

The Global Fuel Economy Initiative



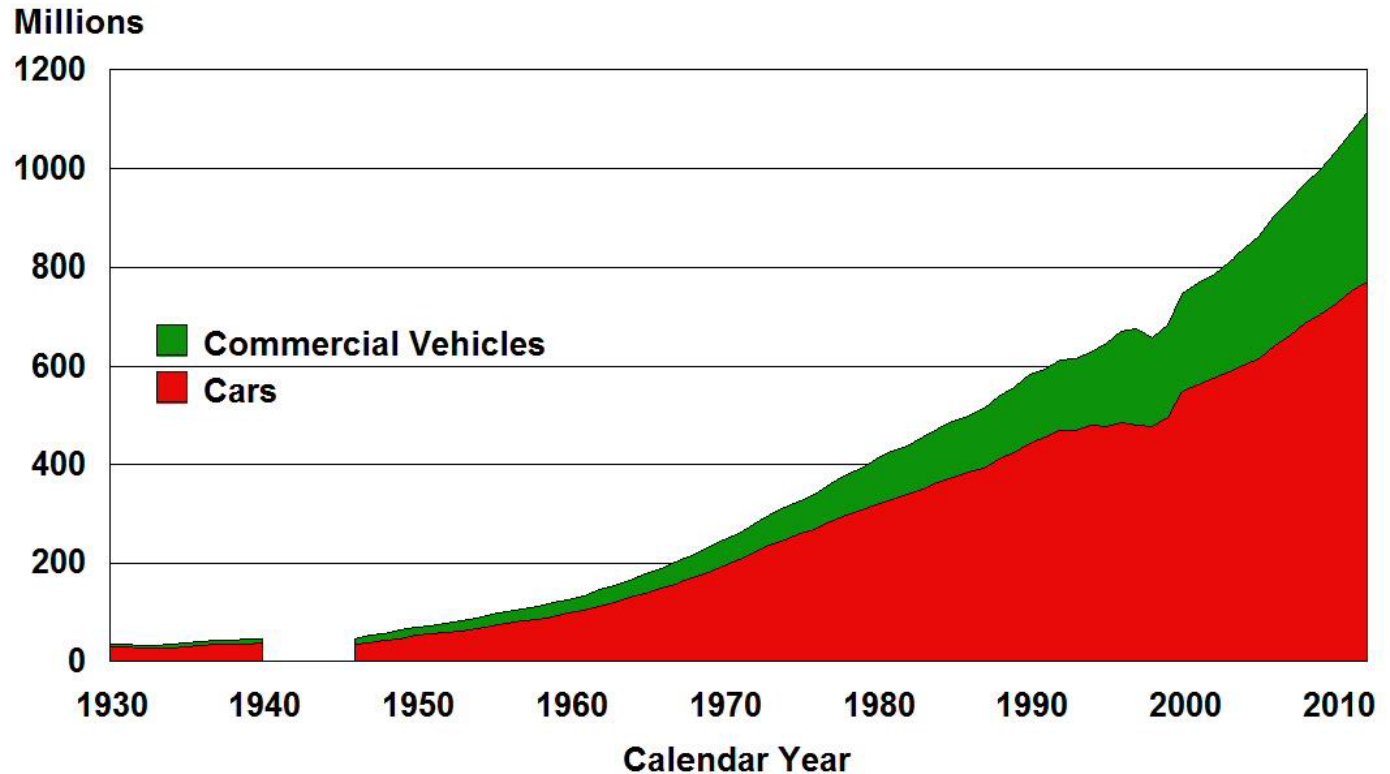
Jane Akumu – UN Environment



Historical High Growth Has Made Vehicles An Important Contributor To Local, Regional and Global Pollution

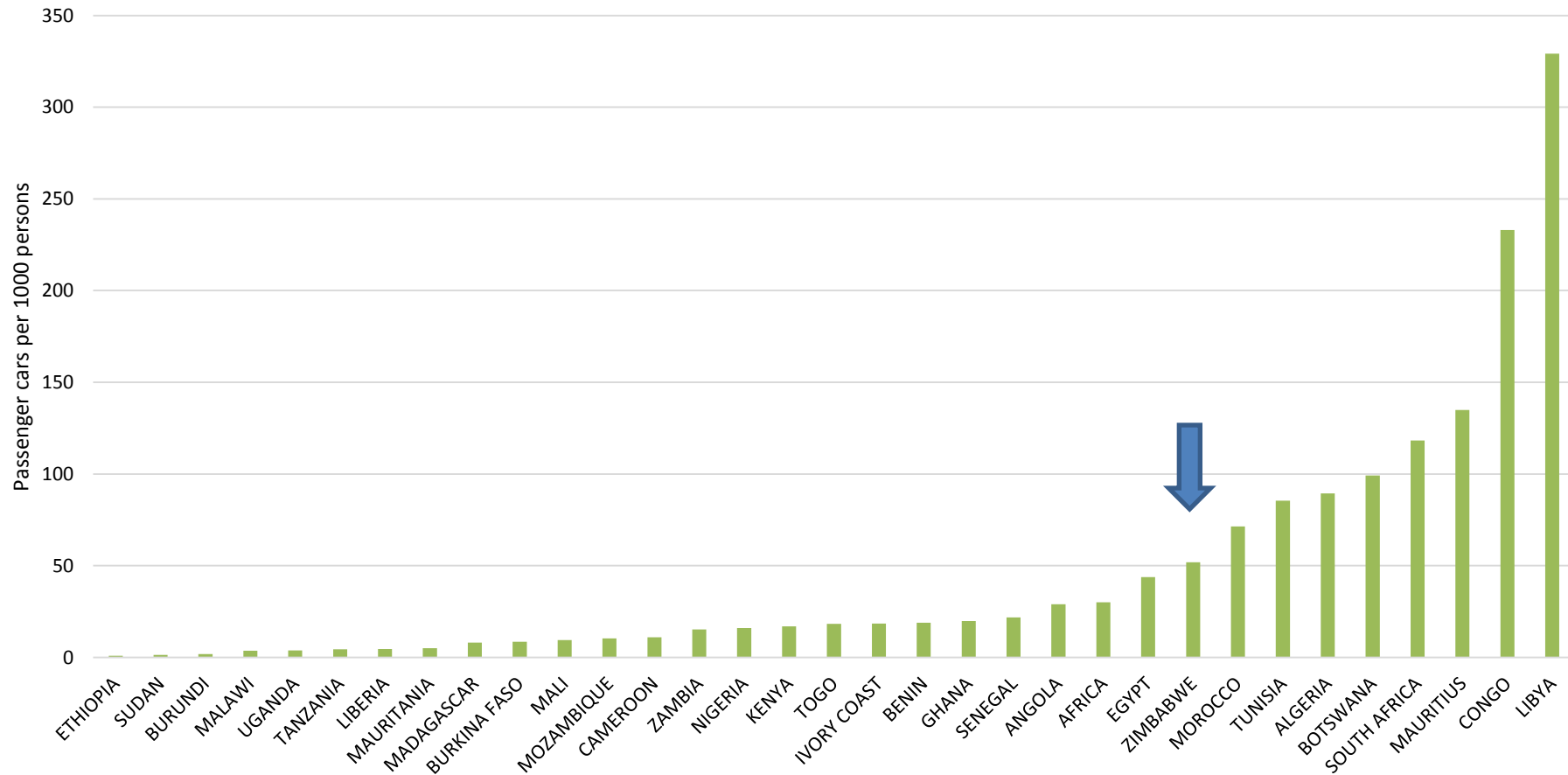
World Population of Cars, Trucks and Buses

- **Vehicle fleet to triple** (from ~1 billion to ~3 billion)
- **90%+ of growth in non-OECD countries**
- **Very few non-OECD countries have policies**



