

# Environmentally Sustainable Transport:

## Current Status in Indonesian Cities

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## Outline

- Background
- Fuel, Vehicle, and Traffic/Transport Management Status
- Policy and Strategy
- Applied Program
- Conclusion
- The Next Steps



## Air Pollution Disaster



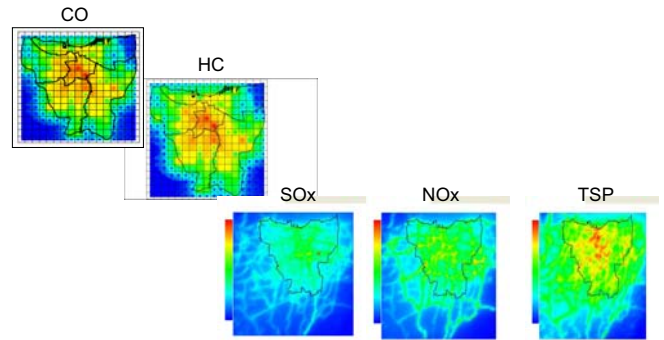
Rapid urbanization, industrialization and land clearing palm oil plantation (forest fire) in Indonesia tend to cause chronic air pollution problems

## Worsening Ambient Air Quality AAQS Report 2008

| City         | Good Air Status | Parameter Dominant |
|--------------|-----------------|--------------------|
| Jakarta      | 81              | PM <sub>10</sub>   |
| Bandung      | 10              | PM <sub>10</sub>   |
| Semarang     | 6               | PM <sub>10</sub>   |
| Surabaya     | 58              | SO <sub>2</sub>    |
| Medan        | 16              | CO                 |
| Palangkaraya | 123             | O <sub>3</sub>     |

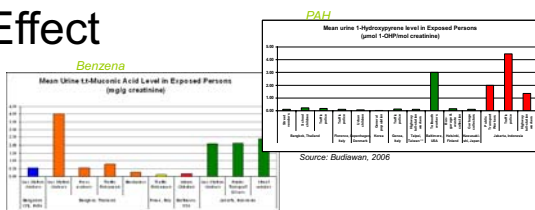
Source: Ministry of Environment 2008

## Annual Concentration Air Pollution

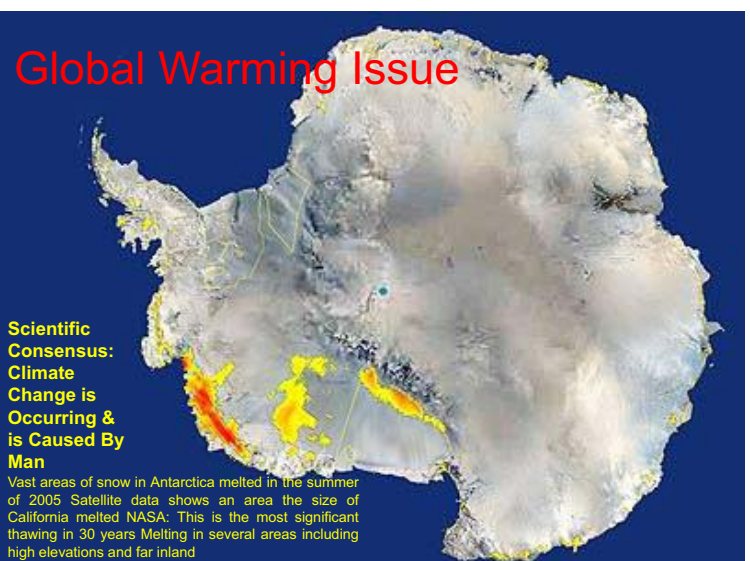


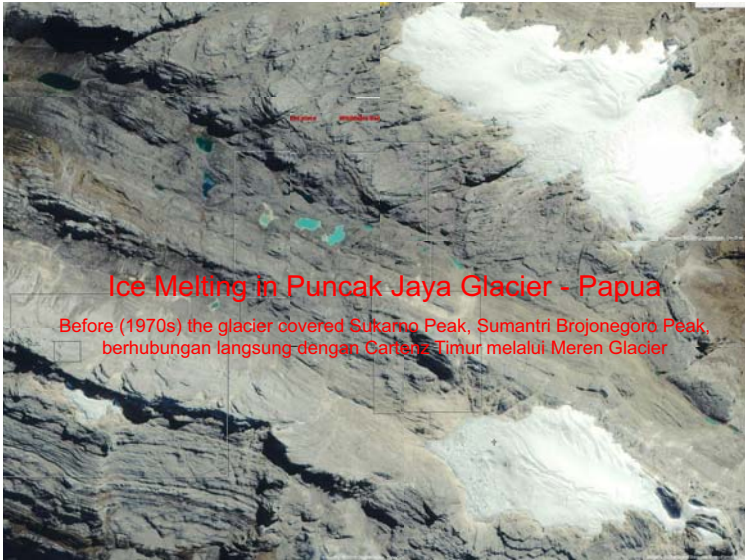
Jakarta Case: The concentration CO exposure is very high and dominate roadside, followed by HC and TSP

