



THE INTERNATIONAL COUNCIL  
ON CLEAN TRANSPORTATION



International  
Energy Agency



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Transport Forum



FIA Foundation  
for the Automobile and Society



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THE INTERNATIONAL COUNCIL  
ON CLEAN TRANSPORTATION



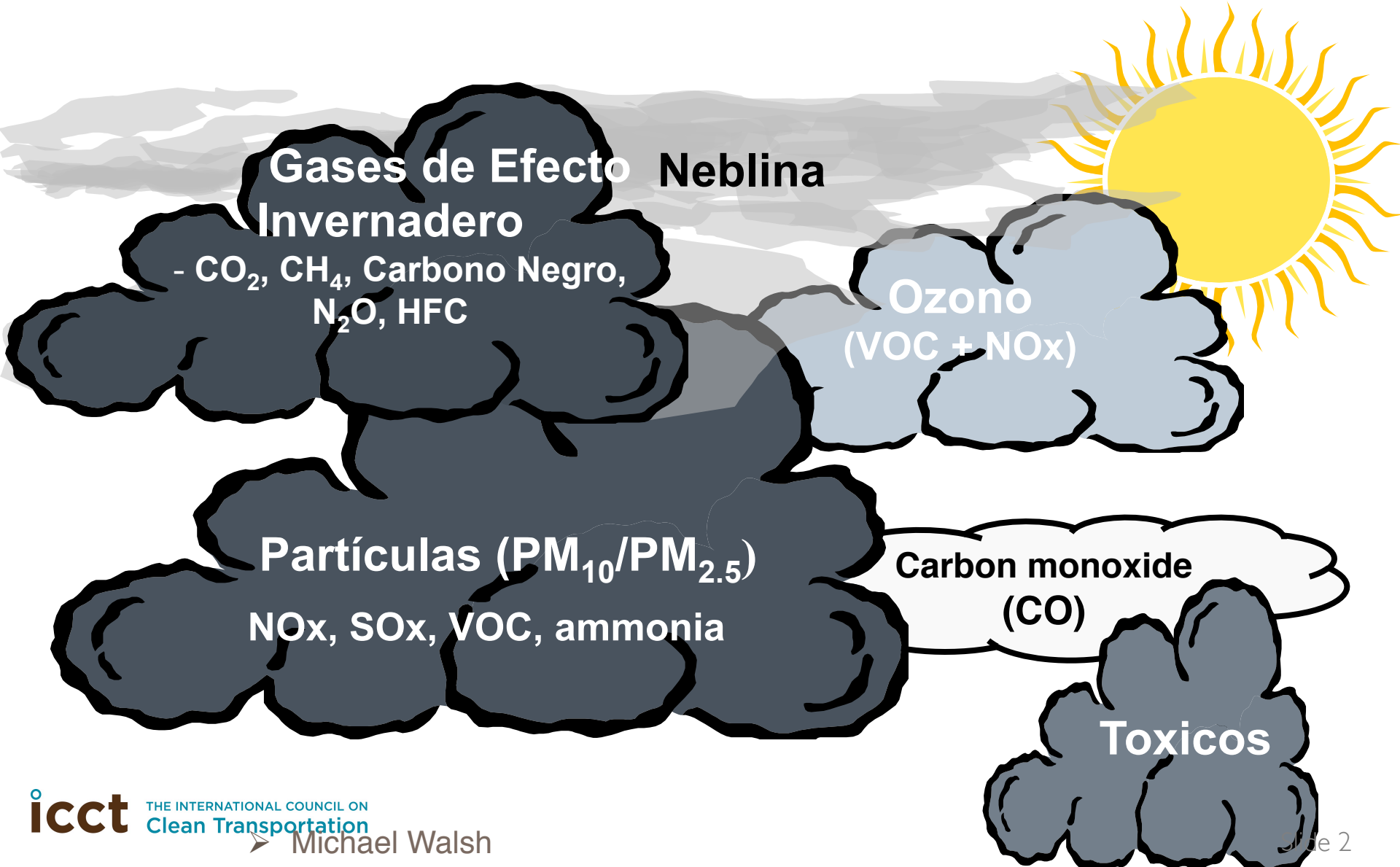
CLIMATE AND CLEAN AIR COALITION  
TO REDUCE SHORT-LIVED CLIMATE POLLUTANTS

icct THE INTERNATIONAL COUNCIL ON  
Clean Transportation



# ¿Cuáles son los contaminantes de interés?

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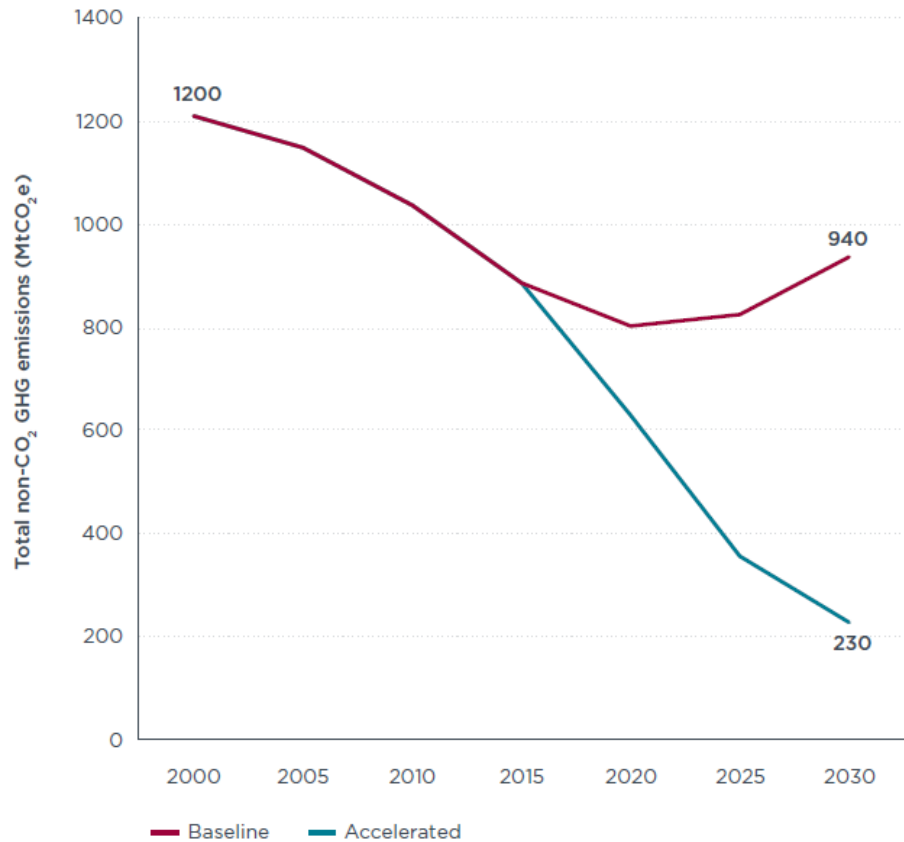


# Diesel exhaust harmful to health and climate



- Globally, diesel vehicles produce 90 percent of PM and 95 percent of BC emissions (ICCT Health Roadmap)
- One kg of black carbon causes as much climate impact in the near term as 3,200 kg of carbon dioxide (Forster, et al.)
- BC is the second largest contributor to climate warming from human activities (Bond, et al.)

Vehicle Non-CO<sub>2</sub> GHG emissions (2000-2030)

