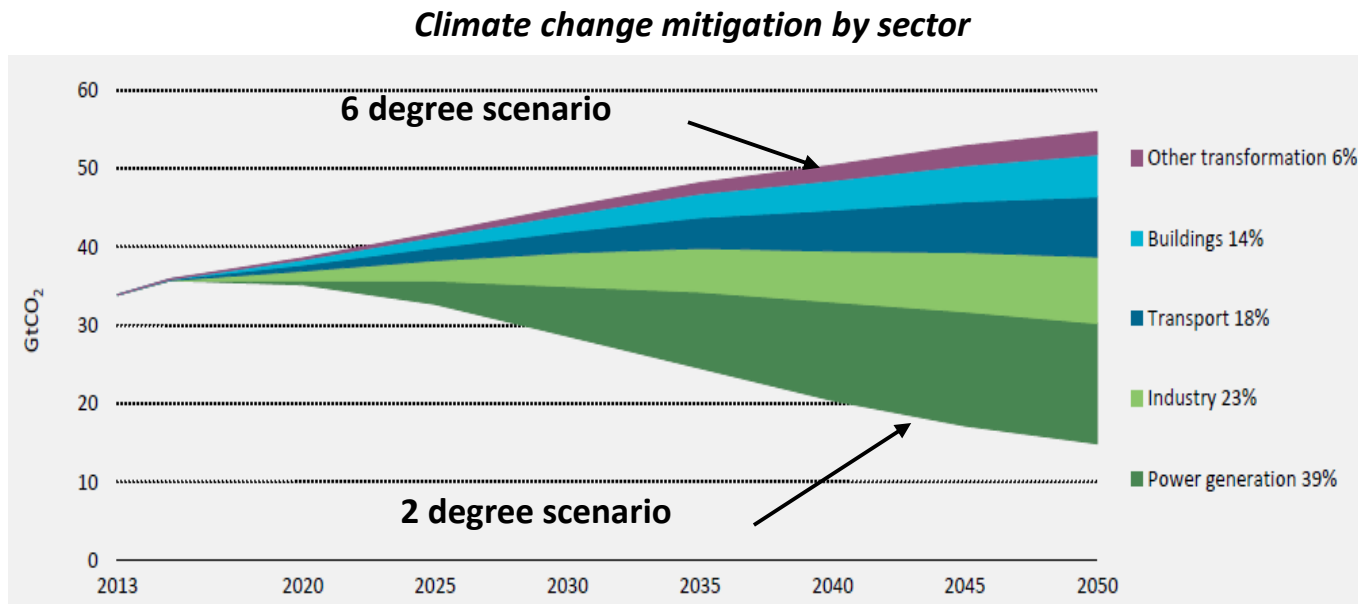


# Policy Options for Improving Vehicle Fuel Economy

Alvin Mejia  
Dhaka, Bangladesh  
April 23, 2019



# Transport and climate change



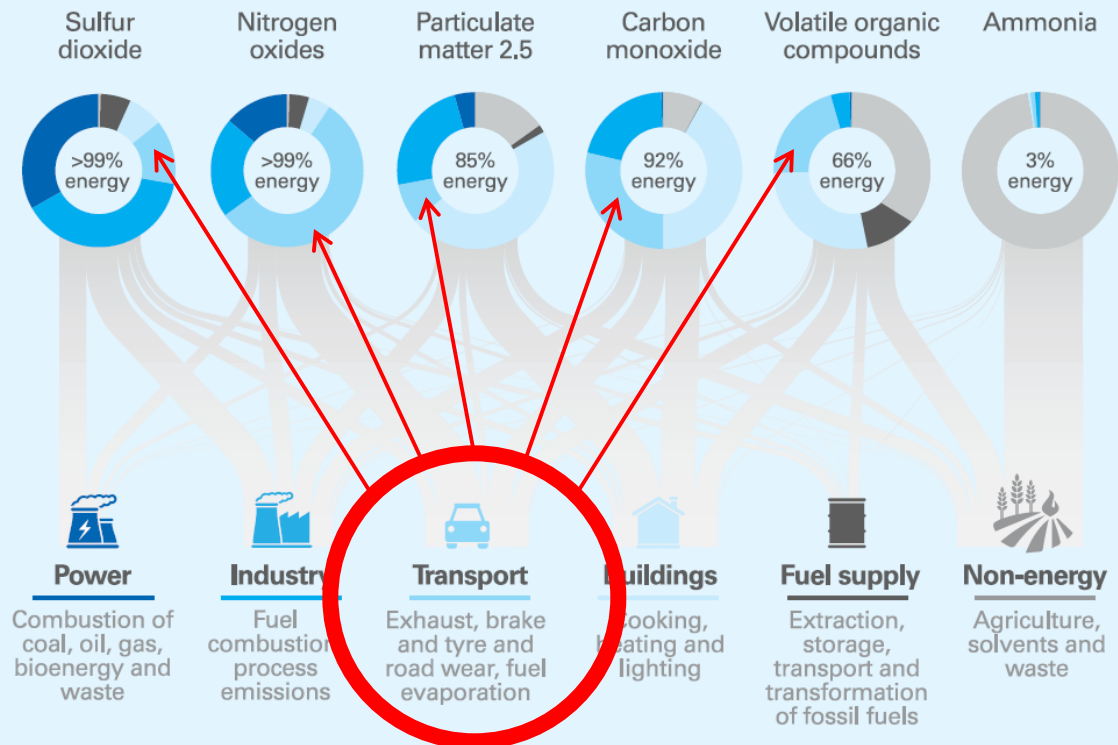
- **Transport needs to contribute 18% to global carbon emission reductions to reach a 2DS**
- **Most of the vehicle fleet growth will take place in non-OECD countries**
- **Climate targets cannot be reached without contribution from developing & transitional countries**

# Transport and air pollution

Transport accounts for:

- More than half of global  $\text{NO}_x$  emissions
- More than a quarter of all CO emissions
- Almost a quarter of volatile organic compounds emissions
- Substantial shares of  $\text{SO}_2$  and PM emissions

Fig. 4: Selected primary air pollutants and their sources, 2015



Source: Energy and Air Pollution, *World Energy Outlook Special Report*, International Energy Agency, 2016

# Global Fuel Economy Initiative



Doubling the efficiency of the global car fleet by 2050



# Doubling the efficiency of the global car fleet by 2050

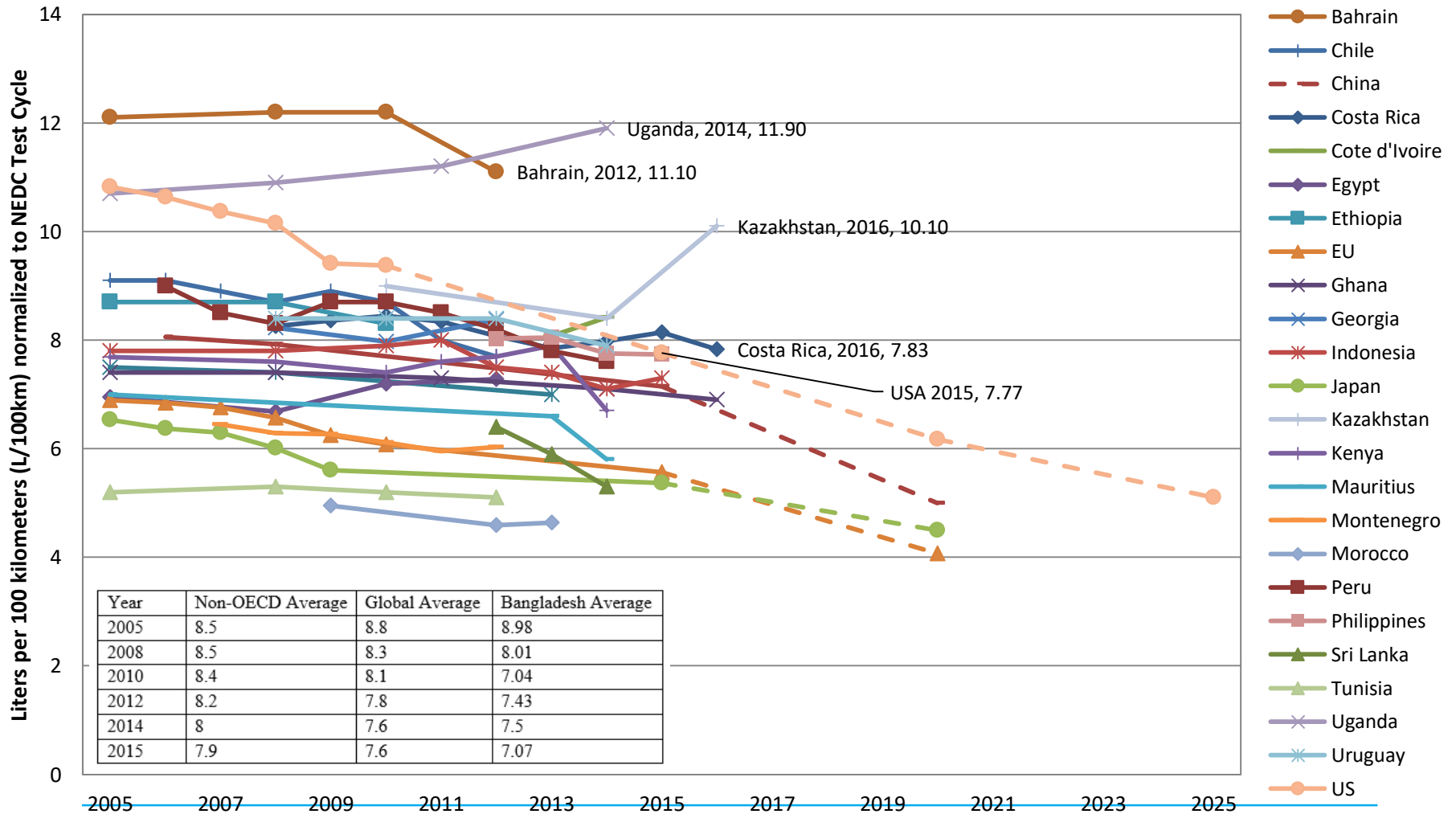


			2005	2008	2010	2012	2014	2015	2030
OECD & EU average	average fuel economy (Lge/100km)		8.8	8.2	7.8	7.6	7.4	7.3	
	annual improvement rate (% per year)		-2.3%	-2.8%	-1.6%	-1.3%	-0.5%		
		-1.8%							
Non-OECD average	average fuel economy (Lge/100km)		8.5	8.5	8.4	8.2	8.0	7.9	
	annual improvement rate (% 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

