AAI Summit
Fuel Economy/ Emission Regulation in Thailand

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1.Country emission from vehicle for regulated and non-regulated

1.1 Emission standard regulation for various new vehicle classification (1/2)

Vehicle emission standards in Thailand are developed by the Thai Industrial Standards Institute (TISI), an agency within the Ministry of Industry, and the Pollution Control Department (PCD), an agency of the Ministry of Natural Resources and Environment.

Thai emission regulations are based on European emission standards and test procedures. The regulations are published as Thai Industrial Standards (TIS).

Emission standards for light-duty vehicles—passenger cars and light commercial vehicles—are summarized in Table 1. The dates are applicable for new types, all types must comply one year later. Emission standards for heavy-duty truck and bus engines are summarized in Table 2. Emission standards for Motorcycle in Table 3.

1.1 Emission standard regulation for various new vehicle classification (2/2)

Table 1
Emission Standards for Light-Duty Vehicles

Date	EU Reference Standard	Thai Standard	
1997	Euro 1	TIS 1440-2540 gasoline TIS 1435-2540 diesel	
1999	Euro 2	TIS 1870-2542 gasoline TIS 1870-2542 diesel	
2006	Euro 3[a]	TSI 2160-2546 gasoline TSI 2155-2546 diesel	
2012	Euro 4[b]	**TIS 2540-2554** **TIS 2555-2554**	**Gasoline** **CNG,LPG** **Gasoline**
		TIS 2550-2554	Diesel

a - Without EOBD
b - With EOBD, without in-use conformity

Table 2
Emission Standards for Heavy-Duty Diesel Engines

Date	EU Reference Standard	Thai Standard	
1998.05	Euro I		
2000.05	Euro II	TIS 1295-1998	
2008.01	Euro III	TIS 2315-2550	
2012.01	Euro III	TIS 2315-2551	
		TIS 2320-2552	**CNG,LPG Heavy-Diesel**

Table 3
Emission Standards for Motor cycle.

DATE	EU Reference Standard	Thai Standard
2009.03	Euro III	TIS 2350-2551

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1.2 In-use vehicle (inspection and criterion) 1/3

In Thailand, the Department of Land Transport (DLT) administers two relevant pieces of legislation:

Motor Vehicle Act (MVA): smaller vehicles, including cars, pick ups, and motorcycles, taxis and so on.

Land Transport Act (LTA): heavy-duty diesel vehicles, including buses and trucks.

Responsibilities for periodic inspection of in-use vehicles are divided as follows:

DLT inspect vehicles regulated under the LTA; and

Private inspection stations authorized by DLT carry out inspection of motorcycles and taxis i.e. vehicles registered under the MVA.

1.2 In-use vehicle (inspection and criterion) 2/3

Light/Heavy Duty Diesel Vehicle

Emission	Standard	Measuring Device	Test Procedure
Black Smoke	50%	Filter	Snap acceleration on test
	45%	Opacity	
	40%	Filter	Full load test
	35%	Opacity	

Heavy Duty Vehicle

Pollutant	Type of Vehicle	Standard	Measuring Device	Test Procedure
CO	Vehicle used gasoline/gasohol	4.5%	Non-dispersive infrared (NDIR)	Idle Test
	Vehicle used Natural Gas	2.0%		
HC	Vehicle used gasoline/gasohol	600 ppm		
	Vehicle used Natural Gas	600 ppm		

Motorcycle

Pollutant	Type of Vehicle	Standard	Measuring Device	Test Procedure
CO	Registered before Jul 1, 2006	4.5%	Non-dispersive infrared (NDIR)	Idle Test
	Registered from Jul 1, 2006	3.5%		
	Registered from Jan 1, 2009	2.5%		
HC	Registered before Jul 1, 2006	10,000 ppm	Non-dispersive infrared (NDIR)	Idle Test
	Registered from Jul 1, 2006	2,000 ppm		
	Registered from Jan 1, 2009	1,000 ppm		

1.2 In-use vehicle (inspection and criterion) 3/3

Passenger Vehicle
(Include the Vehicle Used Natural Gas)

