

REGIONAL EST FORUM IN ASIA



ROADMAP FOR MOTORCYCLE EMISSION STANDARD AND FUEL QUALITY IN VIETNAM

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1. Motorcycle in Vietnam



Urban traffic in major cities of Vietnam



- ✓ Vietnam is the most typical country of MCs.
- ✓ MCs are the most popular type of transport means & indispensable in Vietnam.
- ✓ Almost MCs are two-wheelers.



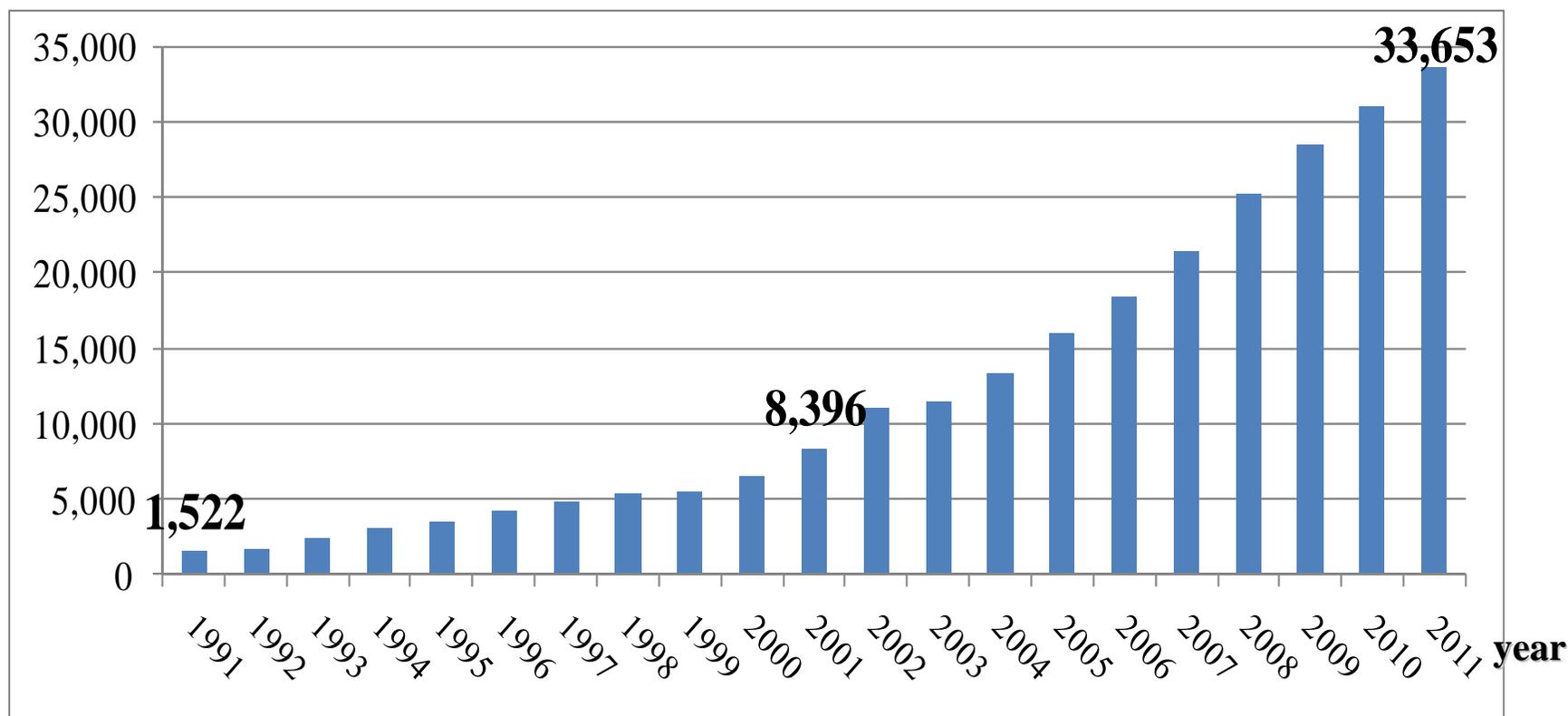
Number of imported & assembled motorcycle

Type \ Year	1995	2000	2005	2010	10/2011
Assembled MC	62,000	1,629,291	2,187,870	3,141,698	2,909,310
Imported MC	-	1,006	45,716	92,516	58,882