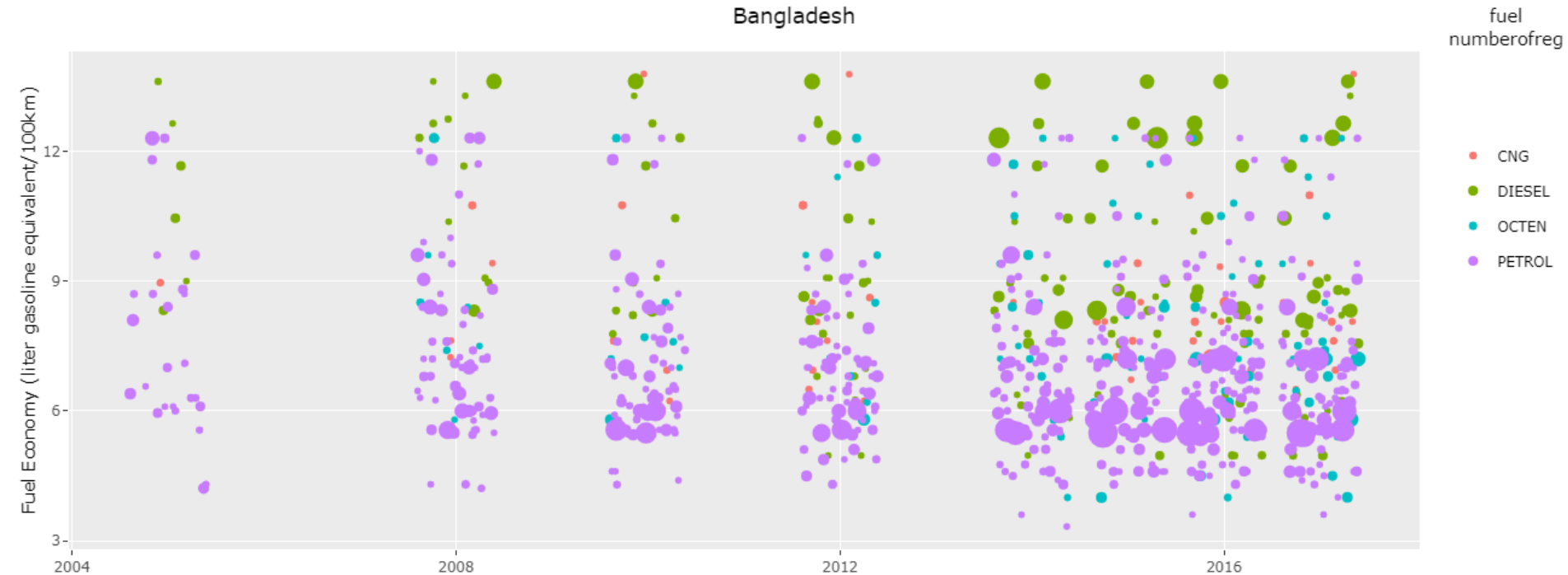
# Focus on Developing Countries

## Baseline Light-Duty Vehicle Fuel Economy and Trends



Source: UNEP, 2018(unpublished).

# Progression : Bangladesh



Year	Non-OECD Average	Global Average	Bangladesh Average
2005	8.5	8.8	8.98
2008	8.5	8.3	8.01
2010	8.4	8.1	7.04
2012	8.2	7.8	7.43
2014	8	7.6	7.5
2015	7.9	7.6	7.07

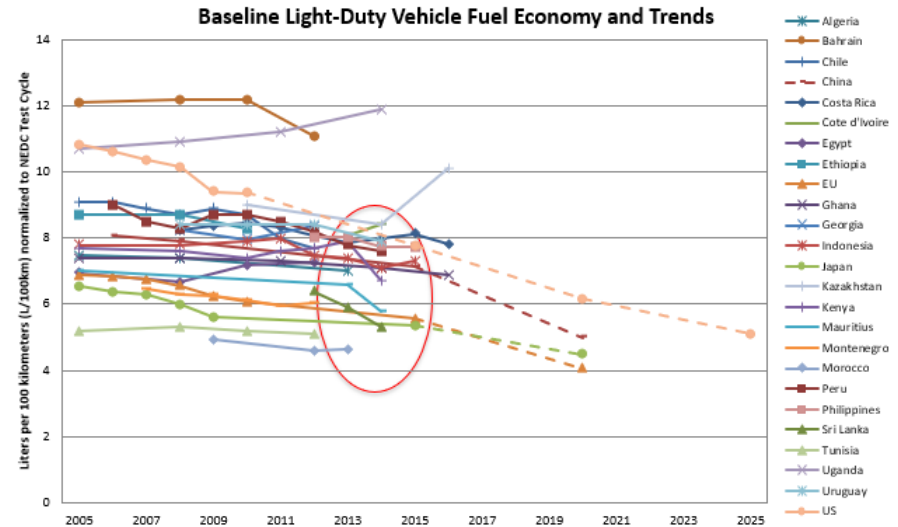
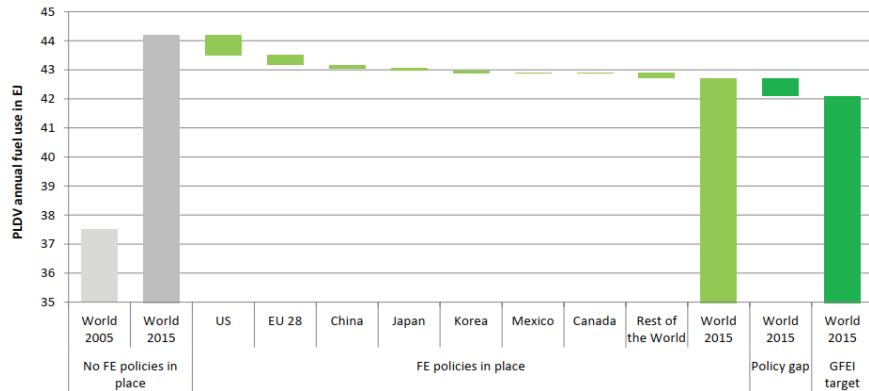
# What is fuel economy?

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- Vehicles use energy, and fuel economy measures energy per unit of vehicle travel. It is the RATE of energy use.
  - Litres per 100km (Europe)
  - Km per litre (Japan)
  - Miles per gallon (United States)
- Fuel economy, fuel efficiency, fuel intensity are all fairly interchangeable terms. But fuel economy always refers to fuel use relative to distance travelled.



# Fuel economy policies can work!



	Yearly	Cumulative
CO <sub>2</sub> saved by achieving GFEI target	0.5 Gt/year by 2025, 1.5Gt/year by 2050	33 Gt in total by 2050
\$ saved by achieving GFEI target	\$400 billion/year in 2050	\$8 trillion net saving by 2050
Barrels of oil saved by achieving GFEI target	3 billion barrels of oil a year by 2050	54 billion barrels of oil in total by 2050

Source: UNEP, 2017 (unpublished) and GFEI 2016.

# Fuel Economy Policy Options

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## VEHICLE FUEL EFFICIENCY STANDARDS

- Introduce and regularly strengthen mandatory standards
- Establish and harmonize testing procedures for fuel efficiency measurement.

## FISCAL MEASURES

- Fuel taxes and vehicle taxes to encourage the purchase of more fuel-efficient vehicles.
- Infrastructure support and incentive schemes for very fuel-efficient vehicles.

## MARKET-BASED APPROACHES

- Voluntary programs such as U.S. SmartWay and other green freight programs

## INFORMATION MEASURES

- Vehicle fuel economy labels
- Improving vehicle operational efficiency through eco-driving and other measures.

