Assessment of National Action Plan for the Reduction of GHG from Transport Sector in Indonesia

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Outline

• Indonesia in a glance

• Indonesia **global commitment** in reducing GHG emission from transport sector

• Indonesia Transport **Challenges**: Paradox of high economic growth

• **Study LPA**: simulating national policy and visioning the future

• **Future policy change**: fundamental shift to more stringent policy with consistent practice
Indonesia in a glance

- The fourth largest country by population in the world after China, India and USA with 243.740 million people in 2011 and average growth rate of 1.4 percent from 2000-2010, which is 66.13 percent of the people are 15-64 years of age group. Average family size is 4-5 person. In 2011, Indonesia reached 72.37 of HDI (BPS, 2013).
• In 2012, Indonesia is the biggest economy in ASEAN region and 17th biggest in the world by GDP, dominated by household expenditure (MGI, 2013, BPS, 2013). Economy grew by average 5.2 percent per year from 2000 to 2010 (MGI, 2012).

• Java is as the economic center contributing 57.63 percent of GDP, which is dominated by secondary and tertiary economic sector.

• Indonesia now has 135 million middle income class or equal to 60 percent of total population with average income of USD 3.850 per capita (BI, 2013). Unemployment rate continue to decrease to 6 percent in 2012 from total 121 million work force (BPS, 2013), with informal sector absorbing 54 percent of total working force.
2. Indonesia **global commitment** in reducing GHG emission from transport sector

- Unilateral reducing GHG emission **26% from BAU scenario by 2020** or 41% with international support
- Presidential Decree No 61 Year 2011 on National Action Plan on GHG Emission Reduction (**RAN GRK**)  
- Transport Ministerial Regulation No 201 Year 2013 on National Action Plan on GHG Emission Reduction in Transport Sector employing **AVOID – SHIT – IMPROVE** approach  
- Recently received **USD 14 Million international support** from German and UK
3. Indonesia Transport Challenges: Paradox of High Economic Growth

- Rapid *motorization* and vehicle *ownership*
- Diminishing *share* of public transport
- Urbanization coexist with *inefficiency*
- High consumption of *energy* and fuel subsidy
Rapid Motorization and Vehicle Ownership

Shift from motorcycle to car due to increasing income

Growth of Vehicle number 2000-2011

Motor Vehicle Ownership 2000-2011

Source: Indonesian Central Statistic Agency, 2013
Diminishing Public Transport Share

Dilapidating Public transport share and stigmatized as mode just for poor

Change of Mode Share, 2002 - 2010

Mode Share by Income 2010

Source: JUTPI, 2010

Source: JAPTrapis 2011
Coexistence of Urbanization and Urban Inefficiency

<table>
<thead>
<tr>
<th>City</th>
<th>Km/h</th>
<th>City</th>
<th>Km/h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bandung</td>
<td>14.3</td>
<td>Surabaya</td>
<td>21</td>
</tr>
<tr>
<td>Bogor</td>
<td>15.32</td>
<td>Medan</td>
<td>23.4</td>
</tr>
<tr>
<td>Depok</td>
<td>21.4</td>
<td>Makassar</td>
<td>24.06</td>
</tr>
<tr>
<td>Bekasi</td>
<td>21.86</td>
<td>Semarang</td>
<td>27</td>
</tr>
<tr>
<td>Tangerang</td>
<td>22</td>
<td>Palembang</td>
<td>28.54</td>
</tr>
<tr>
<td>Bodetabek</td>
<td>20.12</td>
<td>Metro City</td>
<td>24.8</td>
</tr>
</tbody>
</table>
High consumption of energy and fuel subsidy

Fuel Consumption by Sector, 2011

- Industry: 38%
- Transportation
- Household
- Commercial
- Other

Source: MEMR, 2012

Subsidized Fuel Consumption by Sector 2010

- Land Transport: 95%
- Water Transport: 3%
- SME: 1%
- Fishery: 1%

Source: Reforminer, 2010
4. Study LPA simulating national action plan and visioning future policy

- Development Policy:
  NLTDTP (RPJMN), EMP (MP3EI)
- Mitigation Action Plan:
  NAP-GHG (RAN/RAD GRK)
- Visioning future policy
Methodology used in the development of the action plan

1. Current condition
2. Current Policies
3. Historical Data & Trend
4. Global target, 0.033 ton CO₂/capita (IPCC, 2010)

- Stakeholder Meeting
  - Visioning Tools
    - Vision 2050
      - Policy Scenario
        - Future policy & Action
          - Reduction Target
            - Yes
              - Policy Recommendation
            - No