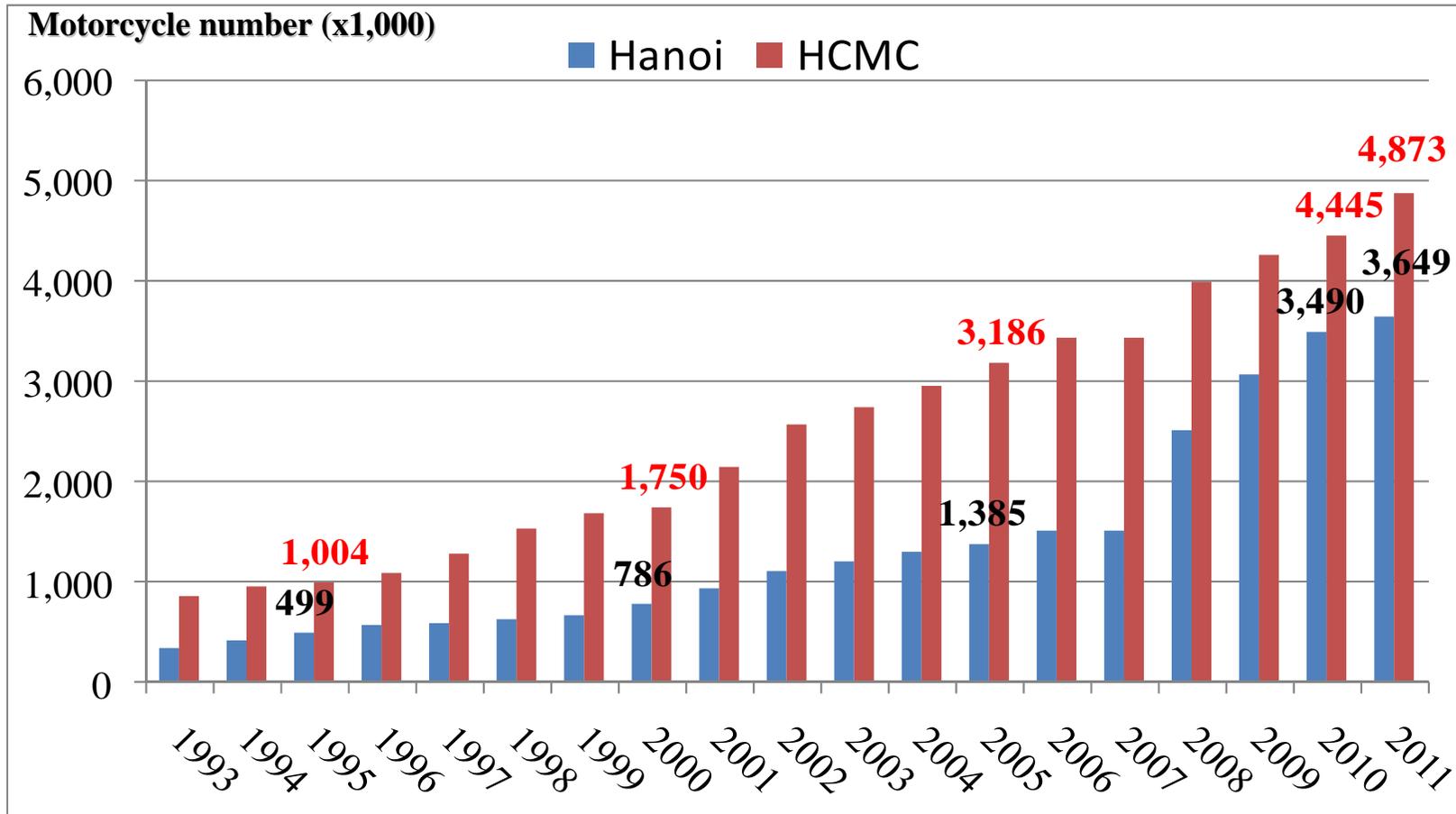
Total number of in-used motorcycle in Vietnam

Motorcycle number (x1,000)





Total number of in-used motorcycle in Hanoi & Ho Chi Minh City



❖ MCs account for 95 % of all type of Motor Vehicles and meet 90% transport demand .

