Clean Air Initiative for Asian Cities

Cornie Huizenga

Asian Vehicle Emission Control Conference

China World Hotel, Beijing, PRC
27-29 April 2004

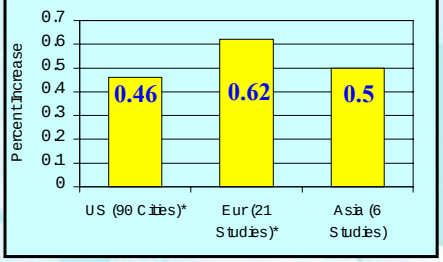
Why are we concerned?

Health Effects

Number of Premature Deaths

Risks	Global Estimate	Asian Estimate
Unsafe Water	1,730,000	730,000
Urban Outdoor Air	799,000	487,000
Indoor Air	1,619,000	1,025,000

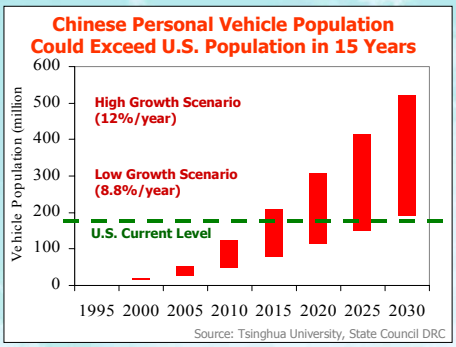
Exposure Risks

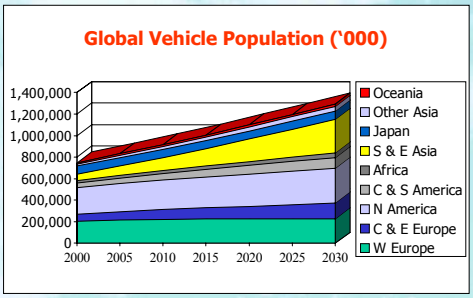


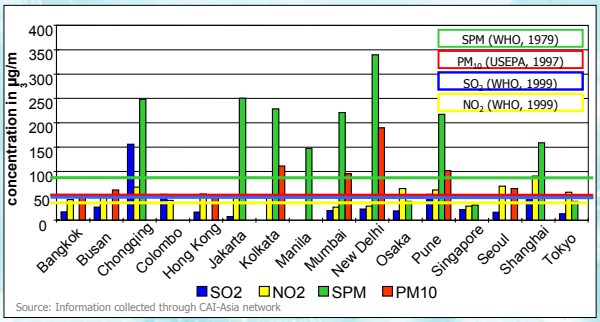
Health Costs (per year)

- Manila US$392M
- Shanghai US$880M
- Bangkok US$424M
- India US$14 to $ 191.6M
- Jakarta US$ 100 M

What is the issue?

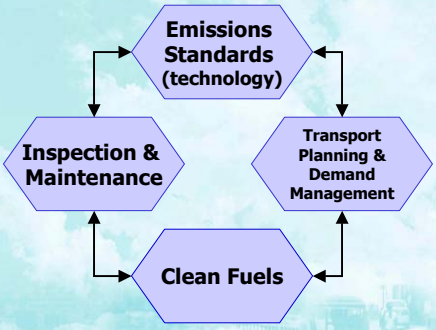






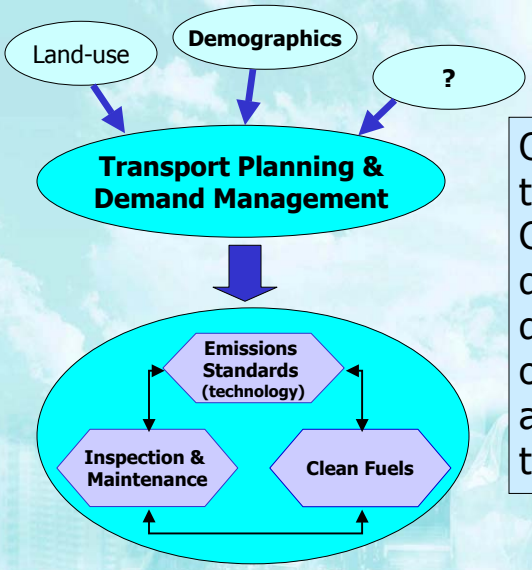
- **Transport in many of the Asian cities is the fastest growing source of emissions**
- **Emissions from the transport sector already substantially contribute to local air pollution**

Are we doing something wrong?



- Current policies and programs in many of the countries and cities in Asia are biased towards tail-pipe solutions
- Few countries and cities have, or are putting into place, policies and programs to substantially promote mass transport systems and non-motorized transport
- Capacity for medium term, pro-active Transport planning and demand management is generally weak

Would it not be great if....?



Our efforts to clean up the vehicles in Asian Cities are preceded by decisions and policies defining the structure of the transport sector and composition of the transport fleet.

