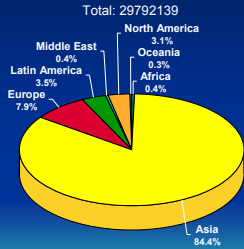
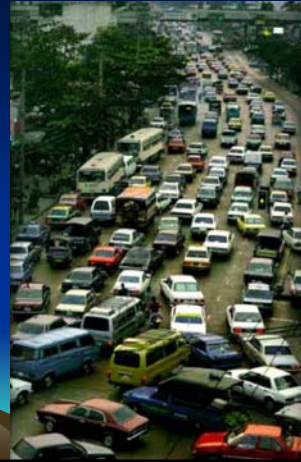


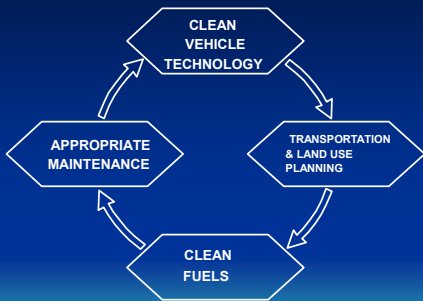
The Global Market For New Motorcycles and Mopeds



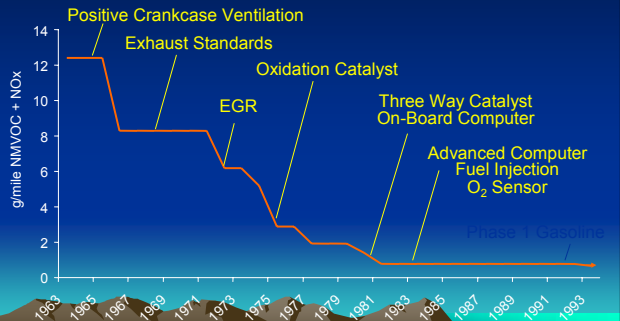
Source: Honda Facts & Figures



ELEMENTS OF A COMPREHENSIVE VEHICLE POLLUTION CONTROL STRATEGY

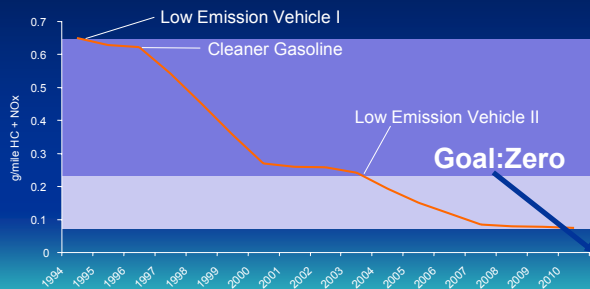


Evolution of California Auto Controls (Implementation: 1963 – 1993)

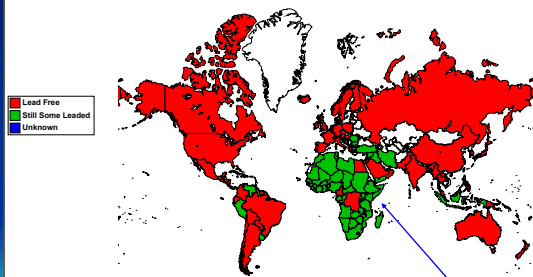


Evolution of ARB Auto Controls

Implementation: 1994 - 2010

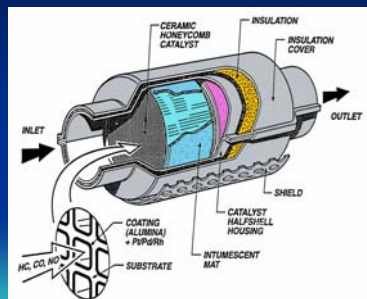


Status of Lead Free Gasoline 2003



Dakar +2 Scheduled For May 5-7 in Nairobi

The Three-way Catalytic Converter: A Familiar Technology Re-Engineered for High Performance in Close-coupled and Underfloor Applications

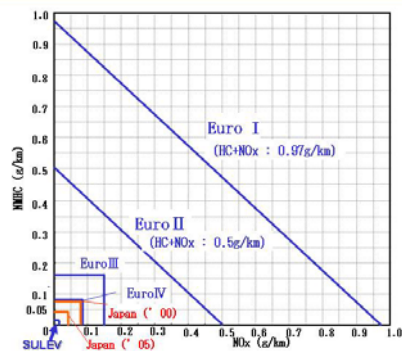


- Layered washcoat architectures and support materials with high thermal stability
- Integrated HC adsorption functions
- Mounting materials with improved durability
- High cell density ceramic or metallic substrates
- Insulation schemes for heat management

