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Global Participation and Sustainable Development: Korea’s Perspectives

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Prospects of Climate Change Negotiation
Marrakesh to Delhi

Marrakesh Accords
- paving the way for widespread ratification of the Kyoto Protocol
- providing the operational detail required to move the Kyoto Protocol from framework designing stage to implementation stage

Delhi Declaration
- beginning of shift in climate change negotiations from the specifics of implementing the Kyoto Protocol to the question of what happens next
- the emergence of a vigorous debate over next step in the development of an international framework for climate change
- beginning of dialogue on equitable sharing of responsibility for protecting climate
Entry into Force of the Kyoto Protocol

Entry into force of the Kyoto Protocol in 2003 is now a possibility.
- EU, Canada and Japan (O); US and Australia (X)
- the timing for its entry into force depending on Russia’s ratification
- Russia’s conflicting signals (COP-8) on the likely timing of a ratification, but remained optimism on Russia’s ratification in 2003

Postponed entry into force of the Kyoto Protocol (if)
- return of US to the Kyoto Protocol
- commitments of leading developing countries such as Korea and Mexico

Rejection of Kyoto Protocol (if)
- new system with global participation
Prospect of Kyoto Treaty

- Effectuation of Kyoto treaty excluding US and some other countries ➔ two tracks of efforts by developed countries:
  - most countries: ratification of the protocol and implementation of domestic P&M to meet the binding target
  - US: pursuit of a separate climate change strategy, initially, separated from the international regime

- No clear potential on interaction between the US framework and the Kyoto framework
  - participation of US in international emission trading

- Two important areas of uncertainty have implications for the economic consequences of Kyoto Treaty
  - future targets
  - party participation
Future Targets and Party Participation

Future targets
- current emission targets applying only to 2008-2012
- further negotiation required on targets for the second and subsequent commitment periods, either as amendments to the protocol itself or as an entirely new agreement
- size and timeframe for these targets having considerable bearing on the costs of achieving them

Party participation
- ratification by some combination of key parties required for entry into force of Kyoto Protocol
- overall economic impacts influenced by the combination
- questions for significant long-term reduction of GHGs
  - developing country participation in emission abatement
  - possibility of any interaction between the Kyoto Protocol and the US framework
Global Participation

- The issue of developing country participation largely avoided in the UNFCCC negotiation
- Developing countries are expected to avoid the discussion about developing country participation without participation of US in Kyoto Protocol
- US approach to climate change
  - lack of developing country commitment \( \Rightarrow \) unfairness condemning developing countries to slow growth or no growth
  - flexible target: provides one of the potential avenues for bringing developing countries into the global abatement effort
  - facilitation of economic growth of each country
- Timing, threshold, flexibility of target, burden sharing, stringency, binding or non-binding of developing country commitment
  - worthwhile to analyze and change information informally at expert level
Position of Korea (1)

- **Ratification of the Kyoto Protocol**
  - endorsed by the National Assembly in 2002

- **Timing of commitment to GHG emission reduction target**
  - declared Korean government’s intention to set the target during the *third commitment period* (1998)

- **Forms of commitment for developing countries**
  - new approach maintaining sustained economic growth in those countries
  - prefer a more flexible architecture to the current fixed target option of the Kyoto Protocol.
  - a dynamic target option in which indexes are assigned based on key economic variables.
Position of Korea (2)

- Per GDP emissions target: one of the preferable methods
  - inviting developing countries to commit to global efforts
  - arguments due to difficulties in GDP verification

- Research on various scenarios of GHG emissions reduction target led by Korea Energy Economics Institute (KEEI)
  - timing and forms of commitments, and their impacts on the national economy
  - focus on the best course of action minimizing the negative impacts on the national economy
Global Participation
Modeling Approach : GTEM-KOR

- Based on GTEM with GTAP database and GEMAPCK software
- Multi-commodity, multi-region, dynamic CGE model
  - 19 commodities and 23 regions
  - dynamic components: debt, capital and population
- Accounts for carbon dioxide, methane and nitrous oxide emissions
- Application to analysis on trade, energy and environmental policies
### Sectors in GTEM-KOR (Max. 50)

