Japan’s View on Sectoral Approach

October 22nd, 2008

Shin Okamoto
JAPAN
What is Sectoral Approach?

**Concept**
- SA is a tool to address global emissions by sectors
- Basic concept of SA is embedded in the Kyoto Protocol

**Advantages**
Through analyzing reduction potentials and setting indicators, SA is useful in
- setting ambitious and feasible national reduction targets for developed countries, ensuring comparability
- promoting effective technology transfer

**Principles**
1) Not replace national emission reduction targets
2) Consistent with the principle of “common but differentiated responsibilities and respective capabilities”
3) Not apply a single common standard to all countries
4) Not lead to any trade sanctions
**Step 1: Focus on sectoral emissions**

- Residential/Commercial
- Road transport
- Power generation
- Iron and Steel
- Cement
- Aluminum
- Other Industries
- International aviation & marine bunker fuel
- LULUCF
- Other gas

**Energy-related CO2**

**Total GHG**

**Step 2: Analyze Sectoral emission**

1. **Efficiency/Intensity**
   - Evaluate improvement of efficiency based on technologies
     - Iron and steel: Emission per unit production/energy consumption per unit production
2. **Activity**
   - Evaluate improvement of intensity by policies & measures
     - Residential: Low-carbonization of social system, national campaigns, enhanced recycling

\[ \text{Efficiency/Intensity} \times \text{Activity} = \text{CO2 Emission} \]
Step 3: Compare the developed countries’ efforts

1. Aggregate potential of each sector to estimate national potential

   - **Iron & steel, cement, aluminum**: based on international efficiency indicator
   - **Power generation, road transport**: based on international efficiency indicator and national policy
   - **Commercial, residential**: based on national policy

2. Cross-check and adjust the level of aggregated national target from the viewpoint of comparability, using various indicators (e.g., intensity, marginal abatement cost, etc.)

---

**Residential, Commercial etc.**

Sectors to be addressed mainly based on domestic efforts

**Power generation, Road transport**

Sectors where international efforts/collaboration can be partly developed

**Iron & steel, Cement, Aluminum**

Sectors where international efforts/collaboration are already well-advanced
Step 4: Disseminate BAT to promote MRV actions

National efforts of developing countries can be supported by:
- identifying BAT/BP and
- promoting effective transfer of them through analyzing reduction potentials

Major developing countries can use sectoral efficiency indicators to set MRV mitigation actions.

Many of these actions have no regret nature with co-benefits (e.g., energy conservation, reduction of air pollution).

*BAT: Best Available Technology

---

**Developed Countries**

- Road Transport: infrastructure, automobiles, etc.
- Power generation: energy policy, coal-fired power generation, etc.
- Iron and Steel
- Cement
- Aluminum

**Major Developing Countries**

- Road Transport
- Power generation
- Iron & steel, Cement, Aluminum

**Transfer of BAT, best practices**

Example of cooperation under the Asia-Pacific Partnership (APP)

- Technology Handbook
- CO2 reduction potential
- Performance diagnosis
- Technology transfer

**Power generation, Road transport**

Covers over 50% of the total energy-related CO2
Through analyzing reduction potentials and setting indicators, Sectoral Approach
- helps to compare the developed countries’ efforts
- accelerates global emissions reduction by
  • supporting national efforts of developing countries through transfer of technology
  • helping major developing countries to set MRV mitigation actions

**Scheme of Sectoral Approach**

CO2 emission reduction target

Aggregate

Compare the efforts

Developed Country X → Developed Country Y

Major Developing Countries Z

Residential

Infrastructure

Energy policy

Automobiles etc.

coal-fired power generation etc.

Iron and Steel

Cement

Aluminum

MRV actions (e.g. based on efficiency indicators)

International Cooperative Actions

e.g. APP, WSA, IAI and CSI of WBCSD
Differentiation and Actions of Developing Countries (DCs)

A) DCs expected to take further mitigation actions based on certain criteria such as economic development stages, response capabilities and shares of global GHG emissions

- Binding targets for:
  - GHG intensity or energy intensity in major sectors (e.g., power, iron/steel, cement, aluminum, road transport)
  - Economy-wide GHG/GDP or TEC/GDP (with estimate of total GHG emissions based on GDP forecast)
- National measurement system for its targets
- Voluntary national action plan to be reviewed periodically by COP

B) DCs emitting very little GHGs and vulnerable to climate change (e.g. LDCs and SIDs)

C) Other DCs
  - Voluntary national action plan to be reviewed periodically

Graduation
  - Move to upper group in accordance with the economic development
**Basic Concept**

1. **Estimate sectoral activity level.**
   - Basic sectors are i) Industry, ii) Commercial and Residential and iii) Transportation.

2. **Estimate sectoral energy demand from activity level**
   - i) Energy efficient technology and ii) energy saving activities improve efficiency.

3. **Calculate sectoral energy supply from demand.**

4. **Calculate sectoral CO2 emission from energy supply.**
   - i) Low carbon technology and ii) change of energy mix improve CO2 intensity.

---

**Diagram:**

- **Activity** → **Energy Intensity** → **Energy** → **CO2 Intensity** → **CO2 Emission**

**Improvement:**

- **Improvement by Energy Efficient technology**
- **Improvement by Low-Carbon technology**
1. **Energy demand** is evaluated from the production.
2. Introduction of **energy efficient technology** is considered.
3. Introduction of **low carbon technology** and low carbon fuel mixture are considered.
4. **CO2** emission from fuel input is directly calculated.
5. **CO2** emission from electricity is indirectly calculated.

**Example: Subsector A**

- **Improve Energy Intensity**
- **Improve CO2 Intensity**
- **Reduce CO2 emission**
Japan’s Case: Structure of Sectors and CO2 Emission

1. Basic sectors are constructed by **sub-sectors**.
2. Energy demand and CO2 emission are evaluated by **sub-sectoral basis**.
3. “Power Sector” is separately estimated.

1. **Industry sector**

<table>
<thead>
<tr>
<th>Sector</th>
<th>Energy Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 Manufacturing Industries</td>
<td>energy demand / unit production (ton)</td>
</tr>
<tr>
<td>Iron &amp; steel, cement, chemicals, paper &amp; pulp</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>energy demand / million yen (value added)</td>
</tr>
</tbody>
</table>

2. **Commercial and Residential sector**

<table>
<thead>
<tr>
<th>Sector</th>
<th>Energy Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial</td>
<td>energy demand / unit floor (m2)</td>
</tr>
<tr>
<td>Residential</td>
<td>energy demand / unit household</td>
</tr>
</tbody>
</table>

3. **Transportation sector**

<table>
<thead>
<tr>
<th>Sector</th>
<th>Energy Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passenger transport</td>
<td>energy demand / passenger * km</td>
</tr>
<tr>
<td>Cargo transport</td>
<td>energy demand / ton * km</td>
</tr>
</tbody>
</table>

4. **Power sector**
Questions for Workshop

1. How bottom-up mitigation potential analysis can contribute to setting fair and equitable quantified emission reduction targets for developed countries with ensuring comparability?

2. How cross-border analysis can contribute to Measurable, Reportable and Verifiable actions by developing countries?
Nov 27-28, 2008: Warsaw
Industrial Ministerial Meeting on Sectoral Cooperation

◆ Sectoral cooperative activities

March, 2009: Bonn
Workshop on Methodological Issues for Sectoral Approach

◆ Sectoral activities on indicators and potentials
◆ Integrating SA into post-2012 framework