# Import Restrictions

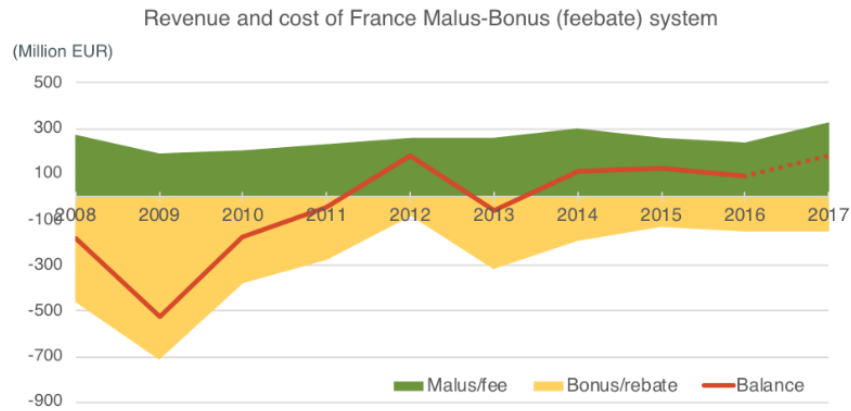
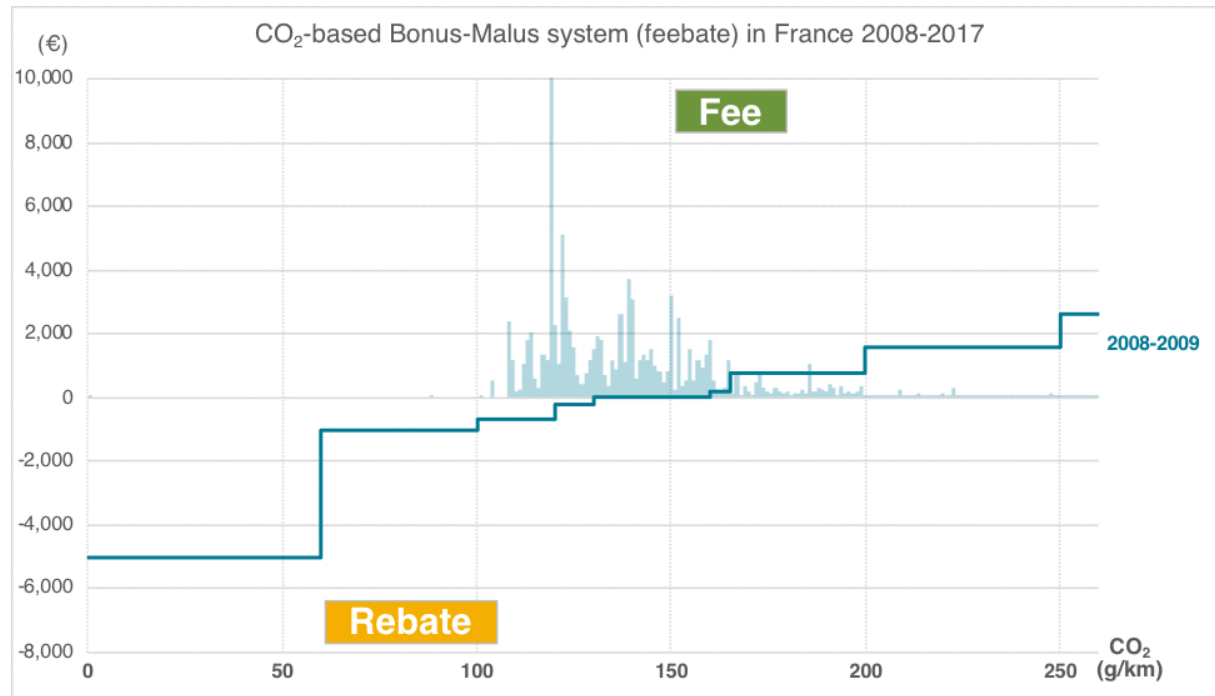
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- Algeria - imported secondhand vehicles must be less than 3 years old.
- Imports of used automobiles into Brazil are not allowed under any circumstances, with special authorization required for the import of used parts. Brazil also has a ban on diesel passenger car imports
- Argentina is also currently considering a similar ban on imports and production of diesel passenger cars.
- South Africa does not allow the import of used vehicles.
- In Jordan, imported secondhand vehicles must be less than 5 years old.

# Economic Instruments

- Feebates
- Taxes
  - Acquisition
  - Ownership
  - Motoring
- Penalties

# Feebates



Note: Rough calculation, does not take account of seperated bonus for hybrid vehicle from 2008 to 2014.

# CO2-based Feebate Scheme in Mauritius

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- Feebate scheme in 2011 = fee on cars above 158 CO2g/km starting from 55\$ per g/km to 137\$ per g/km for cars over 290 CO2 g/km and a rebate starting from 27\$ per g/km for cars with CO2 ratings from 91 to 158 CO2g/km and 82\$ for cars from 90 CO2g/km and below
- From 7l/100km in 2005 to 5.8l/100km in 2014 and rapid increase of new hybrid vehicle sales from 337 in 2011 to 1418 in 2013

**THE EXCISE (AMENDMENT) BILL**  
(No. XVIII of 2011)

**Explanatory Memorandum**

The main object of this Bill is to amend the Excise Act to provide, in addition to the excise duty chargeable on motor cars, for a CO<sub>2</sub> levy on motor cars or for the granting of a CO<sub>2</sub> rebate from the excise duty payable on motor cars, as the case may be, and for related matters.

**P. K. JUGNAUTH**  
*Vice-Prime Minister, Minister of Finance  
and Economic Development*

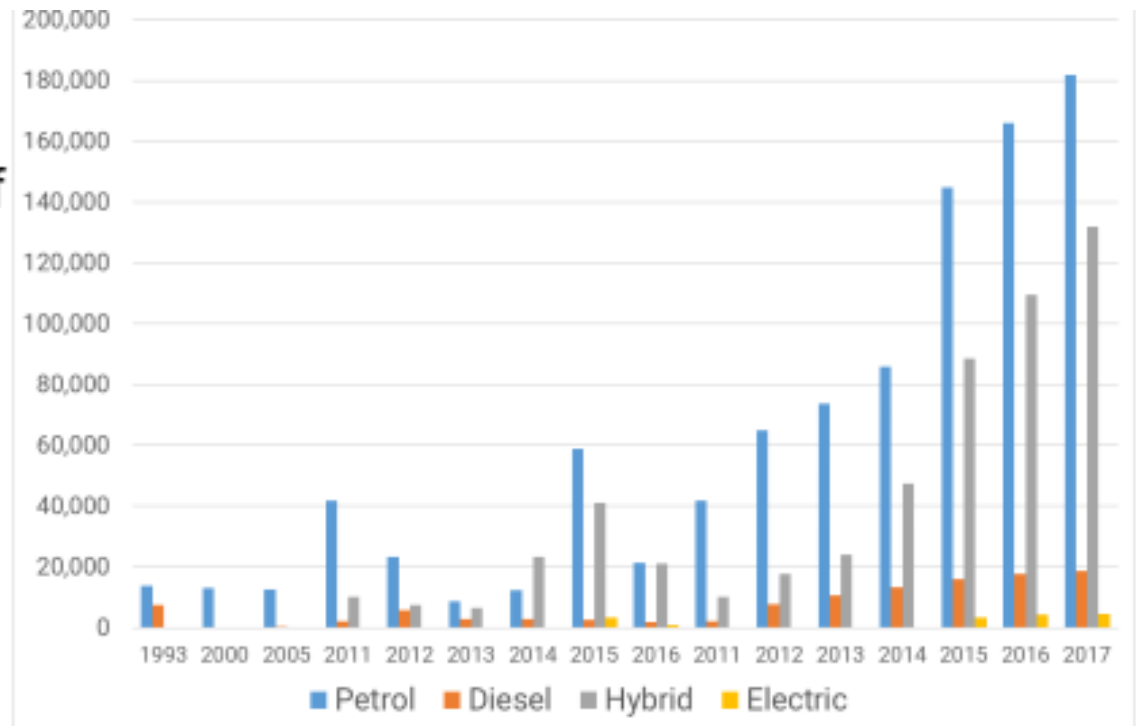
8 July 2011

# Acquisition tax

- Austria - fuel consumption tax is levied on the purchase price (net) or commercial leasing fee of new passenger cars and motorcycles and on passenger cars and motorcycles not yet registered nationally
- South Africa has established an emission tax rate based on CO<sub>2</sub> emissions
- In Belgium, different schemes apply based on the region. In the Flemish region, the tax is calculated as a function of vehicle's specific CO<sub>2</sub> emissions, fuel types

# Excise Taxation 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%
- Revised excise tax focused on cc and kwh car ratings by 2018





# Ownership Taxes

- Singapore

Engine Capacity (EC) in cc	6-Monthly Road Tax Formula (From 1 August 2016)
$EC \leq 600$	$S\$200 \times 0.782$
$600 < EC \leq 1,000$	$[S\$200 + S\$0.125(EC - 600)] \times 0.782$
$1,000 < EC \leq 1,600$	$[S\$250 + S\$0.375(EC - 1,000)] \times 0.782$
$1,600 < EC \leq 3,000$	$[S\$475 + S\$0.75(EC - 1,600)] \times 0.782$
$EC > 3,000$	$[S\$1,525 + S\$1(EC - 3000)] \times 0.782$

- If the car is not Euro IV, Euro V or JPN2009 compliant, the Special Tax is:  
 $= (\$372 \times 6) - S\$50$   
 $= S\$2,232 - S\$50$   
 $= S\$2,182$

Therefore the total 6-monthly Road Tax and Special Tax payable for this car is:  
 $= S\$372 + S\$2,182$   
 $= S\$2,554$

- If the car is Euro IV compliant, the Special Tax is:  
 $= (1,600cc \times S\$0.625) - S\$50$   
 $= S\$1,000 - S\$50$   
 $= S\$950$

Therefore, the total 6-monthly Road Tax and Special Tax payable for this car is:  
 $= \$372 + S\$950$   
 $= S\$1,322$

## ROAD TAX SURCHARGE (FOR VEHICLES OVER 10 YEARS)

For vehicles of more than 10 years old, a Road Tax surcharge is payable in addition to the Road Tax.

