

ADB

European and US Emissions Standards For Motorcycles

Action Plans For Reducing Vehicle Emissions

Regional Workshop

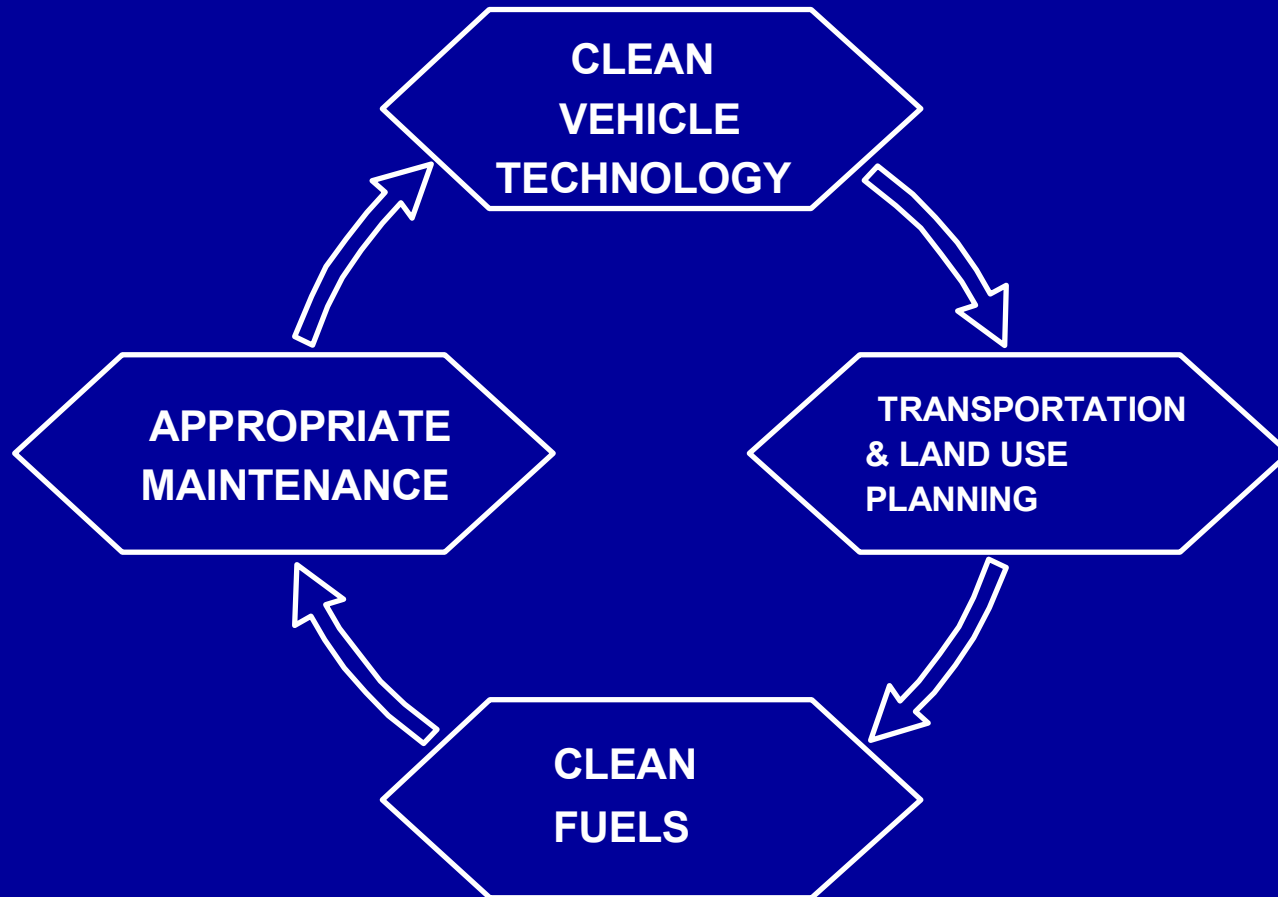
September 5, 2001

Hanoi, Viet Nam

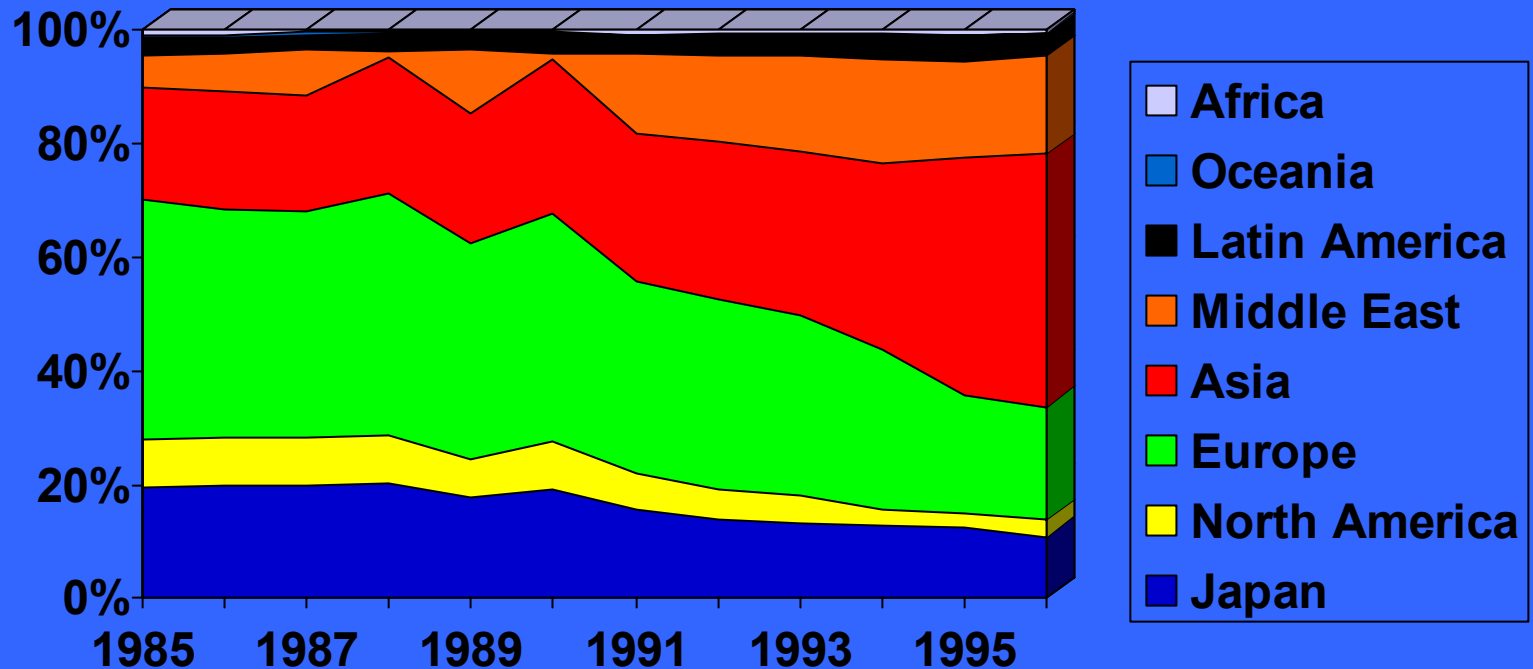
Overview

- Status In Europe
- Status in US
including California

ELEMENTS OF A COMPREHENSIVE VEHICLE POLLUTION CONTROL STRATEGY



Motorcycle Registrations Around The World



European Motorcycle Emission Limits (g/km)

Legislation		ECE 40-00	ECE 40-01	97/24/EC
CO	4-Stroke	25-50	17.5-35	3
	2-Stroke	16-40	12.8-32	8
HC	4-Stroke	7-10	4.2-6	.4
	2-Stroke	10-15	8-12	4
NOx	4-Stroke	-	-	2.0
	2-Stroke	-	-	0.1

