Perspectives on Measurable, Reportable, and Verifiable actions

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1. Introduction

- To avoid dangerous impact by climate change, global mitigation efforts are necessary.

- Developed countries take a lead, but DCs also need to act in accordance with CbDR/RC.

- Bali Action Plan 1(b)(ii) required NAMAs by DCs in MRV manner with MRV support by developed countries.

NAMAs: Nationally Appropriate Mitigation Actions
DCs: Developing countries
CbDR/RC: Common but Differentiated Responsibilities and Respected Capabilities
Future Estimation (Business as Usual)

For ensuring global path toward long-term target, emissions should be measured, reported and verified.

Global GHG emissions

Present  Mid-term  2050

Peak Out in 10-20 years

Long-term Goals Reducing 50% emissions by 2050
MRV Framework should;

- Focus on Quantitative information (GHG emissions)
  - MRV aims to ensure reduction of GHG emissions.

- Facilitate effective actions
  - Support should link to effective actions

- Be developed based on current system
  - Unnecessary administrative burden should be avoided

- Be differentiated based on principles of CbDR/RC
  - Each country should contribute within its capability
**4-1. Measurability: What should be measured?**

- Developed countries
  - QELROs

- Developing countries
  - National action plan
    - including policies and measures for mitigation
    - quantitative to the extent possible in terms of GHG
    - China, Indonesia, South Africa, Brazil have already made its national action plan
      - South Africa and Korea propose “Registry of NAMAs”
      - EC proposes “Low-carbon development strategies”
## Example of MRV indicators

**[Existing sectoral indicators]**

<table>
<thead>
<tr>
<th></th>
<th>Iron &amp; Steel</th>
<th>Cement</th>
<th>Power</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>China</strong></td>
<td></td>
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<tr>
<td>- target in 2020</td>
<td>700 kg-ce*/t-steel</td>
<td>129 kg-ce/t-cement</td>
<td>&lt;Coal fired power plant&gt;</td>
</tr>
<tr>
<td>- Mid &amp; Long-term Energy Saving Plan (2004)</td>
<td>≈ 1.82 t-CO2/t-steel</td>
<td>≈ 0.34 t-CO2/t-cement</td>
<td>320 g-ce/kWh</td>
</tr>
<tr>
<td>- Based on China’s 11th Five-Year Plan (2006-2010)</td>
<td>*ce= coal equivalent</td>
<td></td>
<td>≈ 0.83 kg-CO2/kWh</td>
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<td></td>
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<td></td>
<td>Ex. Raise the proportion of renewable energy (inc. hydro) in primary energy supply up to 10% by 2010</td>
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<td></td>
<td></td>
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<td>From “China’s National Climate Change Program” (2007)</td>
</tr>
<tr>
<td><strong>Japan</strong></td>
<td>2,274 Pjour</td>
<td>3,451 MJ/t-cement</td>
<td>&lt;Electric power industry as a whole&gt;</td>
</tr>
<tr>
<td>- target in 2010</td>
<td>≈ 1.53 t-CO2/t-steel*</td>
<td>≈ 0.23 t-CO2/t-cement</td>
<td>0.34 kg-CO2/kWh</td>
</tr>
<tr>
<td>- Voluntary action plan under Kyoto Protocol</td>
<td>*Supposing that iron &amp; steel output in 2010 will be 100Mt.</td>
<td></td>
<td>Ex.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Photovoltaic generation : 3.0Mkw</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Wind generation : 2.5Mkw</td>
</tr>
</tbody>
</table>

**<Reference>**
- CO2 intensity of Coal : 3.7620 Gg-CO2/10^10 kcal
- CO2 intensity of Crude oil : 2.8641 Gg-CO2/10^10 kcal
- 1 MJ = 2.58258 x 10^-5 kiloliter of crude oil equivalent
- Calorific value of Coal : 6,928 kcal/kg
- Calorific value of Crude oil : 9,126 kcal/L
- 1 MJ = 2.58258 x 10^-5 kiloliter of crude oil equivalent

(Source): EDMC Handbook of Energy & Economic Statistics in Japan
1. Autonomous mitigation actions
   - Its primary purpose is development
   - negative-cost or low-cost actions
   - Energy efficiency improvement in major sectors for major DCs

2. Additional mitigation actions
   - high-cost actions

3. Flexibility mechanisms such as CDM

*What action is Autonomous actions and what is additional depends on capability of each country
4-3. Reportability

• All Parties have obligations to submit national communication incl. inventory (Convention Articles 4.1, 12.1)

• Current situation
  Annex I: National communication every 4-5 years and Inventories every year
  Non-Annex I: Most of countries submit only once

• Need to strengthen the current National Communication
  - Contents (guideline for NAMAs is required)
  - Frequency (yearly is desirable for inventories)

→ Capacity building is necessary
  (Japan hosts series of WS on GHG Inventories in Asia)
• Review by own country for autonomous mitigation actions

• Review by COP for supported mitigation actions
  ➢ A country achieving more effective reductions should get more support.
  ➢ Facilitating actions rather than punishing fault.

