

SIAM



Presentation on

Vehicle Emission standards in India

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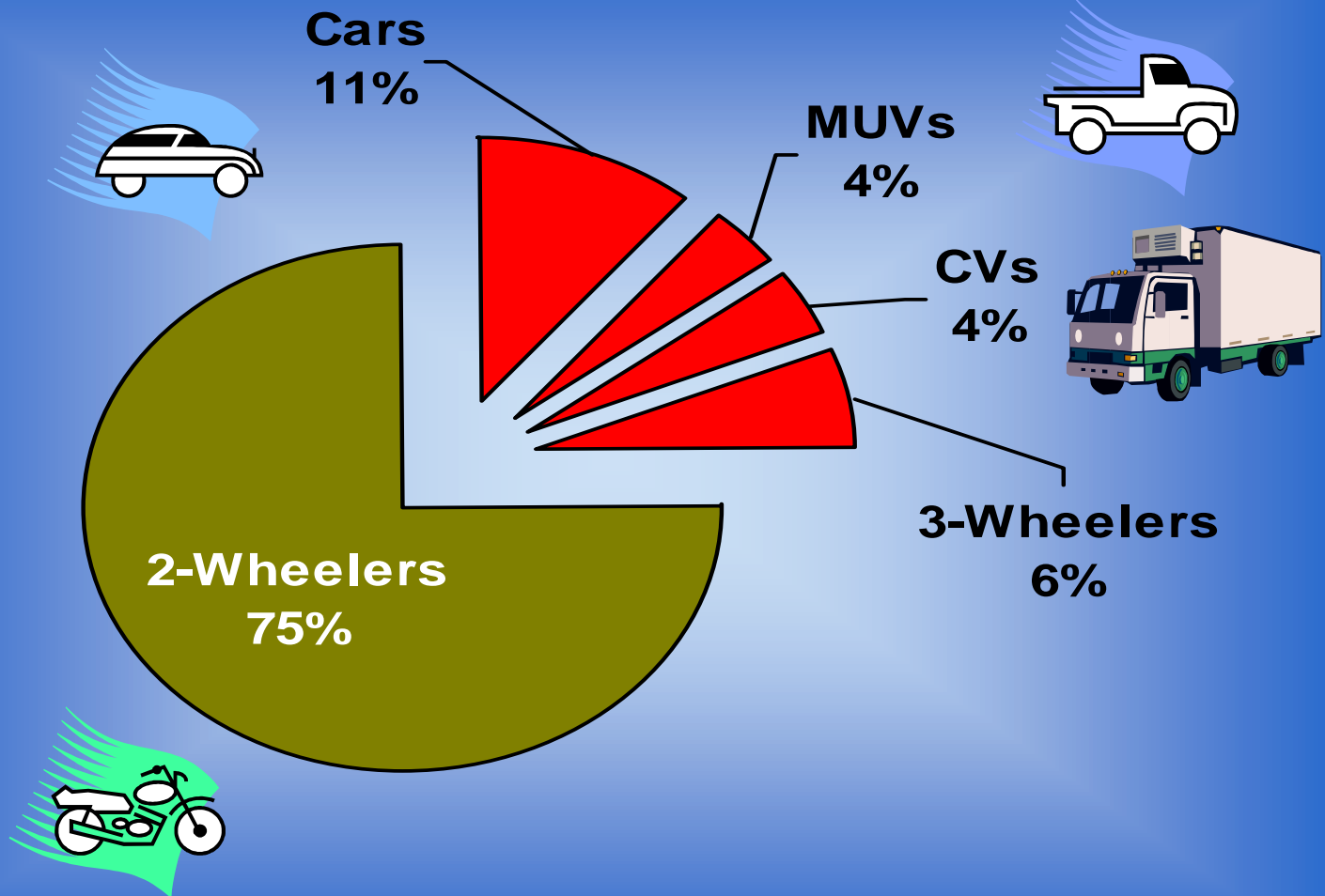
Society of Indian Automobile Manufacturers