2. Motorcycle Emission



Current Emission Control

A. For imported or assembled motorcycle:

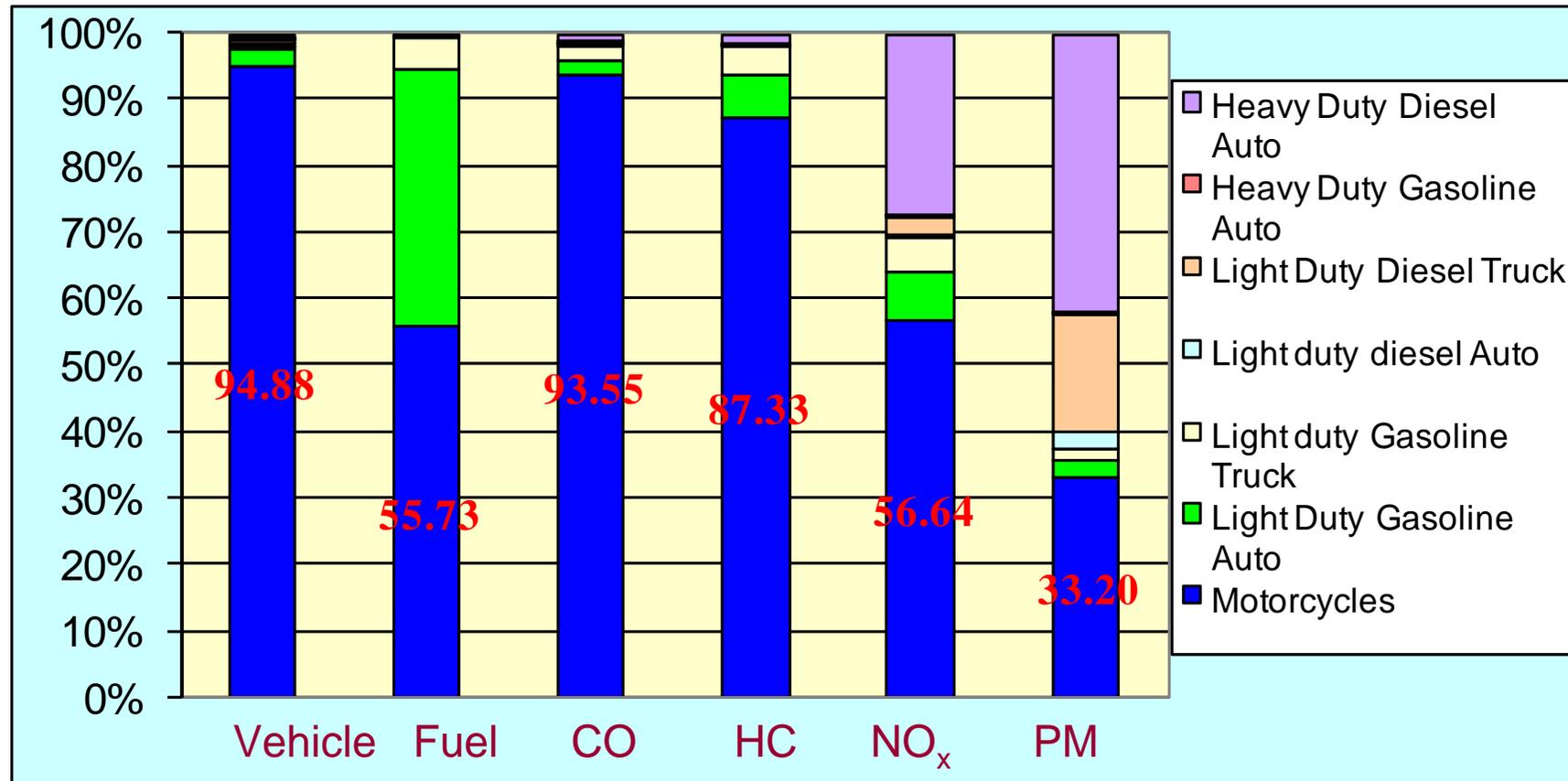
- Before 2007: $\text{CO} \leq 4.5\%$ and $\text{HC} \leq 1,200\text{ppm}$
- After 2007: Euro 2

B. For in-used motorcycle:

None safety & emission inspection.



Motor Vehicle emission in Hanoi & Ho Chi Minh City



MCs - the main source of vehicle emissions



Emission survey for in-used motorcycle in 2006- 2007





Result of Survey

Result of survey 1,675 MCs in Hanoi and 1,627 MCs in Ho Chi Minh City show that:

- Almost motorcyles are not periodical maintained and not corrected repaired.**
- 59% checked MCs in Hanoi and 52% checked MCs in Ho Chi Minh City exceeds emission level (4.5% CO and 1,200 ppm HC)**