Pollutant	Type of Vehicle	Standard	Measuring Device	Test Procedure
CO	vehicle registered before Nov. 1,1993	4.5%	Non-dispersive infrared (NDIR)	Idle Test
	vehicle registered from Nov. 1,1993	1.5%		
	vehicle registered from Jan. 1,2007	0.5%		

Pollutant	Type of Vehicle	Standard	Measuring Device	Test Procedure
HC	vehicle registered before Nov. 1, 1993	600 ppm	Non-dispersive infrared (NDIR)	Idle Test
	vehicle registered from Nov. 1, 1993	200 ppm		
	vehicle registered from Jan. 1, 2007	100 ppm		

1.3 Initiatives on non-regulated emission

- Due to emerged of alternative fuel ,the Ethanol (E10 ,E20 and E85) and Bio diesel (B7) In Thailand has increasing more and more of the demand
- The non –regulated emission gases (such as GHG ,the Aldehyde group) apart from the main emission should were raised for the internal study from the government agency for its side effect
- TAI with PCD have initiate and plan to joint together to do the study the amount of non –regulated emission from the vehicle

2. Some info on various testing authorities and activity

2.1 Emission Testing authorities

TAI

Thailand Automotive Institute

www.thaiauto.or.th

PCD

Pollution Control Department(PCD)

www.pcd.go.th

PTT

PTT PUBLIC COMPANY LIMITED

www.pttplc.com

2.2 Proficiency Testing (PT) program on emission test (Type 1)

Light duty gasoline vehicle

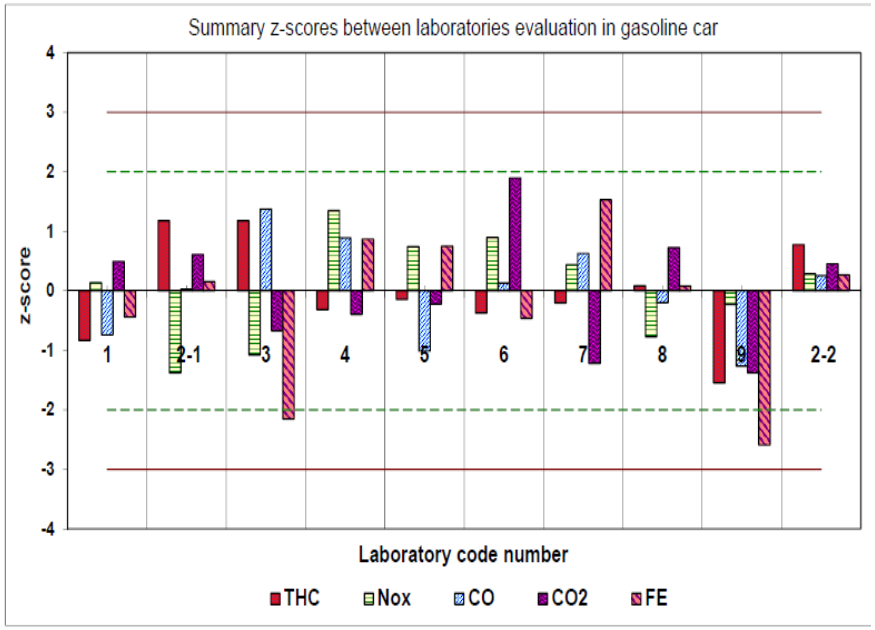

Figure 13. Summary z-score between laboratories evaluation of studied parameters in gasoline car