UMY-UGM-MTI
Possible Impact of RPJMN 2010-2014

<table>
<thead>
<tr>
<th>Policies</th>
<th>Possible effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic growth 6.3 – 6.8% p.a</td>
<td>Increase of transport demand and activity</td>
</tr>
<tr>
<td>Development of <strong>urban public services infrastructure.</strong></td>
<td>Increase urbanization, mobility demand, efficiency, and reduce urban transport pollution</td>
</tr>
<tr>
<td>Development of <strong>19,370 km of road</strong>, inter-mode and inter-island infrastructure</td>
<td>Increase connectivity, demand for based transportation, inter-island people and goods transportation, and sea transport</td>
</tr>
<tr>
<td>Enhancement <strong>transportation system and network</strong> in Jakarta, Bandung, Surabaya, and Medan</td>
<td>More efficient urban transport system</td>
</tr>
<tr>
<td>Implementation of <strong>National Multimode Transportation System</strong></td>
<td>Increase of transport efficiency</td>
</tr>
<tr>
<td><strong>Urban electric railway</strong> transportation development</td>
<td>Reduce transport fuel consumption</td>
</tr>
<tr>
<td><strong>Energy savings and alternative fuel</strong></td>
<td>Increase in urban public transport trips</td>
</tr>
<tr>
<td></td>
<td>More efficient commuting trips</td>
</tr>
<tr>
<td></td>
<td>Demand for energy efficiency vehicle</td>
</tr>
<tr>
<td></td>
<td>Decrease oil fuel consumption and increase alternative fuel utilization</td>
</tr>
</tbody>
</table>
## Possible impact of MP3EI 2010-2050

<table>
<thead>
<tr>
<th>No</th>
<th>Policies</th>
<th>Possible effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Promoting road infrastructure construction</td>
<td>Increase private vehicle population and demand, and increase road based freight</td>
</tr>
<tr>
<td>2</td>
<td>Revitalization of passenger and freight sea and river based transportation</td>
<td>Increase demand and volume of water based transportation</td>
</tr>
<tr>
<td>3</td>
<td>Increasing and betterment of air transportation</td>
<td>Increase air transportation demand and volume</td>
</tr>
<tr>
<td>4</td>
<td>Development of rail transportation</td>
<td>Increase rail based demand and volume</td>
</tr>
<tr>
<td>5</td>
<td>Reduction of cost for logistic system</td>
<td>Increase freight transport integration and efficiency</td>
</tr>
</tbody>
</table>
## Possible Impact of RAN/RAD GRK

<table>
<thead>
<tr>
<th>No</th>
<th>Policies</th>
<th>Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Development and implementation of ITS</td>
<td>- Better travel plan and fuel efficiency,</td>
</tr>
<tr>
<td>2</td>
<td>Traffic Impact Control</td>
<td>- Reduce congestion and emission</td>
</tr>
<tr>
<td>3</td>
<td>Congestion Charging and Road Pricing</td>
<td>- Reduce private car usage, congestion, and fuel consumption</td>
</tr>
<tr>
<td>4</td>
<td>Revitalization of public transport system</td>
<td>- Increase of public transport share and reduce private vehicle travel</td>
</tr>
<tr>
<td>5</td>
<td>Development of BRT system</td>
<td>- Increase mode share of BRT, and fuel efficiency</td>
</tr>
<tr>
<td>6</td>
<td>Development of NMT</td>
<td>- Better NMT share and fuel efficiency</td>
</tr>
<tr>
<td>7</td>
<td>Electrification of railway system</td>
<td>- Increase rail passenger and shift from private vehicle</td>
</tr>
<tr>
<td>8</td>
<td>Emission standardization, labeling and emission based tax and</td>
<td>- Reduce fuel consumption and emission</td>
</tr>
<tr>
<td>9</td>
<td>CNG converter kits</td>
<td>- Reduce fuel consumption and CO2 emission</td>
</tr>
<tr>
<td>10</td>
<td>Eco driving and speed limitation</td>
<td>- Reduce fuel consumption and vehicle emission</td>
</tr>
</tbody>
</table>
Improved RAN GRK Scenario

**Business as Usual - BAU**

- Respecting current policy taken by the government
- Predicting impact of current development and economic policy: RPJMN, MP3EI
- Elaborate scenario for current policies
- Considering dynamic in policy implementation

**Improve RAN GRK**

- Additional policy beyond RAN GRK
- Introduction of more AVOID policy options
- Advance vehicle technology
- Fuel pricing and alternative fuels
- Road pricing and behavioral change