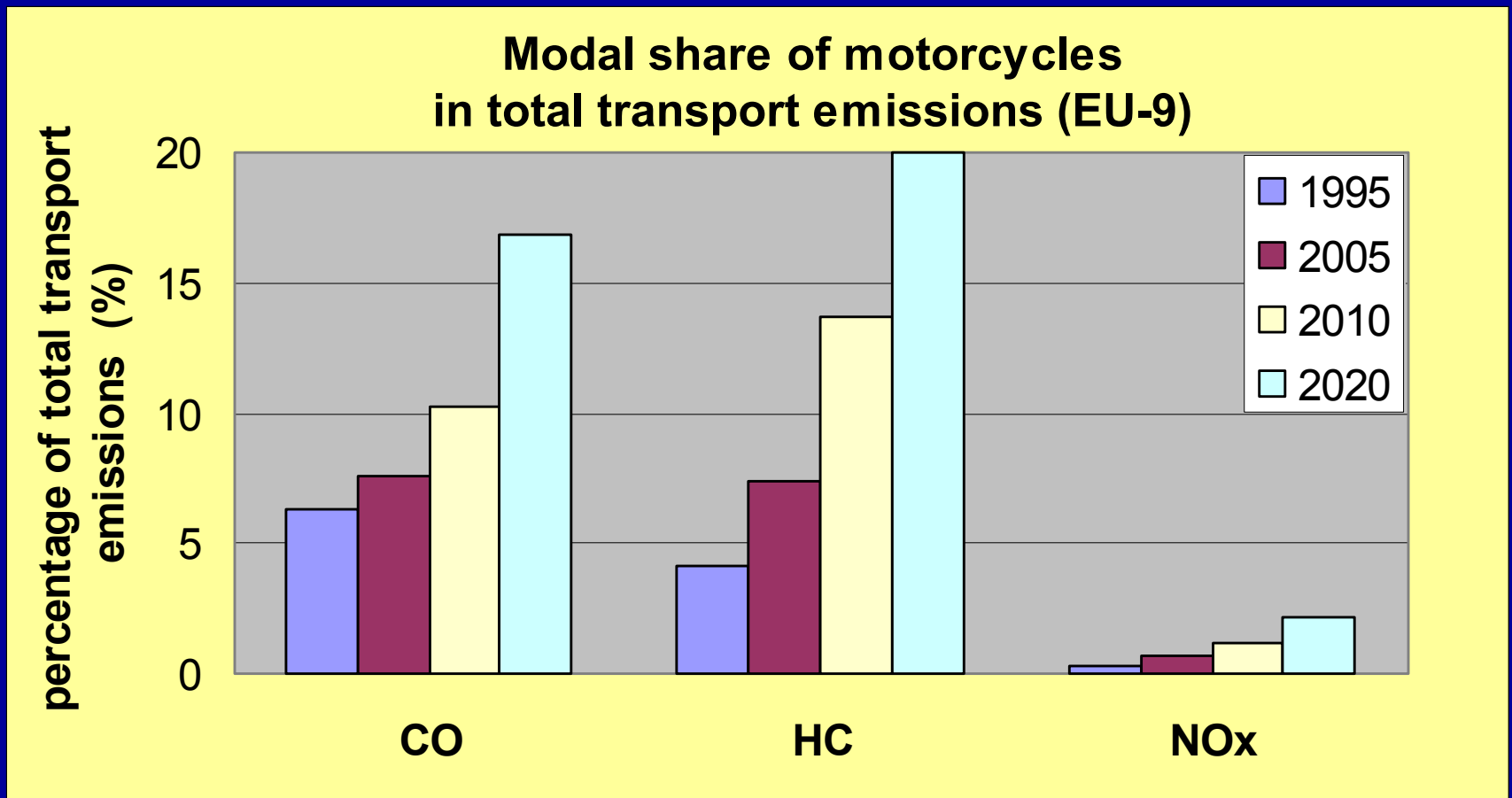
Motorcycles: Directive 97/24/EEC

ECE 40 cycle