Light duty diesel vehicle

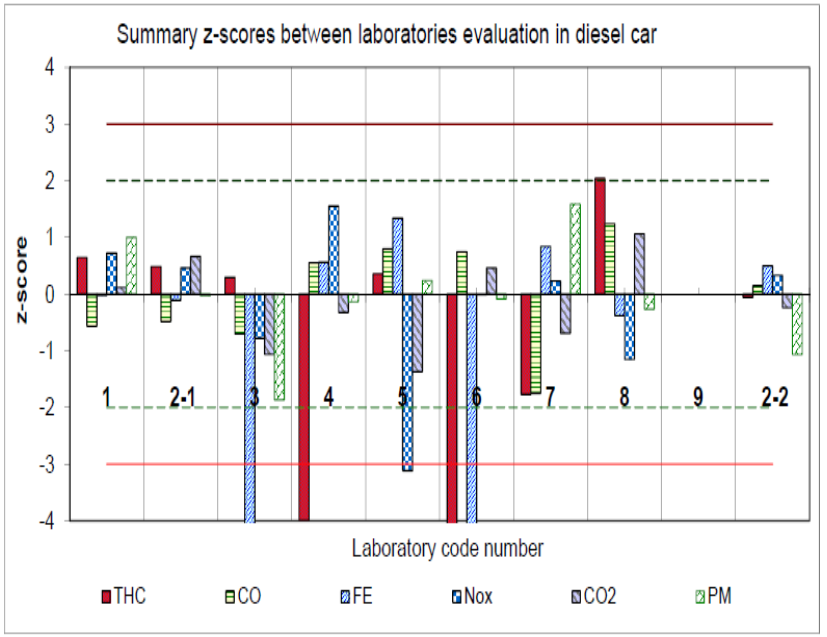

Figure 12. Summary z-score between laboratories evaluation of studied parameters in diesel car

3. Initiatives on fuel efficiency standard (esp. CO_2 emission)

3.1 Methodology study the fuel efficiency standard (1/8)

Project of the study of Motor Vehicle's Fuel Efficiency

Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY

THAILAND AUTOMOTIVE INSTITUTE
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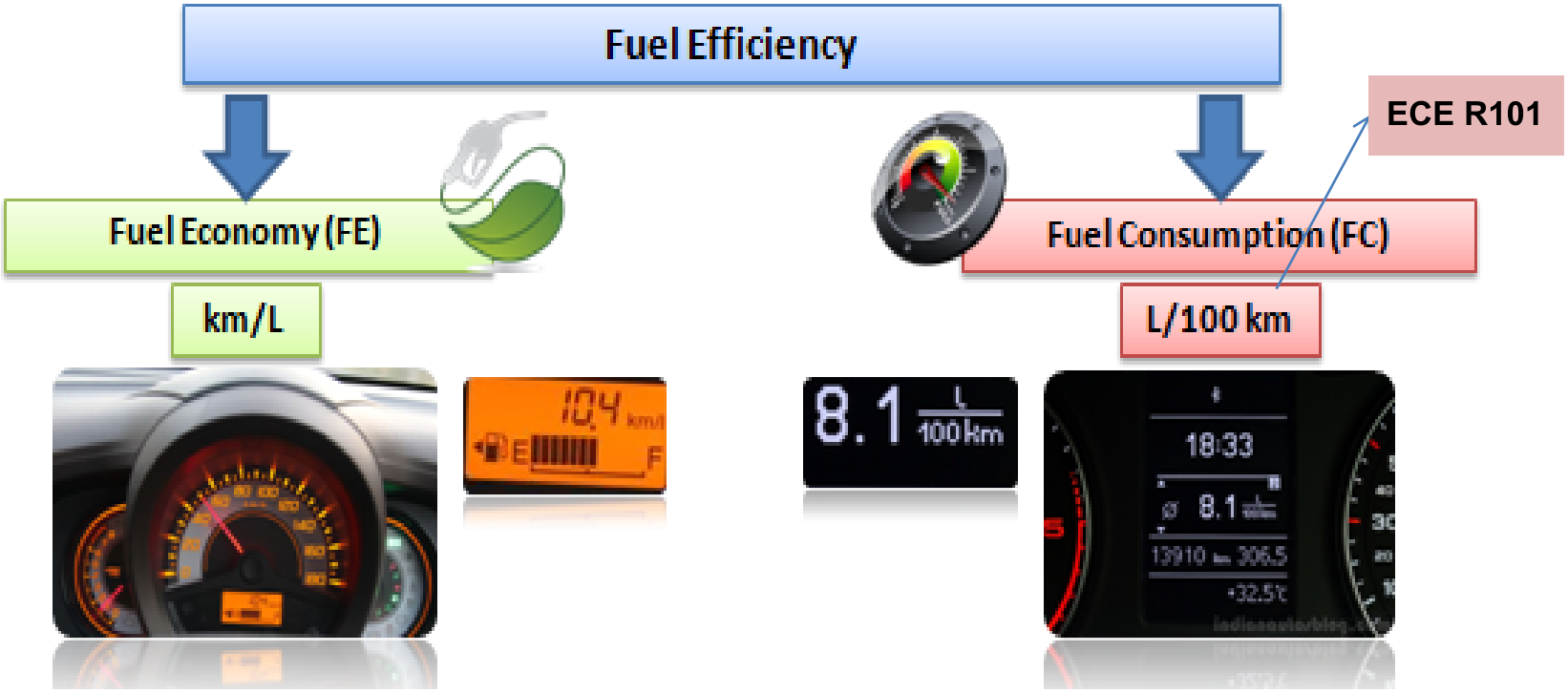
In 2012, The Project Funded by Department of Alternative Energy Development and Efficiency (DEDE), Ministry of Energy with Thailand Automotive Institute (TAI) as an Advisor of the project.(1 year lead time)