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1. Scenario I BAU (RPJP/RPJMN+MP3EI)

Scenario I Estimation of total CO2 emission
2. Scenario II RAN GRK

Scenario II Estimation of total CO2 emission
3. Scenario III IMPROVED RAN GRK

Scenario III Estimation of total CO2 emission
Scenarios Comparison

<table>
<thead>
<tr>
<th>Scenario</th>
<th>2005</th>
<th>2010</th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
<th>2030</th>
<th>2035</th>
<th>2040</th>
<th>2045</th>
<th>2050</th>
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</thead>
<tbody>
<tr>
<td>BAU (MP3EI) (A-&gt;S)</td>
<td>54,484</td>
<td>92,944</td>
<td>123,025</td>
<td>150,744</td>
<td>158,543</td>
<td>178,203</td>
<td>198,983</td>
<td>223,020</td>
<td>224,209</td>
<td>226,1</td>
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<tr>
<td>BAU (MP3EI) (S-&gt;A)</td>
<td>54,484</td>
<td>92,944</td>
<td>123,025</td>
<td>150,744</td>
<td>158,650</td>
<td>178,653</td>
<td>199,951</td>
<td>224,737</td>
<td>226,12</td>
<td>229,1</td>
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<td>RAN GRK A+S+I (A-&gt;S)</td>
<td>54,484</td>
<td>92,944</td>
<td>123,025</td>
<td>151,069</td>
<td>132,990</td>
<td>122,673</td>
<td>135,845</td>
<td>149,927</td>
<td>149,645</td>
<td>151,1</td>
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<tr>
<td>RAN GRK A+S+I (S-&gt;A)</td>
<td>54,484</td>
<td>92,944</td>
<td>123,025</td>
<td>151,069</td>
<td>133,394</td>
<td>124,975</td>
<td>140,198</td>
<td>156,484</td>
<td>158,719</td>
<td>162,1</td>
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<tr>
<td>RAN GRK IMPROV A+S+I (A-&gt;S)</td>
<td>54,484</td>
<td>92,944</td>
<td>123,025</td>
<td>139,068</td>
<td>90,959</td>
<td>74,430</td>
<td>78,664</td>
<td>82,621</td>
<td>82,243</td>
<td>83,5</td>
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<tr>
<td>RAN GRK IMPROV A+S+I (S-&gt;A)</td>
<td>54,484</td>
<td>92,944</td>
<td>123,025</td>
<td>139,132</td>
<td>92,017</td>
<td>79,513</td>
<td>88,091</td>
<td>97,630</td>
<td>101,697</td>
<td>107,1</td>
</tr>
</tbody>
</table>

TTW CO2 (million kgCO2/yr)
Testing of Scenario Emission per Capita (Ton eCO2/per Capita-year)

CO2 Benefits

- Business as Usual
- RAN GRK
- Improved RAN GRK

16% by 2025
Scenarios Comparison

The analyses for scenario comparisons for total emission are as follow:

1. Similar with the emission figure for per capita emission, the results from total emission also show that IMPROVED RAN scenario have better performance compared to RAN GRK.

2. The RAN GRK will reduce the total emission by about 25 Mton CO2 to about 132 Mton in 2025 compared to BAU. On the other hand, IMPROVED RAN scenario will further reduce total CO2 emission by about 67 Mton to only 90 Mton by 2025.

3. The significant difference of results between A->S and S->A sequence for all three (BAU, RAN & IMPROVED RAN) can be seen in 2050. Significant difference especially can be seen in IMPROVED RAN scenario where the A->S sequence can reduce the total emission down to 80 Mton (lower that 90 Mton in 2025). At the same time, the S->A sequence cannot even hold the emission causing rebound of total emission to 107 Mton by 2050.
Co – Benefit from policy improvement

- Transport policies devised GHG mitigation, transport efficiency, system competitiveness and energy consumption.
- Policy improvement will create co-benefit in energy consumption (61% reduction) congestion relieve (35%).
- Transport competitiveness, energy efficiency and GHG emission reduction will achieving global commitment as well as improving the economic and local environmental condition.
5. Visioning Future Policy

- Significant improvement is needed to achieve national commitment and meet global target
- Introduction of various “avoid” policies: promotion of TOD, higher fuel pricing,
- Shift to more advance vehicle technology and cleaner fuel options
- Push policy for transport behavioral changes: road and higher fuel pricing.
- Capacity building to manage and safe guard consistent policy implementation
Combination of transport competitiveness, energy efficiency and GHG emission reduction will help the Indonesian government achieving global climate change commitment as well as improving the economic and local environmental condition.