at

**Regional Workshop for Reducing Vehicle Emissions ;
Strengthening Inspection and Maintenance**

7 - 9 November 2001, Chongqing, PRC

Industry Characteristics



Increasing Vehicle Population

All India Vehicle Population						
Year	2-W	3-W	Cars	MUVs	CVs	Total
Pre 1986	6,133,771	389,542	1,278,654	386,788	1,057,191	9,245,946
Pre 1991	14,046,764	763,513	2,281,569	731,726	1,744,211	19,567,783
Pre 1998	28,736,061	1,398,873	3,938,396	859,153	2,310,000	37,242,483
Upto 2000	38,770,000	2,510,000	4,715,809	1,104,191	2,386,992	49,486,992

Source:

1. Motor Transport Statistics of India, Transport Research Wing, Ministry of Road Transport and Highways
2. Sub-Group on Traffic Forecasts and Fleet Requirement in the Tenth Five Year Plan, Planning Commission
3. Society of Indian Automobile Manufacturers

History of Emission Regulation in India

1989 - Idle Emission Regulation

1991 - Mass Emission Regulation (CO & HC) (Hot Start; Indian Driving Cycle)

1992 - Mass Emission regulation for Diesel Vehicles

1995 - Fitment of CAT Converters for cars in four metros

1996 - Tightening of emission limits (CO, HC & NO_x), Evaporative Emission & Crank Case Emission

1998 - Norms for CAT Fitted vehicles (50% tighter standards)

History of Emission Regulation in India (Contd.)

1998 - From September, fitment of CAT Converters in 42 major cities for petrol driven passenger cars

2000 - India 2000 (Euro-I equivalent) norms for all 4-Wheelers

- Bharat Stage-II (Euro-II equivalent) norms in NCR for Passenger Cars & MUVs

- Extended to Mumbai & Kolkata from January 2001 and Chennai from July 2001

- Tightest norms in the world for two wheelers

2001 – Bharat Stage II (Euro II equivalent) norms for Commercial Vehicles in Delhi & Kolkata (from 24th October, 2001)

- Bharat Stage II norms for CVs in Mumbai and Chennai from 01st November, 2001

Future norms under deliberation

Notified Emission Norms

Petrol Vehicles

Three- Wheelers

(g/km)

Year	CO	HC	IC + Nox
1991	12 - 30	8 - 12	-
1996	6.75	-	5.40
2000	4.00	-	2.00

Two-Wheelers

(g/km)