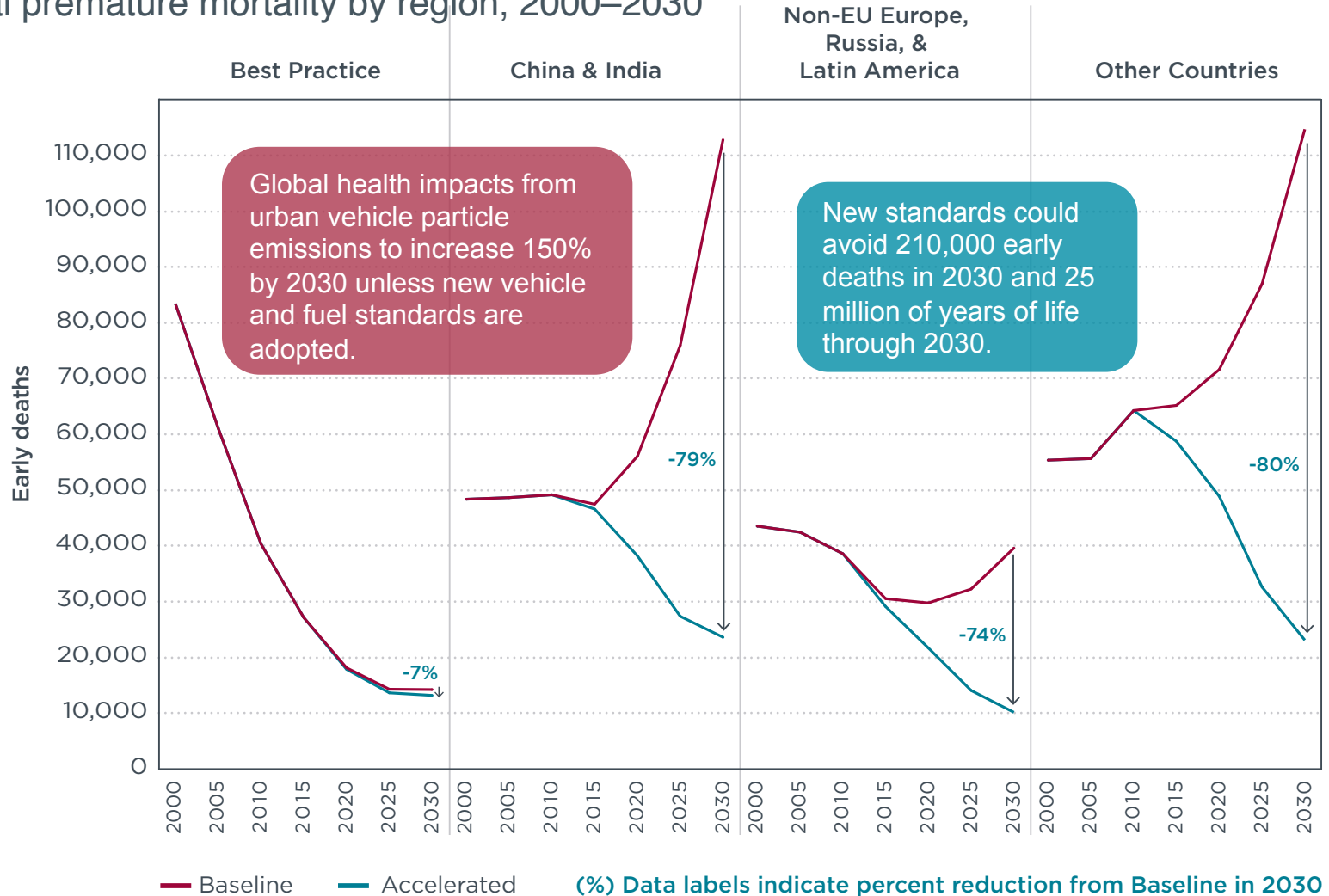


Calculated using GWP-20. Non-CO<sub>2</sub> GHGs include BC, CH<sub>4</sub>, N<sub>2</sub>O, OC, SO<sub>2</sub>