Emission Test for in-used Motorcycles



Emission Test before and after maintenance & repair

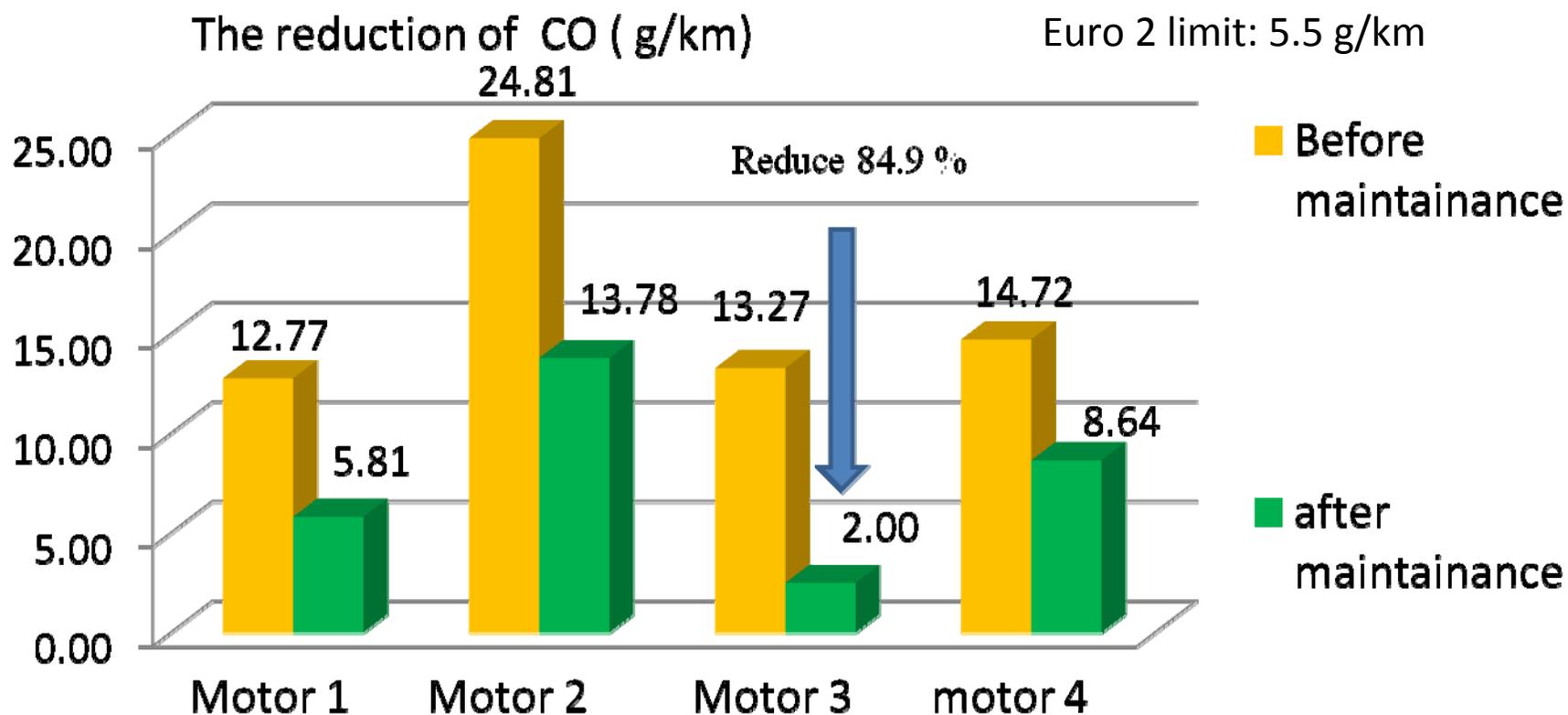


Tested motorcycles

Number	1	2	3	4
Trade Mark	Honda Dream II	Honda Wave	Honda DreamII	Longcin
Origin	Thailand	Thailand	Thailand	China
Engine	4 strokes 100 cc			
Gear box	Manual, 4 gears	Manual, 4 gears	Manual, 4 gears	Manual, 4 gears
Operation time	7 years	11 years	14 years	8 years