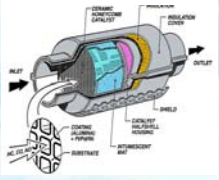
The Impact of Emission Control Devices on Local Air Pollution

Optimum/Required Fuel Quality	Emissions Technology	Pollutants Reduced
Gasoline		
Unleaded gasoline	Catalytic Converters	NOx, HC, & CO
< 50 ppm sulfur	Three-Way Catalyst	NOx, HC, & CO
< 30 ppm sulfur	Advanced TWC	NOx, HC, & CO
< 15 ppm sulfur	NOx Trap	NOx
Diesel		
< 150 ppm sulfur	Diesel Oxidation Catalyst	PM, HC & CO
< 50 ppm sulfur	Diesel Particulate Filter	PM, HC & CO
< 50 ppm sulfur	Selective Catalytic Reduction	NOx
< 15 ppm sulfur	NOx Absorber	NOx

Source: Adapted from Blumberg,, Pera and Walsh, 2003

Engine Technology

3-way Catalytic Converter



Diesel Particulate Filter

Fuel Quality

CAI-Asia Fuel Related Activities

- Refinery modification study: focused on the assessment of costs needed to upgrade diesel refineries in Asia (http://www.cleanairnet.org/caiasia/1412/article-40677.html)
- Fuel quality study: analyses the emission reduction potential of low sulfur diesel fuels in Asian countries
- Fuel quality strategies: focused on strengthening the capacity of regulators to develop short to medium term fuel quality improvement strategies (http://www.cleanairnet.org/caiasia/1412/article-58140.html)
- Dialogue with the oil industry: identify important issues related to fuel composition, relevant in shifting to the production and distribution of cleaner fuels (http://www.adb.org/Vehicle-Emissions/SingaporeStatement.pdf)

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, China	Euro 1	Euro 2					Euro 3				Euro 4					
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							
PRC[a]							Euro 1				Euro 2					
PRC[c]							Euro 1		Euro 2		Euro 3					
Singapore[e]	Euro 1						Euro 2									
Singapore[g]	Euro 1						Euro 2				Euro 4					
Sri Lanka									Euro 1							
Taipei,China					US Tier 1								US Tier 2 for diesel[g]			
Thailand	Euro 1						Euro 2		Euro 3					Euro4		
Viet Nam[e]				Euro 1												
Viet Nam[f]											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, Khampur, 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] for gasoline vehicles
[f] for diesel vehicles
[g] for all types of diesel vehicles

In-use vehicles in Asia

- Useful economic life of vehicles in Asia is considerably longer than that of vehicles in Europe, USA or Japan.
- Majority of Gross Polluting Vehicles are in-use vehicles, often re-built
- Bulk of the vehicles in Asian cities in the next 10 years might not be good candidates for advanced ECDs.

Public Transport Modes in the Philippines

~ US$ 5,000.00

US$ 1,500.00 ~

~ US$ 15,000.00

Diesel Emission Reduction Program- Bangkok

- **The scope and objectives of this CAI-Asia pilot program include:**
  a) To gain a better understanding of factors affecting in-use diesel vehicle emissions.
  b) To assess alternative mitigation options to assist decision making in developing countries.
- **Key outputs:**
  a) City-specific databases relating to diesel emissions from in-use vehicles
  b) Analysis of policy and technical options to reduce diesel emissions
  c) Selection of options, action plans and dissemination of findings

Two Questions for the ECD Industry

1. What is the feasibility of retrofitting the existing in-use vehicle fleet in Asia?
2. How far can the costs be brought down for emission control devices?

Who is CAI-Asia: Members

CITIES

Bangkok,Thailand
Chiang Mai,Thailand
Chengdu,PRC
Chittagong,Bangladesh
Chongqing,PRC
Colombo,Sri Lanka
Dhaka, Bangladesh
Guangzhou,PRC
Haiphong, Viet Nam
Hangzhou,PRC
Hanoi,Viet Nam
Harbin,PRC
Ho Chi Minh City,Viet Nam
Hyderabad, India
Islamabad,Pakistan
Kathmandu,Nepal
Lahore, Pakistan
Makati,Philippines
Metro Manila, Philippines
Mumbai, India
Naga,Philippines
Phnom Penh,Cambodia
Pune, India
Singapore, (NEA)
Surabaya,Indonesia
Tianjin,PRC
Ulaanbaatar, Mongolia
Yogyakarta,Indonesia

NGAs

Andhra Pradesh Pollution Control Board, India
Australia Department of Environment and Heritage
Balochistan EPA, Pakistan
Central Pollution Control Board, India
Department of Environment, Bangladesh
Department of Forests, Ecology and Env't, Karnataka State, India
Department of Environment and Natural Resources, Philippines
Department of Energy, Philippines
Department of Transportation and Communications, Philippines
Dhaka Transport Coordination Board, Bangladesh
Environmental Protection Agency Karachi, Pakistan
Ministry of Environment, Cambodia
Ministry of Environment, Indonesia
Ministry of Public Works and Transport, Cambodia
Ministry of Road Transport and Highways, India
Pollution Control Department, Thailand
State Environmental Protection Administration (PRC focal point)
Viet Nam Register, Viet Nam

48 NGOs and Academic Institutions in the Region

DEVELOPMENT AGENCIES

Asian Development Bank
Australian Department for Environment and Heritage
German Agency for Technical Cooperation
The William and Flora Hewlett Foundation
United States-Asia Environmental Partnership
Sida
World Bank

FULL PRIVATE SECTOR Member

Ford Motor Company **Shell**

ASSOCIATE PRIVATE SECTOR Member

AVL	**Corning**	**ETI**
ACFA	**DEKRA**	**ESP**
Cerulean	**EMITEC**	**IPIECA**
MAHA	**SGS**	

Thank you very much!!!

For further information contact

Cornie Huizenga
chuizenga@adb.org