[theicct.org/global-health-roadmap](http://theicct.org/global-health-roadmap)

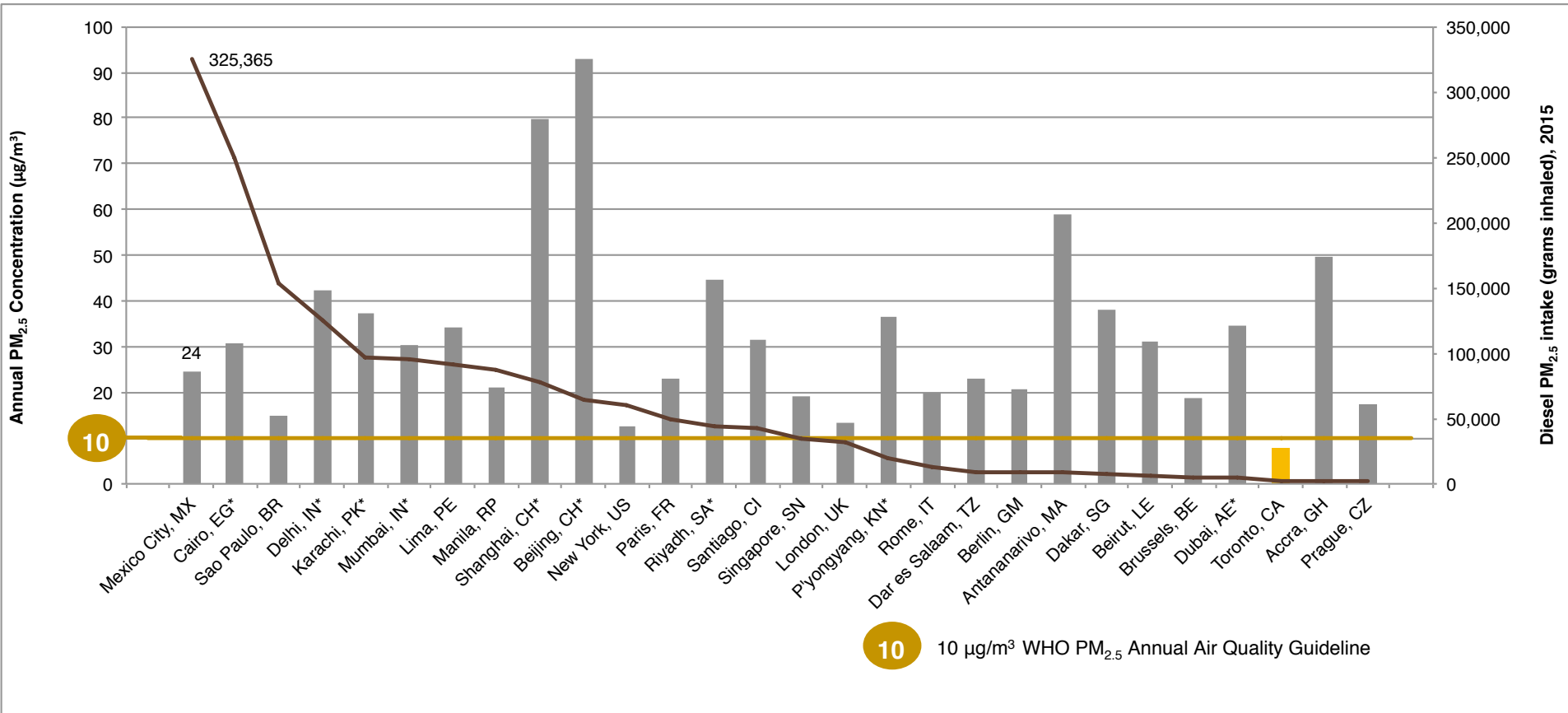
# National vehicle emission control programs