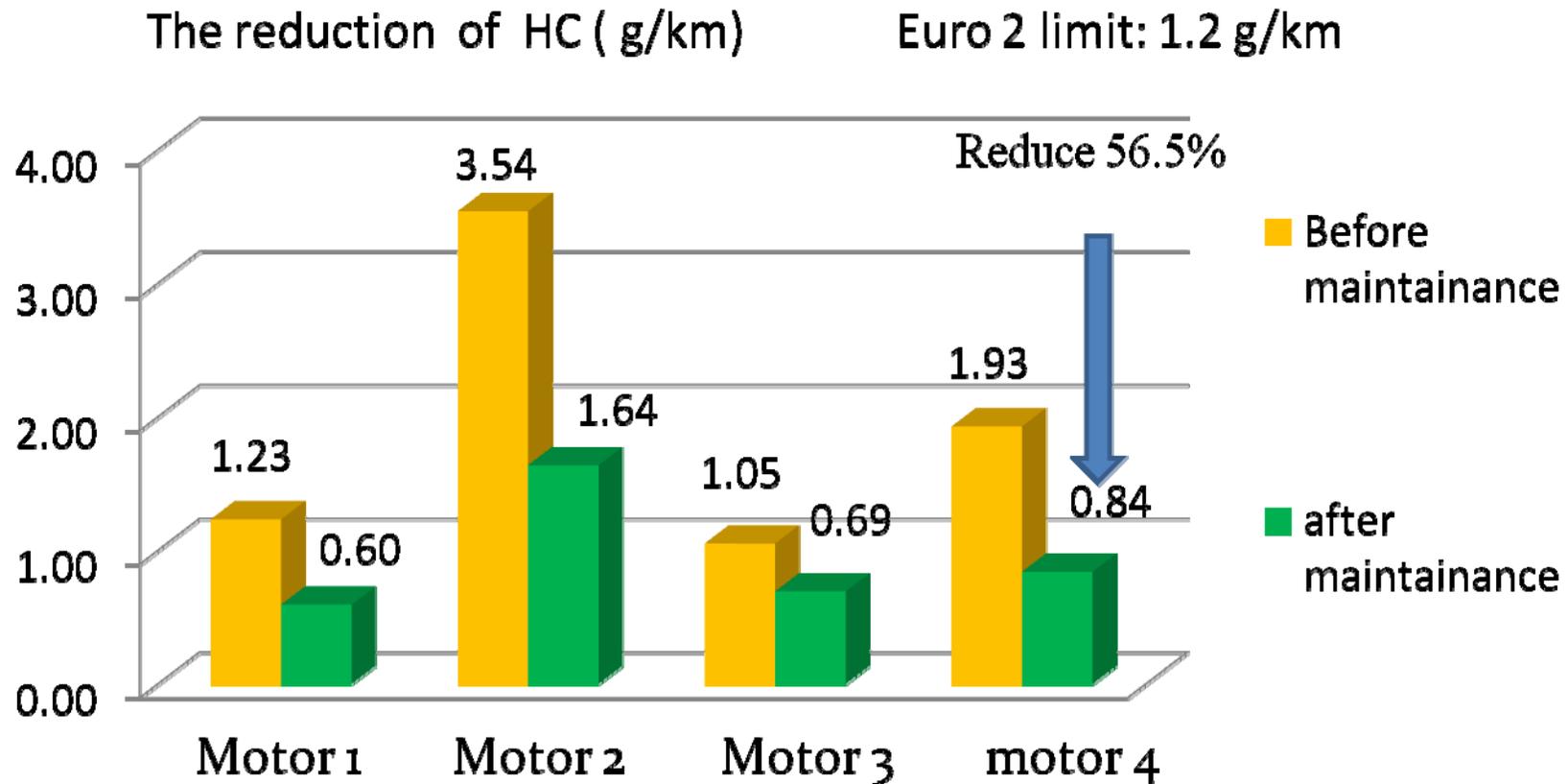


CO content





HC content





Result of Survey

- *Almost MCs with small displacement: 70-150 cc.*
- *Almost are 4 stroke engine motorcycles.*
- *Almost have simple design engines without emissions control system => high emission and low fuel efficiency.*
- *Almost people do not clearly understand the impact of motorcycle emission, not know their own MC emission level and how to reduce the emission.*
- *Repairs & maintenances can reduce about 50% CO&HC and 10-30 % fuel consumption.*