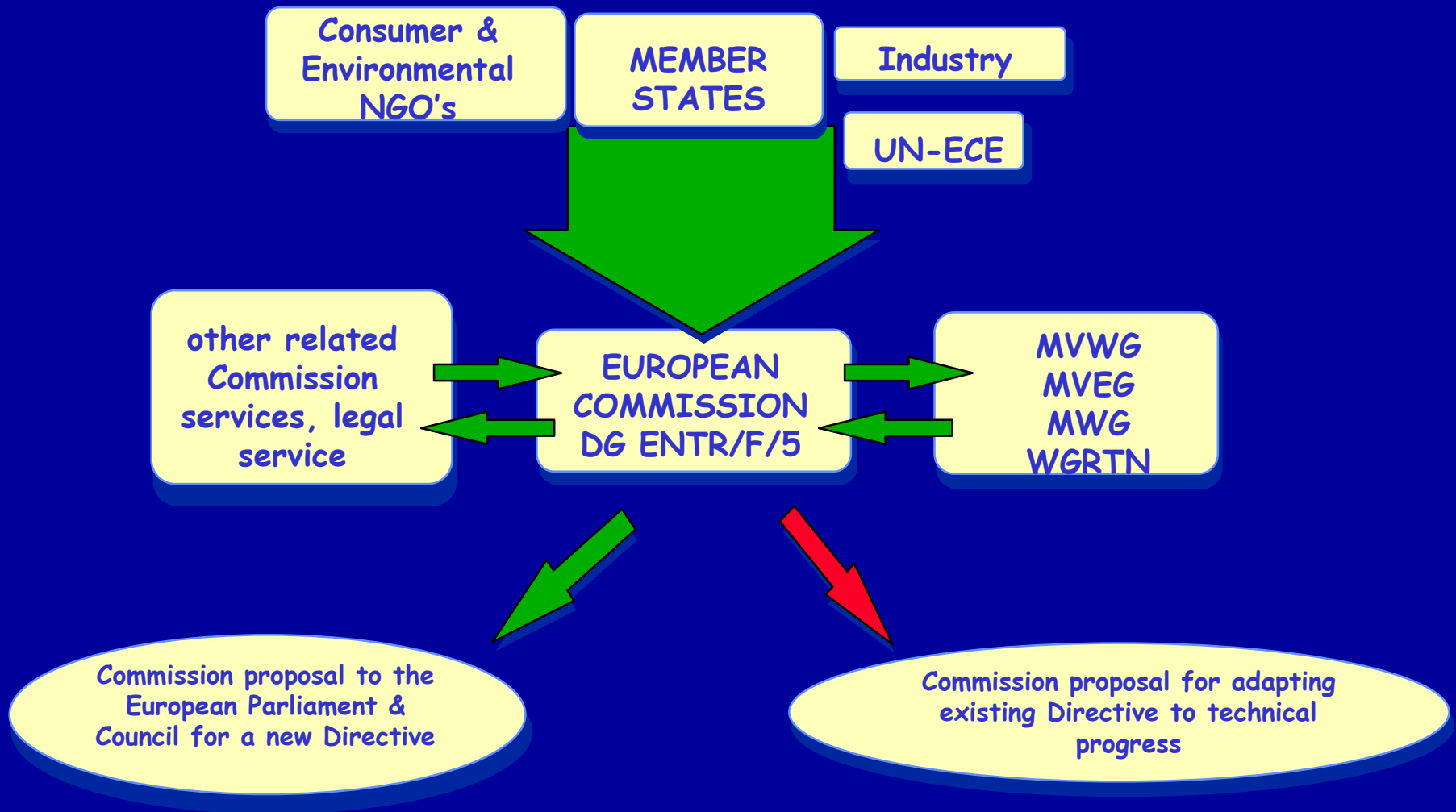
	CO	HC	NOx
	g/km	g/km	g/km
2 stroke	8	4	0.1
4 stroke	3	0.4	2