Year	CO	HC	IC + Nox
1991	12 - 30	8 - 12	-
1996	4.50	-	3.60
2000	2.00	-	2.00

Cars

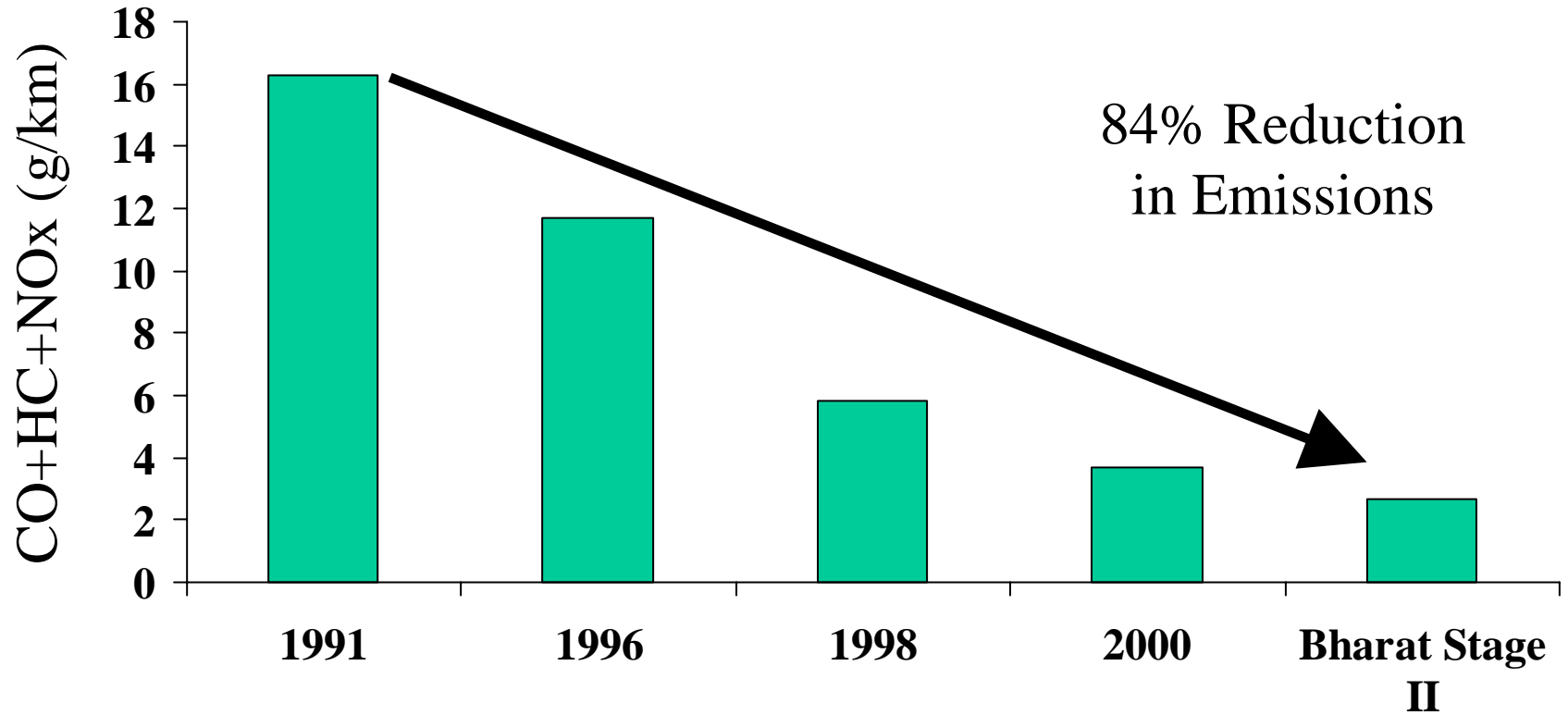
(g/km)

Year	CO	HC	IC + Nox
1991	4.3 - 27	2.0 - 2.9	
1996	.68 - 12.4		3.00 - 4.36
1998*	.34 - 6.20		1.50 - 2.1
2000	2.72		0.97

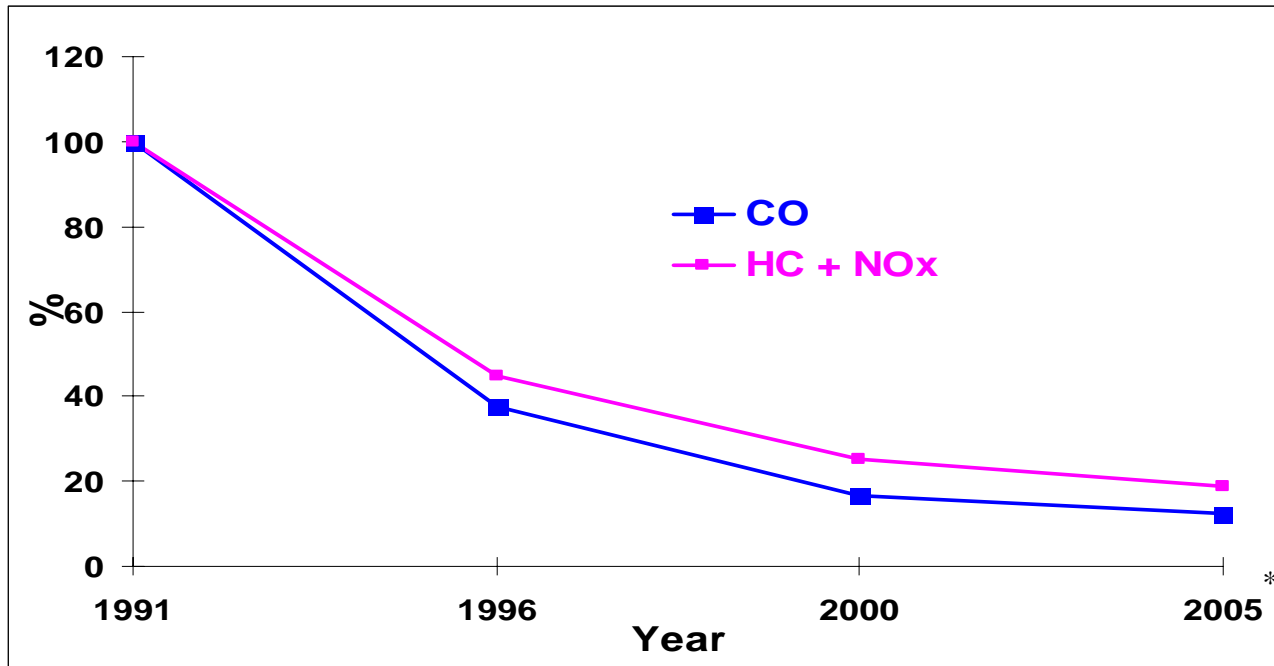
* For Catalytic Converter Fitted vehicles