Can Only Be Used With Lead Free Fuel

Light Duty Vehicle Emissions Standards

Emission standard transition

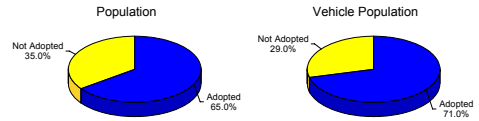


Emission Standards for New Vehicles (light duty)

Country	95	96	97	98	99	2000	01	02	03	04	05	06	07	08	09	10
European Union	Euro 1	Euro 2						Euro 3			Euro 4				Euro 5	
Bangladesh										Euro 2 (under discussion)						
Hong Kong		Euro 1	Euro 2					Euro 3			Euro 4					
China																
India ^a								Euro 1		Euro 2						E3
India ^b					E1	Euro 2				Euro 3						
Indonesia											Euro 2					
Malaysia						Euro 1	Euro 2									
Nepal						Euro 1										
Philippines								Euro 1		Euro 2						
PRC ^c								Euro 1	Euro 2	Euro 3						
Singapore ^d		Euro 1						Euro 2								
Singapore ^e		Euro 1						Euro 2						Euro 4		
Sri Lanka										Euro 1						
Taipei, China						US Tier 1				Euro 3					US Tier 2 for diesel ^f	
Thailand		Euro 1					Euro 2		Euro 3						Euro 4	
Viet Nam ^g						Euro 1										
Viet Nam ^h											Euro 1					

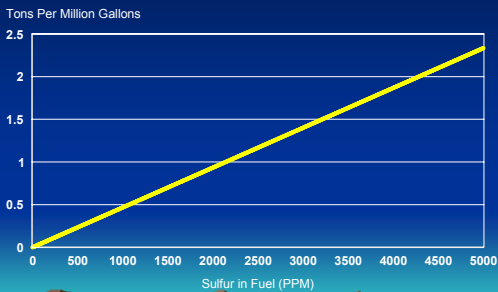
^a Entire country
^b Delhi and other cities; Euro 2 introduced in Mumbai, Kolkata and Chennai in 2001; Euro 2 in Bangalore, Hyderabad, Kolkata, Pune and Ahmedabad in 2003; Euro 3 to be introduced in Delhi, Mumbai, Kolkata, Chennai, Bangalore, Hyderabad and Ahmedabad in 2005
^c Beijing and Shanghai
^d Gasoline vehicles under consideration
^e Gasoline vehicles
^f for types of diesel vehicles
^g for gasoline vehicles
^h for diesel vehicles

Developing Countries Which Have Adopted US Or EU Standards For New Vehicles



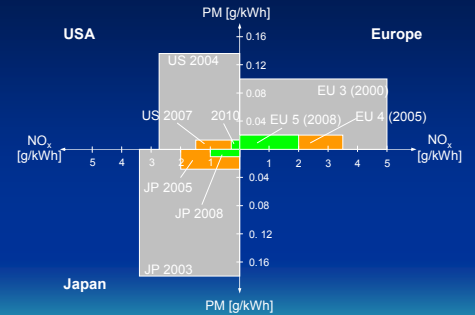
- Two Challenges:
- Eliminate The Yellow Colored Areas
 - Narrow the Technology/Fuel Quality Gap in Blue Areas