Source: Mike Walsh

Motorization in Africa





Local solutions exist



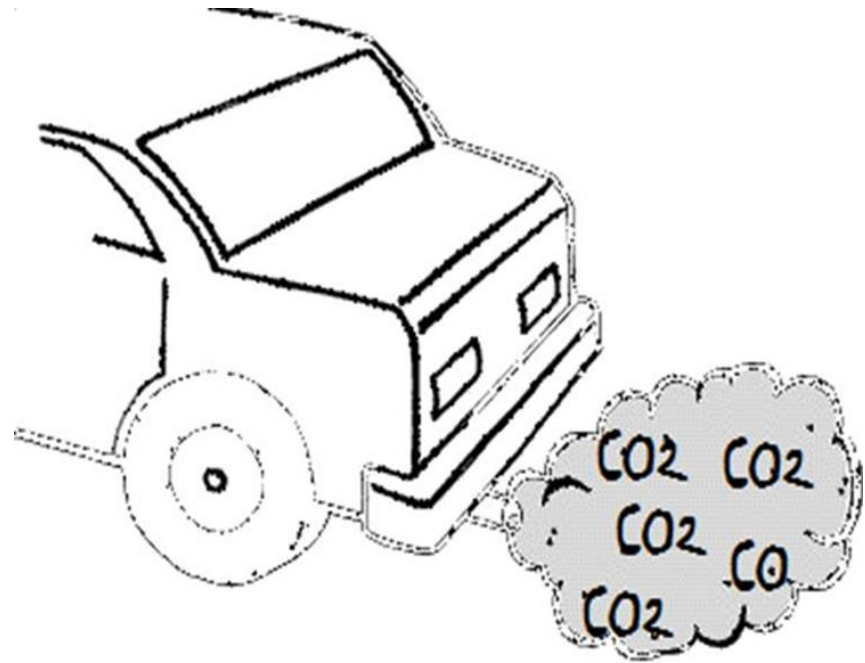
Environmental Impact of Transport

Air Quality & Health

- Largest source of air pollution in cities, exceeding WHO standards and costing more than 5% GDP

Climate Change

- Responsible for 23% global CO₂ emissions & fastest growing sector in GHG emissions, 2.5% yearly until 2020



Reducing Vehicle Emissions

- **Air Quality Improvements**

- Cleaner fuels
 - Leaded petrol elimination
 - Sulphur reduction
- Cleaner vehicles technologies
- Vehicle emission standards and measurement

- **Climate Change**

- Fuel efficient vehicles
- Eco driving
- Traffic management etc.

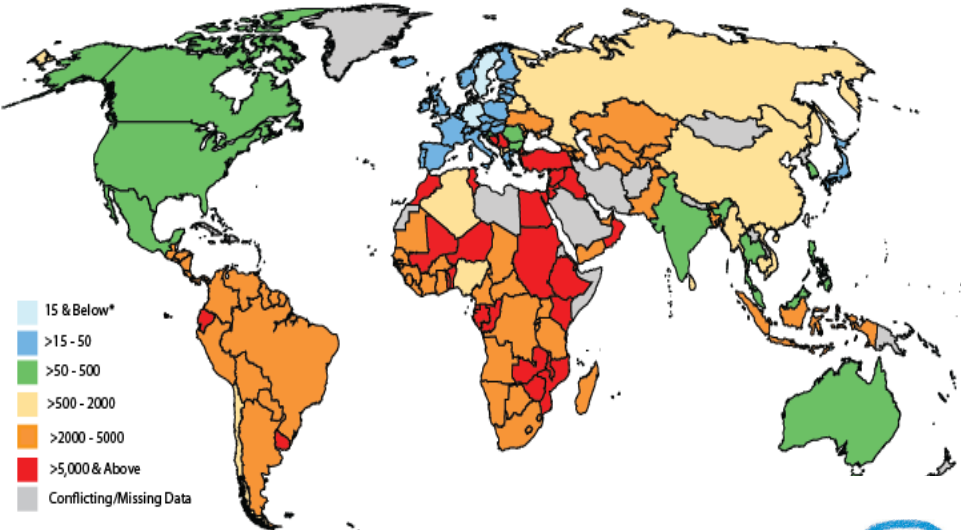




Diesel Fuel Sulphur Levels: Global Status 2005



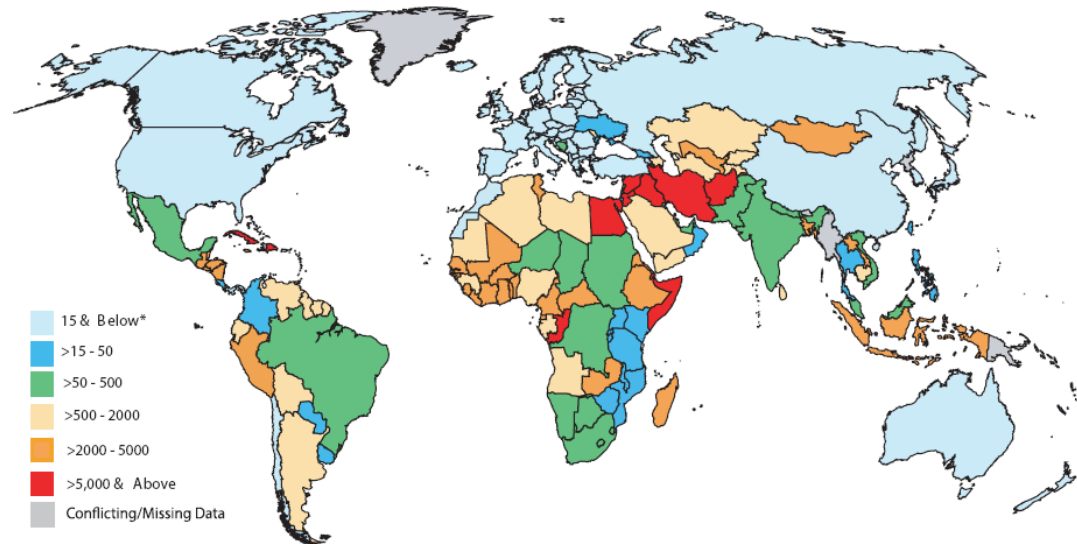
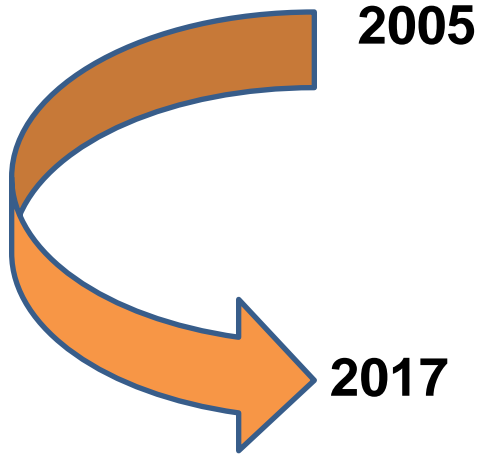
Progress towards Low Sulphur Diesel



* Information in parts per million (ppm)

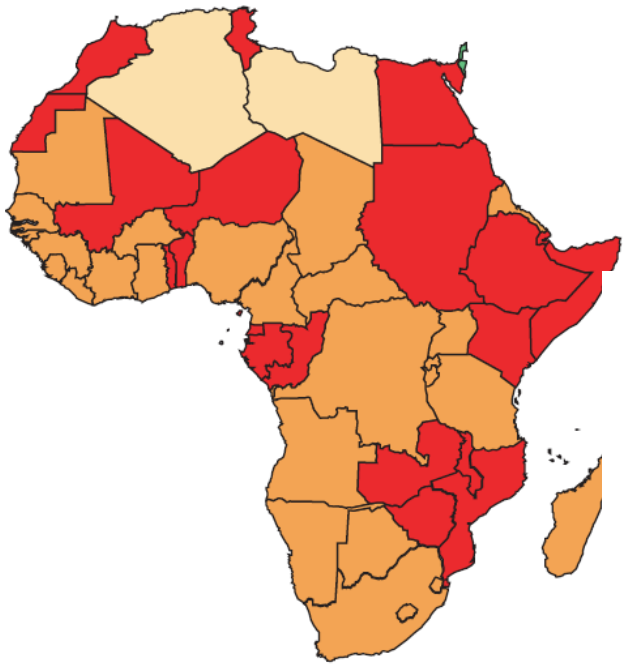


Diesel Fuel Sulphur Levels: Global Status
October 2017

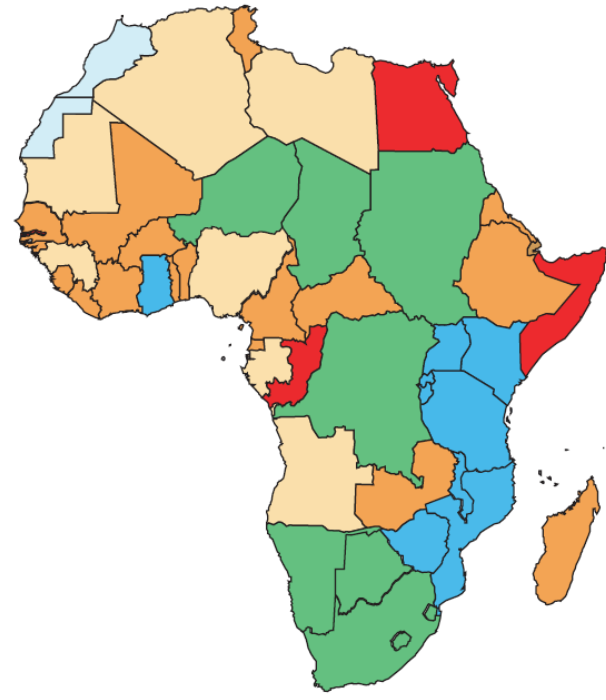


* Information is in parts per million (ppm)
For additional details and comments per country, visit www.unep.org/transport/pcfvl