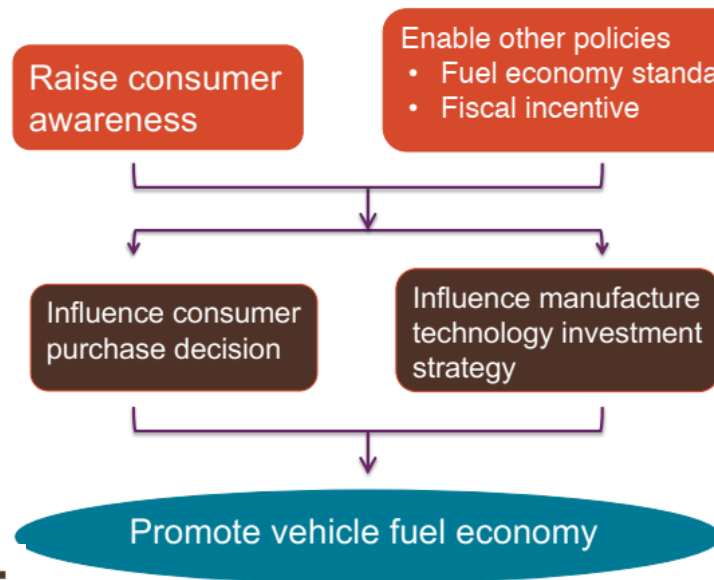
Age of Vehicle	Annual Road Tax Surcharge
More than 10 years old	10% of Road Tax
More than 11 years old	20% of Road Tax
More than 12 years old	30% of Road Tax
More than 13 years old	40% of Road Tax
More than 14 years old	50% of Road Tax

# Fuel Taxation

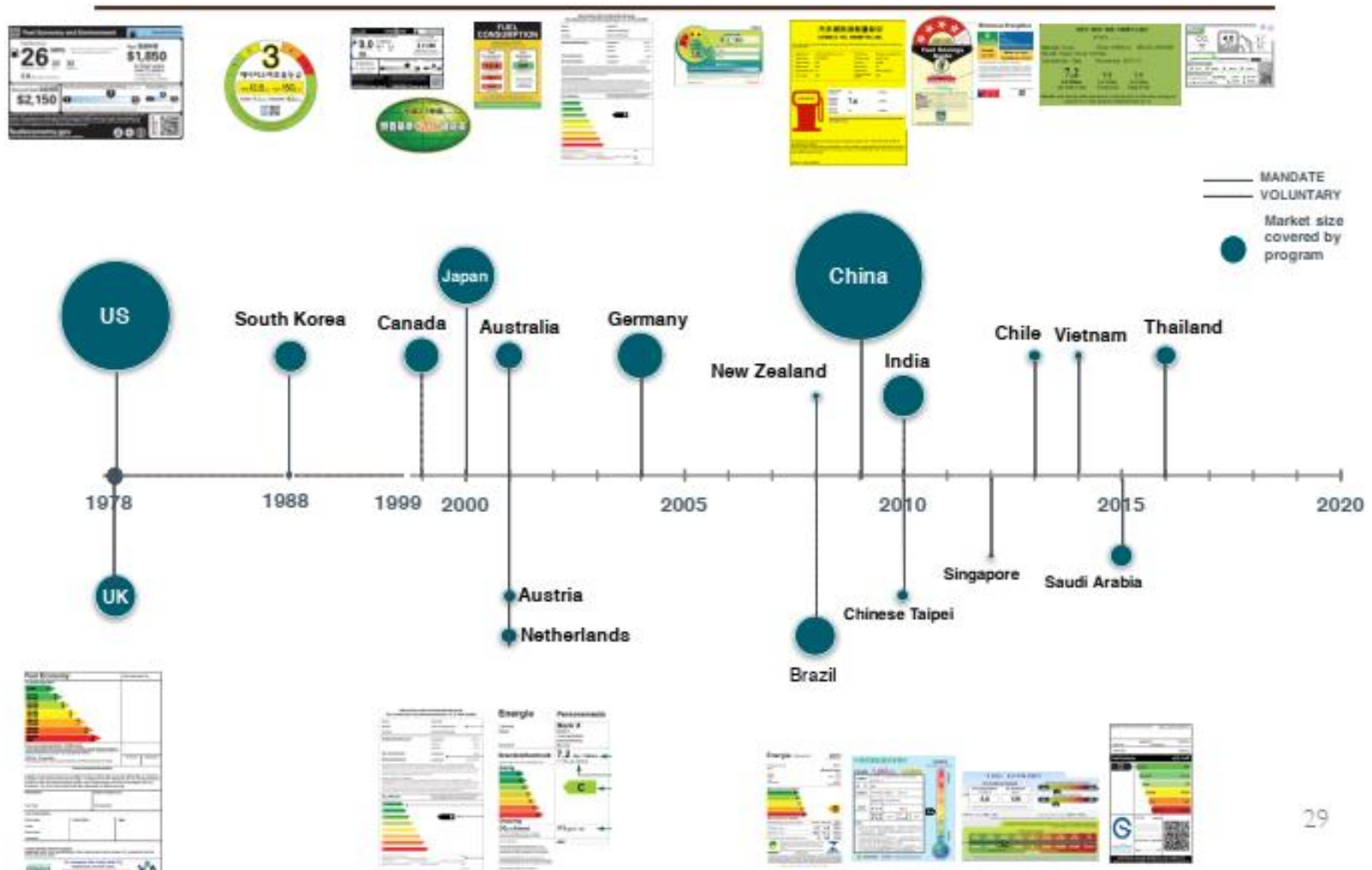
- Fuel taxes can provide incremental incentives to purchase more efficient vehicles
- Fuel taxes can provide revenues to pay for infrastructure costs and can be instrumental to provide funding aimed to the development of sustainable transport
- However, as fuel economy standards become more stringent and governments mandate higher fuel efficiency levels from their national vehicle fleets, fuel tax revenues which help to fund the maintenance of vast transportation infrastructure will decrease.
- Options : mileage-based taxes (pay per mile)

# Fuel Economy Labelling

- The “fuel economy label” referring information that is displayed about the car in the showroom, online or through other media
- Enables other fuel economy related policies (e.g. feebates)



# Historical Timeline Fuel Economy Labelling

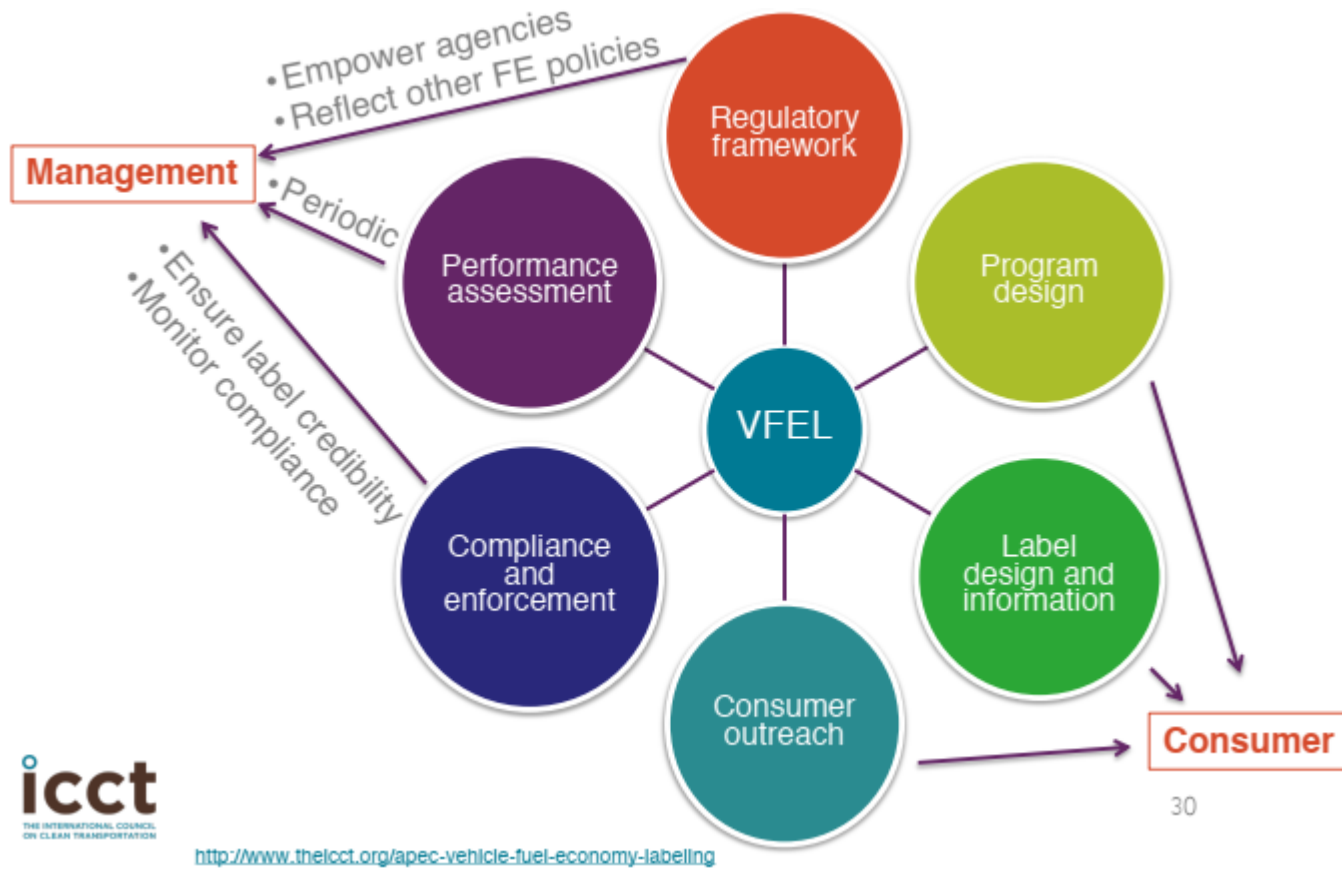


# Effectiveness of Vehicle Labelling

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- influenced by the way that information is presented and how well the consumer can absorb and act on it
- label effectiveness will increase when consumers can compare motor vehicles in same category on a fair and equitable basis
- finding an appropriate balance between sufficient information and label attractiveness to consumers is always essential for policymakers

