Our Challenge for Clean Development and Climate
Steel Industry’s Global Sector-based & Technology-based Approach/Challenge

APP Steel Task Force
Asia-Pacific Partnership on Clean Development and Climate

1. Japan’s 2006fy
2. Overview of Steel’s Sector-based Approach
3. Steel Industry’s global challenge for Clean Development and Climate
   A. Uni-lateral: Voluntary Action Plan
   B. Bi-lateral: Japan-China
   C. Seven-lateral: APP Steel Task Force
   D. Sixty-lateral: IISI international iron and steel institute
4. IISI’s policy statement on Post Kyoto
5. Summary

Monday 10 December 2007
Teruo OKAZAKI, PhD
General Manager, Global Environmental Affairs Department
Nippon Steel Corporation
Japan’s national GHGs emissions (2006fy)

Japan’s national emissions of 2006Fy is +6.4% vs 1990. 7.0% reduction required for complying Kyoto Target, -6%.

1. Japan’s 2006fy

- 0.6%
- 6%

2.3% (5.4%)
Temporal emissions due to lowering nuclear operation rate

Sink (forest) 3.8%
Kyoto mechs. 1.6%

7.0% reduction required
Keidanren’s Voluntary Action Plan

Pledge and Review (commitment and progress)  

Keidanren’s target is 0% or less, 35 industrial sectors participated.

This covers approx. 45% of the national total and 84% of industrial etc.

In 2006, 1.5% reduction under 11.9% increase in the activities (vs. 1990).

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<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>1. Iron and Steel</td>
<td>19,326</td>
<td>-5.1%</td>
<td>-1045 Energy consumption -10%, -5.2%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Production increased by +5.4% (2006)</td>
</tr>
<tr>
<td>2. Power (portion)</td>
<td>3,650</td>
<td>+32.7%</td>
<td>+900 Specific CO2 emission -20%, -2% *</td>
</tr>
<tr>
<td>3. Chemical</td>
<td>7,288</td>
<td>+9.0%</td>
<td>+603 Specific energy consumption -10%, -18%</td>
</tr>
<tr>
<td>4. Cement</td>
<td>2,184</td>
<td>-20.3%</td>
<td>-557 Specific energy consumption -3%, -3%</td>
</tr>
<tr>
<td>5. Petroleum</td>
<td>4,062</td>
<td>+31.3%</td>
<td>+968 Specific energy consumption -10%, -15%</td>
</tr>
<tr>
<td>6. Other sectors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Non-energy CO2</td>
<td>5,214</td>
<td>-</td>
<td>-993</td>
</tr>
<tr>
<td><strong>Total (Keidanren)</strong></td>
<td>50,448</td>
<td>-1.5%</td>
<td>-755 CO2 0% or less, -1.5%</td>
</tr>
</tbody>
</table>

(*if nuclear operated properly, -3.5%)

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Steel’s National and International Collaborations

**World-wide**
- **Coverage**: 100%

**KP (Kyoto Protocol)**
- □ 40%

**APP**
- □ 60%

**KP+APP**
- □ 90%

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In 1996, JISF launched

- Energy-saving by △ 10% (1990→2010)
- Utilization of Waste Plastics etc. (utilization of 1 million-ton).
- Utilization of Waste Energy outside.
- Contribution to society by “Eco-products” and by-products.
- International Technology Transfer.

*JISF: Japan Iron and Steel Federation
Overview of performance

(Steel Industry in Japan total, 2006)

Inside of Steelworks

(Unit: Mt-CO2/year)

- Energy-CO2
  - 1990: 203.7 Mt-CO2
  - 2006: 193.3 Mt-CO2
  - Decrease: -5.1%

- Crude steel
  - 1990: 112 Mt
  - 2006: 118 Mt

Outside of Steelworks

- Household/Office
  - Technology Transfer
  - Products & by-products
    - Eco-Products
      - -7.9 Mt-CO2/y (2006)
      - -10.5 Mt CO2/y
    - Cement (BF slag)
      - -4.6 Mt-CO2/y
      - +abroad 4.6

- Transport
- Forest

Cross-Sector

Long-term R&D, Post Kyoto

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Japan-China Steel Industry Advanced Technology Exchange Meeting in Environmental Protection & Energy-Saving

4-5 July 2005: the 1st meeting in Beijing, China
1-2 Nov. 2006: the 2nd meeting in Beppu, Japan (#1 Expert meeting)
28 Sep. 2007: the 3rd meeting in Beijing, China (#2 Expert meeting)

Common Understanding
Importance of technical exchanges in the area of environmental preservation and energy-saving technologies, from the standpoint of the effective use of resources and the preservation of the global environment.

Agreement
To realize the above, the Japan Iron and Steel Federation and the China Iron and Steel Association will continue exchanges of information and experts on environmental preservation and energy-saving.