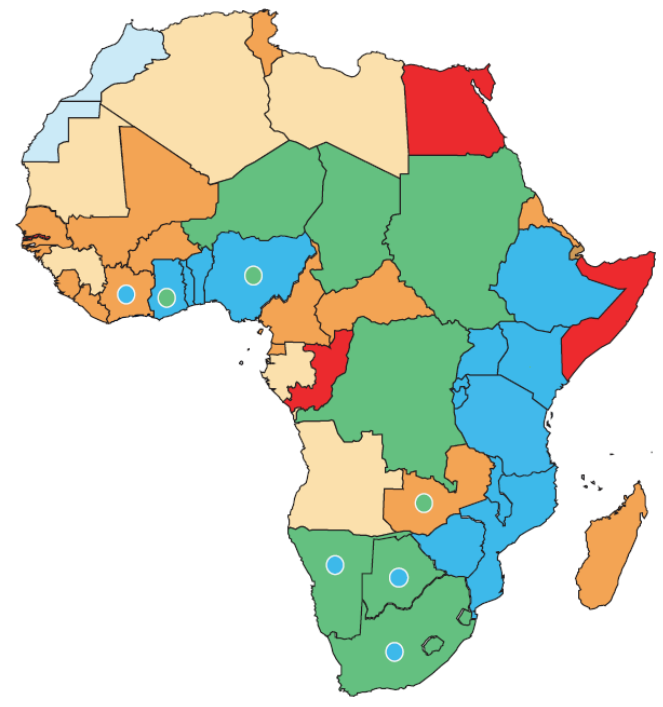
Progress in Lowering Sulphur in Diesel in Africa



2002



1 Nov 2017



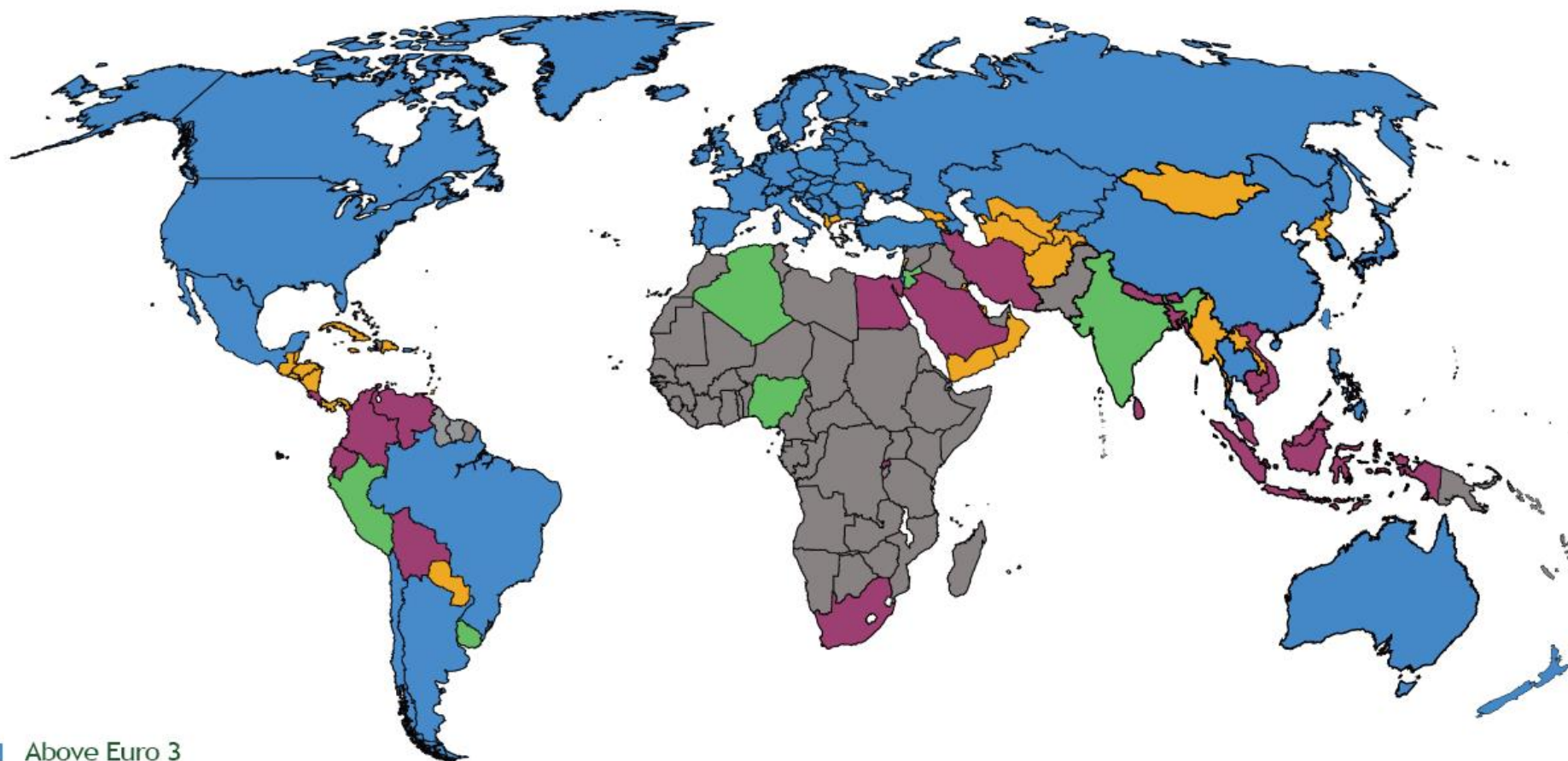
Commitments 2017/2018

- 15 & Below*
- >15 - 50
- > 50 - 500
- > 500 - 2000
- > 2000 - 5000
- > 5,000 & Above

* Information in parts per million (ppm)

