA2010 with OBD



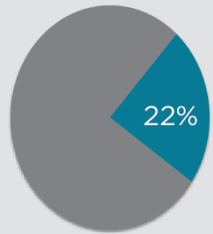
Global Fuel Economy Initiative



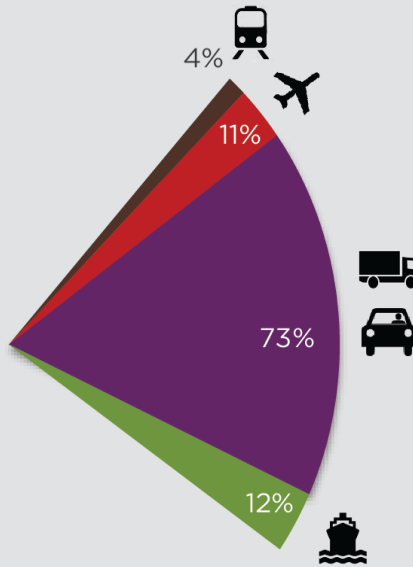
THE TRANSPORTATION SECTOR

A major contributor to global energy-related CO₂ emissions

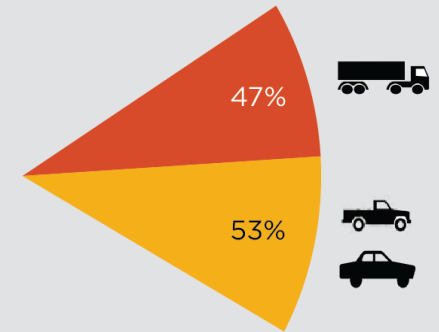
GLOBAL ENERGY-RELATED
EMISSIONS
≈ 30 Gt CO₂



TRANSPORT EMISSIONS
≈ 7 Gt CO₂



ROAD TRANSPORT
EMISSIONS
≈ 5 Gt CO₂



LEGEND

RAIL

AIR

ROAD

SEA

HEAVY-DUTY
VEHICLES

LIGHT-DUTY
VEHICLES

Sources:

ICCT (2014). Global Transportation Roadmap Model. Version 2.0. More information available at <http://www.theicct.org/global-transportation-roadmap-model>.

IEA (2012). CO₂ Emissions from Fuel Combustion: Highlights. 2012 edition. Retrieved from <https://www.iea.org/co2highlights/co2highlights.pdf>.

Global Fuel Economy Initiative (GFEI) target: Doubling the fuel efficiency by 2030

THE GFEI FUEL ECONOMY TARGETS

From 2005 baseline:



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

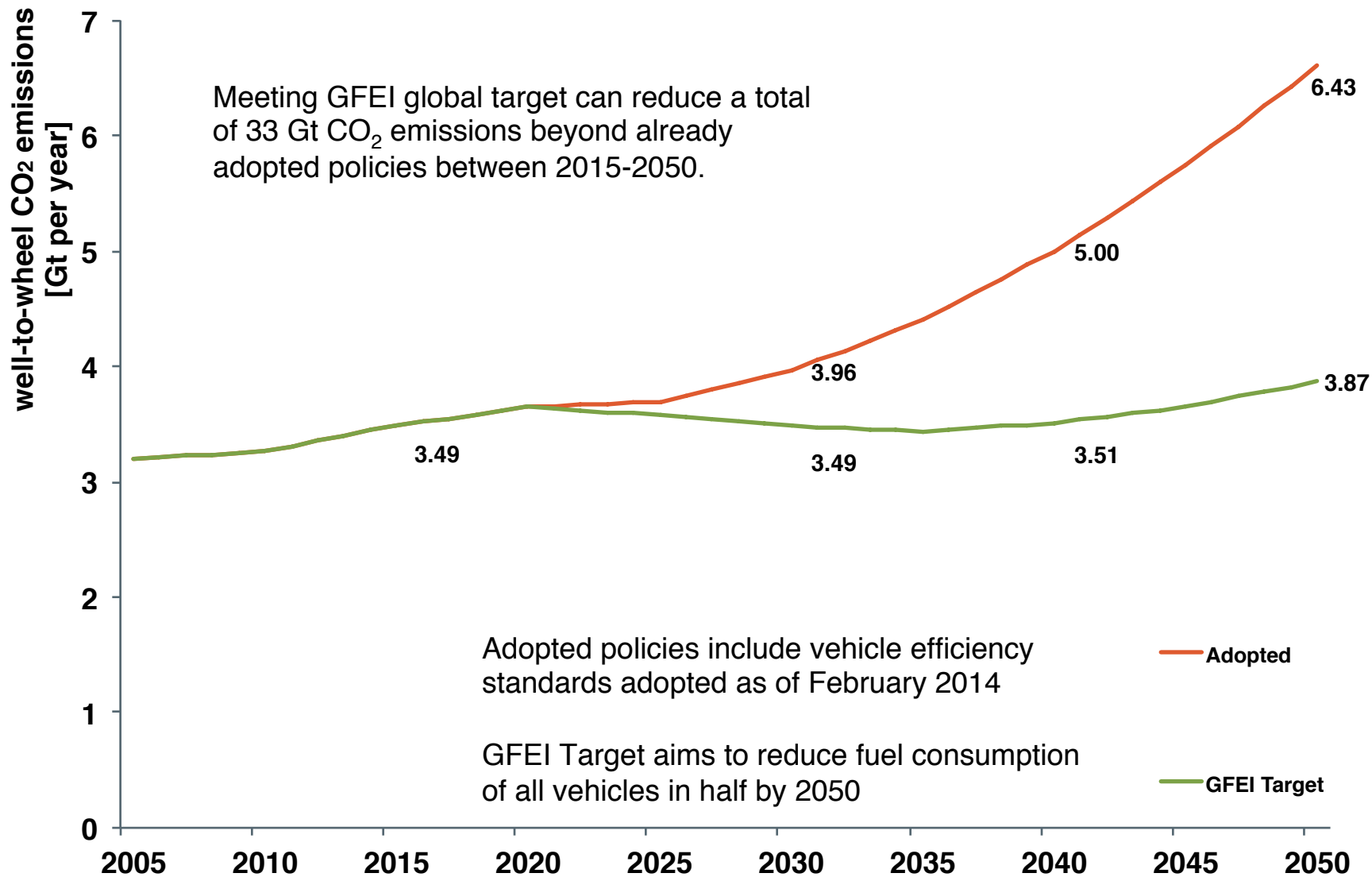


by 2030 in all new cars globally

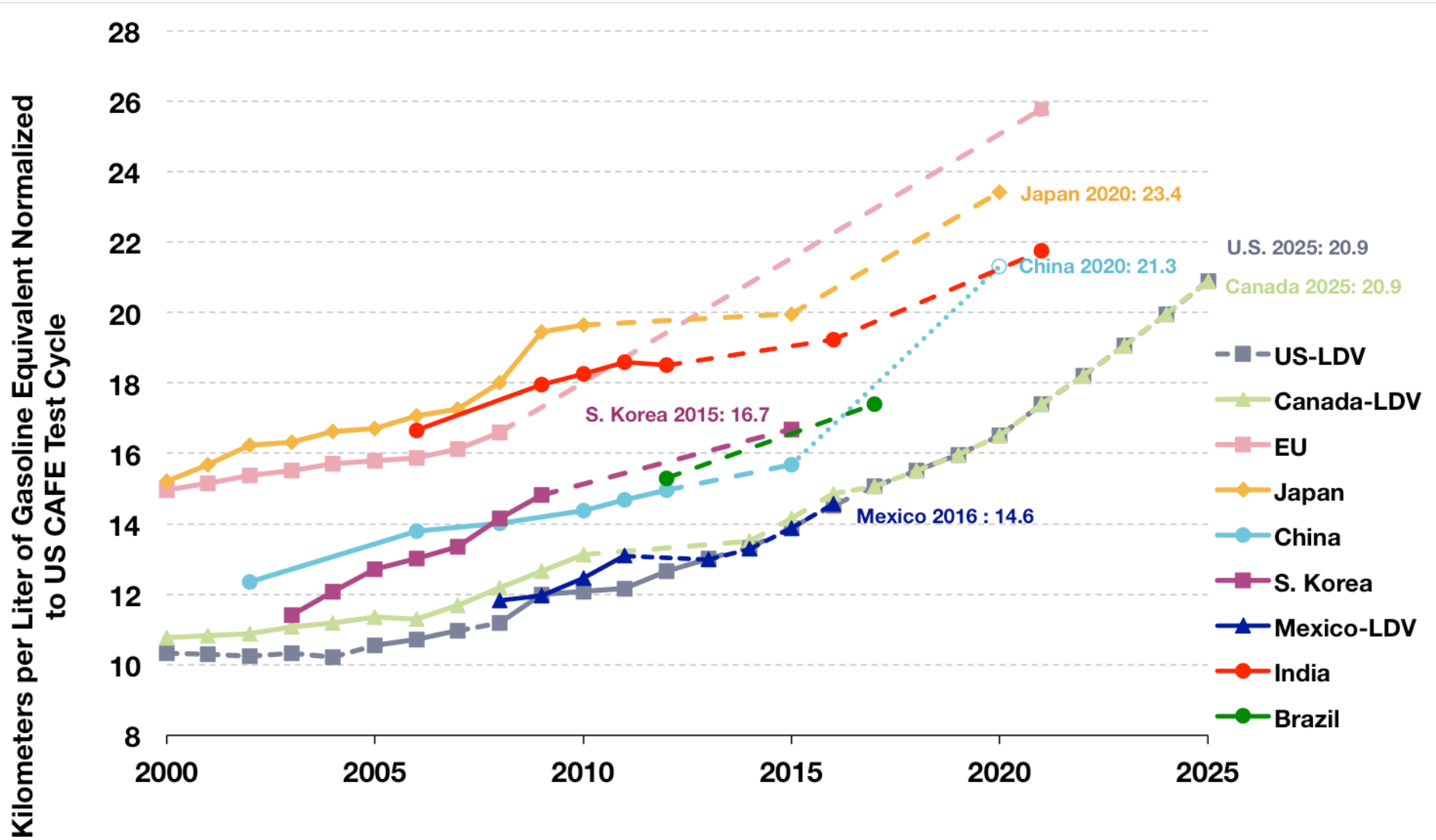


by 2050 in all cars globally

Meeting GFEI targets can stabilize global LDV CO₂ emissions, despite doubling of vehicle fleet.