"To establish an appropriated draft of fuel efficiency standard for motor vehicles to support the energy efficiency labeling and enforcement of Minimum Energy Performance Standards". (2 year in plan the official standard will be launched after establish the draft of fuel eff. Standard)

3.1 Methodology study the fuel efficiency standard (2/8)

Terminology



3.1 Methodology study the fuel efficiency standard (3/8)

Objectives

MEPS = Minimum Energy Performance Standard

"Minimum energy efficiency required for any vehicles to be permissible for sale"

TISI
Thai Industrial Standards Institute
Ministry of Industry

MOI(Ministry Of Industry)

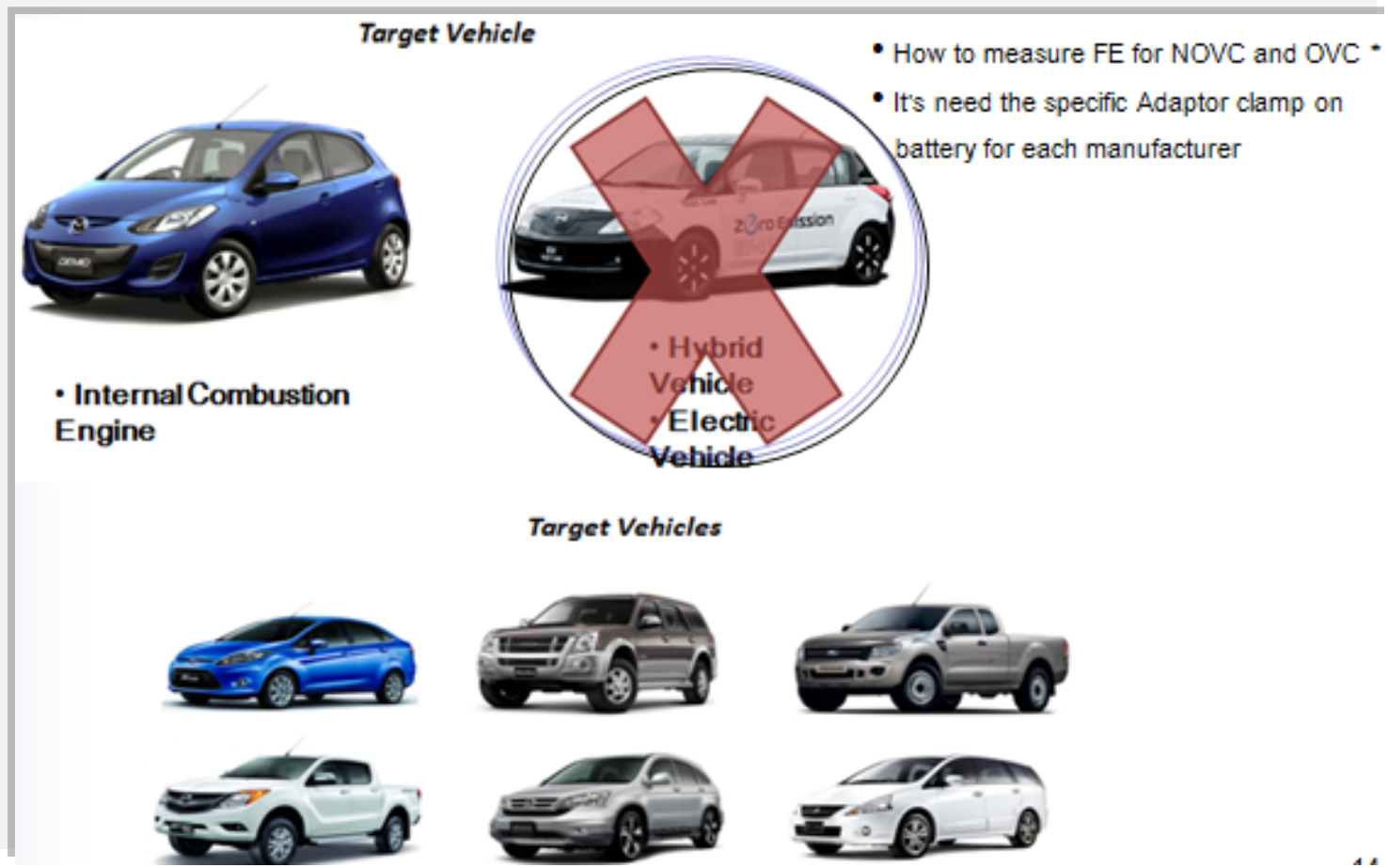
HEPS = High Energy Performance Standard

"Minimum energy efficiency required for any vehicles to get tax promotion"

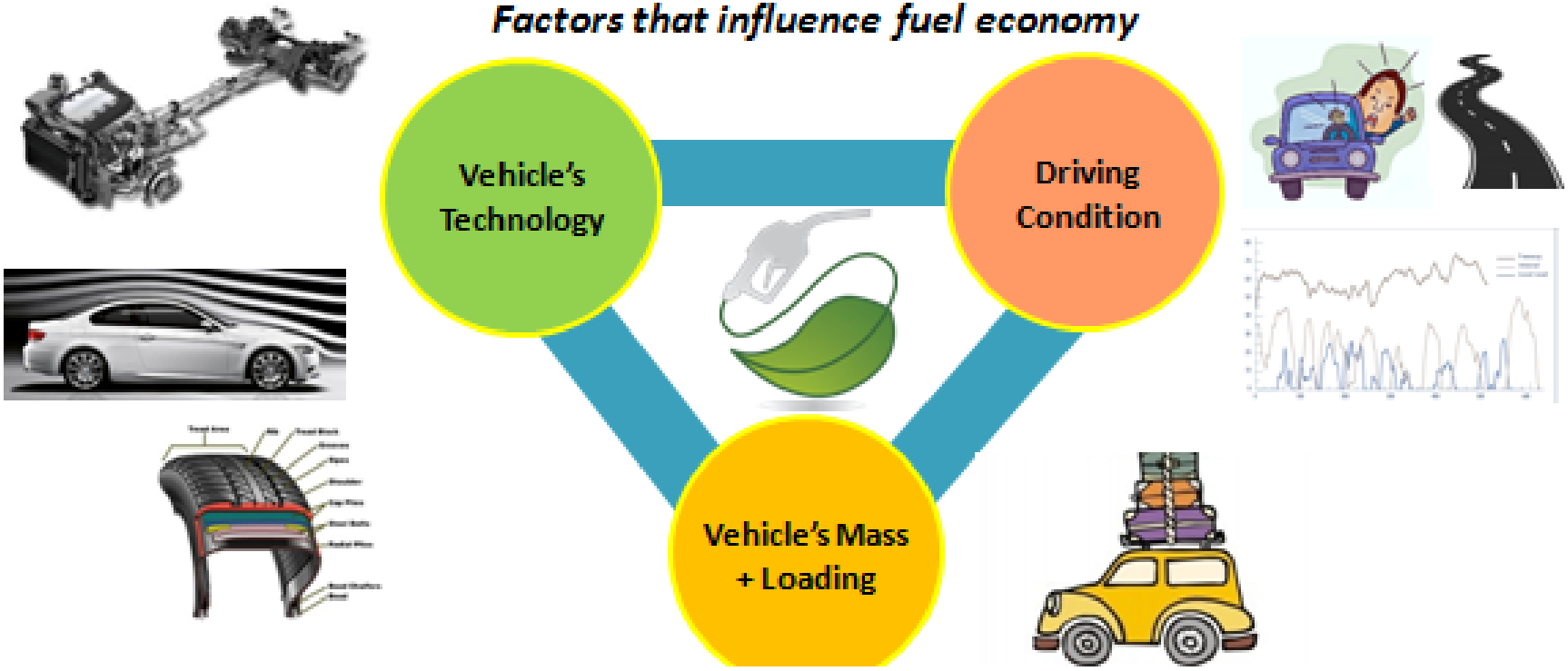
Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY

MOE(Ministry Of Energy)

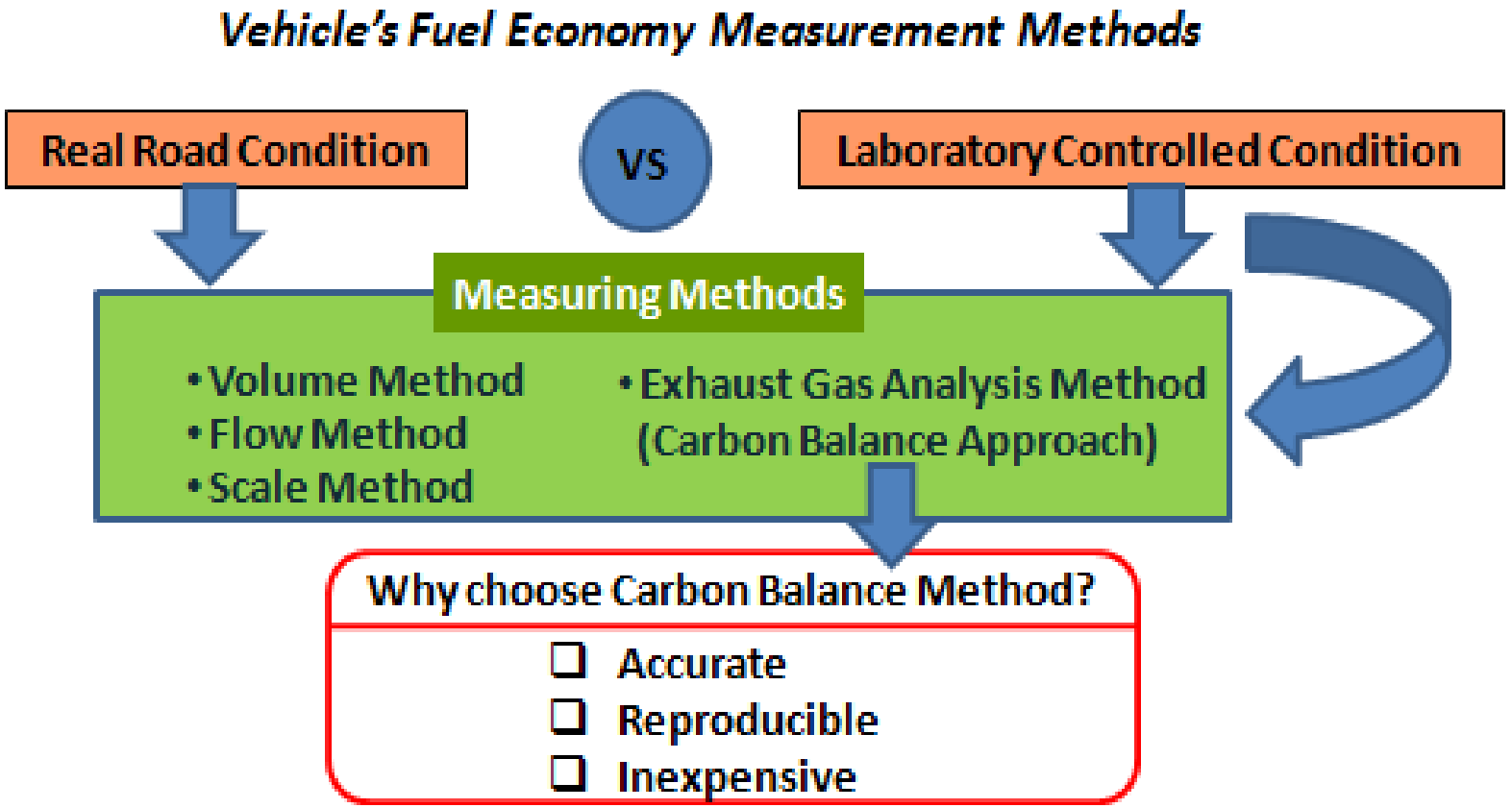
3.1 Methodology study the fuel efficiency standard (4/8)