Annual premature mortality by region, 2000–2030



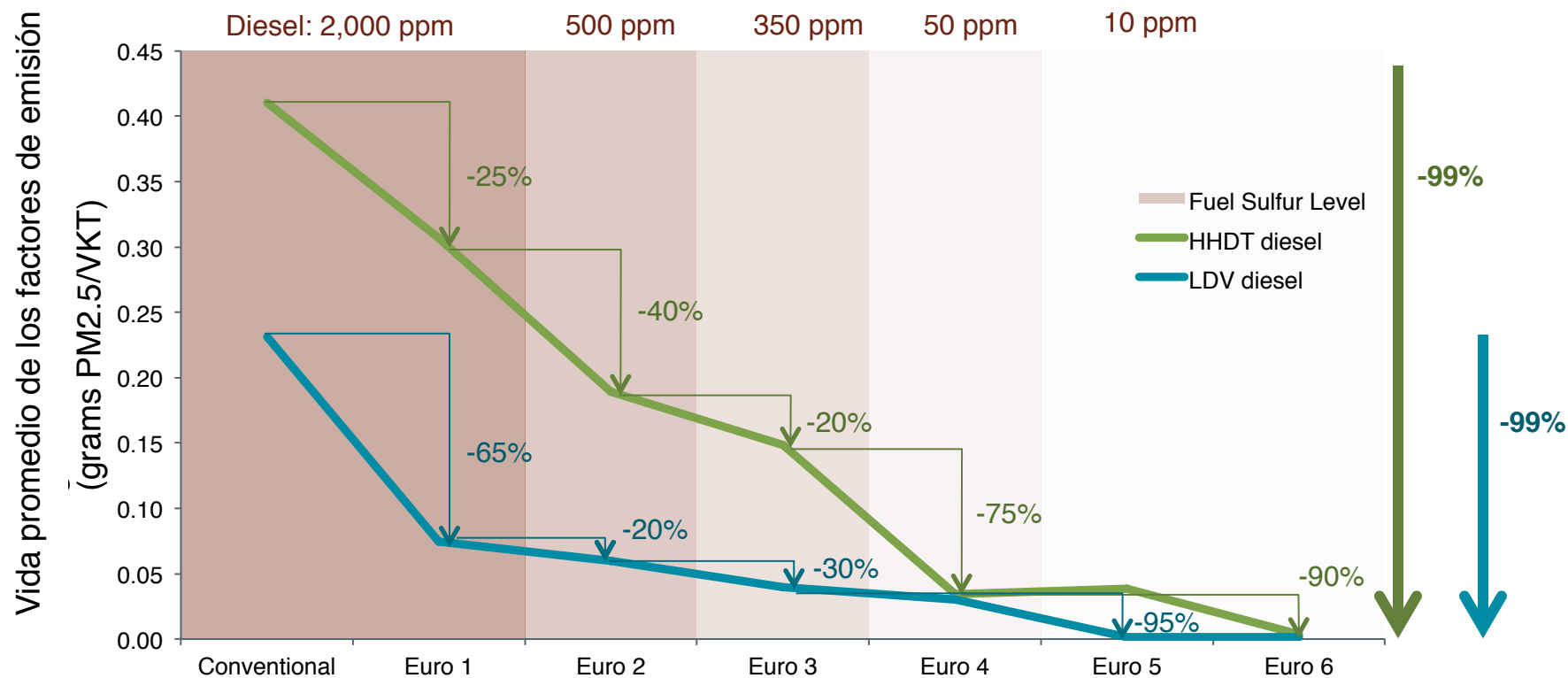


# Exposure to Diesel Emissions Changes How We See Air Pollution in Large Cities



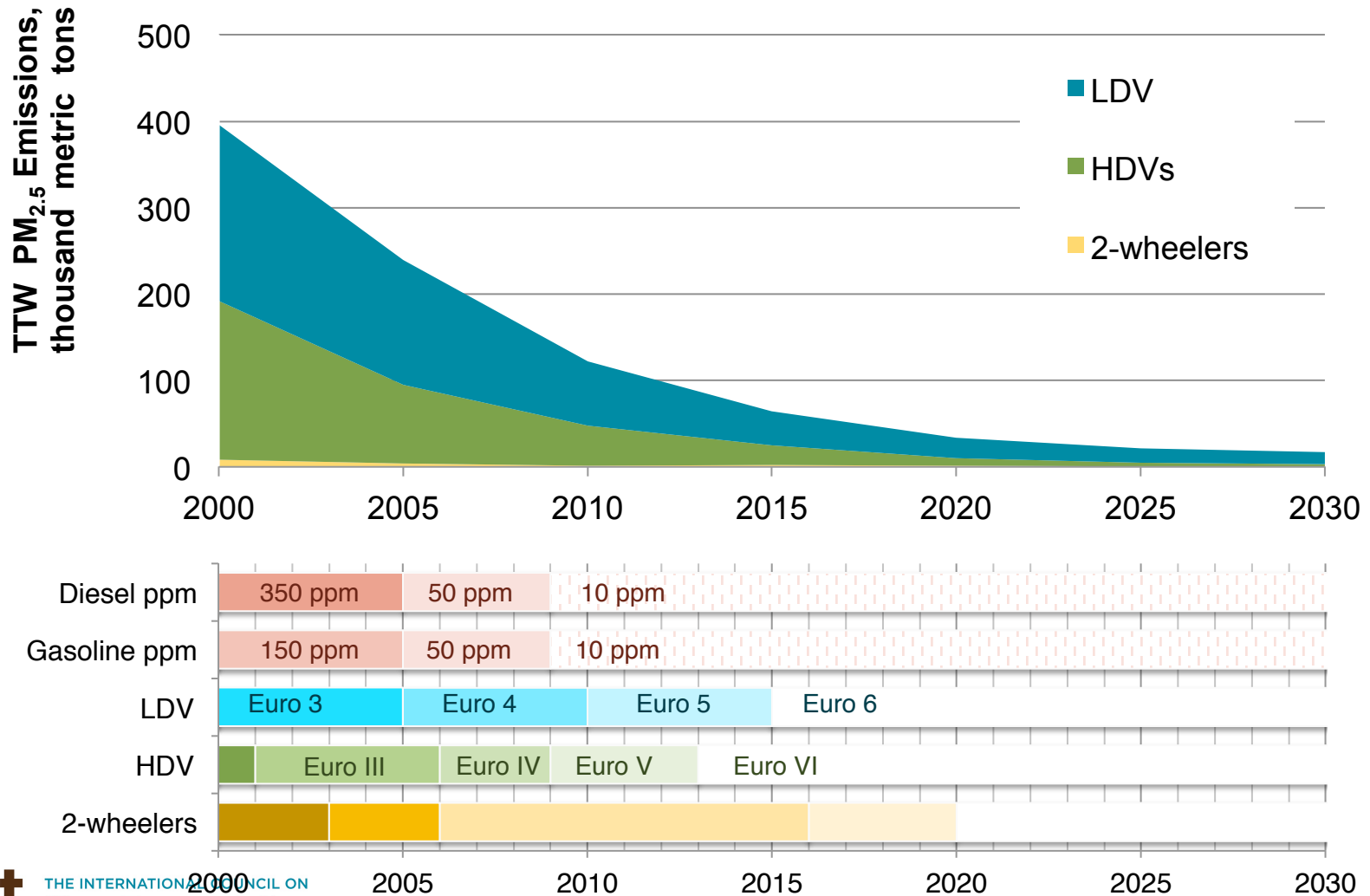
# Los estándares de emisiones en los vehículos nuevos ofrecen un gran potencial de reducción

- Los programas europeos y estadounidenses son ejemplares en forzar la mejora tecnológica
- El estándar Euro sigue una tendencia como se muestra más abajo