## Health Effect



- The concentration of mean urine t.t.-muconic acid level in exposed person in Jakarta – as bio-marker of PAH was 2193.3 mg/g creatinine meanwhile concentration of mean urine 1-hydrocyprien as bio- marker benzene was 8,62 mg/g creatinine.
- In this 2 decades, respiratory infection and respiratory disease is no 1 of the most 10 diseases that affected people in the Greater Jakarta.
- Health Profile 2004 in the Greater Jakarta: 46% respiratory disease have correlation with air pollution (respiratory infection, asthmatic, eyes irritation).
- 32% mortality (predicted) was related to air pollution (cardiovascular disease, pneumonia).





## Transportation and Air Pollution Issue

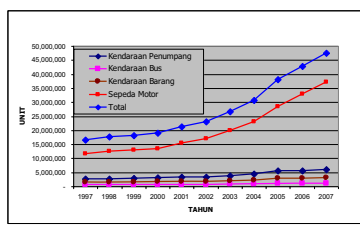
- Motor vehicle is growing faster with old engine technology and worse on I/M
- Disaster Air Pollution:
  - Transportation is major air pollution contributor in cities
  - Transport sector absorbs significant portion of fuels
  - Contributes to 23% GHG emission
- Traffic jam
  - Increasing of transportation demand/mobility
  - Dominated by private car and motor-cycle
  - Social and economic loss almost US\$ 500 million p.a. (Jakarta), and US\$ 65 million p.a. (Bandung),
  - Increasing of emission load in the city.
- Low on public transport services

## Vehicle Statistic



... annual growth?

## Vehicle Statistic



**Growth**  
 0.55 million cars  
 5.5 million motorcycles  
 a year

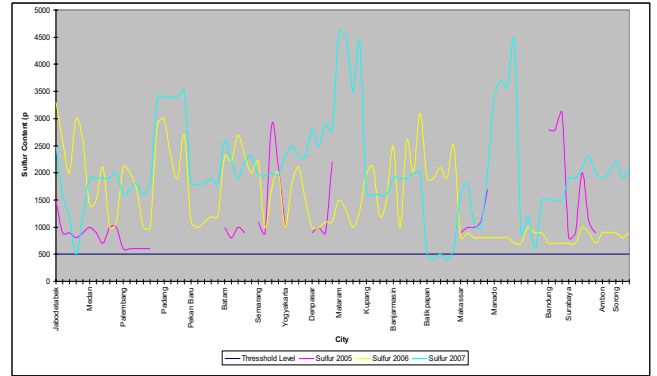
Total number of vehicle: dramatic growth and never ending threat to air quality?

# Vehicle Standard

| Country                       | 95  | 96     | 97     | 98 | 99 | 00        | 01     | 02 | 03     | 04     | 05     | 06 | 07 | 08 | 09 | 10                           |
|-------------------------------|---|--------|--------|----|----|-----------|--------|----|--------|--------|--------|----|----|----|----|------------------------------|
| EU                            | Euro 1  | Euro 2 |        |    |    | Euro 3    |        |    |        |        | Euro 4 |    |    |    |    |                              |
| Bangladesh                    |   |        |        |    |    |           |        |    |        |        |        |    |    |    |    | Euro 2 (under discussion)    |
| Cambodia                      | No specific emission standards for new vehicles |        |        |    |    |           |        |    |        |        |        |    |    |    |    |                              |
| Hong Kong                     |   | Euro 1 | Euro 2 |    |    |           | Euro 3 |    |        |        |        |    |    |    |    |                              |
| India (Delhi & other cities*) |   |        |        |    |    | Euro 1    | Euro 2 |    |        | Euro 3 |        |    |    |    |    |                              |
| India (Entire Country)        |   |        |        |    |    |           |        |    |        | Euro 2 |        |    |    |    |    | E3                           |
| Malaysia                      |   |        | Euro 1 |    |    | Euro 2    |        |    |        |        |        |    |    |    |    |                              |
| Indonesia                     |   |        |        |    |    |           |        |    |        |        | Euro 2 |    |    |    |    |                              |
| Nepal                         |   |        |        |    |    | Euro 1    |        |    |        |        |        |    |    |    |    |                              |
| Philippines                   |   |        |        |    |    |           |        |    | Euro 1 |        |        |    |    |    |    |                              |
| PR China                      |   |        |        |    |    | Euro 1    |        |    |        | Euro 2 |        |    |    |    |    |                              |
| Singapore                     | Euro 1  |        |        |    |    |           | Euro 2 |    |        |        |        |    |    |    |    |                              |
| Sri Lanka                     |   |        |        |    |    |           |        |    |        |        |        |    |    |    |    | Euro 1                       |
| Sri Lanka                     |   |        |        |    |    |           |        |    |        |        |        |    |    |    |    |                              |
| Taipei, China                 |   |        |        |    |    | US Tier 1 |        |    |        |        |        |    |    |    |    |                              |
| Thailand**                    |   |        | Euro 1 |    |    | Euro 2    |        |    | Euro 3 |        |        |    |    |    |    | Euro 4                       |
| Vietnam                       | gasoline  |        |        |    |    |           | Euro 1 |    |        |        |        |    |    |    |    | Euro 4 (under consideration) |
| Vietnam                       | diesel  |        |        |    |    |           |        |    |        | Euro 1 | Euro 2 |    |    |    |    | E3, E4                       |