B.S II	2.2		0.5	upto 6 seaters & GVW upto 2.5 tons
B.S. II	2.2 - 5.0		0.5 - 0.7	More than 6 seaters & GVW upto 3.5 tons

Emission reduction in cars



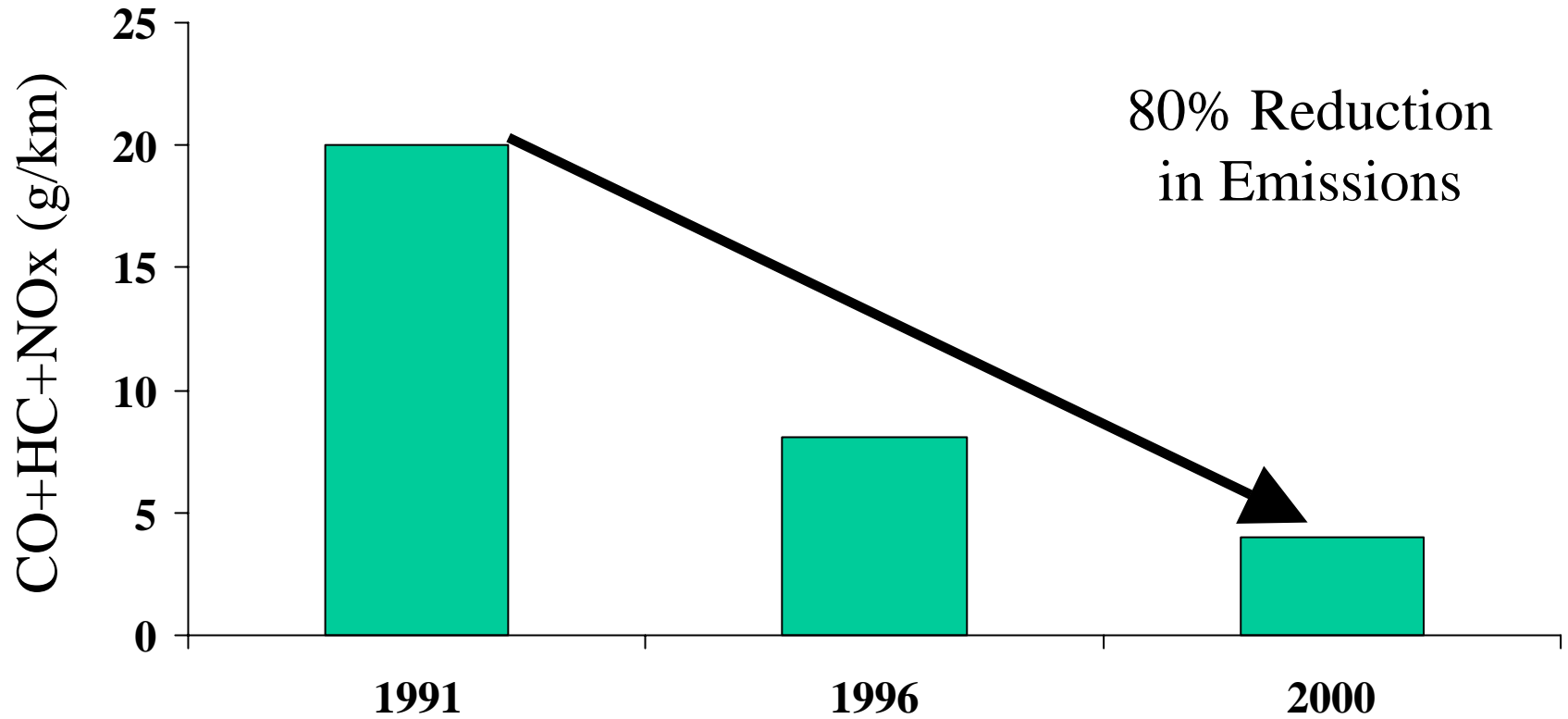
Progressive Reduction of Indian Emission Norms 2 Wheelers (Both 2 and 4 stroke)