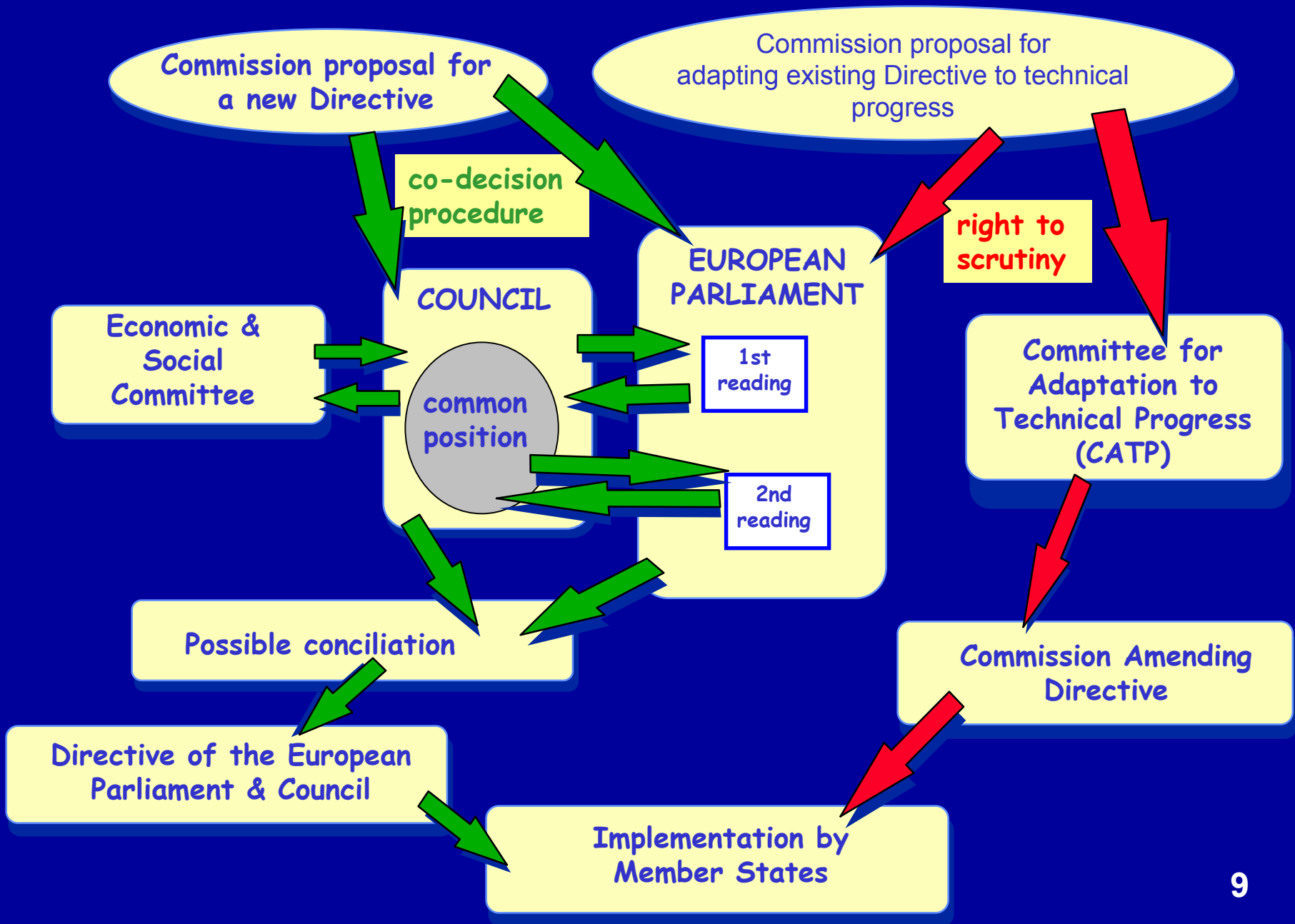
Stringency comparable to passenger cars pre-catalyst
(pre-Euro 1)

Motorcycles Emissions



Preparation of proposals





Motorcycles

- Commission proposal for Stage 2 published on 22 June 2000
- Bernd Lange MEP appointed “rapporteur” and proposed significant changes
- First reading in Euro Parliament (EP) held in February 2001
- Council position “agreed” in March; confirmed in June 2001

