BOGOR leading to SUSTAINABLE PUBLIC TRANSPORTATION

4th KITAKYUSHU INITIATIVE MEETING
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City of Bogor Indonesia
City of Bogor MAP

INDONESIA

JAKARTA

BOGOR

WEST JAVA PROVINCE
City of Bogor Profile

- Bogor is historical City found in 15th century with Presidential Palace and Botanical Garden, CIFOR (Center of International Forestry Research), pre Asia Africa Conf 1954, Jakarta Informal meeting for Kampuchea peace effort 1987, APEC conf 1994 with Mr. Clinton and Nov 2006 Mr. George W. Bush visit
- Located 54 km from the Capital city of Indonesia, Jakarta. 190 – 330 meters above sea level
- Covers an area of 118,5 square km, consist of 6 districts and 68 sub-districts with some 855,000 inhabitants
- Surrounded by 3 mountains: Salak, Pangrango and Gede
- Fairly Cool climate with an average monthly temperature of 26°C, minimum temperature of 21.8°C and maximum temperature of 30.4°C
- Humidity is 70% with an annual precipitation rate of 3,500-4,000 mm (Bogor well-known as Rainy city)
- Most of the land use in Bogor is dominated by housing (70%) and the remaining used for cultivation and mixed horticulture yard
Environmental main issues of the City of Bogor

- Traffic congestion and air pollution
- Waste disposal management
- Sewerage and drainage system
- Raw water source and water supply
- Rivers pollution by solid and liquid waste
- Peddlers The riverside squatters
City Management Priorities
2004 - 2009

1. TRANSPORTATION
2. SOLID WASTE
3. STREET VENDORS
4. POVERTY ALLEVIATION
BOGOR AND ICLEI City for Climate Protection Campaign (CCP)

- Started in December 2001 by attending the ICLEI International conference in Heidelberg
- Achieved the Milestones in Local Climate Protection in December 2003
- Corporate emission from transportation 67.63% and community emission from transportation is 23.61%
- Reduction GHG emission in transportation sector by creating more sub terminals for small public vehicle, age limiting for small public vehicle rerouting and inspection and maintenance (including local government vehicle)
- ICLEI member since 2005
<table>
<thead>
<tr>
<th>Category</th>
<th>CO2</th>
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<tbody>
<tr>
<td>Road Transportation</td>
<td>33%</td>
<td>99</td>
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<tr>
<td>Other Transportation</td>
<td>3/1</td>
<td>1/0</td>
</tr>
<tr>
<td>Electricity Generation</td>
<td>2/34</td>
<td>0/1</td>
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<tr>
<td>Other Industry</td>
<td>13/26</td>
<td>0/4</td>
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<tr>
<td>Domestic</td>
<td>30/14</td>
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<tr>
<td>Others</td>
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General Transportation Condition

- **Element of “MEGAPOLITAN” JAkarta BOgor DEpok TAnggerang BEKasi cianJUR (JA-BO-DE-TA-BEK-JUR), 3 Provinces, 5 Cities, 3 Regencies, populated by around 20 millions inhabitant.**
- Transit city with 8 entrances around 412,000 vehicle movement/day, residential city with about 13.3% commuters.
- Served by 10,401 small public vehicle 46,034 private car and 73,145 motorcycle.
- **No Mass Rapid Transit (up to May 2007)**
- 1 Regional Bus Terminal and 3 sub terminals for minibus.
- Total length of road 834 km
CITY TRANSPORTATION PATTERN

TOL WAY TO JAKARTA

City with 8 entrances
Effort in Reducing GHG and Increasing City Transportation Service

1. Inspection and maintenance.
2. Age limiting for small public transit (minibus)
3. Adding sub terminals for small public transit
4. Relocating Regional Bus Terminal
5. Rerouting small public transit
6. Initiating Mass Transportation mode by Bus Rapid Transit for Replacing small public vehicle gradually
7. Decreasing usage of private car by proposing School Bus.
Effect of using of Sub Terminal and rerouting to reduce too many small public vehicles entering City center

