Asian activities toward two degree target

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Comparison of reduction potential of Asian countries towards achieving two degree target
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Structure of this session

• Asia: Toshihiko Masui, National Institute for Environmental Studies, Japan
• China: Jiang Kejun, Energy Research Institute, China, and Hancheng Dai, National Institute for Environmental Studies, Japan
• India: P. R. Shukla, Indian Institute of Management, India
• Thailand: Bundit Limmeechokchai, Sirindannhorn International Institute of Technology, Thammasat University, Thailand
• Malaysia: Ho Chin Siong, Universiti Teknologi Malaysia, Malaysia
• Cambodia: Hak Mao, Kyoto University, Japan, and Ministry of Environment, Cambodia
• Vietnam: Nguyen Tung Lam, Institute of Strategy and Policy on Natural Resources and Environment, Vietnam
• Nepal: Ram Manohar Shrestha, Asian Institute of Technology, Thailand
• Indonesia: Retno Gumilang Dewi, Institut Teknologi Bandung, Indonesia
What is two degree target?

- Further recognizes that deep cuts in global greenhouse gas emissions are required according to science, and as documented in the Fourth Assessment Report of the Inter-governmental Panel on Climate Change, with a view to reducing global greenhouse gas emissions so as to hold the increase in global average temperature below 2 °C above pre-industrial levels, and that Parties should take urgent action to meet this long-term goal, consistent with science and on the basis of equity; Also recognizes the need to consider, in the context of the first review, as referred to in paragraph 138 below, strengthening the long-term global goal on the basis of the best available scientific knowledge, including in relation to a global average temperature rise of 1.5 °C;

A shared vision for long-term cooperative action, Cancun Agreement

Findings in IPCC AR4

<table>
<thead>
<tr>
<th>Class</th>
<th>Anthropogenic addition to radiative forcing at stabilization (W/m²)</th>
<th>Multi-gas concentration level (ppm CO₂eq)</th>
<th>Stabilization level for CO₂ only, consistent with multi-gas level (ppm CO₂)</th>
<th>Number of scenario studies</th>
<th>Global mean temperature increase above pre-industrial equilibrium at equilibrium</th>
<th>Likely range of global mean temperature increase above pre-industrial equilibrium</th>
<th>Peaking year for CO₂ emissions</th>
<th>Change in global emissions in 2050 (% of 2000 emissions)</th>
<th>RCP</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>2.5-3.0</td>
<td>445-490</td>
<td>350-400</td>
<td>6</td>
<td>2.0-2.4</td>
<td>1.4-3.6</td>
<td></td>
<td>-85 to -50</td>
<td>RCP2.6</td>
</tr>
<tr>
<td>II</td>
<td>3.0-3.5</td>
<td>490-535</td>
<td>400-440</td>
<td>18</td>
<td>2.4-2.8</td>
<td>1.6-4.2</td>
<td>2000-2015</td>
<td>-60 to -30</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>3.5-4.0</td>
<td>535-590</td>
<td>440-485</td>
<td>21</td>
<td>2.8-3.2</td>
<td>1.9-4.9</td>
<td>2010-2030</td>
<td>-30 to +5</td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>4.0-5.0</td>
<td>590-710</td>
<td>485-570</td>
<td>118</td>
<td>3.2-4.0</td>
<td>2.2-6.1</td>
<td>2020-2060</td>
<td>+10 to +60</td>
<td>RCP4.5</td>
</tr>
<tr>
<td>V</td>
<td>5.0-6.0</td>
<td>710-855</td>
<td>570-660</td>
<td>9</td>
<td>4.0-4.9</td>
<td>2.7-7.3</td>
<td>2050-2080</td>
<td>+25 to +85</td>
<td>RCP6</td>
</tr>
<tr>
<td>VI</td>
<td>6.0-7.5</td>
<td>855-1130</td>
<td>660-790</td>
<td>5</td>
<td>4.9-6.1</td>
<td>3.2-8.5</td>
<td>2060-2090</td>
<td>+90 to +140</td>
<td></td>
</tr>
</tbody>
</table>

Source: Metz et al.(2007)
## Assumptions of society in 2050

<table>
<thead>
<tr>
<th></th>
<th>Advanced Society Scenario (ADV)</th>
<th>Conventional Society Scenario (CNV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summary</td>
<td>Accept the new social system, institution, technologies etc. positively and proactively.</td>
<td>Discreet about the new social system, institution, technologies etc., and worry about their transition cost.</td>
</tr>
<tr>
<td>Economy</td>
<td>Annual growth rate from 2005-2050: 3.27%/year (Global) and 4.16%/year (Asia)</td>
<td>Annual growth rate from 2005-2050: 2.24%/year (Global) and 2.98%/year (Asia)</td>
</tr>
<tr>
<td>Population</td>
<td>Total population in 2050: 9.3 billion persons in the World, and 4.6 billion persons in Asia</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>Education system will be improved positively. Education period: from 4-12 years in 2005 to 11-14 years in 2050</td>
<td>Education system will be improved normally. Education period: from 4-12 years in 2005 to 8-13 years in 2050</td>
</tr>
<tr>
<td>How to use time</td>
<td>Time for working and improving career will be longer.</td>
<td>Time for staying with family or friends will be longer.</td>
</tr>
<tr>
<td>Labor</td>
<td>0% of unemployment rate in 2075</td>
<td>Fixed unemployment rate to 2009 level</td>
</tr>
<tr>
<td>Government</td>
<td>Efficiency will Improved immediately.</td>
<td>Efficiency will be improved gradually.</td>
</tr>
<tr>
<td>International Cooperation</td>
<td>Reduction of trade barriers and FDI risks</td>
<td>Gradual improvement in collaborative relationships among Asian countries.</td>
</tr>
<tr>
<td>Innovation</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>Transportation</td>
<td>Increase of demand sue to high economic growth</td>
<td>Gradual increase of demand</td>
</tr>
<tr>
<td>Land use</td>
<td>More speedy and more efficient land use change</td>
<td>Moderate and careful land use change</td>
</tr>
</tbody>
</table>

### Activities in Asia and World toward 2050

**Population (bil. persons)**

- **World**
- **Asia**

**GDP (tri. US$ at 2000 price)**

- **World**
- **Asia**

**Primary energy (bil. toe)**

- **World**
- **Asia**

**CO2 emission (bil. tCO2)**

- Global Target

Source: Estimation by Ms. Kawase (Kyoto Univ), UN, IEA and EDGAR
10 Actions toward Low Carbon Asia

- NIES and other collaborating universities and institutes have proposed the 10 Actions to half global greenhouse gas emission in 2050 compared to 1990 level.
  - narrative storyline/roadmap by 2050 and model simulations

GHG emission reduction in Asia and World

Tentative results

The Global CGE (Computable General Equilibrium) model results.
In Asia, the total GHG emissions in 2050 will have to be lower than the present level, although the GDP will be 3-5 times.
The marginal cost in 2050 will be 260-340 US$/tCO2-eq when “10 actions” will be realized.

Calculation by Dr. S. Fujimori (NIES)
At the following presentations

- “10 actions” are based on “Top-down” approach.
- Introduction of activities/policies in each country toward the low carbon society will be explained from the “Bottom-up” viewpoint;
  - Emission target
  - NAMA
  - Other activities toward low carbon Asia such as capacity building, ...
  - Requests to Japan

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