3. Roadmap for motorcycle Emission control & fuel quality

3.1 MC Emission control

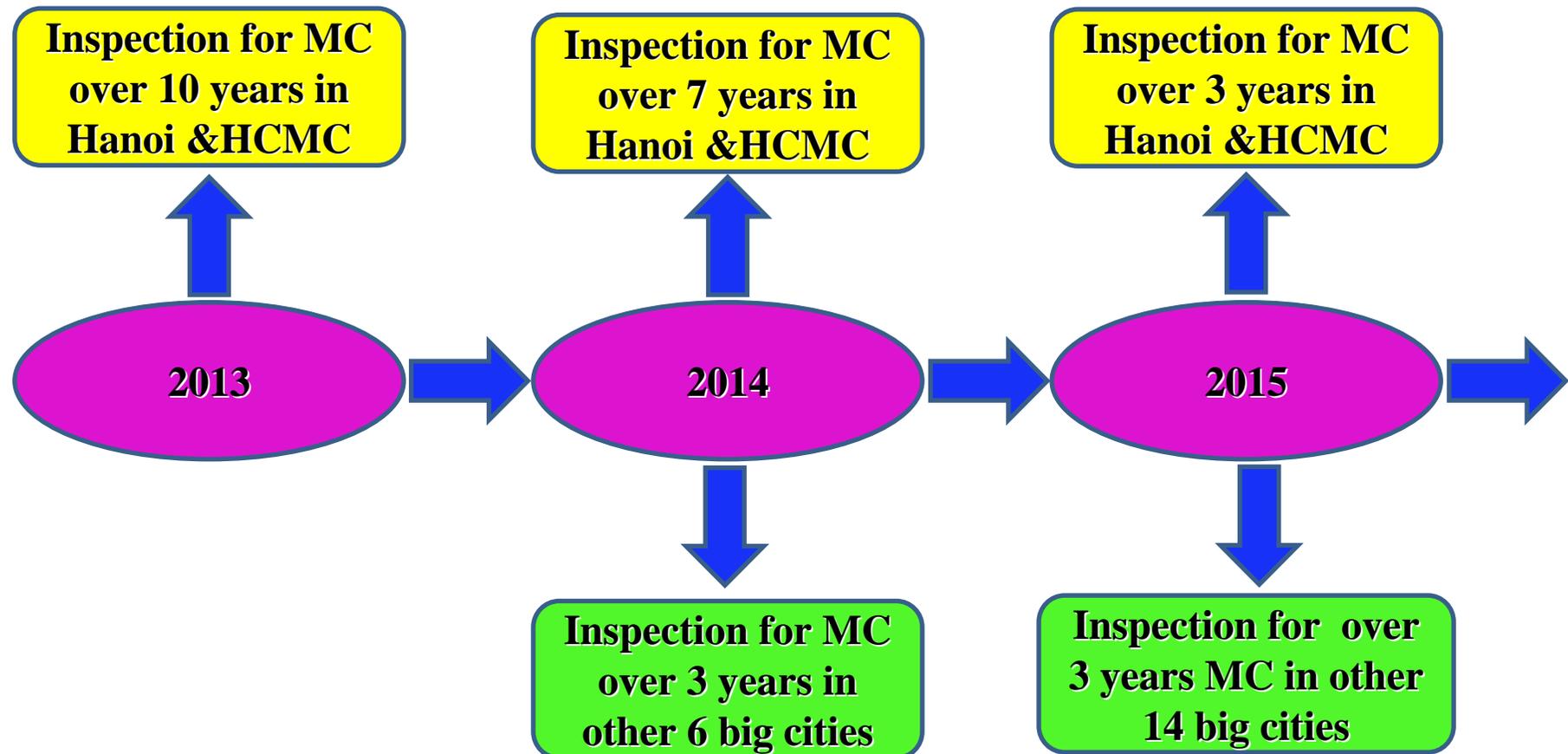


MC Emission control

- ✓ Euro 2 standard from **2007**.
- ✓ Control evaporative emission from **2012**.
- ✓ Periodical emission inspection program from **2013**.
- ✓ Euro 3 standard and Fuel consumption from **2017**



In-used Motorcycle Emission-inspection Plan





In-used Motorcycle emission inspection system

- **MCs emission inspection centers should be located:**
 - **In combination with automotive inspection stations;**
 - **Mainly in combination with MC authorized Dealers / Maintenance Shops of manufacturers;**
- **The MCs pass the idle emission test should be got Emission Inspection Stamp with 01 year period.**
- **The MCs fail the test would be maintained and repaired to meet the emission standard.**
- **Penalize MCs on the road without the Emission Inspection Stamp.**



Proposal motorcycle Inspection Location





Emission standard for in-used motorcycle

Level	Two stroke engine		Four stroke engine	
	CO (%)	HC (ppm)	CO (%)	HC (ppm)
1	4.5	10,000	4.5	2,000
2	3.5	7,800	3.5	1,200
3	2.5	7,800	2.5	800

➤ MCs has non-controlled exhaust emission treatment system or MCs without exhaust emission treatment system:

- Level 1 for the MCs with first registration date before 1 July 2008;
- Level 2 for the MCs with first registration date from 1 July 2008 .

➤ Level 3 for MCs with controlled exhaust emission treatment system.