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>Coal</td>
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<tr>
<td>2</td>
<td>Oil</td>
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<tr>
<td>3</td>
<td>Gas</td>
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<tr>
<td>4</td>
<td>Petroleum and coal products</td>
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<tr>
<td>5</td>
<td>Electricity</td>
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<td>6</td>
<td>Iron and steel</td>
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<td>7</td>
<td>Nonferrous metals</td>
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<tr>
<td>8</td>
<td>Chemals, rubbers and plastics</td>
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<tr>
<td>9</td>
<td>Nonmetalic minerals</td>
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<tr>
<td>10</td>
<td>Other metallic minerals</td>
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<tr>
<td>11</td>
<td>Other manufacturing</td>
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<td>12</td>
<td>Service</td>
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<td>13</td>
<td>Trade and transport</td>
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<td>14</td>
<td>Crops</td>
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<td>15</td>
<td>Rice</td>
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<td>16</td>
<td>Livestock</td>
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<td>17</td>
<td>Meat and milk products</td>
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<tr>
<td>18</td>
<td>Processed foods</td>
</tr>
<tr>
<td>19</td>
<td>Fishery and forestry</td>
</tr>
</tbody>
</table>
Regions in GTEM-KOR (Max. 45)

1. Australia  12. China
2. New Zealand  13. South Korea
4. Canada  15. Indonesia
5. Japan  16. Rest of ASEAN
6. European Union  17. India
7. Former Soviet Union  18. Mexico
9. Middle East  20. Argentina
11. South Africa  22. Columbia
23. Rest of the world
Scenarios of Global Participation

Assumption
- developing countries: abatement commitment with developed countries (including US) from the 2nd commitment period
- 5% reduction of GHG from the 1st commitment period
- international emission trading

Developing countries: three groups
- based on analysis and literature review on the issue of burden sharing
- group 1: Korea, Mexico, Argentina, Indonesia, Brazil, Colombia, Rest of ASEAN
- group 2: China (including Chinese Taipei), India, Middle East, Venezuela
- group 3: other developing countries
## Scenarios of Global Participation

### Scenarios of GHG abatement commitment

<table>
<thead>
<tr>
<th>Scenario</th>
<th>1st commitment period</th>
<th>2nd commitment period</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No U.S. participation (own strategy)</td>
<td>Annex I, group 1</td>
</tr>
<tr>
<td>2</td>
<td>U.S. participation</td>
<td>Annex I, group 1 &amp; 2</td>
</tr>
<tr>
<td>3</td>
<td>U.S. participation</td>
<td>Annex I, group 1</td>
</tr>
<tr>
<td>4</td>
<td>U.S. participation</td>
<td>Annex I, group 1 &amp; 2</td>
</tr>
</tbody>
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**GHG Emissions**

![Chart showing GHG emissions](chart.png)

*Note: Percentage change relative to the reference case in 2015*

- More reduction of GHG emissions with participation of U.S. in the Kyoto Protocol
- Important role of developing countries (especially group 2) in mitigating climate change
GHG Emissions (Annex I)

Note: Percentage change relative to the reference case in 2015

- FSU and EE ⇒ net seller
- Japan and EU ⇒ relatively high marginal abatement cost
- No significant change of emissions with participation of group 2
GHG Emissions (Non-Annex I)

Note: Percentage change relative to the reference case in 2015

- Increase of emissions from China and India without participation to the commitment of GHG emission reduction
- Insignificant change of emissions from group 1 countries with participation of group 2 in the commitment
Increase of economic costs with US's participation in the Kyoto Protocol

Decrease of economic costs of Annex I with expansion of Non-Annex I participation in the GHG abatement commitment

Note: Percentage change relative to the reference case in 2015
Gross National Products (Annex I)

Note: Percentage change relative to the reference case in 2015

- Increase of costs of developed countries and increase of benefits of FSU and EE with US participation in the Kyoto Protocol
- Decrease of costs of developed countries and increase of benefits of FSU and EE with expansion of developing country participation
Gross National Products (Non-Annex I)

Note: Percentage change relative to the reference case in 2015

- Impacts depending on the commitment of GHG abatement and economic circumstance (i.e. industrial structure) of each economy
Implications for Global Participation

- Mitigation of climate change
  - insignificant contribution of participation of leading developing countries (i.e. group 1 countries)
  - small increase of global economic costs with expansion of developing country participation from group 1 to group 1+2, but significant reduction of global GHG emission

- Conditions for effective and cost-saving reduction of GHG emissions
  - participation of US in the Kyoto Protocol
  - participation of developing countries in group 2 in GHE reduction commitment
Thank you !!!

Korea Energy Economics Institute