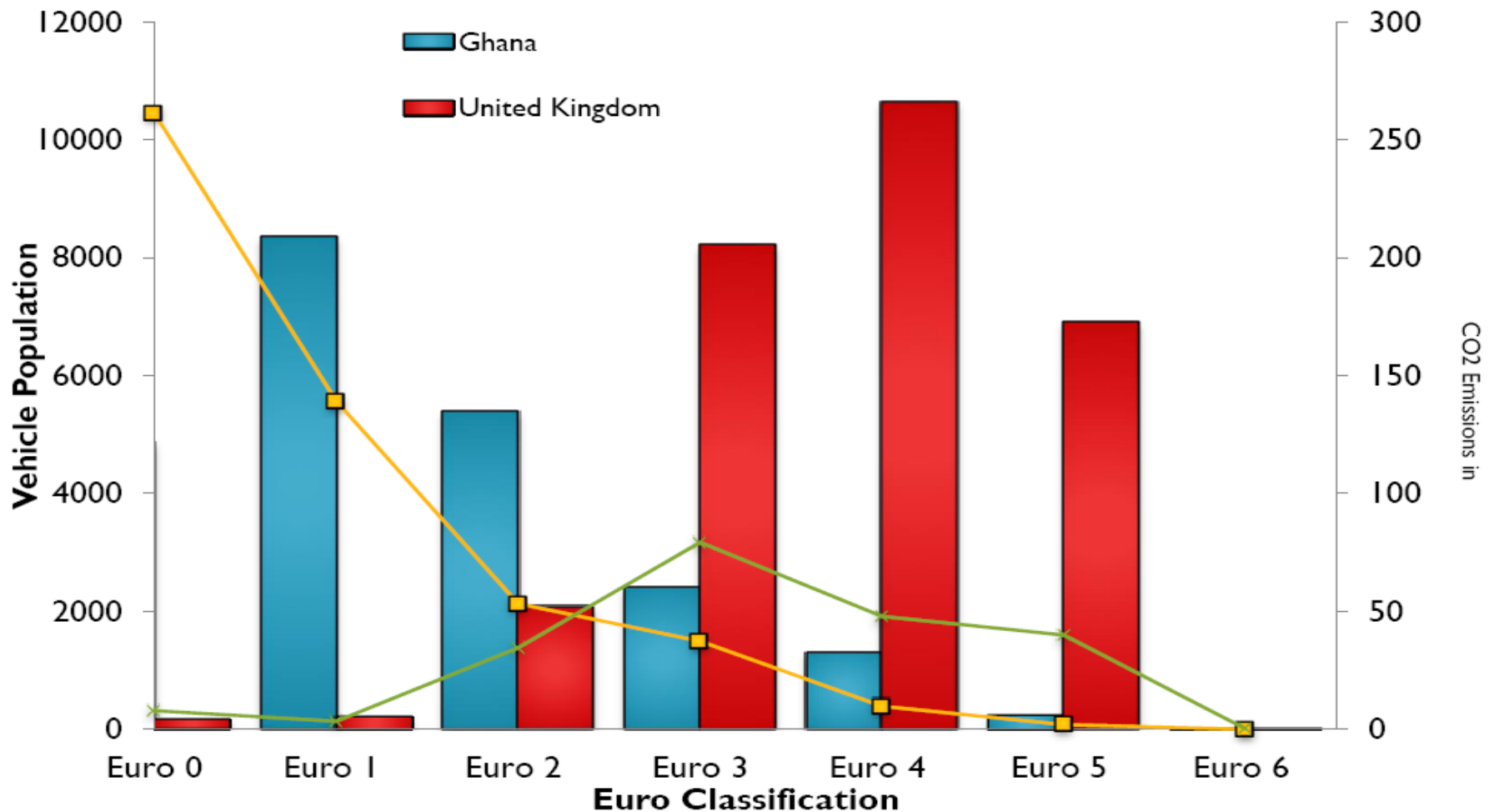
Vehicle Emissions Standards

June 2017

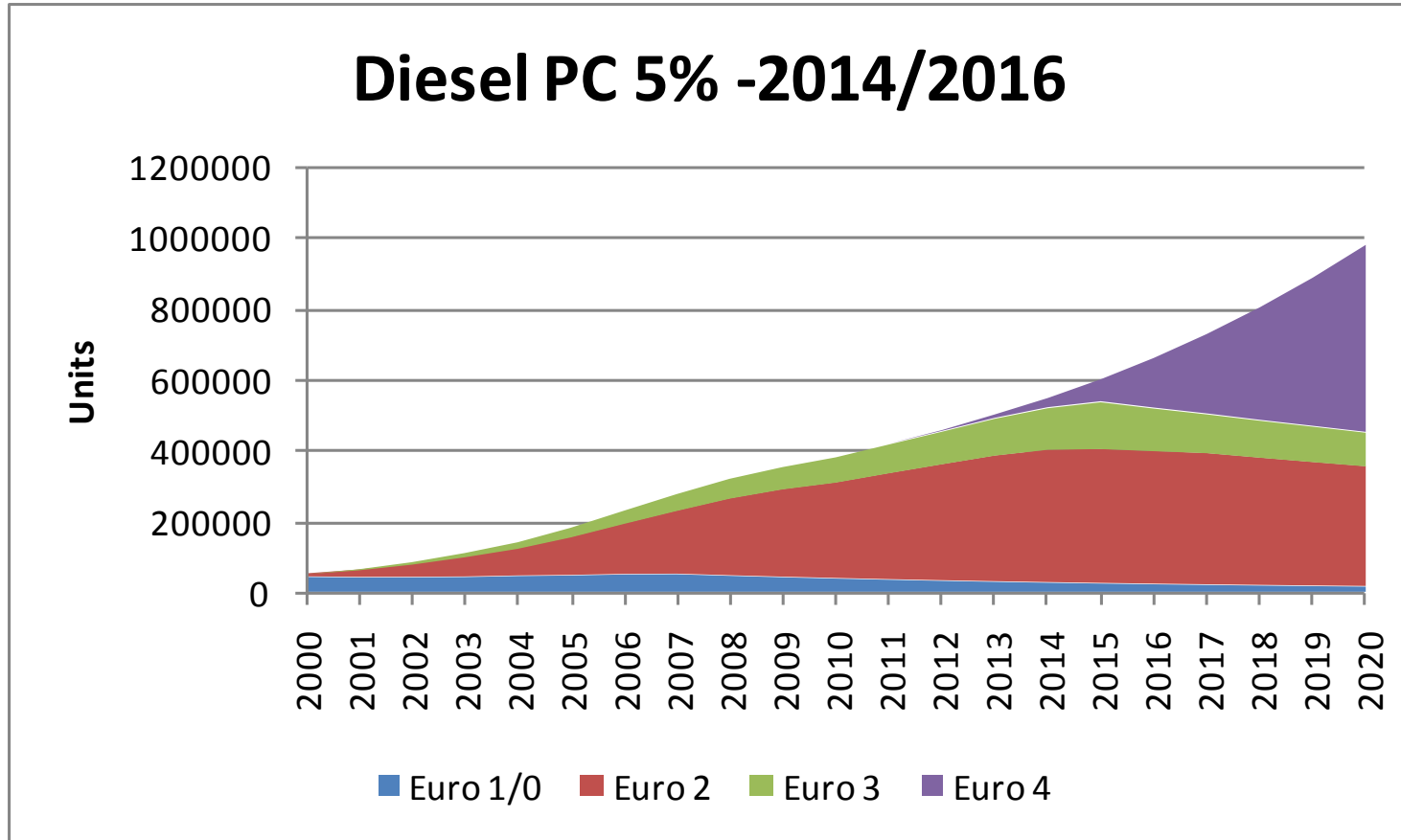


- Above Euro 3
- Euro 3
- Below Euro 3
- No Policy
- Unkown

VEHICLE POPULATION IN GHANA AND REGIONAL STATISTICS



South Africa - Diesel PC Parc 5% growth (Euro 4 Homologation – 2014)



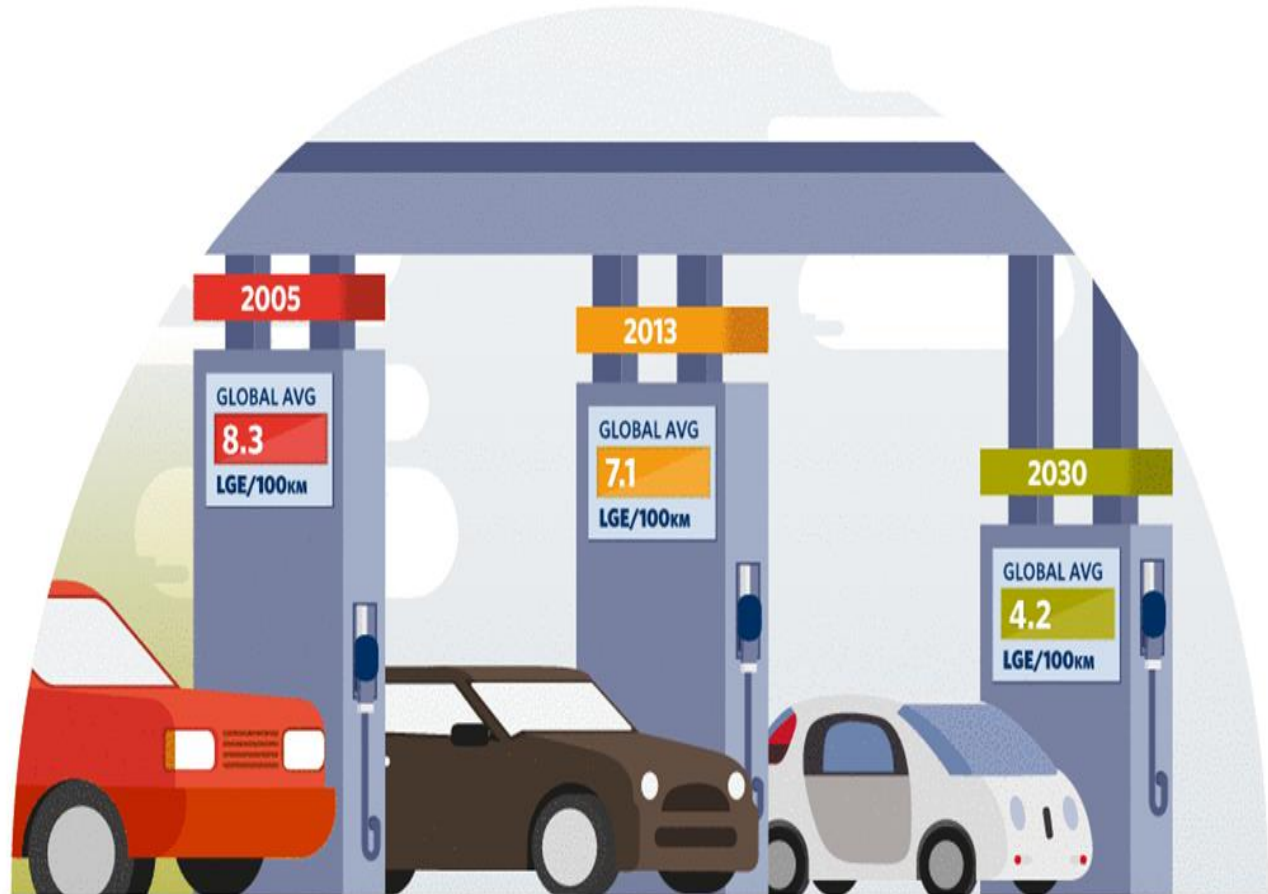
Source: SAPIA/NAAMSA car park study 2009