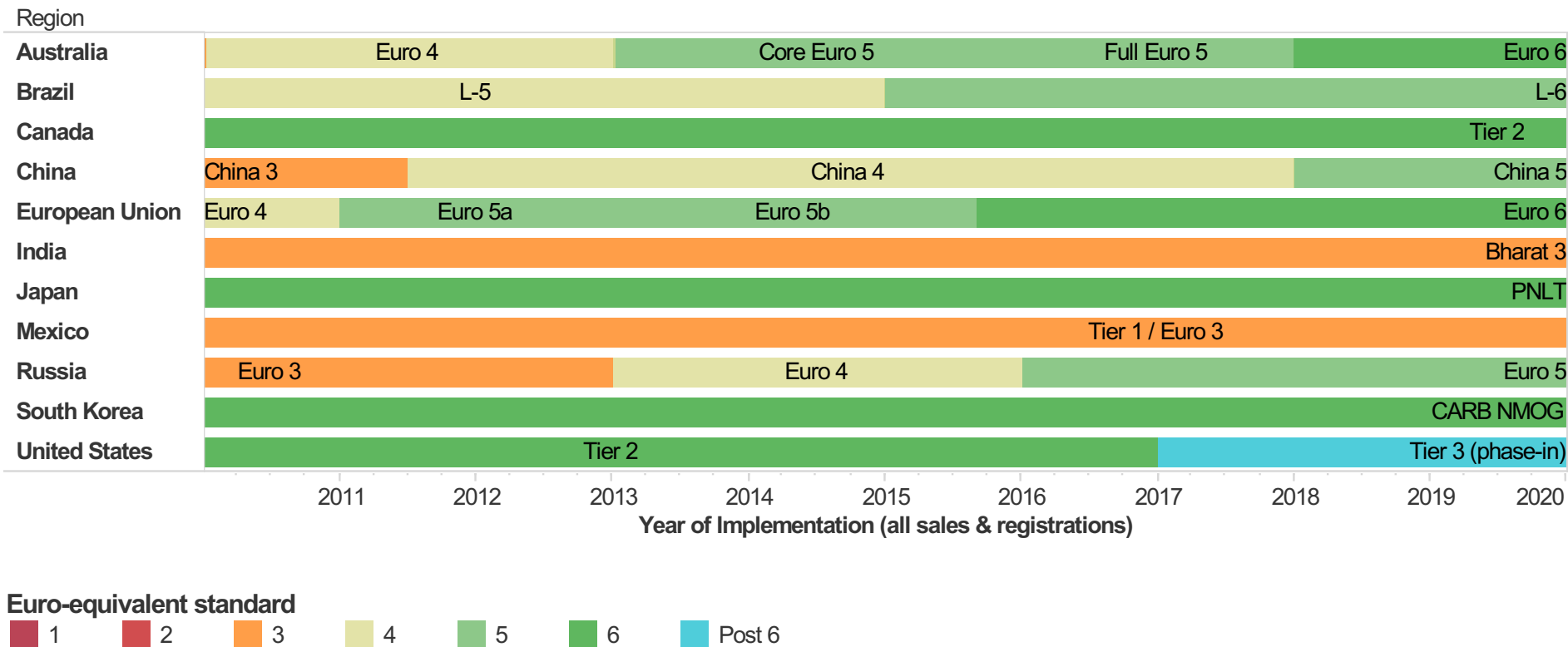


# Full Effects Take Time To Realize

## On-road Emissions and Emission Standards in the EU



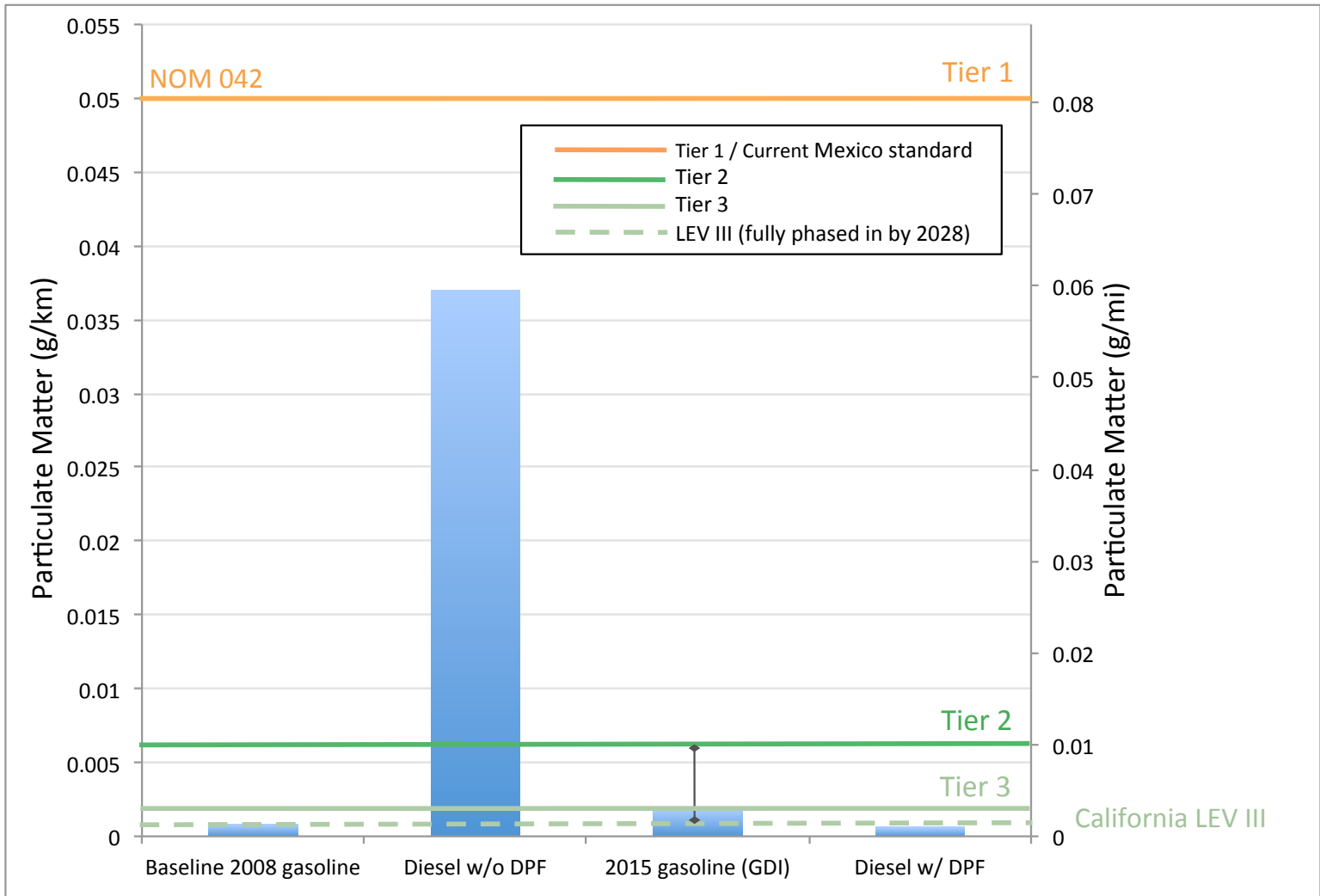
# Timeline for implementation of nationwide emissions standards for light-duty vehicles