# Components of a Vehicle Fuel Economy Labelling Program



# Best Practice : Fuel Economy Labelling

## Regulatory framework

- Establish legislation and labelling specific regulation
- Introduce complementary fuel economy policies

## Program design

- Make the program mandatory
- Design program to encompass widely used vehicles
- Conduct comprehensive market research and survey consumer expectations of fuel efficiency regularly
- Collect in-use fuel consumption performance data

## Label design and information

- Present vehicle fuel efficiency and/or CO2 emissions in both absolute value and comparable grade rating
- Link label to fiscal expense or benefit where possible by presenting running cost or fiscal information
- Make information for alternative fuel vehicles comparable to conventional vehicles, through metrics such as gasoline equivalent fuel efficiency, CO2 emission, running cost, and financial information

# Best Practice : Fuel Economy Labelling

## Consumer outreach

- Establish a user-friendly VFEL website providing additional services beyond the fixed information on the label
- Require fuel efficiency information in promotional materials through other major media, especially online sources
- Build two-way communication channels to collect and respond to questions and comments from consumers

## Compliance and enforcement

- Establish mechanisms to ensure the credibility of the registered fuel efficiency value and empower agencies for enforcement
- Design monitoring and reporting systems to encourage compliance of labeling requirement and specify actions for enforcement.

## Performance assessment

- Schedule periodic assessments to monitor and report on VFEL outcomes and improve the effectiveness of VFEL programs



# Vehicle Labeling - New Zealand

## Fuel economy label generator

Fuel economy labels tell buyers how much it costs to run a vehicle. If you're a registered motor vehicle trader, you are required to print labels to display on vehicles for sale and provide fuel economy information on websites offering vehicles for sale.

Simply enter a vehicle's details into our



- Simplified approach
- Strong consumer outreach component
- 66ktCO2 saved
- 56 million USD cumulative savings (2008-2013)

### Step one: Enter vehicle details

Only enter one option at a time. Use VIN or Plate number if the car was first registered in New Zealand more than two days ago (the database is updated with VIN data nightly) - otherwise try Chassis number.

VIN 

Registration plate

Or, for other vehicles, use:

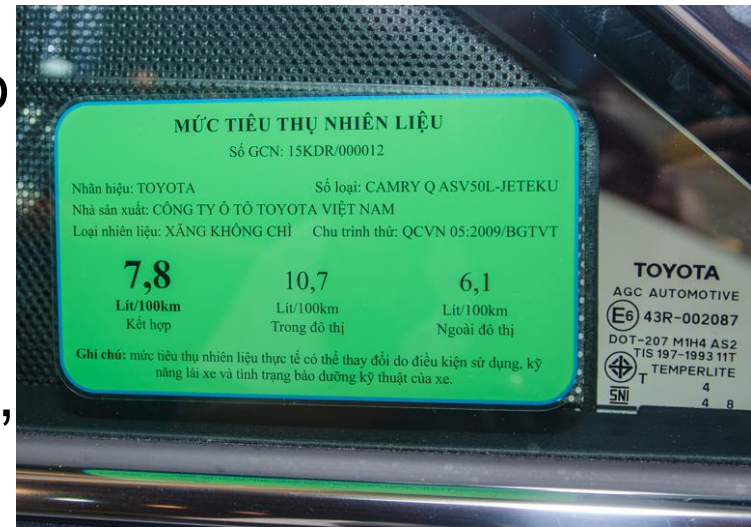
Chassis number 

If the car is a used import

Source: <http://resources.fuelsaver.govt.nz/label-generator.html#970>

# Vehicle Labeling in Viet Nam

- Seven-seater cars and smaller ones are required to carry energy rating labels
- Required on cars from January 1, 2018 and motorcycles from January 1, 2020



# Labeling and taxation in Chile

- Adopted a mandatory fuel economy labelling scheme from February 2013 becoming the first Latin American country to adopt such a scheme
- In September 2014 adopted a taxation scheme that puts a tax on less efficient and polluting vehicles, based on CO<sub>2</sub> and NOx ratings
- In 2015 adopted a scheme to provide subsidies for cleaner and more efficient taxis based on the fuel economy labeling scheme, with the aim to replace the 60,000 taxi fleet over the next 8 years



# Thailand Case Study (1/6)

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- Population: 68.8 million (2016 estimate)
- GDP per capita (nominal): \$7,588
- Total vehicle population (2016): 8.146 million
- What they did:
  - Active participation in GFEI trainings and meetings since 2012
  - Baseline development (2012)
  - Establishment of national multi-stakeholder process
  - Review of current policies



Sources:

Wikipedia; Googlemaps

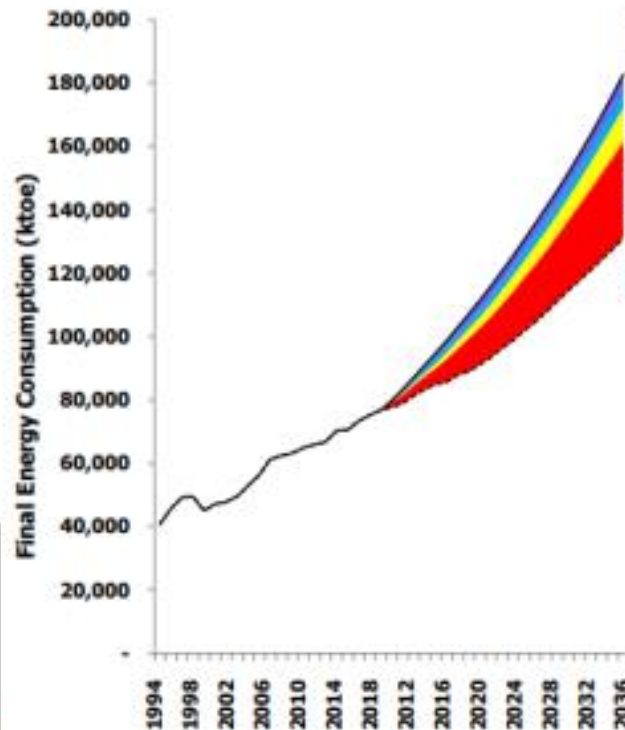
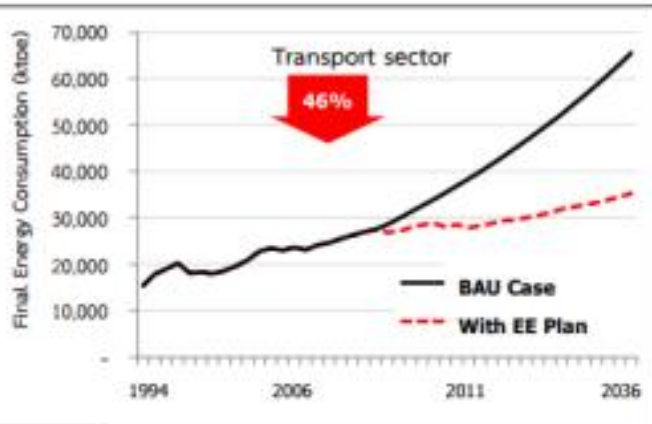
<http://englishnews.thaipbs.or.th/thailand-now-has-more-than-37-million-registered-cars/>

# Integrating fuel economy improvement policies and targets into national plans (2/6)

## Fuel Efficiency Targets

### Thailand Energy Efficiency Development Plan

(2015 - 2036)



Expected Energy Saving by Economic sector	Total	
	(ktoe)	(%)
EE1 Enforcement of energy conservation standard in designated factory/building	5,156	10%
EE2 Building Energy Code (BEC) for the new buildings	1,566	2%
EE3 Energy Labeling (HEPs & MEPs)	4,149	8%
EE4 Energy Efficiency Resource Standard (EERS) for large energy producers and distributors	9,524	18%
EE5 Financial incentives and support for energy performance achievement	991	2%
EE6 Promoting greater use of LED	590	1%
EE7 Energy saving measures in transport sector	30,213	58%
<b>Total (ktoe)</b>	<b>51,700</b>	<b>100%</b>