**THE GLOBAL GOALS:
FUEL ECONOMY**



**DOUBLE
AVERAGE
FUEL
ECONOMY**

**OF NEW CARS BY 2030
AND ALL CARS BY 2050**



Doubling the efficiency of the global car fleet by 2050

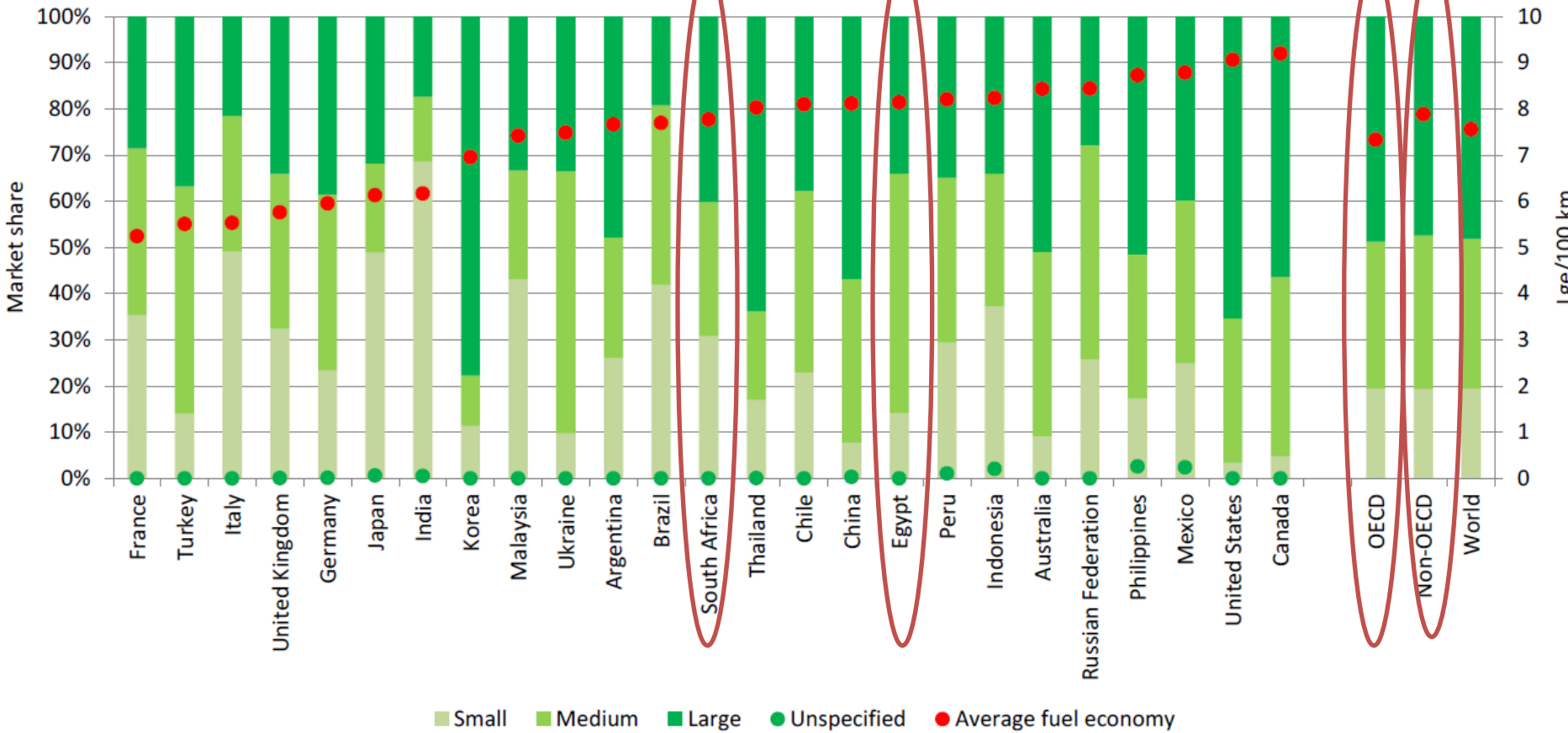


			2005	2008	2010	2012	2014	2015	2030
OECD & EU average	average fuel economy (Lge/100km)		8.8	8.2	7.8	7.6	7.4	7.3	
	annual improvement rate (% per year)		-2.3%	-2.8%	-1.6%	-1.3%	-0.5%		
		-1.8%							
Non-OECD average	average fuel economy (Lge/100km)		8.5	8.5	8.4	8.2	8.0	7.9	
	annual improvement rate (% per year)		-0.1%	-0.3%	-1.4%	-1.2%	-1.6%		
		-0.8%							
Global average	average fuel economy (Lge/100km)		8.8	8.3	8.1	7.8	7.6	7.6	4.4
	annual improvement rate (% per year)		-1.8%	-1.6%	-1.3%	-1.3%	-1.1%		
		-1.5%							
GFEI target	required annual improvement rate (% per year)	2005 base year	-2.8%						
		2015 base year							-3.7%

- **Slowing improvement in OECD countries**
- **Increasing improvement in non-OECD but not enough**
- **Still far from meeting the GFEI target**