* Indicative

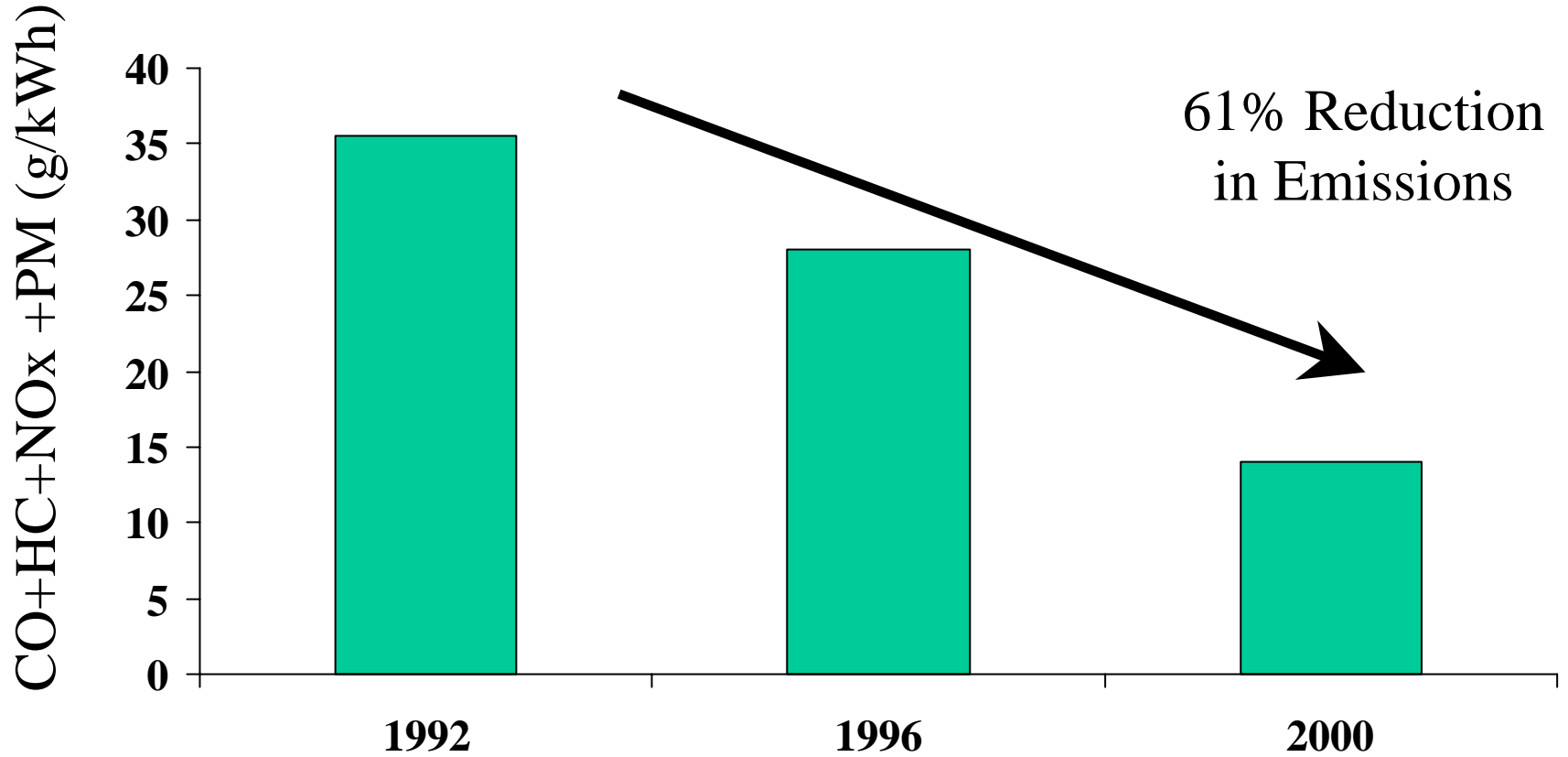
	1991	1996	2000	2005
CO gm/km	12	4.5	2.0	1.5
HC+NOx gm/km	8	3.6	2.0	1.5

