THAILAND’S experience on Emission measurement and mitigation policies

26 September 2013

UNESCAP, Bangkok

Office of Transport and Traffic Policy and Planning, OTP
Ministry of Transport, Thailand
TOPIC

• Current situations

• Environmental Sustainable Transport Master Plan
Bangkok Metropolitan Region, BMR
POPULATION: 17.5 millions
AREA: 7,760 sq.km.
GDP 68% of National GDP
Bangkok’s Land Use (Urban Sprawl)
Bangkok situation
Number of Vehicle registration: 2003 - 2012

Source: Department of Land Transport
Ratio of Air Emissions (Pollutants) In Bangkok

- **NO$_x$**: 80%
- **SO$_x$**: 75%
- **CO**: 54%
- **PM**: 87%
- **HC**

- **% Mobile sources (Motor Vehicle)**
- **% Point source**
- **% Area source**
Quality of Life

The CO₂ PROBLEM IS A TRANSPORT PROBLEM, PREDOMINATELY CARS AROUND URBAN AREAS
Air Pollution

- Health Impact
- Air pollution from transport sector (Bangkok)
  - 75% of CO
  - 80% of NOx
  - 54% of PM
Social Impact

- Road Accident
- Injuries
- Death
- Stress
GHGs Emission by Sector: 2011

- **Energy**: 87,162 thousand tons (39%)
- **Transportation**: 59,806 thousand tons (27%)
- **Industry**: 54,600 thousand tons (25%)
- **Other**: 19,891 thousand tons (9%)

Source: Thailand Energy Statistic 2012
Volumes of Greenhouse gas released by Thailand’s Transport Sector

- Road Mode: 96.84%
- Air Mode: 2.06%
- Rail Mode: 0.68%
- Water Mode: 0.42%

Source: National Greenhouse Gas listing
Green Transportation

- Change to Alternative Energy, Green Energy and Efficiency use in Energy
- Road and Rail integrated Network around country and Neighboring Country
- Improve Multi-modal Transportation
- Improve Transport System, Efficiency, Effectiveness, Accessibility, Safety, Transport for all, (Aging people and Handicap)
- More Public Private Participation (PPP) Investment
Master Plan Development

Internal Driving force

International Driving Force: EST forum, Rio+20, UNFCCC

Environmental Sustainable Transport Masterplan

Environment
Economic
Social
Ministry of Transport

Vision: Toward Sustainable Transport

Transport and Traffic Development Master Plan 2011 - 2020

Economic prosperity
- Decrease economic loss (VOT, VOC)
- Increase Competitiveness

Sustainable Transport

Environmental friendly
- Energy saving,
- Energy efficiency
- Reduce air emission & GHGs reduction

Social & Quality of life
- Safety, Accessibility,
- Equity, Sufficiency
SUSTAINABLE TRANSPORT MASTER PLAN

Bangkok Declaration
EST 2010 - 2020

Avoid, Shift, Improve

Reduction of GHG and Transportation Emission

- Infrastructure and Demand Management Measure
- Public Transport and Non-Motorized Mode
- Information and Technology Measure
- Policy and Regulation Measure
- Awareness on Environment Measure
**Strategy 1:** Upgrade capability of agencies and personnel for the development of an environmentally sustainable transport system.

**Strategy 2:** Establish appropriate plans and mechanisms for interfacing and monitoring of transport and traffic work plans/measures/projects; and to move them forward to implementation.

**Strategy 3:** Establish comprehensive and inter-connected transport infrastructure.

**Strategy 4:** Efficient transport management for sustainability and greenhouse gas reduction.

**Strategy 5:** Promote transport R&D and adoption of environment-friendly innovations and technologies.

**Strategy 6:** Promote public awareness of the environment.
Strategy 1: Upgrade capacity of agencies and personnel for the development of an environmentally sustainable transport system. (11 plans/projects)

- Upgrade capability of bus services quality
- Development and Training in “Global warming and transport”

Strategy 2: Establish appropriate plans/mechanisms for interfacing/monitoring of transport and traffic work plans/measures/projects; forward to implementation (19 plans/projects)

- Plan for development of public transport in regional cities
- Study of sustainable and environmental-friendly water and air transport

Strategy 3: Establish comprehensive and inter-connected transport infrastructure (44 plans/projects)

- Mass rapid transit projects (15 projects)
- Construction of Sea port in Chumporn province
Strategy 4: Efficient transport management for sustainability and greenhouse gas reduction (22 plans/projects)