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Overview of APP

APP denotes Asia-Pacific Partnership on Clean Development and Climate. This initiative was started in January 2006. This covers energy security and climate change issues etc. as a regional partnership.

- **Asia-Pacific countries participation**
  - Seven nations: Japan, USA, Australia, Korea, China, India, Canada

- **Focusing on Energy and SOX/NOX issues**

- **Government-Private Partnership with small number of nations**

### Characteristics of APP

- **Huge potential for CO2 emissions reduction**
  - APP seven nations CO2 emissions are approx. 60% or a whole world.

- **Technology oriented, sector-based and bottom-up approach**

- **Government-Private collaborations** non-legally binding
  - Dynamism of private sector and potential for R&D activated

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< Benefit of sector-based approach >

- Based on the actual technical situations of each sector, it is possible to evaluate accurate and practical potential of CO2 emissions reduction.
- Energy efficiency of developed and developing countries can be evaluated.
- Best practices can be shared in the easier way.
- Practical projects can be Implemented.

1st Ministerial and PIC

Date 】11-12 January 2006
Venue 】Sydney

- Ministries and CEOs from industry participated and APP was officially launched. Constructive discussion on sector-based approach etc. Political will for promoting partnership was confirmed among ministries.
- Eight task forces were established by participating governments and privates.

2nd Ministerial meeting
15 October 2007
In New-Dehli
Date 】 19-20 July 2007
【Venue】 Tokyo

- Activities of each TF reported
- Discussed on the collaboration with international financial agencies and IEA etc.
- Canada attended as an observer.
- Steel TF and Cement TF that are chaired by Japan’s government showed plans to have site visit in China and India.
- **Steel TF reported the potential of CO2 reduction by the results of diffusion survey and showed steps to actual cut down of CO2 emissions. This was attracted by the each member country due to applicability of this methodology to the other TFs.**
### Overview: APP Steel TF

#### 1st TF (April 2006) • USA
- Agreed on Action Plan
- Zero-order-draft for SOACT (State-of-the-art Clean Technology Handbook)
- Methodology for the diffusion-rate Survey

#### 2nd TF (September 2006) • Japan
- Results of diffusion survey
- Methodology for energy efficiency survey

#### 3rd TF (March 2007) • India
- Reduction Potential evaluated by diffusion survey
- Agreed on the methodology for energy efficiency survey
- First-order-draft for SOACT

#### 4th TF (October 2007) • Australia
- Performance indexes and energy efficiency survey
- Site visit in China and India
- Measures for promoting technology transfer and diffusion

#### 5th TF (Spring 2008)

### Further discussions
- A guideline for information sharing and disclosure
- A procedures for target setting
- Applying to the national policy and measures

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## APP Steel Task Force Action Plan

<table>
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<tr>
<th>Projects Steel Task Force</th>
<th>Chair of Project</th>
<th>Project description</th>
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<tbody>
<tr>
<td><strong>Project-1</strong> (APP Steel workshop)</td>
<td>Host country (rotational basis)</td>
<td>- Annual exchanging information and sharing experience. Incl. On-site visits.</td>
</tr>
</tbody>
</table>
| **Project-2** (Status Review of Steel Industry Related Indicators for Energy Saving etc) | Japan | - Reviewing of equipment diffusion of energy saving, environmental protection and recycling with identification of barriers in diffusion.  
- Estimation of potentials for emission reduction.  
- A common boundary definition setting and survey of energy efficiency. |
| **Project-3** (Performance Indicators Setting) | Korea (Co-chair Japan/USA) | - Identification of indicators for energy saving and environmental improvement.  
- Setting ambitious and realistic milestones. |
| **Project-4** (Performance Diagnosis) | China, India | - Site visit for performance diagnosis of energy saving and environment protection. |
| Projects-5-1 (State-of-the-art Clean Technology Handbook) | USA (co-chair Japan) | - Compile a comprehensive information document for global and local environment countermeasures as a bible. |
| **Project-5-2** (Technology Deployment) | Australia | - Flagship project on the basis of plant diagnosis(project-4). |

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Establish of Common Methodology to Identity Reduction Potential and Performance Benchmarking

**Step-1: Status Review**

- Diffusion rate of technologies
  - Selection of technologies for survey from a common data base, SOACT handbook
- Intensity benchmarking
  - A common Methodology setting for benchmarking

**Step-2: Reduction potential**

**Step-3: Target setting**

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Development of Mechanism
for Eligible Technology Adaptation
based on Expert Diagnoses Methodology and Procedures

Step-1: Site visit (Project-4)

Fact findings
- On-site evaluations, candidate technologies for improvement of a particular steelworks

Recommendations
- Appropriate and suitable implementations from SOACT for each steelworks
- Energy saving
- SOX, NOX etc.