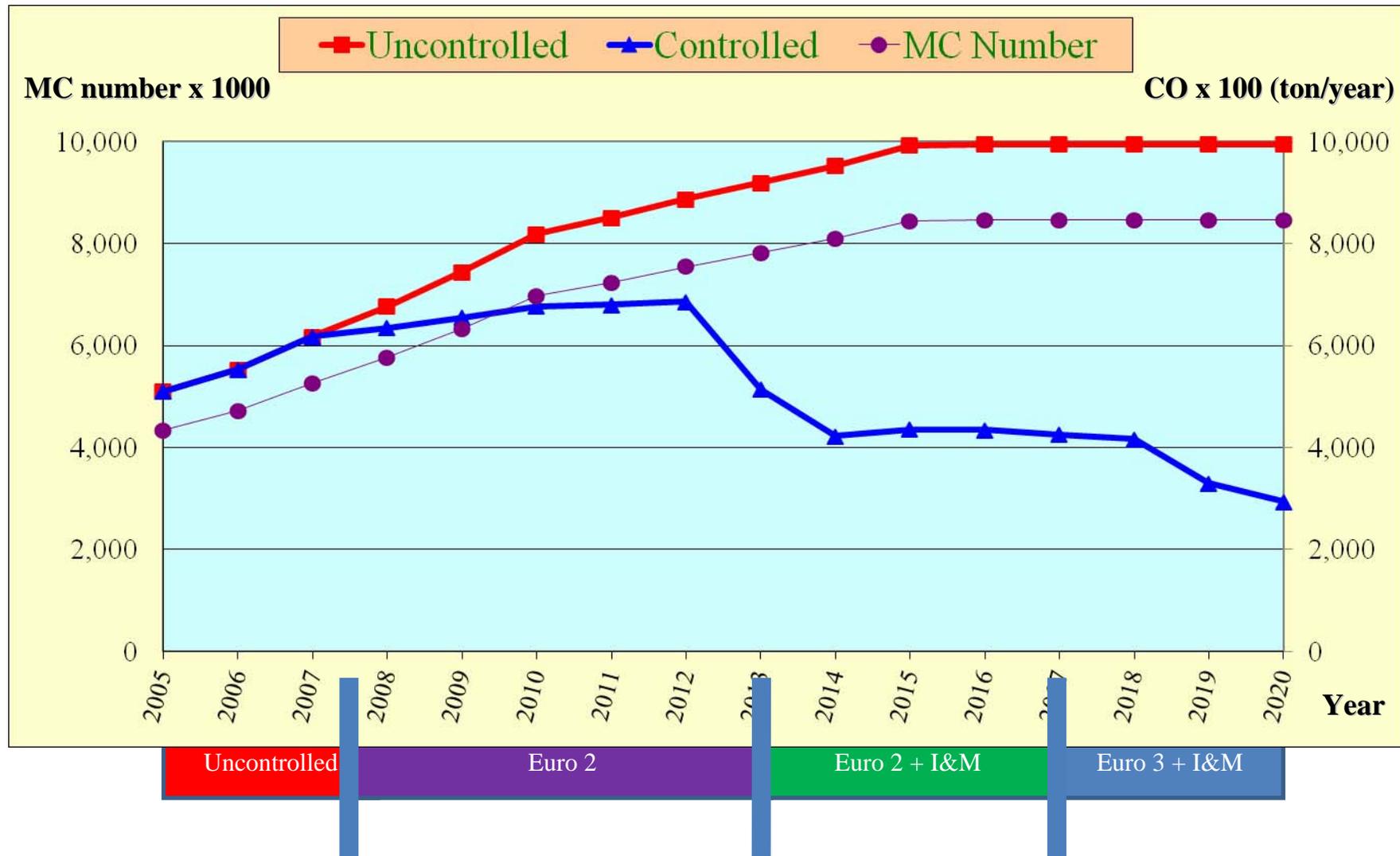


Inspection stamp for in-used MC



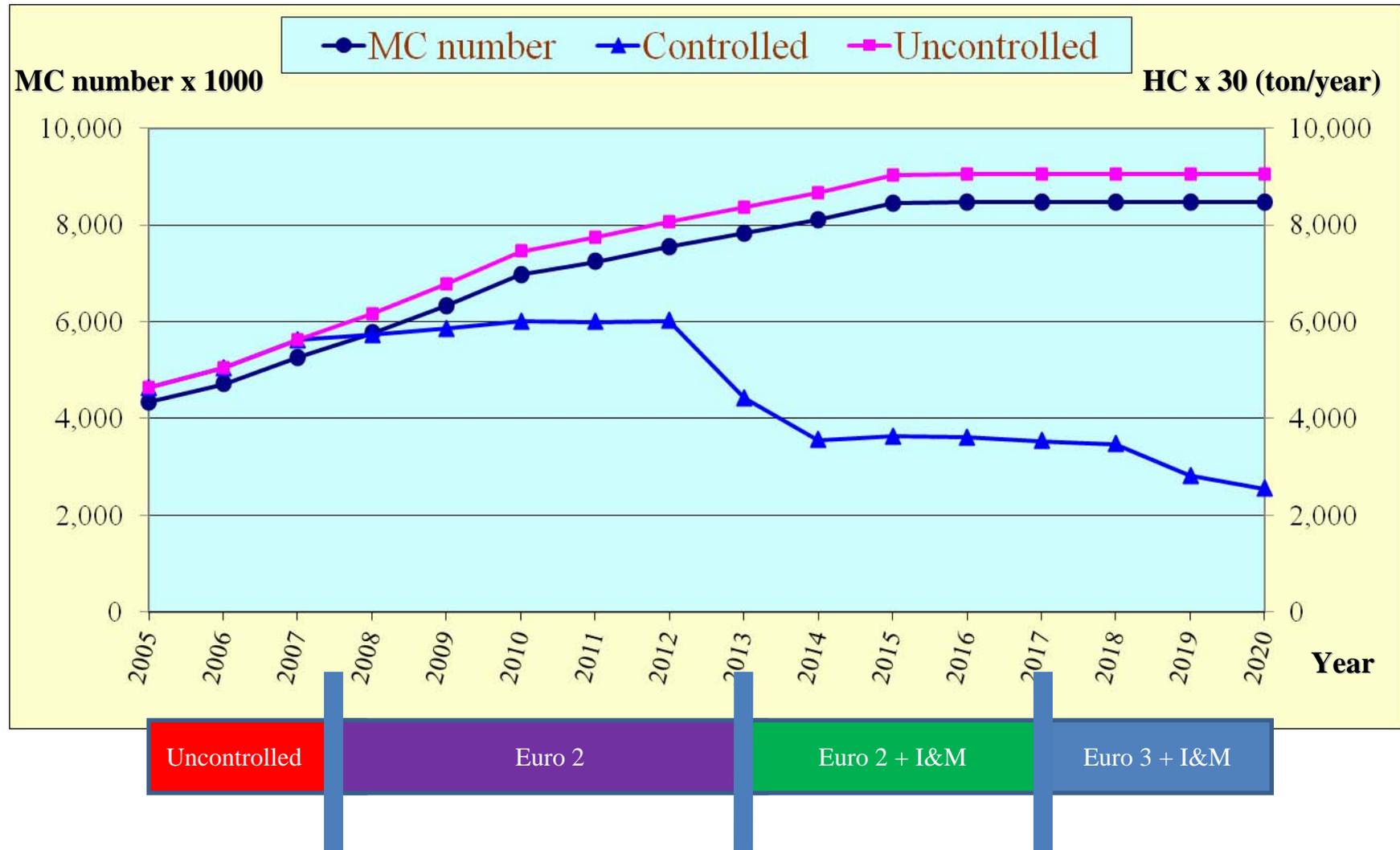


Estimated total emission CO reduction effectiveness in Hanoi and Ho Chi Minh City





Estimated total emission HC reduction effectiveness in Hanoi and Ho Chi Minh City



3.2 Fuel quality



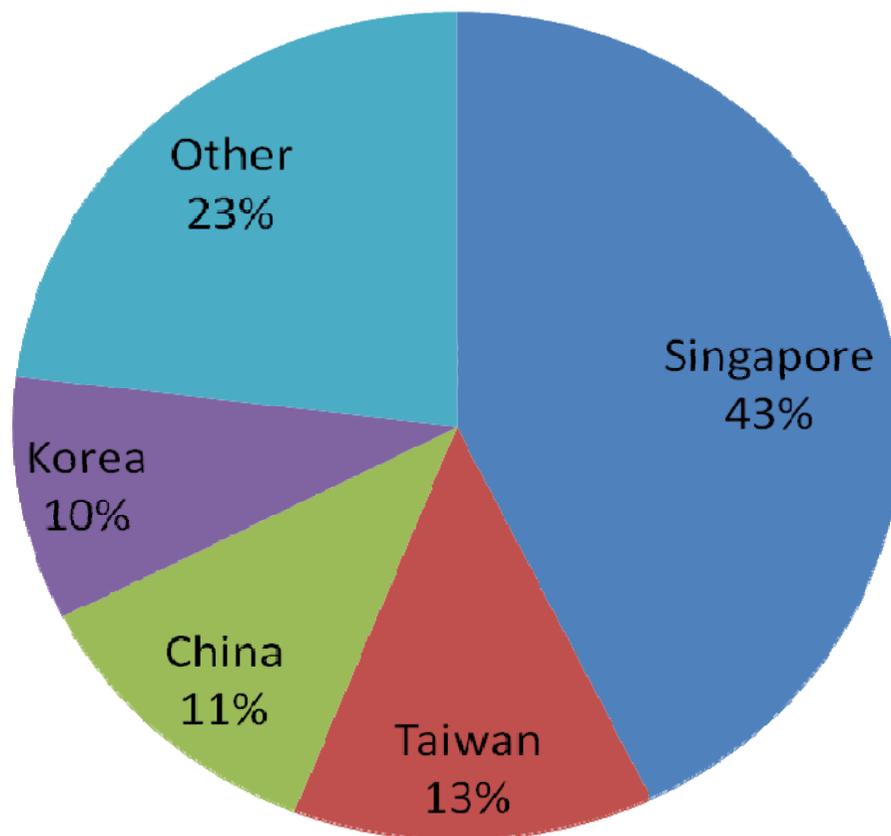
Fuel import and production

Year	Fuel (mil. ton)	
	Import ¹⁾	Production ²⁾
2005	11.5	0
2006	11.2	0
2007	12.9	0
2008	13.0	0
2009	12.7	2.5
2010	9.5	4.7
9/2011	8.4	3.3

Source: ¹⁾ Vietnam customs
²⁾ Dungquat oil refinery



Market share fuel import in Vietnam



Source: Vietnam customs, from 1/1/2011 to 9/30/2011



Current regulation on unleaded gasoline

N ^o	Indicator	Level not exceed	Test method
1	Lead content, g/l	0.013	TCVN 7143 (ASTM D 3237)
2	Sulphur content , mg/kg	500	TCVN 6701 (ASTM D 2622) or TCVN 7760 (ASTM D 5453)
3	Aromatic hydrocarbon content, % vol.	40	TCVN 3166 (ASTM D 5580)
4	Benzen content, % vol.	2.5	TCVN 7330 (ASTM D 1319)
5	Olefin content, % vol.	38	TCVN 7330 (ASTM D 1319)
6	Oxygen content, % mass	2.7	TCVN 7332 (ASTM D 4815)

Source: QCVN 1: 2007/BKHCN



Roadmap unleaded gasoline quality for Motorcycle

Sulphur content max (mg/kg)

Type \ Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	·	·	·
	Gasoline	1500			500 (Euro 2)										150 (Euro 3)								



Thank you for your attention!