Economic Sector

1. Industry
2. Commercial
3. Residential
4. Transportation

2014

A Target to reduce Energy Intensity by 30% in 2036, compared with that in 2010



# Fuel economy labeling – Thai Eco-Sticker (3/6)

## Eco Sticker



**CO<sub>2</sub>**  
199  
g/km

**7.5**  
L/100 km  
( = 13.3 km/L )  
สภาวะรวม \*  
(combined)

สภาวะในเมือง \*  
**9.2**  
สภาวะนอกเมือง \*  
**6.6**  
L/100 km

อัตราการใช้น้ำมันอ้างอิง \*

มาตรฐานสิ่งแวดล้อม

★ มอก. ☆ EURO 4 ☆ EURO 5 ☆ EURO 6

สท.ข้อมูลรถรุ่นที่ สท.บน QR code ID : 000093

มาตรฐานความปลอดภัย

★ ABS+ESC ที่ทำการทดสอบ ☆ UN R13 ☆ UN R13H ☆ UN R94 กรณีชนด้านหน้า ☆ UN R95 กรณีชนด้านข้าง

\* ทดสอบตามมาตรฐาน UN R101 ในห้องปฏิบัติการ จูรี่เจ้าหน้าที่ ECO sticker: <http://www.car.go.th>

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**ข้อมูลพื้นฐาน**

ยี่ห้อ : Mitsubishi  
รุ่น : Pajero Sport 2.4D GT-Premium  
แบบ : รถยนต์นั่งสี่ล้อขับเคลื่อนสองล้อขับเคลื่อน  
หมายเลขตัวถัง (VIN) : MMTGUKS1XCH000000  
รหัสโรงงาน : KROW  
รหัสเครื่องยนต์ : 4N15  
เครื่องยนต์ : ดีเซล - ความจุกระบอกสูบ : 2442 ซีซี  
ระบบเกียร์ : เกียร์อัตโนมัติ  
น้ำหนักรถ : 2090 กิโลกรัม  
ขนาดยาง(หน้า,หลัง) : 265/60R18  
จำนวนที่นั่ง : 7  
ประเภทเชื้อเพลิง : ดีเซล  
โรงงานที่ผลิต : บริษัท มิตซูบิชิ มอเตอร์ส (ประเทศไทย) จำกัด

**อุปกรณ์ที่ติดตั้งจากโรงงาน**

1. ระบบ ABS พร้อมระบบกระจายแรงเบรคแบบอิเล็กทรอนิกส์ EBO และระบบเสริมแรงเบรค
2. ระบบค้ำล้อเครื่องยนต์ เพื่อช่วยเบรค
3. อุปกรณ์รักษาหน้า ด้านข้าง บริเวณหัวเสา ด้านหลังและบริเวณประตูท้าย
4. ระบบ Active Stability Control and Traction Control
5. ระบบช่วยออกตัวบนทางลาดชัน และระบบควบคุมความเร็วขณะลงทางชัน
6. ระบบรักษาเสถียรภาพการทรงตัวขณะเลี้ยว
7. ระบบเตือนการชนด้านหน้าหรือระบบช่วยชะลอความเร็ว
8. ระบบค้ำล้อเครื่องยนต์ช่วยยึด เมื่อยึดขึ้นเนินอย่างรุนแรงและรวดเร็ว
9. ระบบสัญญาณเตือนจุดอับสายตา
10. กล้องมองภาพรอบคัน
11. จอภาพแบบ Wide Screen พร้อมเครื่องเล่นคีวี รีโมท และบูทอินฟราเรด 2 ชุด
12. ระบบเชื่อมต่อระบบแบบ A2DP และระบบนำทางในรถยนต์

ชื่อ : บริษัท มิตซูบิชิ มอเตอร์ส (ประเทศไทย) จำกัด  
ที่อยู่ : 88 หมู่ที่ 11 ถนนพหลโยธิน 12120  
เว็บไซต์ : <http://www.mitsubishi-motors.co.th>

Source: Mitsubishi Motors Thailand

<https://www.mitsubishi-motors.co.th/en/about-us/news/press/attached-eco-sticker-on-mitsubishi-motors-new-cars>

# Thailand vehicle excise tax structure (4/6)



## Thailand Vehicle excise tax structure

Categories Of Vehicle	Tax Structure Before Jan'2016				Current Tax Structure			
	Engine Capacity (Horse Power)	Tax Rate (%)			CO <sub>2</sub>	Tax Rate (%)		
		E10	E20	E85		E10/E20	E85/NGV	Hybrid
Passenger Vehicles -Passenger Vehicles and, Vans less than 10 seats	≤2,000 CC	30	25	22*	≤ 100 g/km	} 30*	} 25	10
	2,001-2,500 CC	35	30	27	101-150g/km			20
	2,501-3,000 CC	40	35	32	151-200 g/km	35	30	25
	>3,000 CC (Pw 220 HP)	50	50	50	>200 g/km	40	35	30
PPV / DC /Space Cab/ Pick Up	≤3,250 CC	20/12/ - /3,18			≤ 200 g/km	25*/12/5/3,18		
	>3,250 CC	50			>200 g/km	30/15/7/5,18		
Eco Car (Benzine/Diesel) / E85	1,300/1,400 CC	17			≤100 g/km	14*/12		
Electric Vehicle /Fuel Cell/ Hybrid	≤ 3,000 CC	10			>3,000 CC	10		
	>3,000 CC	50				50		
NGV-OEM	≤ 3,000 CC	20			>3,000 CC	**		
	>3,000 CC	50				50		

HEV-PPV <75 g/km= 23%  
HEV-DC <75 g/km= 10%

EV tax=2%  
Hybrid tax + 2

**Remarks** \* : Assign safety standard for Active Safety (ABS+ESC) for Passenger Vehicles and, Vans less than 10 seats must obtain CO<sub>2</sub> ≤150 g/km / PPV must obtain CO<sub>2</sub> ≤200 g/km / Eco Car must obtain CO<sub>2</sub> ≤100 g/km Source: <http://www.ratchakitcha.soc.go.th/DATA/PDF/2560/E/166/4.PDF>  
\*\* Depend on CO<sub>2</sub> emission \* less than 1,780 CC but not over 2,000 CC

# Improvement of the vehicle fleet (5/6)



## Results from GIZ's study (Phase I)

Weight Average FE of Passenger Light Duty Vehicles (PLDV) sales during 2013-2016

Vehicle Type	New sale (Top 10 ranked vehicles)				Weight-averaged FC (Lge/100km)			
	2013	2014	2015	2016	2013	2014	2015	2016
001 Eco car	187,429	118,519	87,745	114,095	4.88	4.89	4.88	4.75
002 City car, subcompact : Sedan & Hatchback	271,018	167,522	117,548	76,447	5.99	5.98	5.78	5.85
003 Compact car C-segment : Sedan Hatchback Coupe Roadster	89,975	66,586	40,624	47,820	6.45	6.51	6.55	6.19
004 : D-segment full size sedan	34,363	19,343	16,407	12,312	7.22	7.33	7.11	7.21
005 : mini-MPV and B-SUV	42,046	41,046	50,690	39,417	7.44	6.95	6.62	6.25
006 : MPV and SUV	10,307	10,617	14,332	13,790	8.83	7.74	7.59	7.74
007 : PPV	58,942	48,646	69,063	60,683	9.52	9.17	8.43	8.15
008: Single cab pickup	75,024	51,325	50,851	48,127	7.57	7.58	7.60	7.40
009 : Extended cab pickup	278,019	206,130	168,236	176,758	7.68	7.66	7.69	7.40
010 : Double cab (4 doors) pickup	164,650	114,385	107,986	108,602	8.65	8.60	8.58	7.96
Sub-total vehicle (% share of total vehicle registration)	1,211,773 (93.25%)	844,119 (93.28%)	723,482 (90.88%)	698,051 (86.02%)				
DLT new registers	1,299,508	904,969	796,089	811,518				
Annual weight-averaged FC					6.98	7.01	7.08	6.81