Emission Reduction in Two Wheelers



Diesel Vehicles						
Diesel Vehicles (GVW Upto 3.5 Tons)						
(g/ kwh)	Engine Dynamometer					
Year	CO	HC	Nox	PM		
1992	14	3.5	18			
1996	11.20	2.40	14.4			
2000	4.5	1.1	8.0	0.36/ 0.61 #		
B.S II	4.0	1.1	7.0	0.15		
or						
(g/km)	Chasiss Dynamometer					
Year	CO	HC	HC + Nox	PM		
1992	17.3 - 32.6	2.7 - 3.7				Light Duty Vehicles
1996	5.0 - 9.0		2.0 - 4.0			
2000	2.72 - 6.90		0.97 - 1.70	0.14 - 0.25		
B.S II	1.0 - 1.5		0.7 - 1.2	0.08 - 0.17		
Cars						
(g/km)	Chasiss Dynamometer					
B.S. II	1.0		0.7	0.08		upto 6 seaters & GVW upto 2.5 tons
B.S. II	1.0 - 1.5		0.7 - 1.2	0.08 - 0.17		More than 6 seaters & GVW upto 3.5 tons
Diesel Vehicles (GVW > 3.5 Tons)						
(g/ kwh)	Engine Dynamometer					
Year	CO	HC	Nox	PM		
1992	17.3 - 32.6	2.7 - 3.7				
1996	11.20	2.40	14.4			
2000	4.5	1.1	8.0	0.36/ 0.36 #		
B.S II	4.0	1.1	7.0	0.15		
# For Engines with Power exceeding 85 kw/ For engines with power upto 85 kw						

Emission reduction in Heavy Diesel Vehicles



SIAM Proposal (April 2000)

For Adoption of Emission Norms

Vehicle Category	EURO III	EURO IV	GAP with Europe
Passenger Cars	2003/2004	2005/2006	1 year
MUVs	<i>Skip Euro III</i>	2006/2007	2 years
Commercial Vehicles	<i>Skip Euro III</i>	2007/2008	2 Years
2&3 Wheelers	2005	2009	India Unique norms

SIAM recommended skipping Euro III stage

To achieve Euro III and Euro IV norms matching fuel quality is essential

Recommendations of Inter-ministerial Task Force

March 2001

Vehicle Category	Bharat Stage II (All Over India)	Bharat Stage III (Seven Mega Cities)
Passenger Cars	April 2005	April 2005
MUVs	April 2005	April 2005
Commercial Vehicles	April 2005	April 2005
2&3 Wheelers	-	April 2005