Average fuel economy in new cars in selected countries

New cars by size by country in 2015



Source: IEA/ GFEI, 2017. Working Paper 15

Fuel Economy Levels

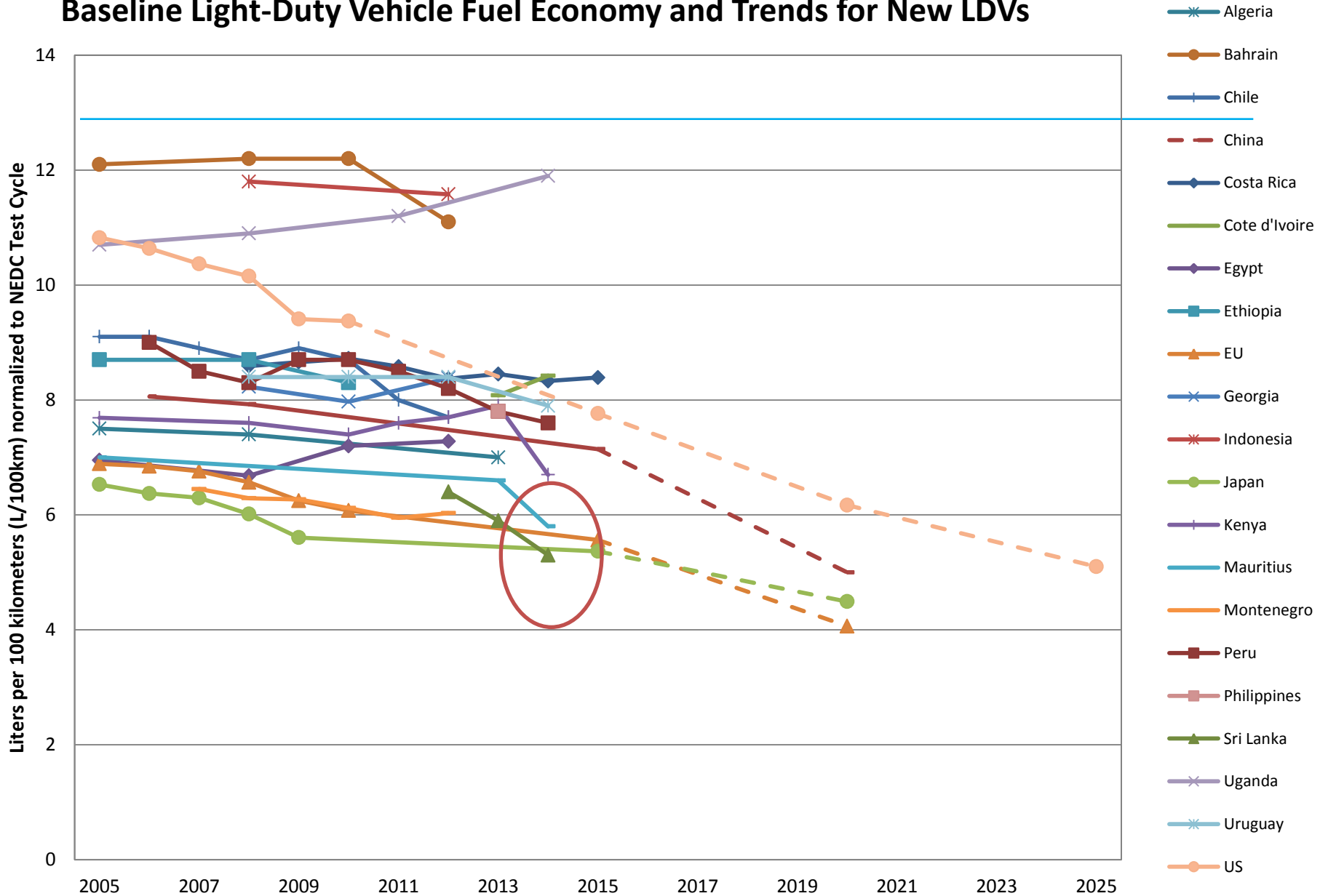
Global	2005	2008	2011	2013
Average (l/100km)	8.07	7.67	7.2	7.1
OECD Average	8.1	7.6	7.0	6.9
Non-OECD Average	7.5	7.6	7.5	7.2

Zimbabwe	2005	2008	2011	2013	2016
Average (l/100km)	8	7.6	8.6	8.5	8.4

Kenya	2010	2011	2012	2013	2014	2015	2016
Average (l/100km)	7.4	7.6	7.7	7.5	6.7	7.4	7.3

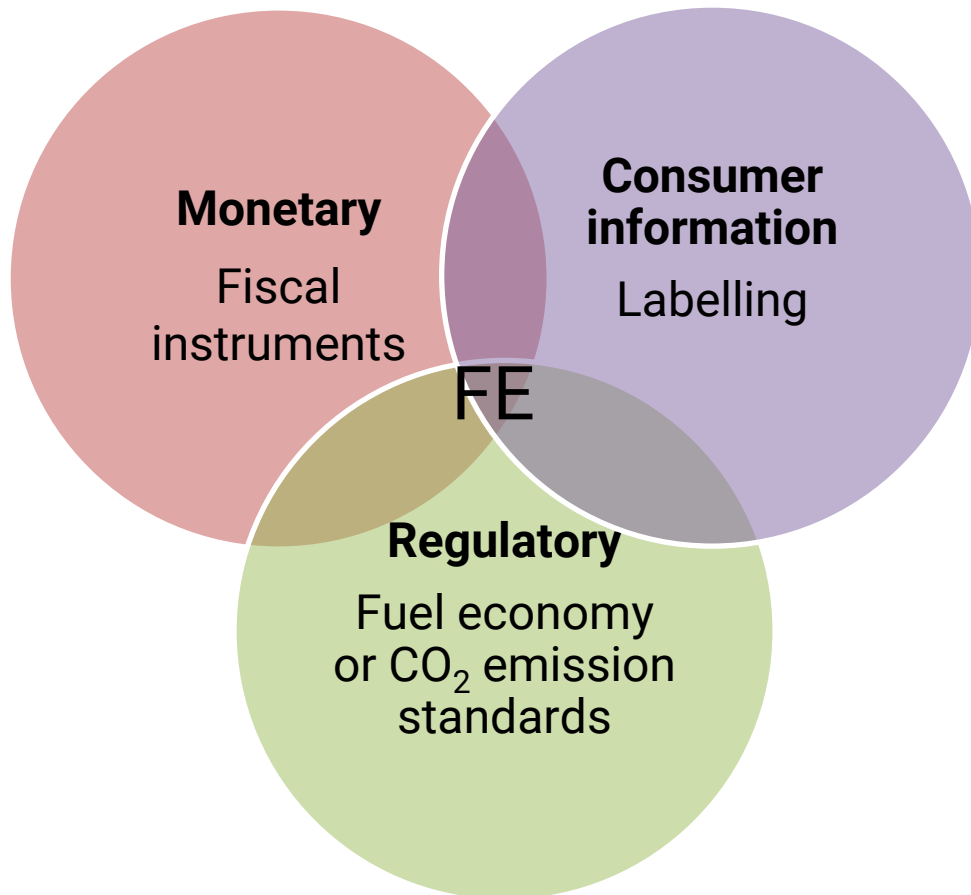
Mauritius	2005	2013	2014	2015
LDV Average (l/100km)	7.0	6.6	5.8	5.9
HDV Average (l/100km)			19.5	17.8

Baseline Light-Duty Vehicle Fuel Economy and Trends for New LDVs



Source: UNEP, 2017 (unpublished).

Fuel economy policies & instruments



Target group:
Consumer

Manufacturer

European Union

- 12% of total CO₂ emissions from transport
- average for all new cars is 130 grams of CO₂ per kilometre (g/km) by 2015 and 95g/km by 2021
- reductions of 18% and 40% compared to 2007 -158.7g/km
- **2015 fuel consumption target**
 - 5.6 l/100 km of petrol
 - 4.9 l/100 km of diesel
- **2021 target**
 - 4.1 l/100 km of petrol
 - 3.6 l/100 km of diesel



China's Example

- China introduced Fuel Economy Standards for LDV in September 2004: phase 1 from July 2005 and 2 phase from Jan 2008
- Chinese FES is the 3rd most stringent in the world, behind the EU and Japan, reduction of average fuel consumption (litre/100km) of LDV by 11.5%
- Subsidized smaller, fuel efficient cars and penalize large-engine cars
- Promoting electric mobility

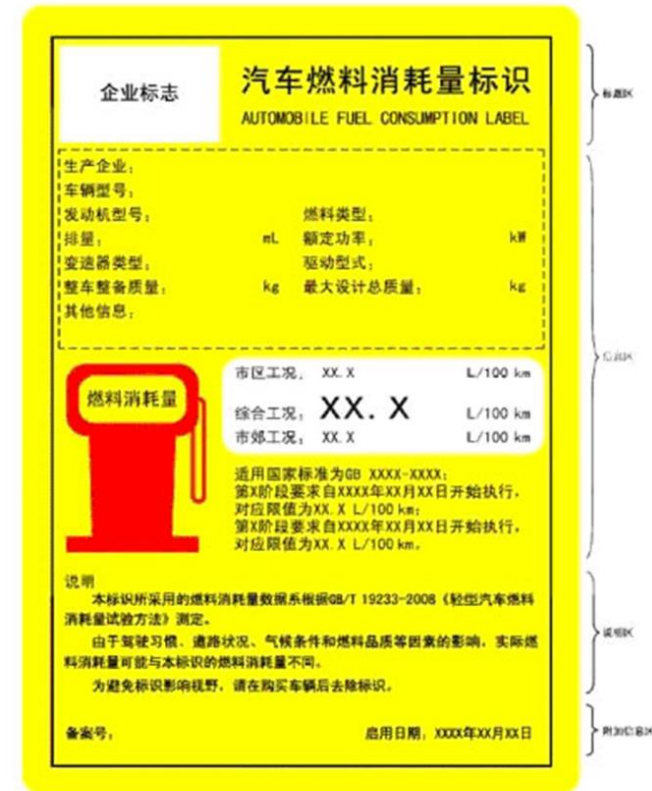


图 A.1 标识各功能区分布示意图

South Africa

- CO2 Taxation implemented March 2011
- The rate of emissions tax on passenger vehicles is R100 per gram CO2 emissions in excess of 120 g/km based on test reports
- The rate of emissions tax on double cabs is R100 per gram CO2 emissions in excess of 175 g/km based on test reports
- Vehicle labeling mandatory