Ref: GIZ preliminary study based on data from Department of Land Transport

<http://www.fiafoundation.org/media/45112/wp11-iea-report-update-2014.pdf>

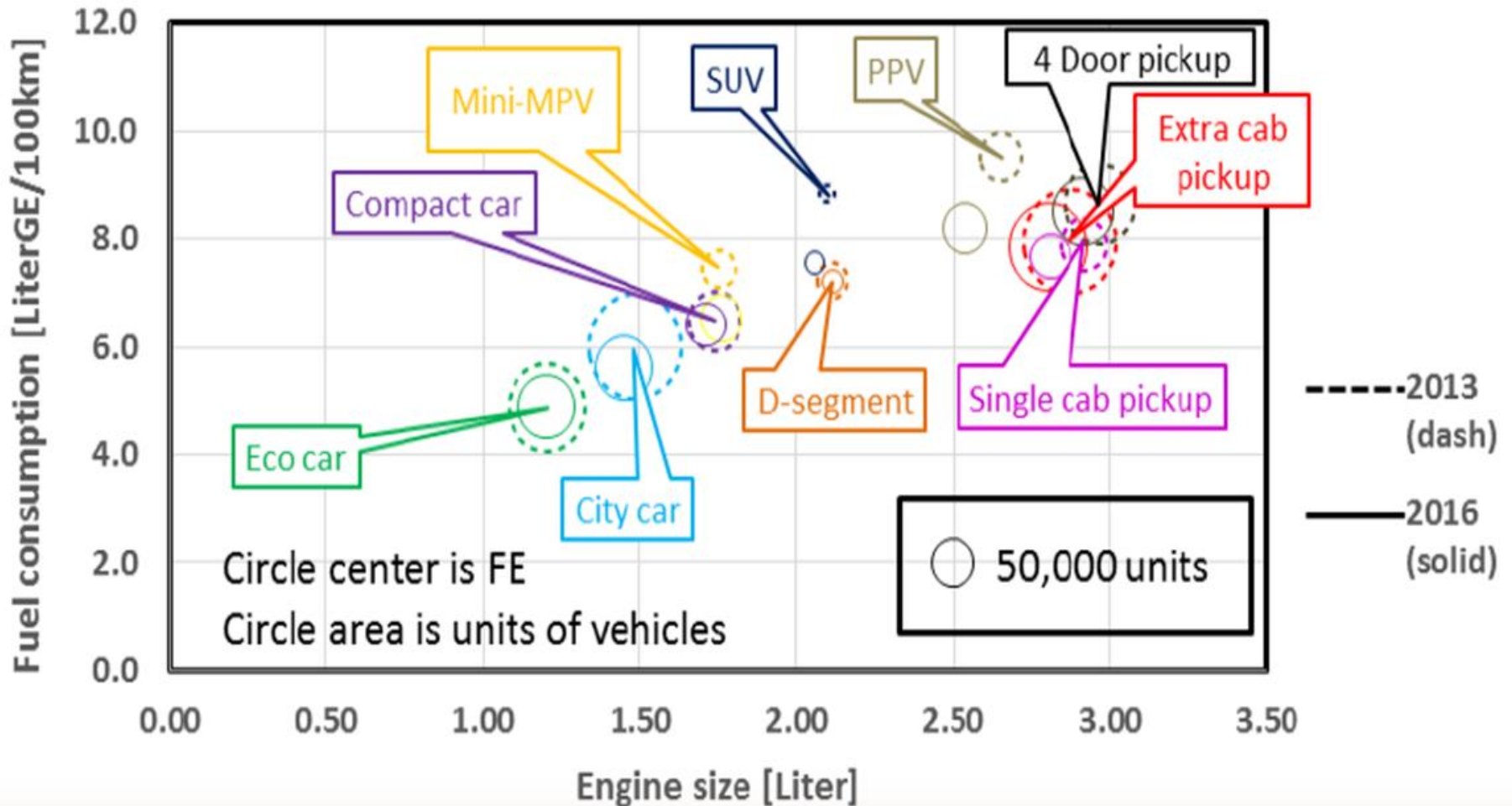
<https://www.globalfueleconomy.org/media/418761/wp15-ldv-comparison.pdf>

ASEAN German Technical Cooperation – Transport and Climate Change



# Impact of CO<sub>2</sub>-based excise tax on engine size (6/6)

CO<sub>2</sub>-based excise tax approved in Dec 2012 for implementation on 1 Jan 2016



# Philippines Case (1/3)

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- Population: 100.9 million (2015 estimate)
- GDP per capita (nominal): \$3,541 (2018 estimate)
- Total vehicle population (2017): approx. 10 million
- What they did:
  - Active participation in GFEI trainings and meetings since 2014
  - Baseline development (2014)
  - Review of current policies
  - Inclusion of fuel economy policies in national strategies and plans
  - Revision of vehicle taxation scheme
  - Development of fuel economy label



Sources:

Wikipedia; Googlemaps

[http://www.transport.gov.lk/web/index.php?option=com\\_content&view=article&id=255&Itemid=0&lang=en](http://www.transport.gov.lk/web/index.php?option=com_content&view=article&id=255&Itemid=0&lang=en)

# Moving from engine size to vehicle price... (2/3)

Vehicle Base Price	Tax Rate
Up to P600,000	4%
Over P600,000 to 1,000,000	10%
Over P1,000,000 to P4,000,000	20%
Over P4,000,000	50%

“(a) Automobile shall mean any four (4) or more wheeled motor vehicle regardless of seating capacity, which is propelled by gasoline, diesel, electricity or any other motive power: *Provided*, That for purposes of this Act, buses, trucks, cargo vans, jeepneys/jeepney substitutes, single cab chassis, and special-purpose vehicles shall not be considered as automobiles.

“*Provided*, That hybrid vehicles shall be subject to fifty percent (50%) of the applicable excise tax rates on automobiles under this Section: *Provided*, further, That purely electric vehicles and pick-ups shall be exempt from excise tax on automobiles.

# Estimated impact of vehicle price-based tax system (3/3)

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- Vehicle excise tax reform results to new LDV fuel consumption of about 6.2 Lge/100km, therefore leading to an annual fuel economy improvement rate of about 3.2% between 2013 and 2020
- The fuel economy improvement results in significant reductions in fuel use and emissions within the LDV segment, especially over the longer 10-year time-frame until the year 2027
- Fuel use could be reduced by 7% in 2020 and by 17% in 2027 compared to the benchmark scenario
- By 2020 1.5 MtCO<sub>2</sub> emissions of could be saved annually, growing to 6.2 MtCO<sub>2</sub> by 2027

# Electromobility

## TRANSPORT TRANSFORMATION

This large-scale transformation will ensure that transport is carbon neutral by 2050.



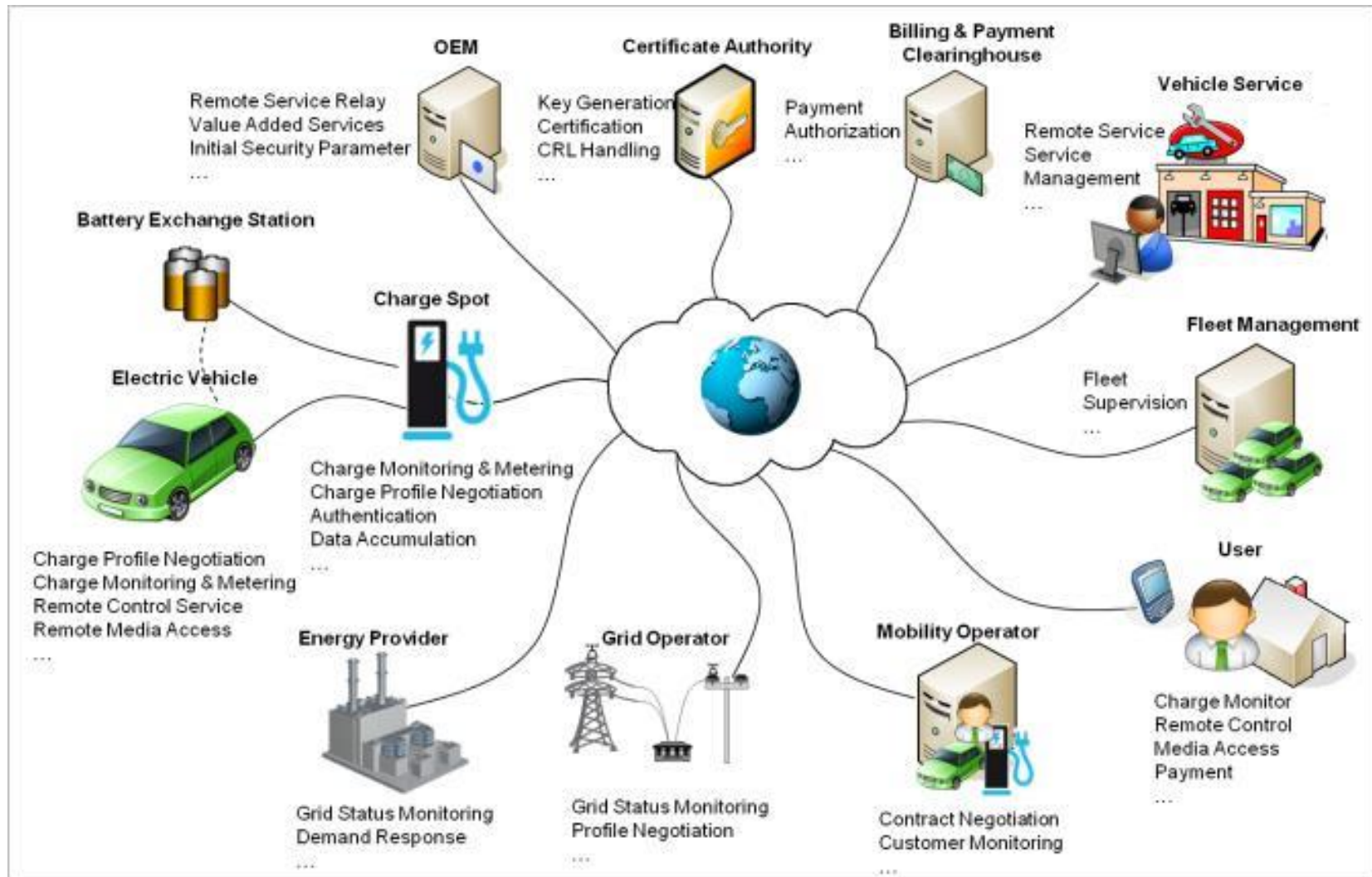
### MOBILITY TRANSITION

The transition to sustainable mobility will reduce energy consumption without limiting mobility.