- Procurement of new efficient buses with low pollution emissions (BMTA’s 3183 NGV buses)
- Study of standards for parking control/fee collection of parking lots

Strategy 5: Promote transport R&D and adoption of environmentally – friendly innovations and technologies (15 plans/projects)

- Promotion of R&D of efficient high-tech equipment
- Promotion of the use of eco-friendly vehicle

Strategy 6: Promote Public awareness about environmental issues (9 plans/projects)

- Holding public relations activities and provision of knowledge about eco-friendly driving
- Study and production of national public relations materials to disseminate information about global warming
Emission Test (Laboratory Test)

1. การเตรียมรถตัวอย่าง
2. การนำรถขึ้นแท่นทดสอบ
3. การเตรียมข้อมูลทดสอบและรูปแบบการขับขี่
4. การเตรียมเครื่องมือและระบบทดสอบ
5. การเตรียมกระดาษกรองในกรณีทดสอบรถยนต์ดีเซล
6. การดำเนินการทดสอบผลพิษจากรถยนต์
7. การวิเคราะห์ข้อมูล
8. การประมวลผลข้อมูล
1. Calculate the reduction in greenhouse gas emissions (%) in the area of influence of the project/programme using the equation for changes in travel in the equation - ASI.

\[
\text{GHGs} = \text{Number of vehicles} \times \text{Distance travelled} \times \text{Emissions per vehicle-distance travelled}
\]
### Transport Model:

<table>
<thead>
<tr>
<th>Year</th>
<th>Growth Rate</th>
<th>CO2 NAM</th>
<th>CO2 e-BUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>2553</td>
<td></td>
<td>34.84</td>
<td>18.05</td>
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<tr>
<td>2554</td>
<td>2.41%</td>
<td>36.43</td>
<td>18.21</td>
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<td>2560</td>
<td>3.20%</td>
<td>43.99</td>
<td>24.35</td>
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<tr>
<td>2573</td>
<td>3.20%</td>
<td>62.30</td>
<td>35.90</td>
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<table>
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<tr>
<th>Energy Consumption</th>
<th>CO2</th>
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<tr>
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<tr>
<td>24,594</td>
<td>57.07</td>
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<td>25,186</td>
<td>58.44</td>
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<td>30,425</td>
<td>70.60</td>
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<td>46,810</td>
<td>108.62</td>
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### Nationally

<table>
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<tr>
<th>Year</th>
<th>Growth Rate</th>
<th>CO2 NAM</th>
<th>CO2 e-BUM</th>
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<tbody>
<tr>
<td>2553</td>
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<td>22.23</td>
<td>7.17</td>
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<td>2554</td>
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<td>22.01</td>
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<td>26.61</td>
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<td>2573</td>
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<td>46.32</td>
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<table>
<thead>
<tr>
<th>Energy Consumption</th>
<th>CO2</th>
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<tr>
<td>11,347</td>
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<td>11,710</td>
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<td>14,146</td>
<td>30.47</td>
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<td>21,305</td>
<td>37.98</td>
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*ปริมาณก๊าซ CO2 หน่วยเป็น ล้านตัน
**การใช้พลังงานในภาคขนส่ง หน่วย ktoe
GHGs emission from Transport sector

![Graph showing GHGs emission from Transport sector]
### Potential GHGs reduction in Transportation Sector

<table>
<thead>
<tr>
<th>Year</th>
<th>GHGs at BAU (Million tons CO₂ e)</th>
<th>Potential of GHGs reduction (Million tons CO₂ e)</th>
<th>%</th>
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<tbody>
<tr>
<td>2005</td>
<td>57.52</td>
<td>-</td>
<td>-</td>
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<tr>
<td>2017</td>
<td>67.53</td>
<td>11 - 13</td>
<td>16 - 19</td>
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<tr>
<td>2020</td>
<td>74.02</td>
<td>15 - 16</td>
<td>20 - 22</td>
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<tr>
<td>2030</td>
<td>102.82</td>
<td>27 - 30</td>
<td>26 - 29</td>
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</tbody>
</table>


Conclusion

Thailand’s EST Master Plan 120 projects/plans/policies

- Avoid
  - Urban planning
  - Complex city

- Shift
  - Mode of Transport: public and mass transit
  - Freight: road to rail

- Improve
  - Vehicle/fuel standard
  - Technology

- Cross Cutting
  - Safety: Decade of road safety
  - Climate Change
  - Awareness

Most difficult: Not yet
Implementing: Largely Implemented
Implementing: Largely Implemented
Thank you

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