Unfortunately, not all car manufacturers were prepared to uphold the standard. They dragged their feet around the implementation of the regulation.

# Sulfur Content in the Pump



Source: KPBB/Ministry of Environment

# Global Sulfur Reduction Movement

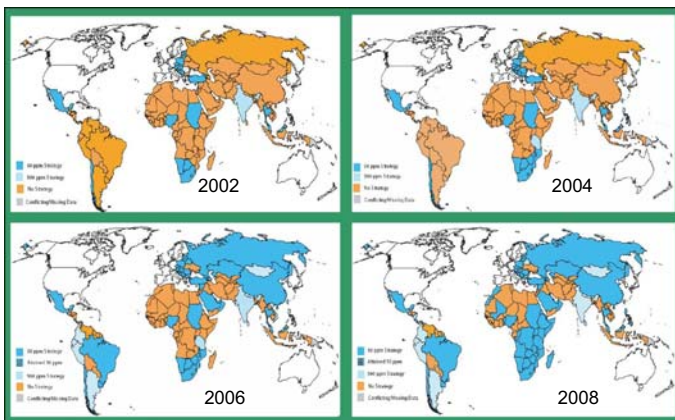
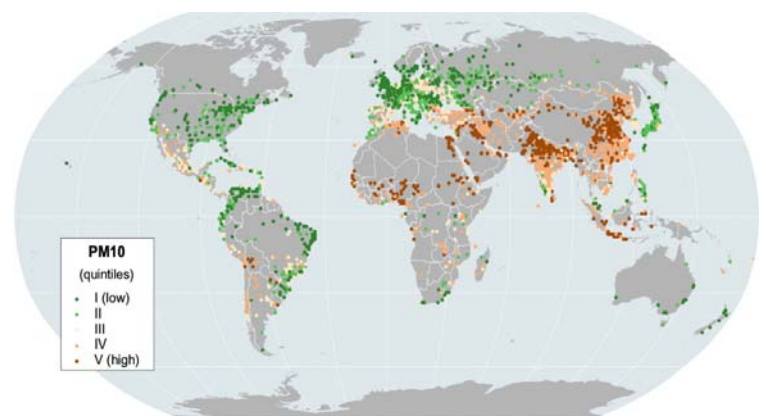


Figure: Progress of Sulfur Reduction Program

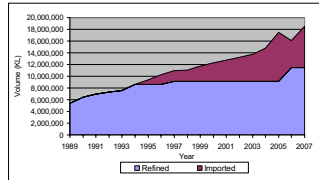
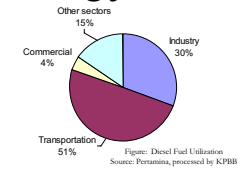
# PM<sub>10</sub> in The Various Cities



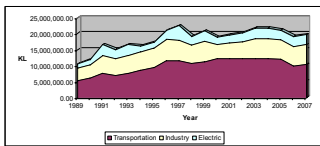
Slide 16

Source: Cohen et al, 2005

## Energy for Transport Sector



Diesel fuel (ADO, IDO) supply by sector



## Traffic and Transport Management

- Lack of Integrated Transport Planning and Land-use Planning
- Insufficient Public Transport
- Non Motorized Transport
- Carrying Capacity



## Lack of Integrated Transport Planning and Land-use Planning



- Instant policy, no environmental risk assessment, no feasibility study
- Inconsistence, contra productive

## Insufficient Public Transport



- Unbalance (road base vs rail base, private vehicle vs public vehicle)
- Bias to business interest of automotive industry?