FUEL CONSUMPTION	
MORRIS MINOR 1200	
Comparative fuel consumption	
6.8	litres per 100km
Comparative CO ₂ emissions	
159	grams per km
<small>■ Carbon dioxide (CO₂) is the main greenhouse gas responsible for global warming</small>	
<small>■ Actual fuel consumption and CO₂ emissions depend on factors such as traffic conditions, vehicle condition and how you drive</small>	

Mauritius

- Adopted a feebate scheme in 2011 at 158 CO₂g/km
- 2013 amended to 150 CO₂g/km
- Fuel economy improved from 7l/100km in 2005 to 5.8l/100km in 2014
- 50 % excise duty waived on electric and hybrid cars and registration fee
- 2009 to 2014, hybrid increased from 43 to 1824 and electric cars from 0 to 8
- 2016 replace by a taxation system with additional incentives to electric vehicles

Type	Current	New
Conventional		
Up to 550 cc	15%	0
551-1000 cc	55%	45%
1001-1600 cc	55%	50%
1601-2000 cc	75%	No change
Above 2,000 cc	100%	No change
Hybrid		
Up to 1600 cc	55%	25%
1601-2000 cc	75%	45%
Above 2000 cc	100%	70%
Electric cars		
Up to 180 Kw	25%	0
Above 180 Kw	25%	No change

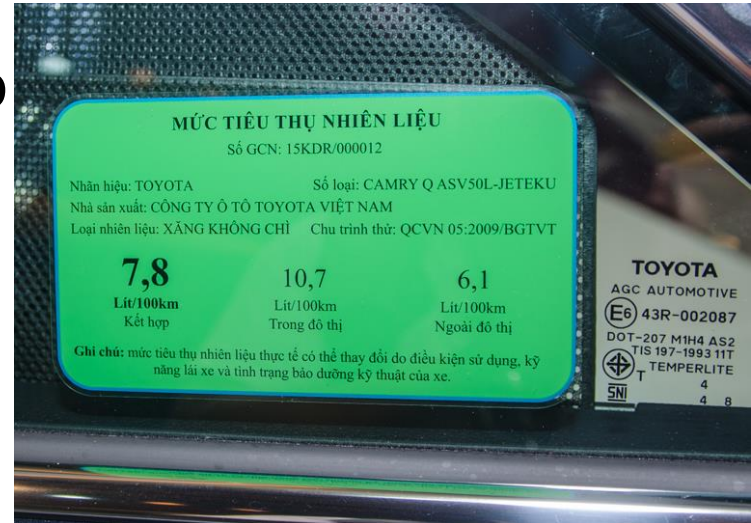
Feebate Scheme in Singapore

National Environment Agency to introduce the Vehicular Emissions Scheme (VES) to replace the Carbon Emissions-Based Vehicle Scheme (CEVS) for all new cars, taxis and newly imported used cars with effect from 1 January 2018

Bands	CO ₂ (g/km)	HC (g/km)	CO (g/km)	NO _x (g/km)	PM (mg/km)	Rebate/ surcharge(-/+) for cars (\$)	Rebate/ surcharge(-/+) for taxis (\$)
A1	A1 ≤90	A1 ≤0.020	A1 ≤0.150	A1 ≤0.007	A1 =0.0	-20,000	-30,000
A2	90< A2 ≤125	0.020< A2 ≤0.036	0.150< A2 ≤0.190	0.007< A2 ≤0.013	0.0< A2 ≤0.3	-10,000	-15,000
B	125< B ≤160	0.036< B ≤0.052	0.190< B ≤0.270	0.013< B ≤0.024	0.3< B ≤0.5	0	0
C1	160< C1 ≤185	0.052< C1 ≤0.075	0.270< C1 ≤0.350	0.024< C1 ≤0.030	0.5< C1 ≤2.0	+10,000	+15,000
C2	C2 >185	C2 >0.075	C2 >0.350	C2 >0.030	C2 >2.0	+20,000	+30,000

Vehicle Labeling in Viet Nam

- Seven-seater cars and smaller ones are required to carry energy rating labels
- Labeling for those with more than seven seats will be voluntary until December 31, 2017 and for motorcycles until December 31, 2019 and required on cars from January 1, 2018 and motorcycles from January 1, 2020



Labeling and CO₂-based Tax in Thailand

- Excise tax combines CO₂ ratings/engine capacity/fuel type
- Mandatory eco-sticker