Compilation of all sites data and list-up the candidate projects

Step-2: Prioritization and selection of actual flagship projects using results of site visits

Evaluation and prioritization of all candidate projects
- Barriers for realization (financial, technological etc.)
- Cost-effectiveness etc.

Step-3: Proposal to the Steel Task Force as actual Flagship Projects

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SOACT Handbook is under compiling to be shared state-of-the-art clean technologies relating environmental protection and energy saving by the member countries.

By the end of 2006,

53 of environmental protection technologies and 48 of energy saving technologies are compiled. 63 technologies are presented by Japan.
<table>
<thead>
<tr>
<th>Process</th>
<th>Technology for Steel Industry</th>
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<tbody>
<tr>
<td>Sinter</td>
<td>Flue Gas Treatment</td>
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<td></td>
<td>Waste heat recovery</td>
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<tr>
<td>Cokes</td>
<td>CDQ: Coke Dry Quenching</td>
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<td></td>
<td>CMC: Coal Moisture Control</td>
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<td></td>
<td>SCOPE21</td>
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<tr>
<td>Blast Furnace</td>
<td>Flue Gas Treatment</td>
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<td>TRT</td>
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<td></td>
<td>Hot Stove heat recovery</td>
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<td>PCI: Pulverized Coal Injection</td>
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<td></td>
<td>Regenerative Burner</td>
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<td>Direct Reduced Iron</td>
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<tr>
<td>Basic Oxygen</td>
<td>Flue Gas and Water Treatment</td>
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<tr>
<td>Furnace</td>
<td>Evacuation</td>
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<tr>
<td>Recycling</td>
<td>Utilization of slag, sludge and dust</td>
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</table>

Power generation by Waste Heat Recovery Technology (CDQ)
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CO2 emissions reduction Potential
127 million t-CO2/year
APP Steel Task Force’s features

【Strong points】
- Steel specific sectoral-approach based on the common technology basis. This leads to easier-entry to this approach.
- Vast potential for CO2 reduction by diffusing SOACT. Technology diffusion is a powerful measures against global warming.

【Challenge】
- Further survey required for identifying barriers for diffusion.
- Establishing accelerating/promoting mechanisms for technology diffusions (appropriate policy etc.)
IISI’s CO2 Breakthrough Program

October 2003~

North American Program

South American Program

EU
ULCOS
*Ultra Low CO2 Steelmaking
CCS, H2, BFG recycling with CO2 separation

Korea Program

Japan Program JISF

Australia Program

Phase-1: Seeds R&D (until 2008 )

Phase-2: Pilot project (2008~ )

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The Commitment of steel industry (7 main sets of actions)

“A Global issues requires Global solutions”
“There is a need for a Steel specific solution”

1. Expanding the use of current efficient technologies.
2. New technology solutions to radically reduce the CO₂ intensity.
3. Continuing to optimise and maximise the recycling of steel scrap.
4. Maximising the value of steel industry by-products.
5. Using the new generation of steels to improve the energy efficiency.
6. Developing common and verified reporting procedures.
7. Adopting a global sector-specific approach.

“The Expert Group set up by the Board is busy working on developing the framework for a global sector-specific approach. It is also establishing how the steel industry can report its present CO₂ emissions which is the starting point for setting future commitments.
Governments need to:

- **Replace cap and trade emission regimes with policies that allow the most efficient steel companies in terms of CO2 emissions to expand and the least efficient to decline.**
- Engage with industry to adopt a “Sector Specific” framework which involves all major steel producing countries.
- Establish recycling rules for “Steel-to-Steel recycling” as a closed-loop which encourages market-based recycling as used in the steel industry.
- Encourage the closure and replacement of the least efficient steelmaking plants.
- Support the long-term research initiatives for radical new technology solutions proposed by the steel industry. Government also need to develop policies that encourage demonstration of these innovative technologies.
- Engage with industry develop reporting procedures that account for and report progress towards achieving CO2 emission reductions.
Global Approach for Steel to address Climate Change

- **Global Sectoral Approach**
  Establishment of the data on a common and consistent basis is the essential starting point for the setting of commitments in the Post Kyoto.

- **No cap**
  Cap and trade policies such as those currently used in the EU are making global carbon dioxide emissions worse and are counter-productive for a global competitive industry such as steel.

- Participation of **all major steel producing countries** and focusing on **improving intensity**
  - Near term: universal application of current best practice and technology
  - Longer-term: investing in research on the development of radical new steelmaking technologies.
1) Participation of all major emitters (countries, sectors, entities ~)

2) Technology ~Solution
   - Diffusion of best practice and technology
   - CO2 Breakthrough Technologies

3) Sector-based and technology-based collaborations
   - “Sectoral Approach”

4) Taking action toward a challenging target
   - “Global top-runner (front-runner)
   - Challenging target with pledge and review

5) Mechanisms for promoting and accelerating technology transfer and R&D

6) Collaboration through APP and IISI etc.
   - Asia-Pacific model.