## Non Motorized Transport



- No space for non motorized transport?

## Carrying Capacity



- Maximum total number of vehicle in the city compare to length of road and carrying capacity
- Make longer and broader of road to solve the problem of traffic jump?

## Policy and Strategy

- **Rational:** the strategy to curb air pollution is focused on reducing vehicle emissions, integral to increase people mobility/accessibility.
- **Strategy and approach:** improvement of cleaner fuel/energy, introduction of low emission vehicles, improvement of traffic management, and land use planning, stringent emission standards, and law enforcement.
- **Prior agenda for traffic management improvement** programme:
  - Mass public transportation, non motorized mobility, and transport demand management (TDM)
  - Arranged as strategy based on the idea of Environmentally Sustainable Transport (EST).

## Increasing of Vehicle Utility

Emissions per Passenger  
Kg

| Vehicle      | PM10   | CO2 |
|--------------|--------|-----|
| Car          | 0.17   | 244 |
| Taxi         | 0.40   | 586 |
| Motorcycle   | 0.42   | 98  |
| Bajaj        | 1.00   | 300 |
| BRT - diesel | 0.01   | 22  |
| BRT- CNG     | 0.0005 | 22  |

Passengers per Vehicle

| Vehicle      | Passengers |
|--------------|------------|
| Car          | 1.2        |
| Taxi         | 0.5        |
| Motorcycle   | 1.2        |
| Bajaj        | 0.5        |
| BRT - diesel | 65         |
| BRT- CNG     | 65         |

## Policy and Strategy (2)

- Mass public transportation system
  - BRT, minimum services standard, park and ride facility, to reform public transport management, and TOD
- Solve traffic jam:
  - TDM, Parking controls and management, Regulatory controls such as "odd-even" schemes and its variants, Physical measures such as pedestrianization, bus priority, etc., Pricing & charges, through fuels, annual taxes, etc., Congestion charging, through cordon pricing or area licensing/pricing, Restraint through land use development controls
  - NMT: pedestrian, bike-lane, car-free day.
  - Law enforcement
- Promote lower emission vehicle technology and methods
  - I/M, fuels economy, [Increasing of Vehicle Utility.ppt](#)
- Cleaner fuels diversification
  - Gaseous fuels (CNG and LPG), Bio-fuel (bio-diesel and bio-ethanol)

## Status

- Improve transportation system:
  - Operate and completing BRT Corridor
  - Add city train series, road network system
- Promote Cleaner Fuel and Vehicle:
  - Using of gases fuels for public transport,
  - Promoting bio-fuels,
  - Promoting Euro 2 Standard of car
- I/M:
  - Decentralized (self financing system) periodic inspection (I/M) for in-used vehicle
- Prevention Effort:
  - Town reboization,
  - Promoting flexible hours (for school)
- NMT and Raising Awareness:
  - Pedestrian, Promoting bike-lane, Car-free day, Public campaign.



## Status (2)

- Cities have being started to replicate what has been done in Jakarta, e.g. mass public transport, non motorized mobility, car-free day:
  - Implemented partially, and its have not developed in the frame of grand design of EST – include what have been implemented in Jakarta –
  - Misleading on EST concept and its program details on implementation
- Trigger to implement EST (by correct definition with integrated, and holistic approach) in the city:
  - e.g. Bandung, Surabaya, Bogor, Yogyakarta, Surakarta, Pekanbaru, Palembang, Makassar, and Batam.

## The challenges

- Air pollution is still being a threat for most cities in Indonesia
  - Transportation is major air pollution contributor in cities
  - Lack of mass public transportation system, NMT, and TDM encourage people tend to use private car/motorcycle for their mobility
  - Traffic jam increases emission load in the city.
- EST is prior to solve vehicular emissions integrated to increase mobility/accessibility.

## The challenges

- Capacity building to avoid misleading on EST concept and its program details on implementation:
  - As integrated and holistic approach that would be cover all the key elements of EST
  - Program exchange, technical assistance, and technical/financial support from other cities in the region as well as international cooperation (bilateral and multilateral)
  - Participatory approach must be taken to formulate EST and localized it in the city which will involve all element and stake holder in the city.
- Coordination to binding commitment and gain political will among key stake holder:
  - Harmonize current regulation and continuing legislation process to complete policy and regulation on EST
  - An effective budgeting to cover funding limitations
- To raise public awareness => affective

Terimakasih

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