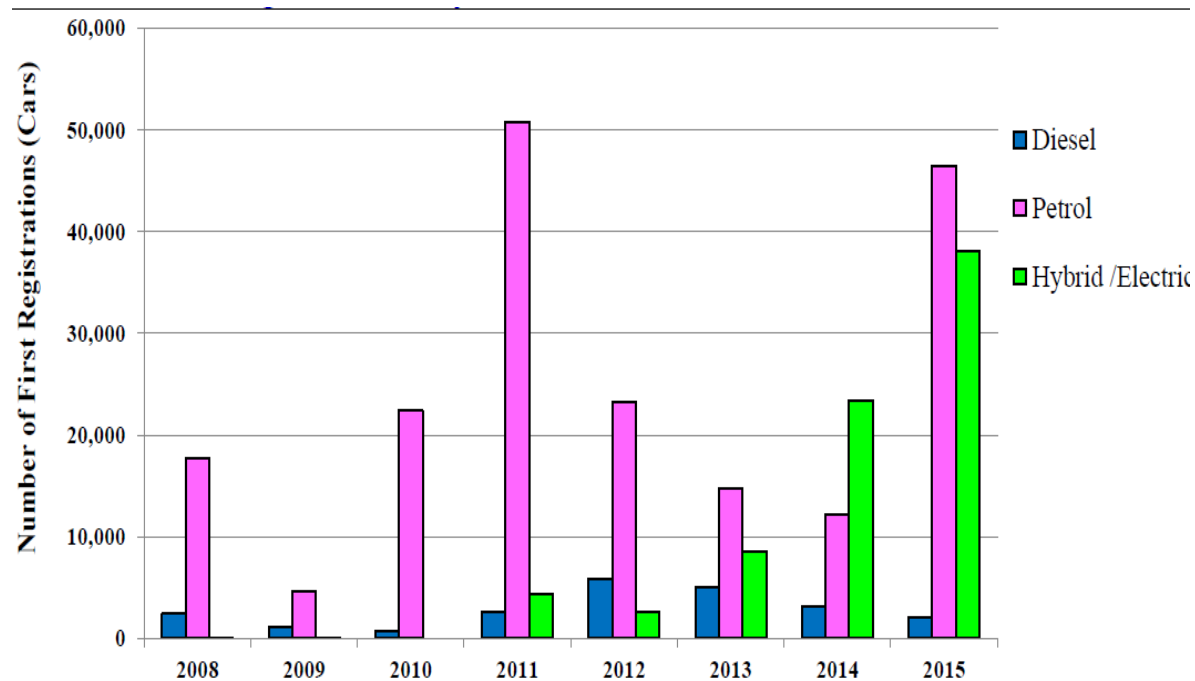


Types of Vehicles	Fuel type / Tax rates			
	CO ₂ / engine capacity	E10/ E20	E85/ NGV	Hybrid
Passenger vehicles – cars and vans with less than 10 seats	≤ 100 g/km	30	25	10
	101-150 g/km	30	25	20
	151-200 g/km	35	30	25
	>200 g/km	40	35	30
	>3,000 cc	50	50	50
~~~~~				
Electric vehicle/ fuel cell	≤ 3,000 cc (180 Kw)		10	
	> 3,000 cc (180 Kw)		50	

Source: Energy Policy and Planning Office and Department of Alternative Energy Development, 2015

# Hybrid and Electric cars in Sri Lanka

- Hybrid and electric cars in 2014 was 56% of the total number of cars
- Hybrid-petrol, petrol and diesel vehicles attract 58%, 253% and 345%, respectively, in excise tax
- Fully electric vehicles are levied at 25%.



# PROPOSED VEHICLE LABELS FOR KENYA

**REPUBLIC OF KENYA**

Fuel Consumption (L/100km)	CO ₂ Emissions (g/km)
<b>7.32</b>	<b>169.88</b>
Combined Test	Combined Test

CO₂ Relative Comparison

Fuel Consumption Relative Comparison

Make and Model: **VOLKSWAGEN GOLF**

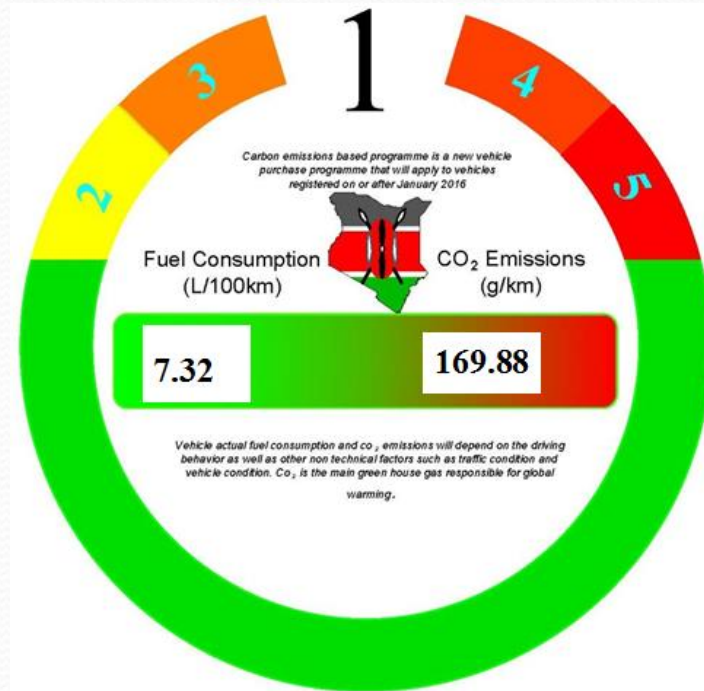
Engine Capacity and Fuel Type: **1980 cc. PETROL**

Vehicle actual fuel consumption and CO₂ emissions will depend on the driving behavior as well as other non technical factors such as traffic condition and vehicle condition. CO₂ is the main green house gas responsible for global warming.

**CARBON EMISSIONS BASED ON VEHICLE BANDING**  
(Year 2016 & 2017)

CO ₂ Emissions (g/km)	Fee/Rate Amount
A1 0 - 100	Ksh. ....
A2 101 - 120	Ksh. ....
A3 121 - 140	Ksh. ....
A4 141 - 168.9	Ksh. ....
B 169 - 170	Ksh. 0
C1 171 - 220	Ksh. ....
C2 221 - 250	Ksh. ....
C3 251 - 270	Ksh. ....
C4 > 270	Ksh. ....

Carbon emissions based programme is a new vehicle purchase programme that will apply to vehicles registered on or after January 2016



**MORE STARS  
MORE SAVINGS**

**Fuel Economy  
Consumer Information**

**FUEL CONSUMPTION & EMISSIONS BASED VEHICLE BANDING (Year 2016 & 2017)**

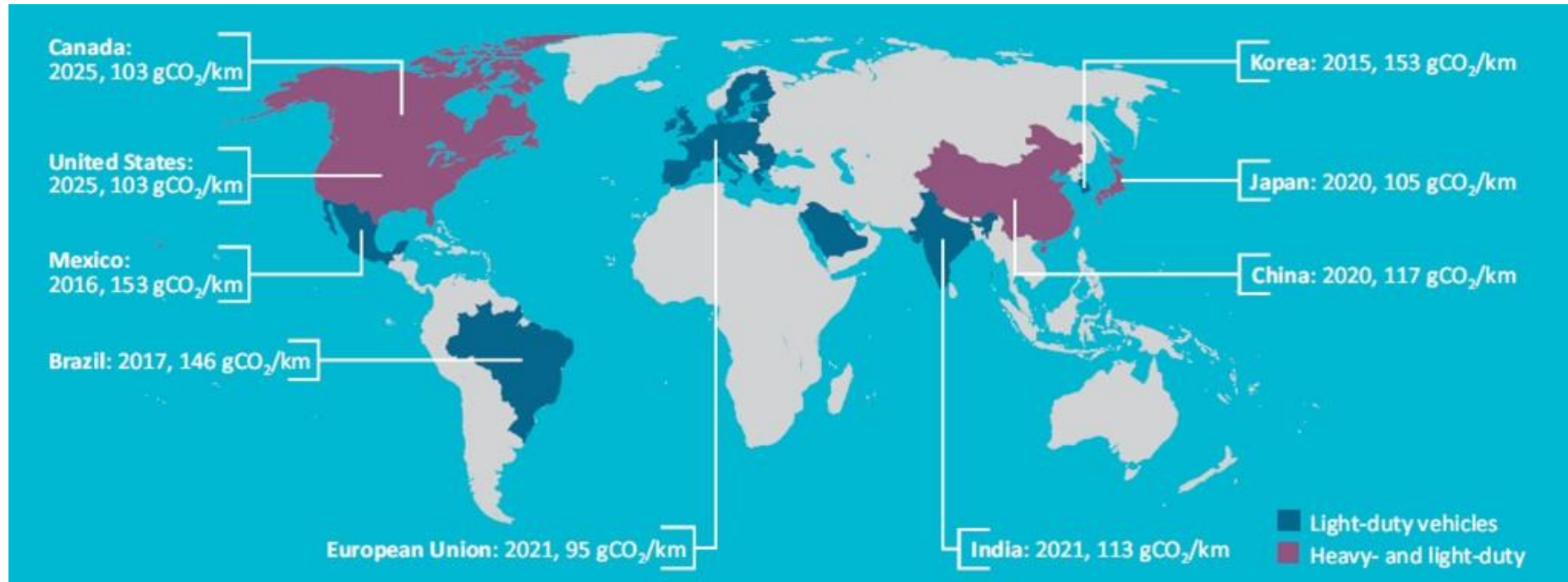
Petrol
<b>7.32</b>
Liters per 100 Kilometers

CO ₂ Emission	:169.88 g/km
Brand/Make	:TOYOTA
Model Year	:2010
Vehicle Category	:SALOON
Engine Size (cc)	:1500cc
Transmission	:Auto
Weight Class	:1001-2000

Vehicle actual fuel consumption and CO₂ emissions will depend on the driving behavior as well as other non technical factors such as traffic condition and vehicle condition. CO₂ is the main green house gas responsible for global warming.



# Countries are at various points in developing fuel economy policies



**Note:** light vehicle fuel economy values normalized or NEDC test cycle

**Source:** IEA ETP 2015 and ICCT



### CLEANER, MORE EFFICIENT VEHICLES



# Tool

- Introduction
- Instruments
- Case Studies
- Resources
- Global View

## Instruments

- **Regulatory**
  - **Standards**
- **Economic**
  - **Feebate**
  - **Registration Tax**
- **Information**
  - **Labeling**

Regulatory policies
+ National Standards
• Import Restrictions
• Technology Mandates
Economic instruments
Traffic control measures
Information
Technology

## Case Studies

- **Europe**
- **North America**
- **Africa**
- **Latin America**
- **Asia**
- **Middle East**

Case Studies
+ Europe
+ North America
+ Africa
• South Africa
• Kenya
• Mauritius
+ Latin America
+ Middle East West Asia
+ Asia Pacific

## Resources

- **Baseline**
- **Finance**
- **FE Resources**

## Global View

# Summary

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- High growth rate of passenger car sales (and other vehicles) with relatively high fuel economy will persist without fuel economy policies
  - Implementing fuel economy policies can substantially reduce CO₂ emissions – supporting the Paris Agreement
  - Also reduces fossil fuel consumption and national expenditures on fossil fuels
  - Improves air quality through adoption of more advanced vehicles and technologies
-

# UN Environment Transport Programmes



***Share the Road (StR)***



***Global Fuel Economy Initiative (GFEI)***



***Electric Mobility***



***Partnership for Clean Fuels and Vehicles (PCFV)***



***Climate and Clean Air Coalition (CCAC)***





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