Commission proposal: limits

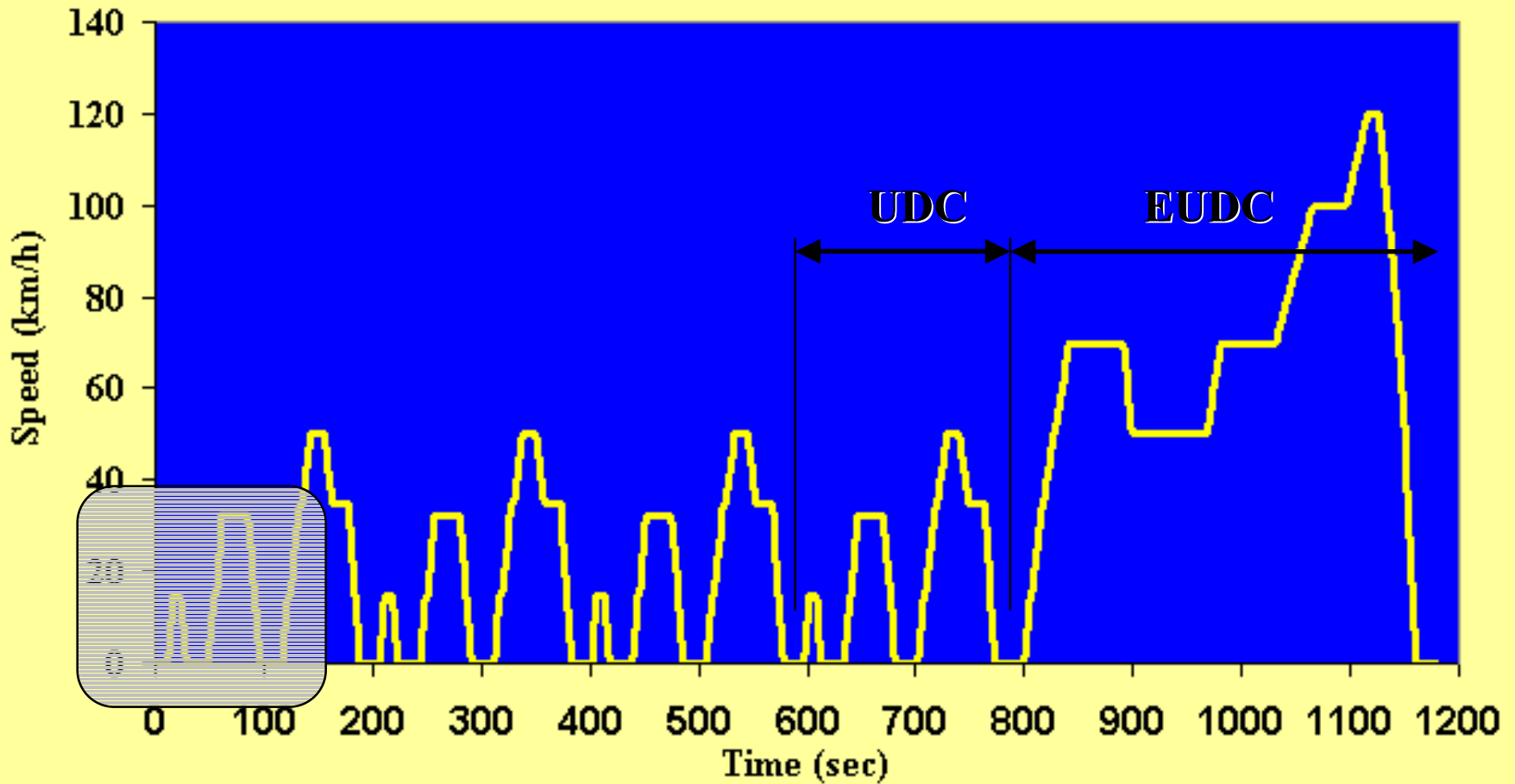
ECE 40 cycle	CO g/km	HC g/km	NOx g/km	
2 + 4 stroke	5.5	1.2	0.3	2003/4
< 150 cc	2	0.8	0.2	?
>150 cc	2	0.3	0.1	?

EU Council Position

2006 Permissive Limit Values

- NOx limit values for all capacities of motorcycles are **0.15 g/km** (from 0.2 for ≤ 150 cc and 0.1 for > 150 cc)
- Motorcycles over 150 cc to be tested on current car test
- Represents significant improvement over Commission proposal; does not go as far as Parliament and Germany want setting mandatory standards for the second stage