• Review by CDM Executive Board for CDM
5. MRV Support

• Financial support to effective mitigation actions
  ➢ Linking support to quantitative actions give incentives to take effective mitigation actions

• Focusing on areas not covered by private investment and leveraging private investment (private investment account for 86% of all investment)

• Including support from carbon market
6. MRV framework (example)

National action plans /support to UNFCCC, report to COP, verification

- **Developing Countries**
  - National action plan
    - Autonomous mitigation actions
      - *Negative/low-cost actions*
      - *Major developing countries energy/GHG intensity improvement in major sectors*
    - Mitigation by flexibility mechanism
      - *Verification by CDM Executive Board*
    - Additional mitigation actions
      - *High-cost actions*
      - *Countries get financial support according to their mitigation actions*

- **Support**
  - *Financial support to effective mitigation actions*
    - *Including additional finance*
    - *Focusing on areas not covered by private investment*
    - *Implement in MRV manner*

- **UNFCCC**
  - *Report to COP*
  - *Verification*

- **Developed Countries**
  - Support outside the Convention
    - *Measurement and report of contribution outside the Convention (incl. ODA)*
  - Financial support to effective mitigation actions
    - *Including additional finance*
    - *Focusing on areas not covered by private investment*
    - *Implement in MRV manner*
Conclusion

• MRV is a key to ensure global reduction toward long-term target.
• MRV should quantify GHG emissions.
• MRV actions by DCs should be differentiated based on the principles of CbDR/RC.
• Linking support and actions can provide incentives for effective mitigation actions.
• MRV is not new. We should build on our experience from current system.
• Capacity building is necessary.
ANNEX
<table>
<thead>
<tr>
<th>Items</th>
<th>Unit</th>
<th>2000</th>
<th>2005</th>
<th>2010</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal consumption of power supply</td>
<td>gce/kWh</td>
<td>392</td>
<td>377</td>
<td>360</td>
<td>320</td>
</tr>
<tr>
<td>Comprehensive energy consumption per tone steel</td>
<td>kgce/t</td>
<td>906</td>
<td>760</td>
<td>730</td>
<td>700</td>
</tr>
<tr>
<td>Comparable energy consumption per ton steel</td>
<td>kgce /t</td>
<td>784</td>
<td>700</td>
<td>685</td>
<td>640</td>
</tr>
<tr>
<td>Comprehensive energy consumption of 10 types of non-ferrous metals</td>
<td>tce /t</td>
<td>4.809</td>
<td>4.665</td>
<td>4.595</td>
<td>4.45</td>
</tr>
<tr>
<td>Comprehensive energy consumption of copper</td>
<td>tce /t</td>
<td>4.707</td>
<td>4.388</td>
<td>4.256</td>
<td>4</td>
</tr>
<tr>
<td>Energy consumption of unit energy factor of oil refining</td>
<td>kgoe /t.factor</td>
<td>14</td>
<td>13</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>Comprehensive energy consumption of ethylene</td>
<td>kgce /t</td>
<td>848</td>
<td>700</td>
<td>650</td>
<td>600</td>
</tr>
<tr>
<td>Comprehensive energy consumption of large scaled synthetic ammonia</td>
<td>kgce /t</td>
<td>1372</td>
<td>1210</td>
<td>1140</td>
<td>1000</td>
</tr>
<tr>
<td>Comprehensive energy consumption of caustic soda</td>
<td>kgce /t</td>
<td>1553</td>
<td>1503</td>
<td>1400</td>
<td>1300</td>
</tr>
<tr>
<td>Comprehensive energy consumption of cement</td>
<td>kgce /t</td>
<td>181</td>
<td>159</td>
<td>148</td>
<td>129</td>
</tr>
<tr>
<td>Comprehensive energy consumption of plate glass</td>
<td>kgce /weighting box</td>
<td>30</td>
<td>26</td>
<td>24</td>
<td>20</td>
</tr>
<tr>
<td>Comprehensive energy consumption of architectural ceramics</td>
<td>kgce /m 2</td>
<td>10.04</td>
<td>9.9</td>
<td>9.2</td>
<td>7.2</td>
</tr>
<tr>
<td>Comprehensive energy consumption of railway transportation</td>
<td>tce/million t-km</td>
<td>10.41</td>
<td>9.65</td>
<td>9.4</td>
<td>9</td>
</tr>
</tbody>
</table>

AGSTC can contribute to both transfer and development of the key technologies.

- Consists of representatives of industrial community and experts (IEA, etc) by each sector
- Analyze the current situation of development and transfer of the technologies by each sector.
  - For development: government R&D budget, international roadmaps for key tech., latest development outcomes, international cooperation activities
  - For transfer: the BAT, the BP, reduction potentials, barriers and solutions
- Formulate advice for further actions by each sector based on the analysis
- Regularly report on outcomes to the COP/equivalent body