Source: TransportPolicy.Net



# PM standards for diesel passenger vehicles



# Impact of fuel sulfur

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- Diesel fuel quality
  - 15 ppm required for Tier 2 and beyond diesel vehicles.
  - Higher sulfur will increase emissions rapidly and could damage vehicle.
- Gasoline fuel quality
  - 30 average / 80 maximum for Tier 2
  - 10 average / 80 maximum for Tier 3
  - Sulfur locks up the precious metal sites on the catalyst, reducing catalyst efficiency. Important benefits from better catalysts even with higher sulfur fuels.
  - Impacts of higher sulfur fuels are completely reversible. Possible to phase in cleaner fuels and vehicles at the same time.

# Fundamentals of controlling air pollutant emissions from motor vehicles

## New vehicle standards

Must consider emissions from all mobile sources: on-road, off-road, marine, locomotives, aviation, construction...

Limit values only as good as:

- Compliance and enforcement
- Real-world performance

## Fuel quality standards

High fuel quality (especially low sulfur levels) enables advanced emission control technologies to be deployed in the fleet.

Fuel quality compliance programs critical to prevent damage to engines and prevent misfueling

## “Systems Approach”

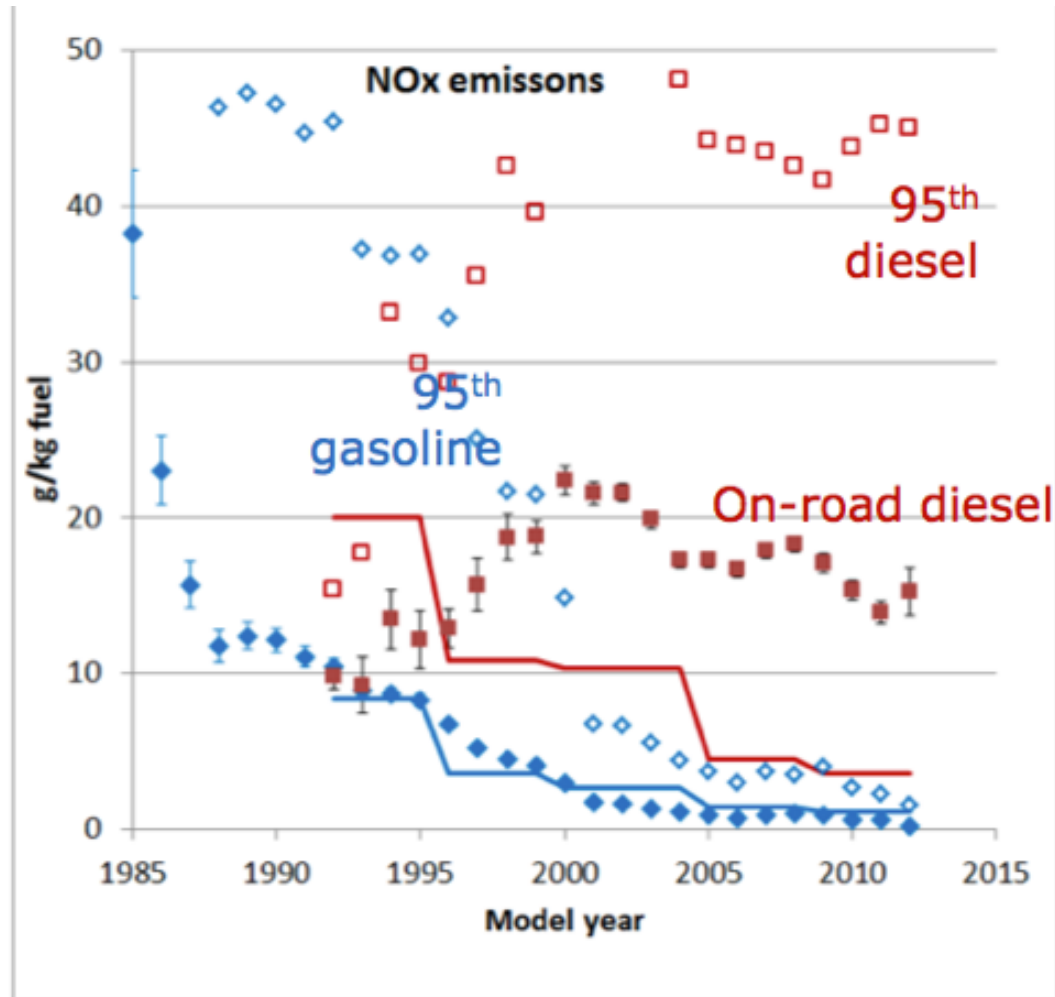
## In-use vehicle emission control

Measures include:

- Catching gross-emitters (I/M, remote sensing, maintenance)
- Cleaner fuels
- Fleet renewal
- Retrofit programs
- Complementary strategies (low emission zones, driver training, etc.)

Not shown but also important: transportation demand management, modal shift, traffic optimization, and more

# Real-world emissions



# Options to reduce transport emissions

Objective	Program	Form	PM	BC	CO <sub>2</sub>
New vehicles	Stringent standards	Mandatory; federal	✓	✓	
Existing vehicles	Lower sulfur fuels	Government implemented; generally federal	✓		
	Retrofits for PM and NOx control	Generally voluntary; local; fiscal incentives	✓	✓	
	Transporte Limpio/ SmartWay	Generally voluntary; federal and local collaboration; fiscal incentives	✓	✓	✓
	Accelerated fleet renovation/Scrappage	Voluntary or mandatory; local or federal; fiscal incentives	✓	✓	
	I/M, remote sensing, spotter programs	Mandatory; generally local	✓	✓	✓
Complementary measures	Low Emission Zones	Mandatory; local	✓	✓	
	Anti-idling restrictions	Mandatory; local	✓	✓	✓
	Driver training program	Voluntary; local			✓
Demand and mode shifting	Congestion relief measures	Range from mandatory to voluntary to government-implemented; local	✓	✓	✓
	Improve non-motorized & public transit options	Government-implemented; local	✓	✓	✓
	Parking programs	Mandatory or fee-based; local			✓

# ¡Gracias!

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# NOM-042 vigente (opciones de EPA y Euro)

Standard	Class	CO	NMHC	NO <sub>x</sub>		PM							
		All	All	Gasoline	Diesel	Diesel							
A	PC	Tier 1	Tier 1	Tier 1	Tier 1	Tier 1							
	CL1					Tier 1 (100k) <sup>a</sup>							
	CL2												
	CL3												
	CL4		Tier 1 (100k) <sup>a</sup>										
B	PC	Tier 2 Bin 5–10 <sup>b</sup>	Tier 2 Temporary Bin 10 <sup>b</sup>	Tier 2 Temporary Bin 10 <sup>b</sup>		Tier 1							
	CL1					Tier 1 (100k) <sup>a</sup>							
	CL2		Tier 2 Temporary Bin 10 <sup>b</sup>										
	CL3	Tier 2 Temporary Bin 10 <sup>b</sup>											
	CL4												
C	PC	Tier 2 Bin 5–8	Tier 2 Bin 5–7		Tier 2 Bin 7		Tier 1						
	CL1						Tier 1 (100k) <sup>a</sup>						
	CL2		Tier 2 Bin 8		Tier 2 Temporary Bin 9 <sup>b</sup>								
	CL3												
	CL4												

<sup>a</sup> Tier 1 (100k) indicate values are taken from the higher emissions limits required in the US after 100,000 miles of use, but applied here after only 50,000 miles of vehicle use. As a result, these limits are less stringent than the US Tier 1 standard on which they are based.

<sup>b</sup> Bins 9 and above are temporary bins that are no longer allowed under the US Tier 2 regulation.

Standard	Class	CO		NMHC		NO <sub>x</sub>		PM
		Gasoline, LPG, NG	Diesel	Gasoline, LPG, NG	Diesel	Gasoline, LPG, NG	Diesel	Diesel
B	PC, CL1, CL2, CL3	Euro 3 <sup>a</sup>	Euro 3	Euro 3 <sup>a</sup>	Euro 3	Euro 3 <sup>a</sup>	Euro 3	Euro 3
C	PC, CL1, CL2, CL3	Euro 4	Euro 4	Euro 4	Euro 4	Euro 4	Euro 4	Euro 4

<sup>a</sup> These standards are somewhat more stringent than Euro 3 but not as stringent as Euro 4.

# NOM 042 vigente, línea de tiempo

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## Phase-In Schedule of Light-Duty Vehicles Meeting B Standards

Standard	2007	2008	2009	2010
A	75%	50%	30%	0%
B	25%	50%	70%	100%

## Phase-In Schedule of Light-Duty Vehicles Meeting C Standards

Standard	Year 1	Year 2	Year 3	Year 4
A+B	75%	50%	30%	0%
C	25%	50%	70%	100%

# US and Mexico standards for NOx and PM