- *Matching fuel quality as per Euro norms to be made available.*
- *Time frame for Bharat Stage III norms throughout India and introduction of Bharat Stage IV norms to be deliberated.*
- *Require requisite fuel quality for development work a year in advance.*

Fuel Quality Improvements

- Unleaded Petrol

- All over country: February 2000

- 1% Benzene in petrol

- NCT: 1st October 2000

- NCR & Mumbai : 2001

- 0.05% sulphur in petrol

- NCR : 31 May 2000

- Mumbai & Kolkata : January 2001

- Chennai : July 2001

- All over Country : 2005

- 0.05% sulphur diesel

- NCT : 31st December 2000

- NCR : 30 June 2001

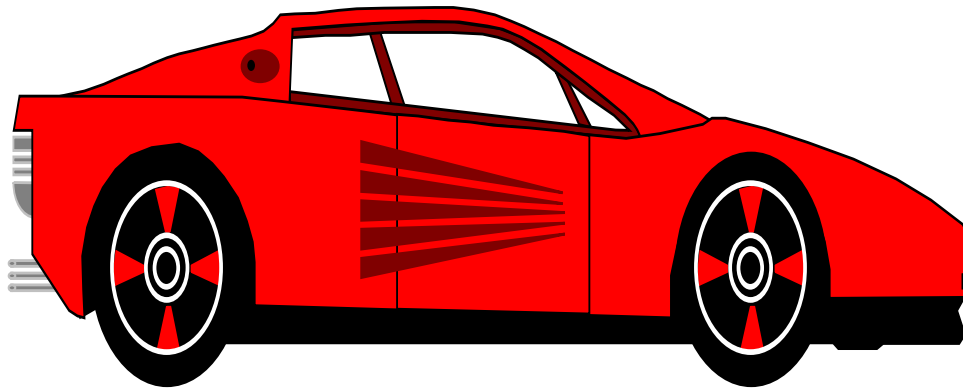
- Mumbai & Kolkata : January 2001

- Chennai : July 2001

- All over Country : 2005

Old Vehicles

- * Significant number of vehicles of Pre-Emission era are still on road
- * Pollute more due to poor & improper maintenance



In-use Vehicle Emission Management

- Present Scenario:
 - Transport vehicles need to undergo an annual Fitness check carried out by RTOs :
 - Emission
 - Safety
 - Roadworthiness
 - All Vehicles need to undergo a periodic emission check (3 months/ 6 months) - PUC Centres at Fuel Stations and Private Garages authorised to check the vehicles