Tons of Directly Emitted PM From Diesel Fuels Sulfur

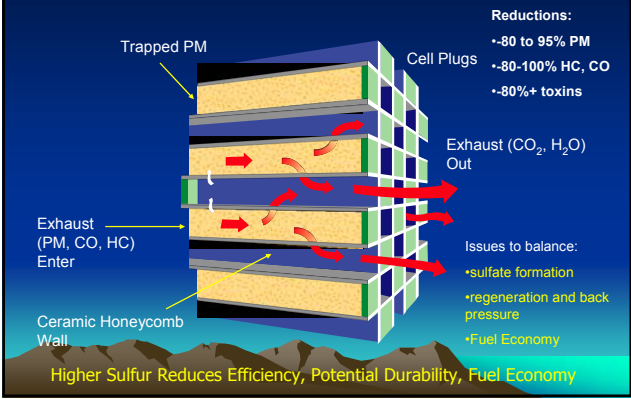


Derived From US EPA Data

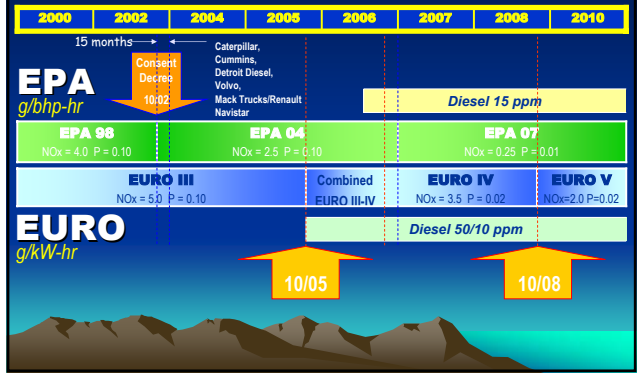
Emissions Regulation for HDDV



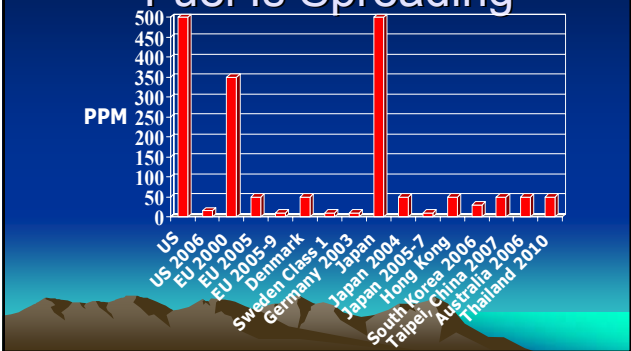
Diesel Particulate Filters



Close Linkage Between Vehicle Emissions Standards and Fuel Sulfur Levels

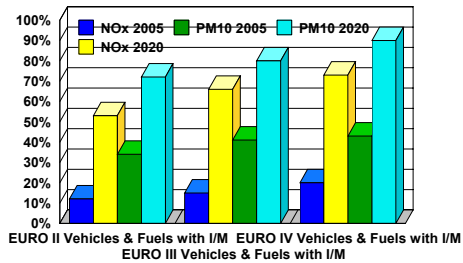


Ultra Low Sulfur Diesel Fuel Is Spreading



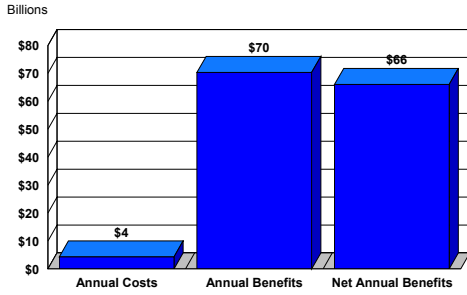
Impact of Clean Vehicles and Fuels On Diesel Vehicle Emissions

Percent Reduction in Emissions

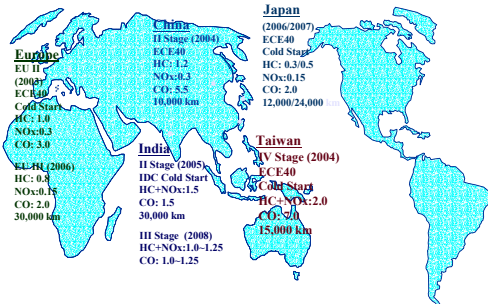


Source: Camarsa, BAQ 2003

Costs and Benefits of Low Sulfur Diesel Fuel (<15 PPM) and Very Stringent Heavy Duty Engine Standards in the US