Revised Emissions Test Cycle



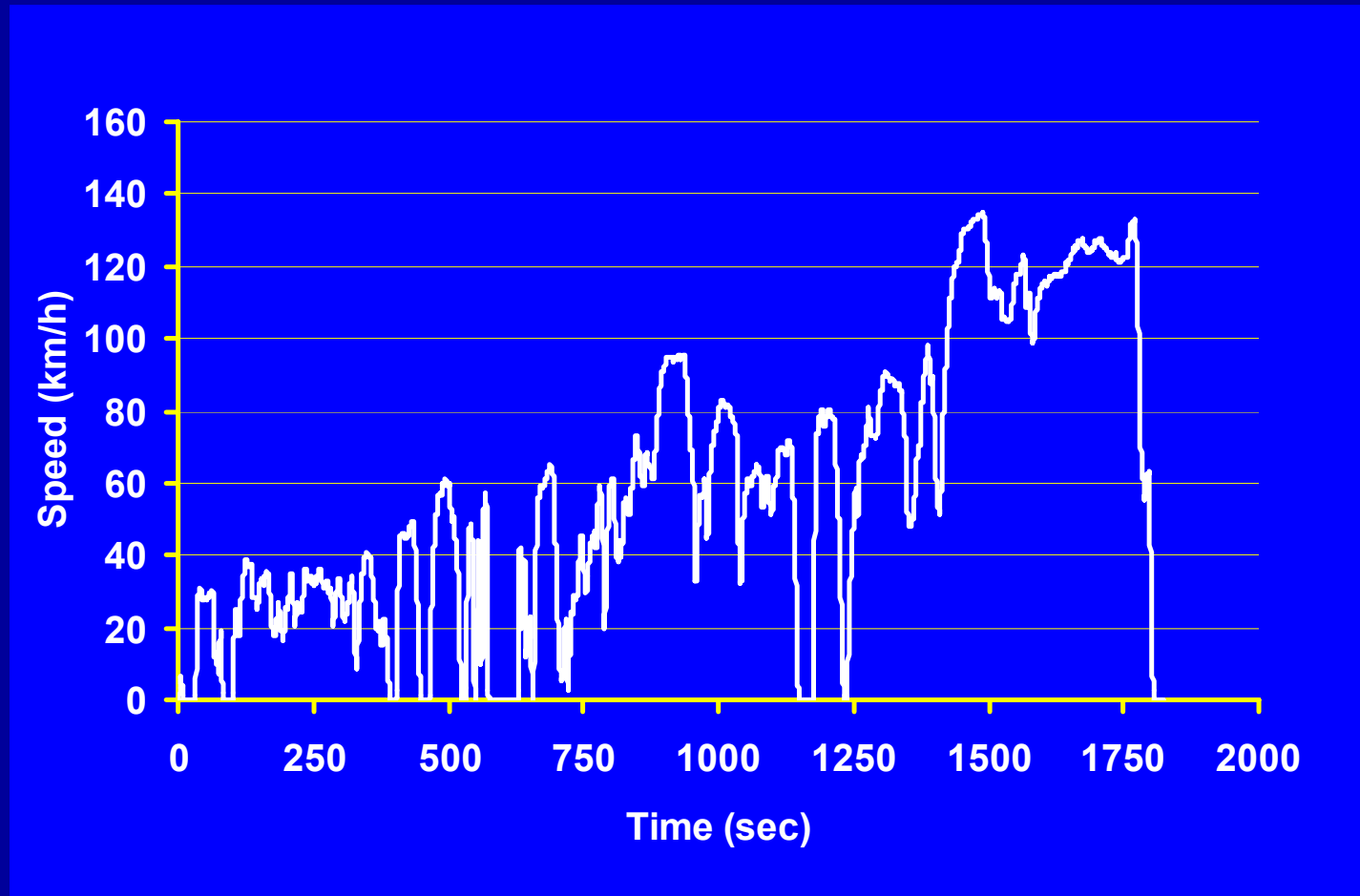
EP Motorcycle Position

- 2003 limit values and test cycle unchanged
- 2006 motorcycles >150 cc limit values/test to Stage 3 cars
- Mandatory limits are (Commission permissive proposals on the R40 warm test in brackets):
- CO 2.3 (2.0), HC 0.2 (0.3), NOx 0.15 (0.1) g/km
- Tricycles and quadricycles have separate 2006 limits with PM limits for diesels