Inspection & Certification Programme for all vehicles

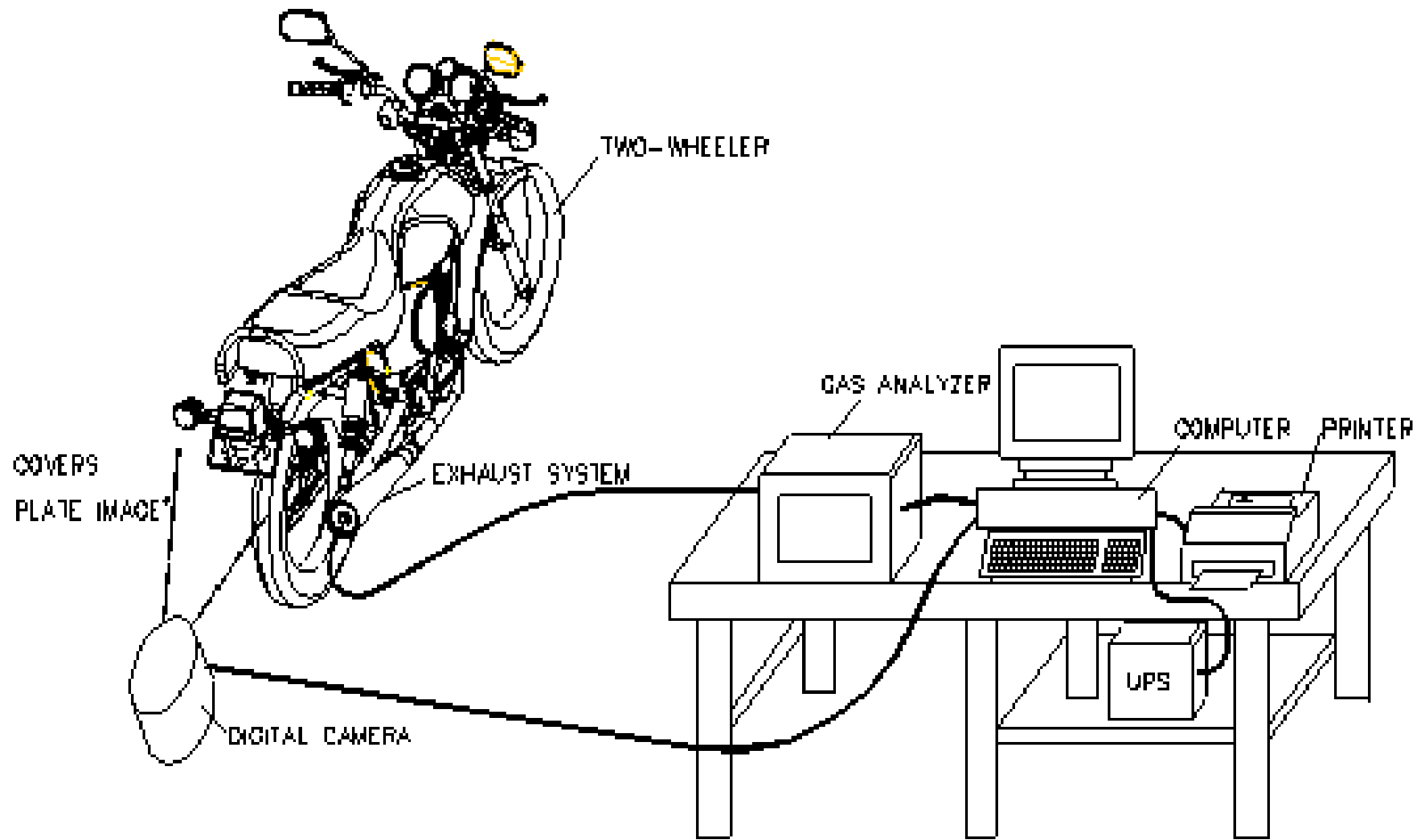
- Presently I & C only for commercial vehicles (Buses, Trucks, Taxis & Autorickshaws) - RTOs only authorised agencies
- Need to extend I & C for all category of vehicles - awaiting Government notification
- Recommend participation of Private Sector through a rigid accreditation system

Problem of Present PUC System

- The objective of reducing pollution not achieved by the present System
- Reasons:
 - **Independent centres do not follow rigorous procedures due to inadequate training**
 - **Equipment not subjected to periodic calibration by independent authority**
 - **Lack of professionalism has led to malpractice**
 - **Tracking system of vehicles failing to meet norms non-existent**

Proposed Computerised PUC centre for Petrol Vehicles

Designed by SIAM



Computerised Emission Test

EMISSION TEST CERTIFICATE

(Rule 231 (B) (81 of KMV Rules 1989)

Serial Number : KAXXX200100005 Make : TVS Date : Apr 04, 2001
Registration Number : KA 05 EA 2192 Model : SUZUKI Time : 3:00:40 PM
Year of Registration : 1999 Type Of Engine : 2S Catalyst : No
Speedometer Reading : 4500
(Kms)
Type of Vehicle : 2W

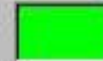
Test Result : IDLING

	Regulation (%)	Actual Reading	
CO	4.5	2.4	% Vol

This vehicle has been tested as per details shown in the certificate and meets the Emission Standards prescribed by the Rule 115(2) of Central Motor Vehicle Rules 1989.



GRADE : A



Valid Upto: Oct 04, 2001

SEAL OF TEST
STATION

CODE OF TEST
STATION

TRANSPORT DEPT.
SEAL

Thank You !

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