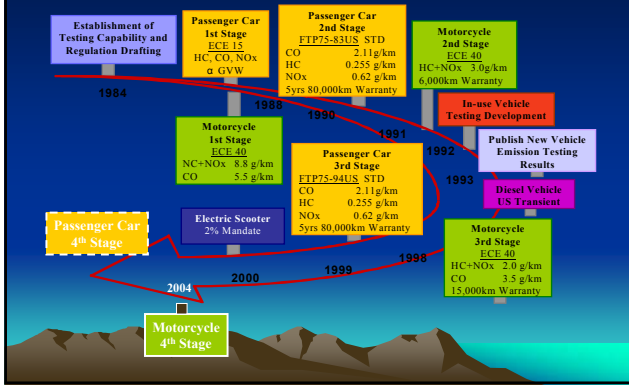
Worldwide Emission Regulations



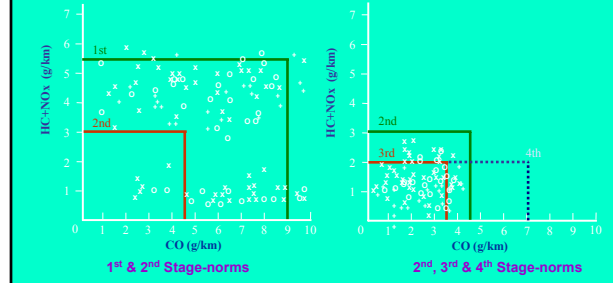
Worldwide Emission Regulations

Nation	Engine Displacement	Engine/Vehicle Type	Emission Standard			Durability Mileage (km)	Effective Year	Remarks
			CO (g/km)	HC (g/km)	NOx (g/km)			
Taiwan	< 700 c.c.	2-stroke	7.0	1.0	2.0	15,000	2004	1. ECE R40 Cold Start excluding 0-40 seconds idle
	> 700 c.c.	2- or 4-stroke	12.0	2.0	2.0			
China	< 50 c.c.	2- Wheeler	1.0	1.2	NA	10,000	2004	1. ECE R40 Warm Start 2. COP to be effective 2005
	> 50 c.c.	2- Wheeler	5.5	1.2				
	> 50 c.c.	3- Wheeler	7.0	1.5				
India	NA	2- Wheeler	1.5	1.5	NA	30,000	2005	1. IDC Cold Start
	NA	3- Wheeler	2.25	2.0				
Japan	< 50 c.c.	NA	2.0	0.5	NA	12,000	2006	1. ECE R40 Cold Start
	50-125 c.c.	NA	2.0	0.3				
	> 125 c.c.	NA	2.0	0.3				
Europe	< 150 c.c.	NA	2.0	0.8	TBD	30,000	2006	1. ECE R40 Cold Start 2. OBD & Evap
	> 150 c.c.	NA	2.0	0.3				

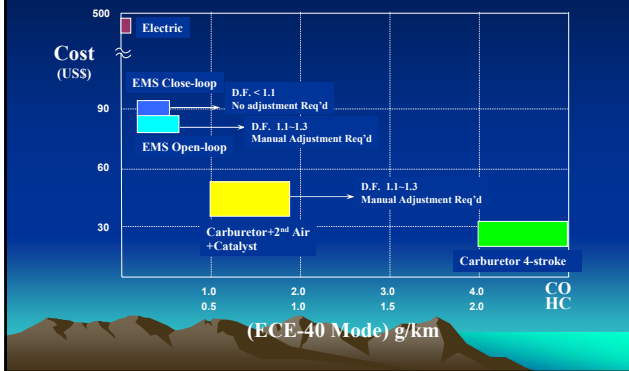
Taiwan Emission Regulation Milestones



Taiwan Motorcycle Emission Reduction



Cost and Emission Analysis

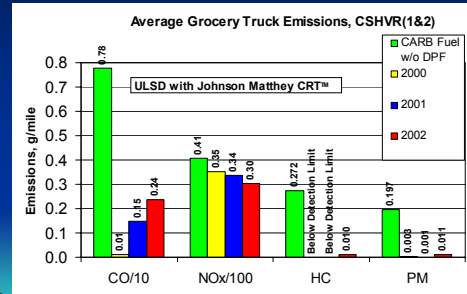


Dealing With Existing Vehicles

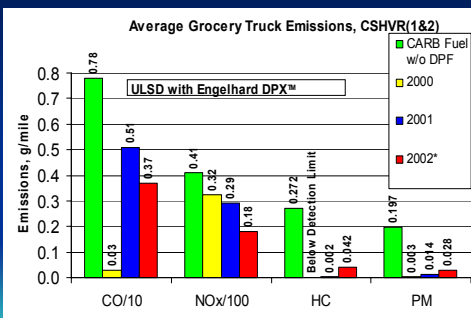
• Ultra low sulfur diesel with a catalyzed diesel particulate filter offers the following benefits:

- >90 - 98% PM reduction
- >70 - 90% CO reduction
- > 90% HC reduction
- >90% air toxics & ozone precursor reduction
- 0 - 5% NOx reduction

Durability & Reliability



Durability & Reliability



Conclusions

- Technologies Exist Today Which Would Allow Tight Control of New Vehicle Emissions
- These Technologies Are Spreading Throughout The Region and The World
- Clean Vehicle Technology Requires Clean Fuels
- Good I/M Program Can Help Maximize The Benefits of Any Vehicle Pollution Control Program

Vietnam Road Map

- Light Duty Gasoline Vehicle – Euro 2
 - Light Duty Diesel Vehicle – Euro 1
 - Heavy Duty Diesel Engines – Euro 1
 - HDDE – Euro 2
 - Fuel Sulfur
 - Gasoline 500 PPM
 - Diesel 500 PPM
- 2006/2007
 - 2006/2007 (Why Not Euro 2?)
 - 2006/2007 (Why Not Euro 2?)
 - 2009 (Why Wait?)
 - 2005 in Discussion
 - 2004 In Discussion