### ENERGY TRANSITION IN TRANSPORT

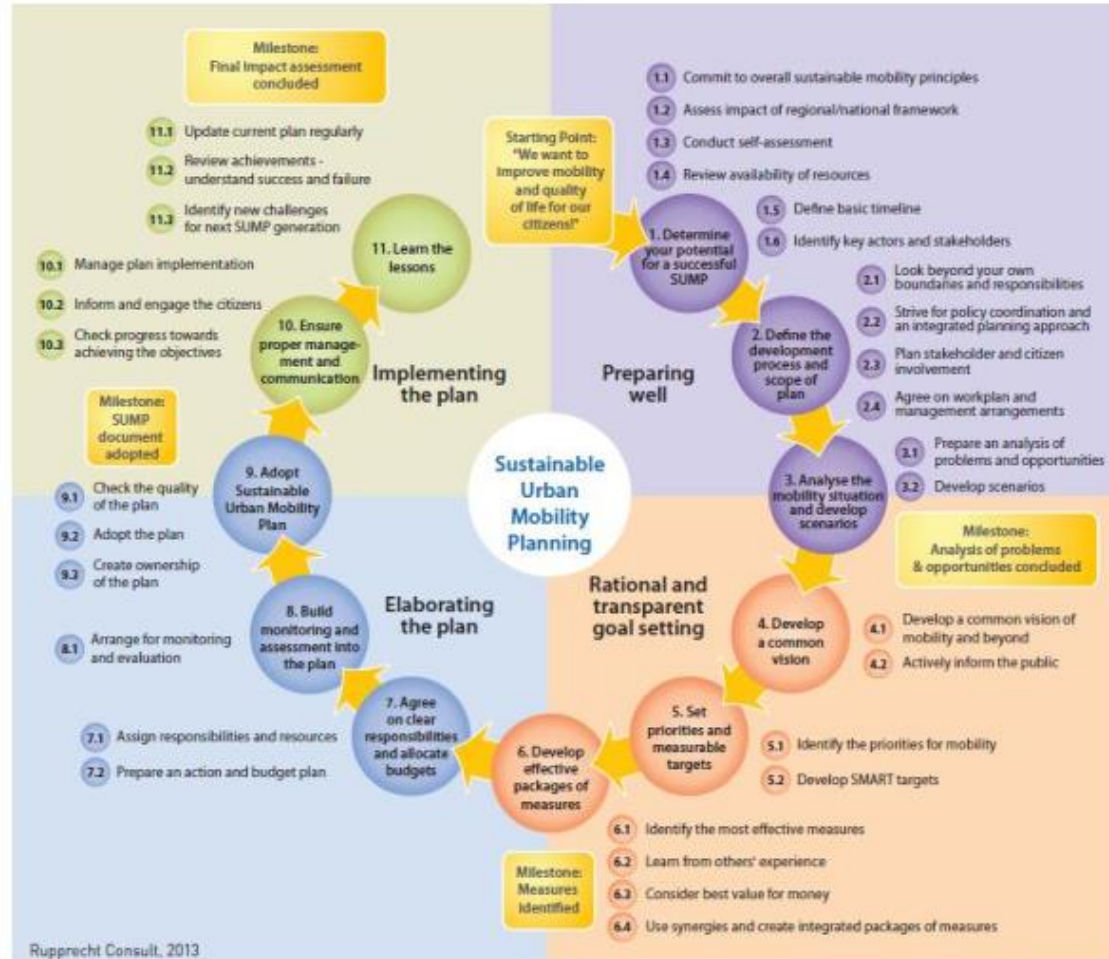
The transition to clean energy in the transport sector will cover remaining demand with carbon-neutral energy.

# Electromobility : Not just about vehicles





# Opportunity for Transformation



# Prioritizing E-mobility Options





# Areas of implementation

rail/ tram



private cars



governmental/  
company/ tourism  
fleets



public transport



two-wheelers



three-wheelers



x-sharing/ taxi/  
ridehailing



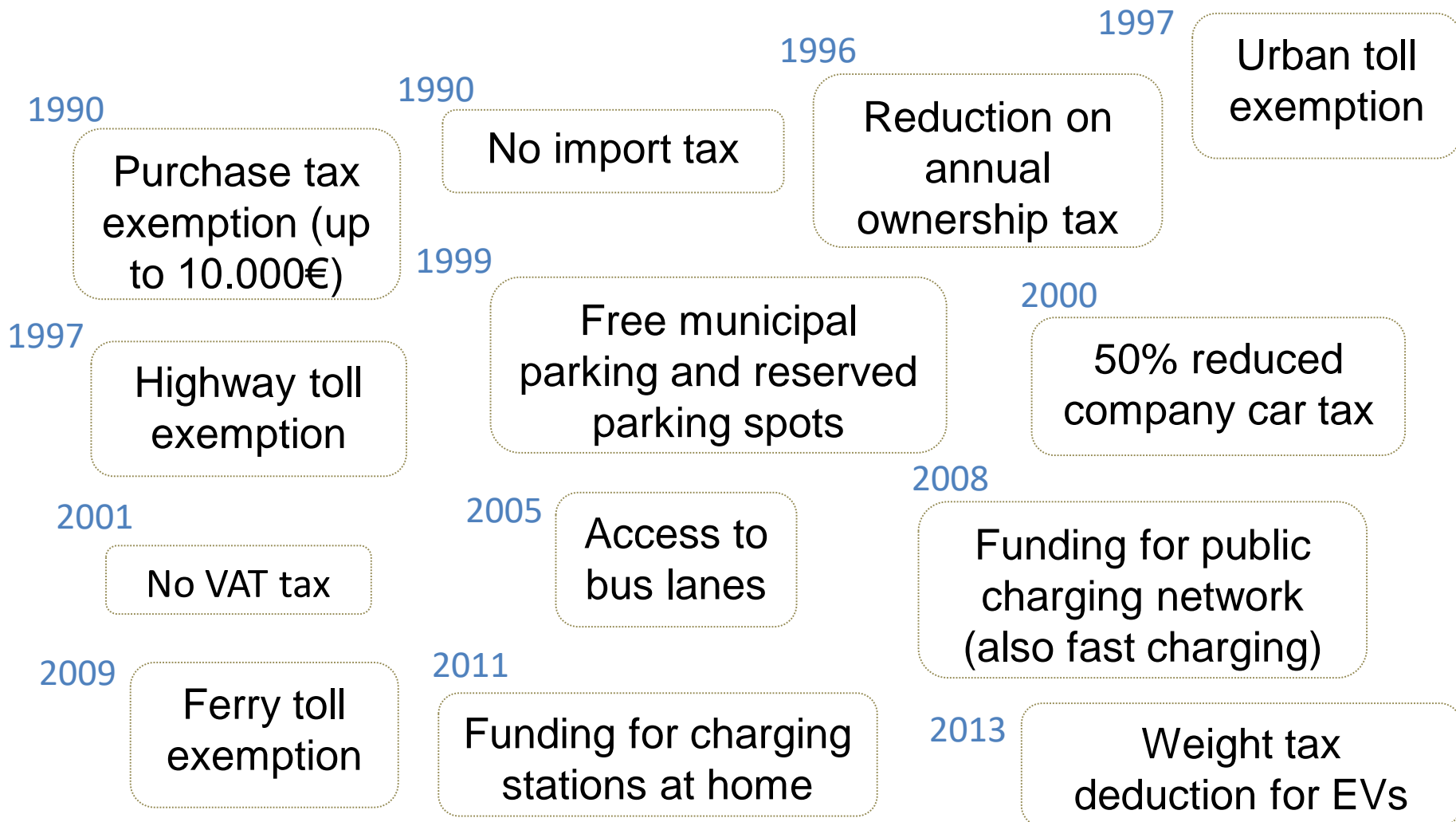
urban freight



# Polymakers' Toolbox

Tools	Description
Legal	Rules and directives designed to mandate, enable, incentivize, limit or otherwise direct subjects to act accordingly to policy goals
Financial	The policy instruments involve either the handing out or taking away of material resources (cash or kind), in order to incentivize or disincentivize behaviour by subjects.
Communication	Instruments that influence the value chain of e-mobility through to the communication of arguments and persuasion, including information and education
Organisation	Actions by government that provides the physical ability to act directly, using its own forces to achieve policy goals rather than others. This includes the allocation of means, capital, resources and the physical infrastructure needed to act

# Case Norway: Regulations



# Building and Electrical Codes

- Policymakers can ensure preparedness for the integration of hardware through building code legislation.
- For example, California has required that new housing and parking lots have conduit and service panel capacity since 2015.
- Palo Alto (California) has mandated new homes to be prewired and moving towards charging and parking requirements for hotels, apartments, commercial buildings. It is estimated that the cost of wiring an EVSE in new homes are four times cheaper than existing structures.
- In Seattle, Washington, the 2008 edition of the city's adopted version of the electrical code identified and added some notable changes specific to EVs, with the purpose of making it easier to install home and commercial EVSE

# Zoning Ordinances

- Zoning ordinances relating to charging stations and PEVs provide homeowners and businesses with details and direction on how to handle charging stations. The sample PEV zoning ordinance covers permitted locations, right of way restrictions, accessibility, lighting, safety, usage fees, signage, and maintenance, among other things.
- Incorporating language specific to PEVs in a jurisdiction's Master Plan is an important step for any municipality.



Source: Clean Energy Coalition, Next Energy, OHM. (2013)

5/1/2019

# Summary

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- Fuel economy policies work
- Implementing fuel economy can substantially reduce CO<sub>2</sub> emissions
- Variety of policy tools exist
- Importance of multi-stakeholder and inter-government consultation processes
- Strong vehicle taxation are effective in encouraging more efficient vehicles
- Fuel economy labelling a strong prerequisite for other policies
- Electromobility: systems thinking, not just about vehicles
- E-mobility to be situated within wider goals, but pose significant opportunities for transformation

# Thank you

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