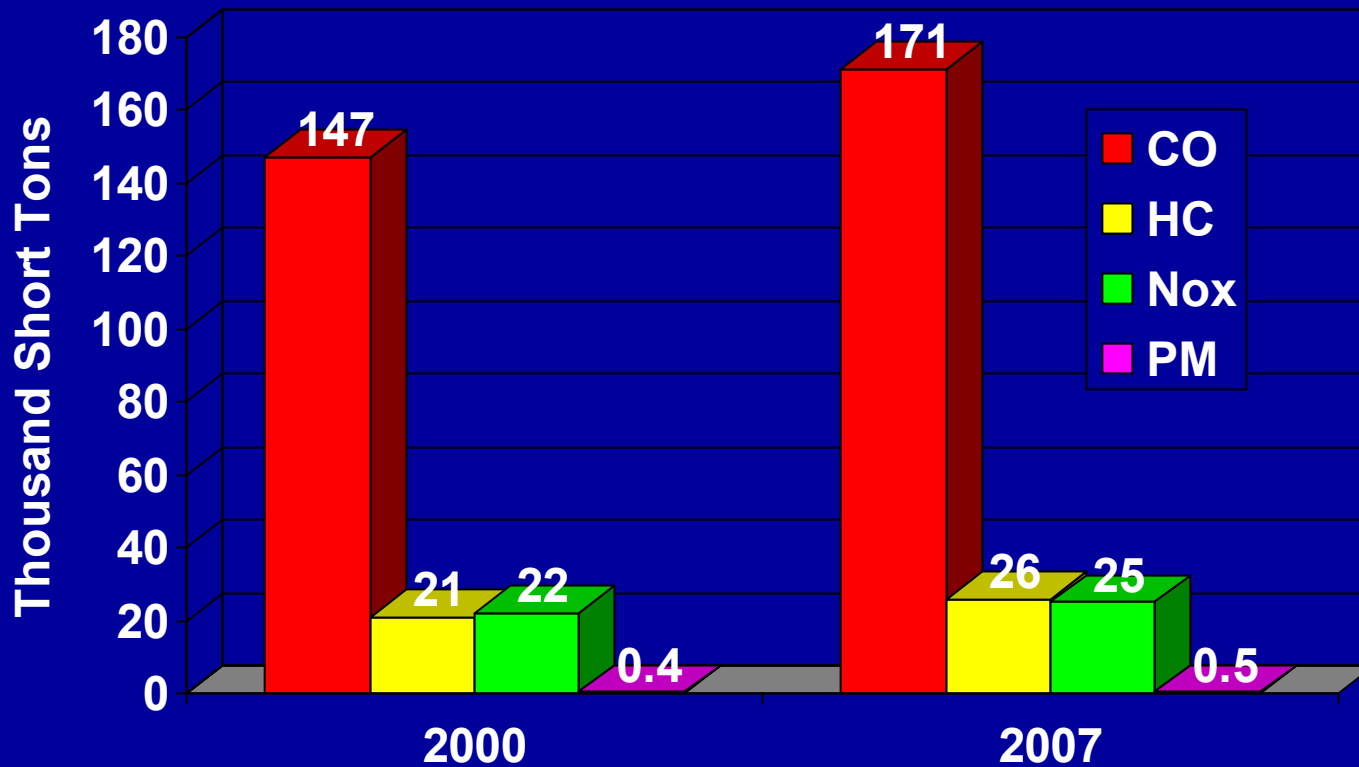
European Parliament Position

- Members states to:
 - offer fiscal incentives
 - promote retrofitting with fiscal incentives
- OBD from 2006 for >150 cc bikes
- 30 000 km/5 yr durability (2003); 50 000 km (2006)
- No cycle-beating
- Commission to propose by 2002 on service life, in-use conformity, cycle beating & report on new test cycle (WMTC) & correlation factors; progress on OBM and evaporative emissions

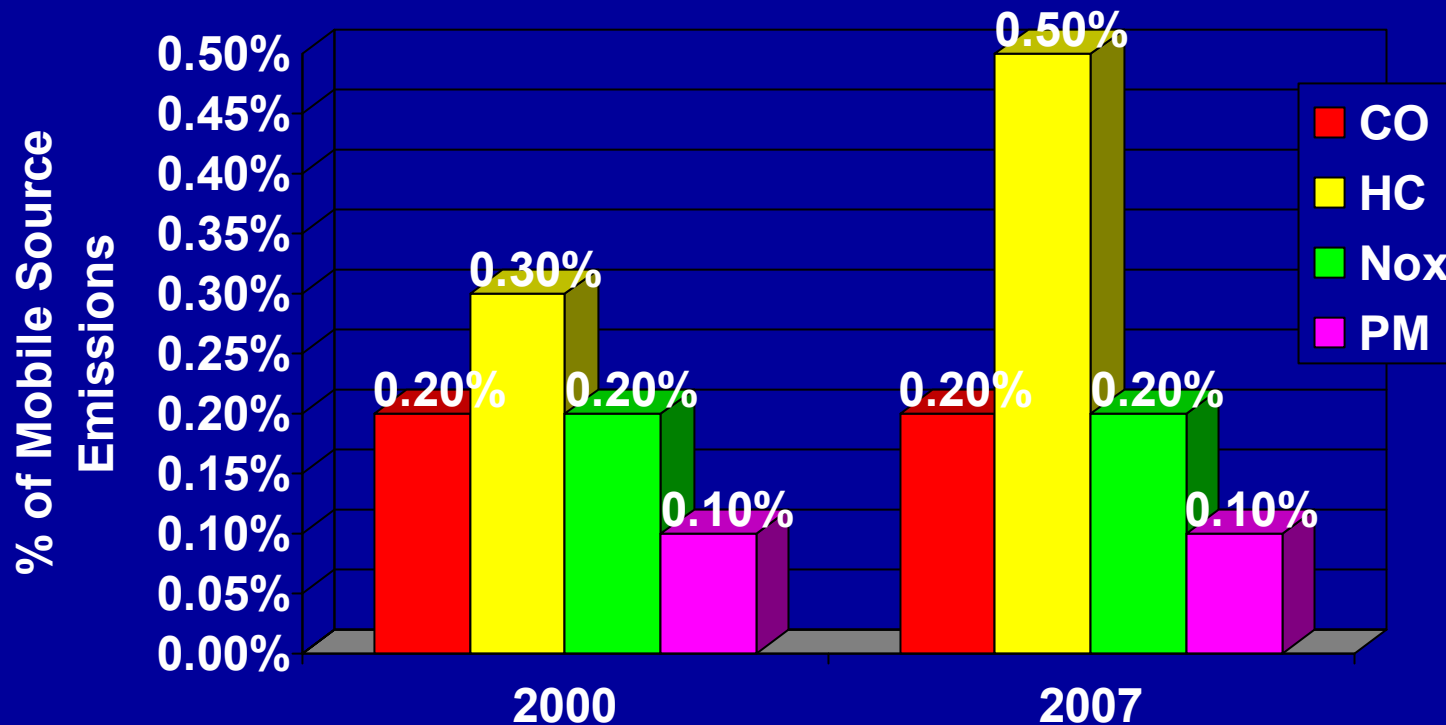
World Motorcycle Test Cycle



Motorcycle Emissions in the US



Motorcycle Emissions in the US



US Motorcycle Classifications

	Engine Displacement (cubic centimeters)
Class 1	50-169
Class 2	170-279
Class 3	280 and Greater

US Motorcycle Standards (gm/km)

	Useful Life	HC	CO
Class 1	5 Years or 5,000 km	5	12
Class 2	5 Years or 18,000 km	5	12
Class 3	5 Years or 30,000 km	5	12