3.1 Methodology study the fuel efficiency standard (5/8)



3.1 Methodology study the fuel efficiency standard (6/8)



3.1 Methodology study the fuel efficiency standard (7/8)

Scope of the study

- The testing standard shall compatible with the current motor vehicles emissions standard enforced by Thailand Industrial Standard Institute (TISI) which equivalent to Euro 4 standard.
- Passenger cars and 1 ton pick-up truck that complied with current exhaust emission standard are the target vehicles of the study.
- The evaluation of vehicle's fuel economy will be done separately between gasoline and diesel vehicle, which each of them will be classified by vehicle's mass to set an appropriate criteria of fuel economy for each level of the vehicle's mass.

3.1 Methodology study the fuel efficiency standard (8/8)

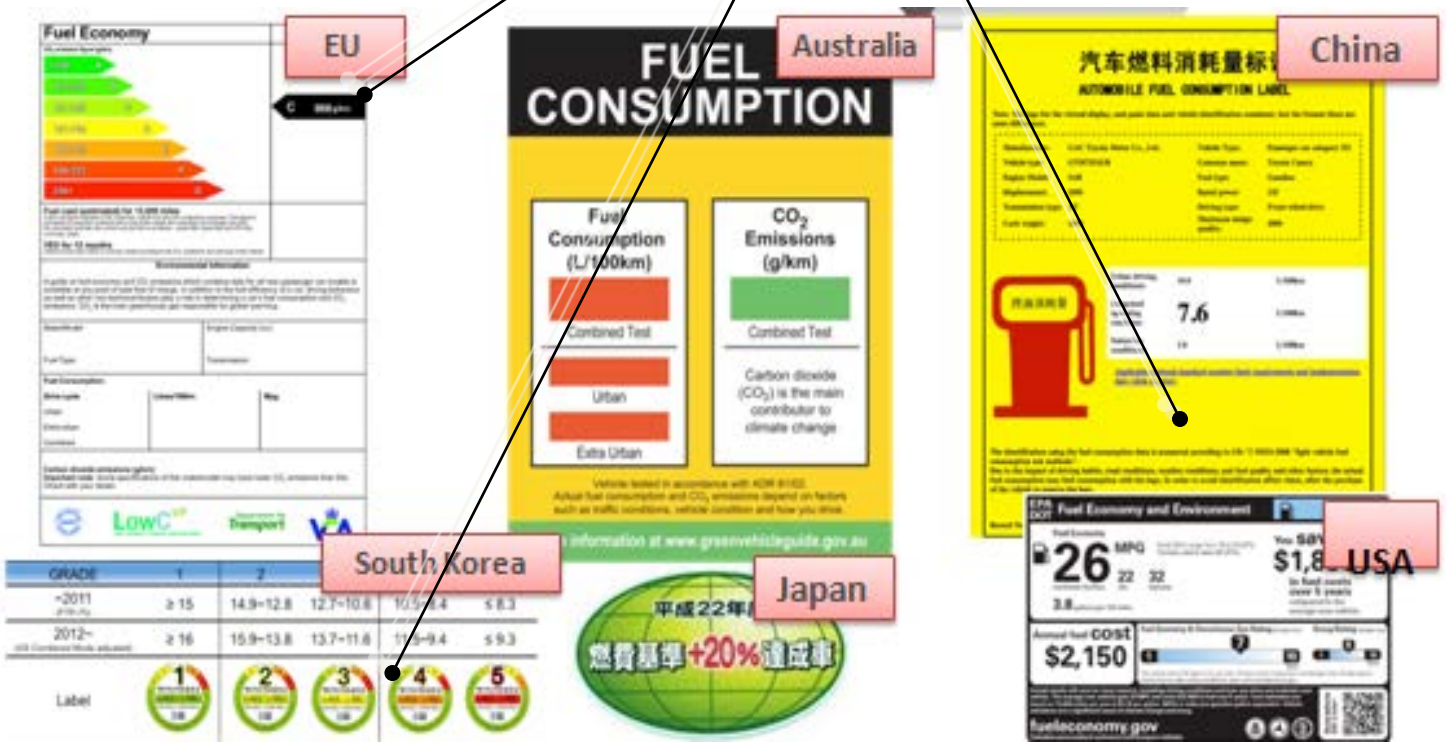
Thailand motor vehicle's emission standard & Type of Test