Fuel Economy Standards Worldwide

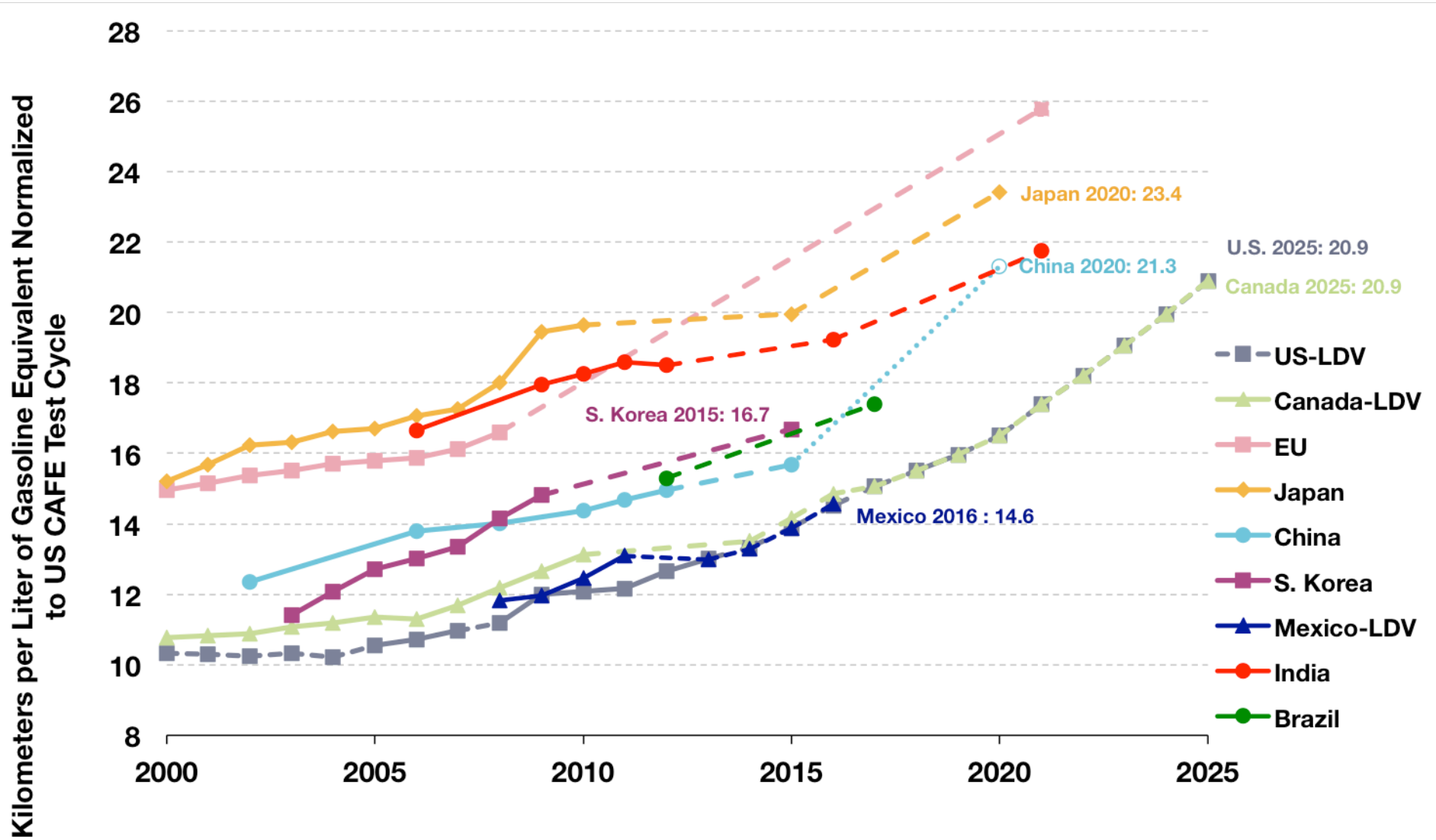


Emission Standards Keys

- Needed to fix market imperfections
 - Pollution
 - Energy security (tax alternative)
 - Climate change (tax alternative)
 - Coordination problem for vehicle manufacturers
- Manufacturers need lead time
 - Long-term indicative targets very useful for planning production



Fuel Economy Standards Worldwide



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