California Motorcycle Standards (gm/km)

	Useful Life	HC	CO
Class 1 50-279	5 Years or 5,000 km	1	12
Class 2 280-699	5 Years or 18,000 km	1	12
Class 3 700cc+	5 Years or 30,000 km	1.4	12

Evaporative HC Cannot Exceed 2 g/test

New California Motorcycle Standards (gm/km)

	Engine Size	HC+NOx	CO
	Under 280 cc	No Change	No Change
2004-2007	280 cc or higher	1.4	12
2008+	280 cc or higher	0.8	12

Typical US Motorcycle Technologies

■ US

- No 2 Stroke Engines
- Leaner A/F
- Electronic Ignition
- Misc.Engine Modifications (ignition Timing, Combustion Chamber Design, etc.)

■ California

- Mostly Similar To National MCs
- A Few 3-Way Catalysts + FI
- Some Air Injection

■ New Standards

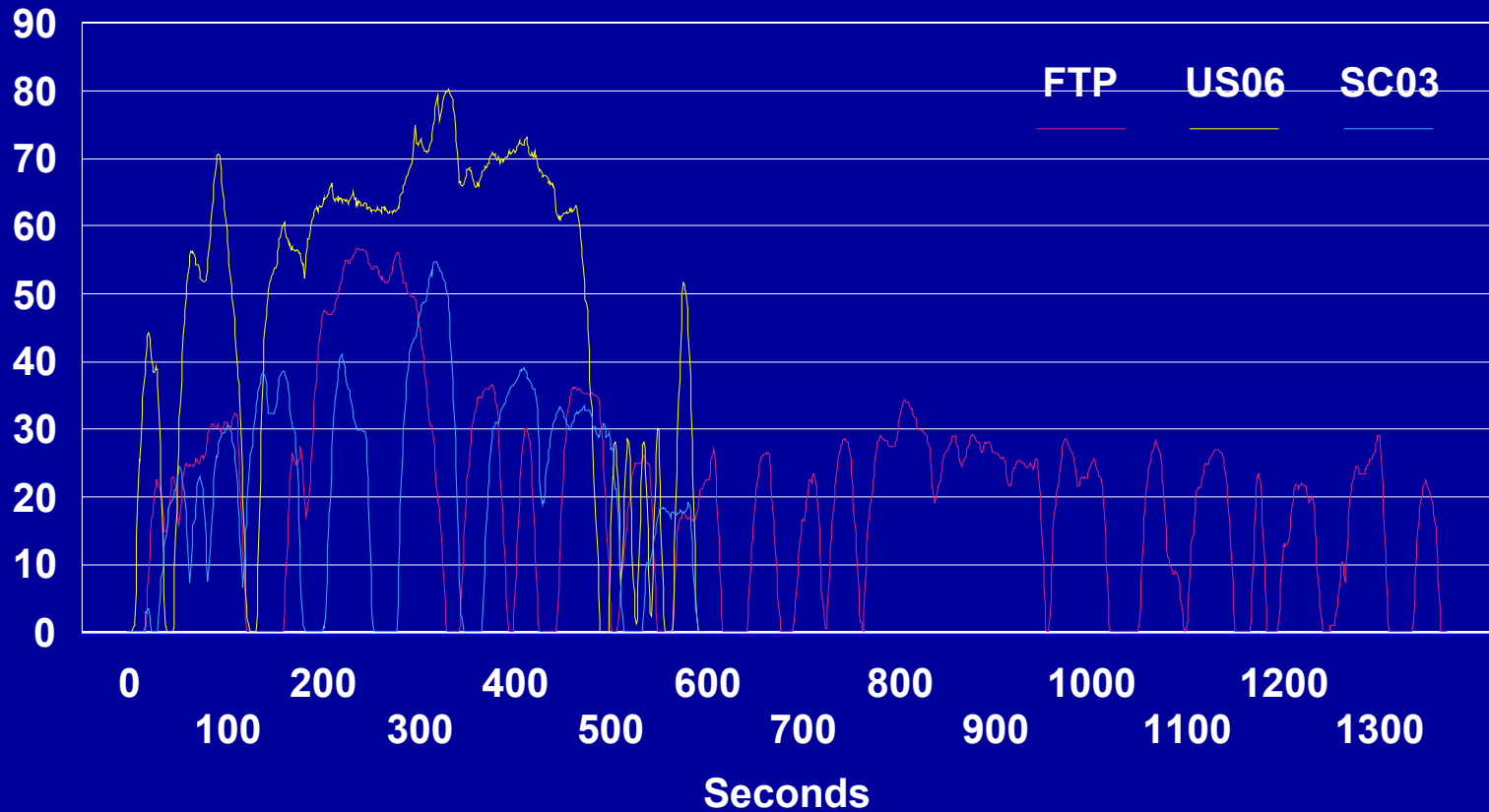
- Additional Catalysts
- Fuel+Air Injection

Future US Plans

- ANPRM Issued December 2000
- NPRM Expected in 2001 & Final Rule in 2002
- Issues:
 - California Standards?
 - Longer Useful Life?
 - FTP75/US06/ World Driving Cycle?

US Emissions Test Procedures

Miles Per Hour



Tighter MC Controls Are On The Horizon