Gasoline Vehicles TIS. 2540-2554	*Light Duty Diesel Vehicles TIS 2550-2554*
Type I : Verifying the average tailpipe emission after a cold start *Type II : Carbon monoxide emission test at idling speed* *Type III : Verifying emissions of crankcase gases* *Type IV : Determination of evaporative emission from vehicles with positive ignition engines*	*Type I: Verifying the average tailpipe emission after a cold start)*

3.2 Issues of reference fuel

How about Thailand ?

(What is appropriate/During on process)



4.Current/future implementation on vehicle related tax

4.1 Eco-car project: phase I [2007] & II [2014 Current/future implementation on vehicle related tax

Requirements, benefits Thailand's eco-car program

First Phase	Product	Second Phase
Nissan, Honda, Mitsubishi, Suzuki, Toyota (approved by government)	**Manufacturer**	Participants in first phase, plus Mazda, GM, Ford, Volkswagen, SAIC Motor-CP (applied to participate)
Gasoline-powered cars with engine displacements of 1.3 liters or less	**Engine displacement**	Gasoline-powered cars with engine displacements of 1.3 liters or less
Diesel-powered cars with engine displacements of 1.4 liters or less		Diesel-powered cars with engine displacements of 1.5 liters or less
20km/liter or more	**Mileage**	23km/liter or more
Euro 4 (European emissions standard)	**Emissions standard**	Euro 5
100,000 cars per year in year 5 and beyond	**Annual production**	100,000 cars per year in year 4 and beyond
5 billion baht or more	**Minimum investment**	6.5 billion baht or more (5 billion baht or more for automakers participating in first phase)
8 years	**Corporate tax exemption**	6 years
17%	**Excise tax on new cars**	14% (estimate)
In production since 2010	**Other**	Production to start in 2019
$CO_2 \leq 120$ g/km		$CO_2 \leq 100$ g/km

4.2 CO_2 tailpipe emission based on new excise tax

The Comparison between "Current" and "New" Excise Tax Structure

Unit: %	Current				New			
	Engine Capacity (HP)	Excise Tax Rate			CO2	Excise Tax Rate		
		E10	E20	E85		E10/E20	E85/NGV	HV
Passenger Car, Bus ≤ 10 seats					≤3,000 CC			
	≤2,000 CC	30	25	22	≤100 g/km	30*	25*	10*
	2,001-2,500 CC	35	30	27	101-150 g/km	30*	25	20
	2,501-3,000 CC	40	35	32	151-200 g/km	35	30	25
					>200 g/km	40	35	30
	>3,000 CC	50	50	50	>3,000 CC	50	50	50
PPV / D-CAB / Extra-Cab / Single-Cab	≤3,250 CC	20 / 12 / 3 / 3,18			≤200 g/km	25* / 12 / 5 / 3,18		
					>200 g/km	30 / 15 / 7 / 5,18		
	>3,250 CC	50			>3,250 CC	50		
ECO car (Gasoline/Diesel) / (E85)	≤1,300/1,400 CC	17			≤100 g/km	14* / 12*		
					101-120 g/km	17 / 17		
EV / Fuel Cell Vehicle	≤3,000 CC	10				10		
HV		10				**		
	>3,000 CC	50			>3,000 CC	50		
NGV OEM	≤3,000 CC	20				**		
	>3,000 CC	50			>3,000 CC	50		

Remark: * Enforce active safety standard for passenger car, bus ≤ 10 seats with CO2 ≤ 150 g/km / PPV with CO2 ≤ 200 g/km / Eco car with CO2 ≤100 g/km
** Considering the tax structure of passenger car by using CO2

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Thank you for your attention.