Benefit:
- Fuel Consumption saving: 7,275,328 Liter/Year
- Cost Saving (Value of Time): US$ 610,595 /year
Effect of Implementation of Rerouting beside Botanical Garden

Benefit:
- Fuel Consumption Saving: 712,800 Liter/Year
- Cost Saving (Value of Time): US$ 522,186/year
GASOLINE CONSUMPTION OF MANY KINDS OF PUBLIC VEHICLES

Type of Vehicle

- Long Bus
- Bus
- Medium Bus
- Small Bus (Diesel)
- Mini Bus (1500cc)
- Mini Bus (1000cc)
- Motorcycle

Gasoline Consumption (ml/passanger-km)
INCOMING PROGRAM
MASS RAPID TRANSIT

PURPOSE

- Programmed to change Small public vehicle / SPV (1,000-1,500 cc minibus) with larger capacity vehicle to meet the street spaces efficiency.
- Increase the mass rapid transit service
- Increase the mobility and discipline culture

AIM

To make an efficient and qualified mass rapid transit system, which support a good, safe and comfortable traffic.
PROTOTYPE
Bus and Shelter

- The height of shelter is 70 cm
- The bus only can stop in the shelter, because of entrance
- AirconBus with 18 seats and 17 stands.
BUS SHELTER
Comparison between SPV AND BRT

SPV: 1,000-1,500 cc gasoline engine

BRT: 4,500 cc Diesel engine

Benefit:
- Fuel Consumption Efficiency
- Lower CO2 emission, up to 52.3%
BUS RAPID TRANSIT (BRT) vs SPV

- 1 Bus will replace 3 small public vehicle (SPV)
- 2007 start with 10 buses another 10 buses on 2008
- Planned to replace 1,376 SPV served selected route (from 10,401 SPV) equal to 459 buses in 2015
- 30 units SPV annually consume 547,500 ltr gasoline and emit 1,246 tons CO2
- 10 units BRT annually consume 219,000 ltr diesel fuel and emit 594.21 tons CO2
- Reduction emission in operating 10 BRT is $1.246 - 594.21 = 651.79$ tons CO2 per year (52.3%)
PROPOSED CDM PROJECT

- Combine or replace fossil fuel with biofuel for BRT
- Initiate the usage of biodiesel for garbage trucks fleet
- Used cooking oil for raw material biofuel
- Establish existing “private” pilot refinery plant biofuel
BUS RAPID TRANSIT AND GARBAGE TRUCKS ENERGIZED BY USED COOKING OIL WILL CREATE LOWER GHG EMISSION
BOGOR BIODIESEL MINI PROCESSING PLANT

600 L/ DAY PROD CAPACITY

BIODIESEL SAMPLE
BOGOR MINI BIODIESEL PROCESSING PLANT
PRODUCTION CAPACITY 600 L/DAY
## Produced Bio Diesel Composition

<table>
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<tr>
<th>Characteristic</th>
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<tr>
<td>Composition</td>
<td>Metil Ester</td>
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<tr>
<td>Setana No</td>
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<tr>
<td>Density, g/mL</td>
<td>0.8624</td>
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<td>Viscosity, cSt</td>
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<td>Burning point, °C</td>
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<tr>
<td>Energy, MJ/Kg</td>
<td>40.1</td>
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OUR FUTURE PUBLIC BUS

ENERGIZED BY USED COOKING OIL
The amount of solid waste generated by city of Bogor is estimated about 2,205 m³/day or 793,800 m³/year approximately 735 tons/day or 268,275 tons/year.

The solid waste comes from domestic waste (64.2%), markets (12.5%), stores, hotels, and restaurants (7.1%), waste that thrown to the street (7.3%), industry (4.7%) and social-public services (4.2%).

Solid waste is sent to an open dumping final disposal site in 13.4 Ha area.

CH4 is eliminated by flare or used for micro power plant.
GALUGA FINAL DISPOSAL SITE
13.4 Ha area, 14 km outside City, 735 tons solid waste/day
THANK YOU FOR YOUR ATTENTION
SEE YOU LATER IN BOGOR