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: JISF’s 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

Wednesday 13 February 2008

Teruo OKAZAKI, PhD

Chair for International Environmental Strategic Committee

Japan Iron and Steel Federation

General Manager, Global Environmental Affairs Department

Nippon Steel Corporation
Blast Furnace

Process flow

Coke oven  Sintering  Basic Oxygen Furnace  Continuous Casting
**Keidanren’s 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).

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Iron and Steel</td>
<td>19,326</td>
<td>-5.1%</td>
<td>-1045</td>
<td>Energy consumption -10% , -5.2%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><em>Production increased by +5.4% (2006)</em></td>
</tr>
<tr>
<td>2. Power (portion)</td>
<td>3,700</td>
<td>+20.5%</td>
<td>+630</td>
<td>Specific CO2 emission -20%, -2% *</td>
</tr>
<tr>
<td>3. Chemical</td>
<td>7,288</td>
<td>+9.0%</td>
<td>+603</td>
<td>Specific energy consumption -10%, -18%</td>
</tr>
<tr>
<td>4. Cement</td>
<td>2,184</td>
<td>-20.3%</td>
<td>-557</td>
<td>Specific energy consumption -3%, -3%</td>
</tr>
<tr>
<td>5. Petroleum</td>
<td>4,062</td>
<td>+31.3%</td>
<td>+968</td>
<td>Specific energy consumption -10%, -15%</td>
</tr>
<tr>
<td>6. Other sectors</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Non-energy CO2</td>
<td>5,215</td>
<td>-</td>
<td>-993</td>
<td></td>
</tr>
<tr>
<td><strong>Total (Keidanren)</strong></td>
<td>50,458</td>
<td>-1.5%</td>
<td>-745</td>
<td>CO2 ±0% or less, -1.5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(*if nuclear operated properly, -3.5%)</td>
</tr>
</tbody>
</table>

The 3rd Symposium of Japan-UK Joint Research Project on Low-Carbon Societies, JISF Wednesday 13 February 2008
Steel’s National and International collaborations

2. Steel’s Sector-based

10^8 ton/year, 2006 crude steel production

D. Sixty-lateral: IISI

B. Bi-lateral: Japan-China

A. Uni-lateral: JISF

C. Seven-lateral: APP

**World-wide**

<table>
<thead>
<tr>
<th>Coverage</th>
<th>KP (Kyoto Protocol)</th>
<th>APP*</th>
<th>KP+APP*</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td>≧40%</td>
<td>≧60%</td>
<td>≧90%</td>
</tr>
</tbody>
</table>

APP*: Asia-Pacific Partnership on Clean Development and Climate    STEEL TASK FORCE

The 3rd Symposium of Japan-UK Joint Research Project on Low-Carbon Societies, JISF Wednesday 13 February 2008
In 1996, JISF launched:

2. Utilization of Waste Plastics etc. (utilization of 1 million-ton).
5. 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
2006: 193.3
-5.1%

Crude steel
1990: 112
2006: 118 mt/y

Outside of Steelworks

Products & by-products
-12.4 Mt-CO2/y

Eco-Products
-7.9 Mt-CO2/y (2006)

Transport

Forest

Technology Transfer

Cross-Sector

CO2 Global reduction
Kyoto mechanism
-8.8 Mt-CO2/y
BF slag
-4.6

Long-term R&D, Post Kyoto

The 3rd Symposium of Japan-UK Joint Research Project on Low-Carbon Societies, JISF Wednesday 13 February 2008
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.
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
APP structure

Ministerial

PIC (USA)

CFE (Australia)  REDG (Korea)  PTG (USA)  Steel (Japan)  Aluminium (Australia)  Cement (Japan)  Coal (USA)  BA (Korea)


<<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.
Overview: APP Steel TF

1st TF (April 2006) • USA
- Agreed on Action Plan
- Zero-order-draft for SOACT (State-of-th-art Clean Technology Handbook)
- Methodology for the diffusion-rate Survey
- Identifying 101 technology For energy-saving and environment SOACT Handbook

2nd TF (September 2006) • Japan
- Results of diffusion survey
- Methodology for energy efficiency survey
- Coherent and common Methodology for energy survey (A common boundary definition And coefficients) agreed
- Most important 17 technology Site-by-site diffusion 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
- Methodology for energy Efficiency survey agreed (the 1st challenge in the world)
- CO2 reduction potential Evaluated by the results From diffusion survey

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

5th TF (Spring 2008) • Korea
- Further discussions
  - A guideline for information sharing and disclosure
  - A procedures for target setting
  - Applying to the national policy and measures

The 3rd Symposium of Japan-UK Joint Research Project on Low-Carbon Societies, JISF Wednesday 13 February 2008
### APP Steel Task Force Action Plan

<table>
<thead>
<tr>
<th>Projects Steel Task Force</th>
<th>Chair of Project</th>
<th>Project description</th>
</tr>
</thead>
<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>
<tr>
<td><strong>Project-2</strong> (Status Review of Steel Industry Related Indicators for Energy Saving etc)</td>
<td>Japan</td>
<td>-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.</td>
</tr>
<tr>
<td><strong>Project-3</strong> (Performance Indicators Setting)</td>
<td>Korea (Co-chair Japan/USA)</td>
<td>-Identification of indicators for energy saving and environmental improvement. -Setting ambitious and realistic milestones.</td>
</tr>
<tr>
<td><strong>Project-4</strong> (Performance Diagnosis)</td>
<td>China, India</td>
<td>-Site visit for performance diagnosis of energy saving and environment protection.</td>
</tr>
<tr>
<td><strong>Projects-5-1</strong> (State-of-the-art Clean Technology Handbook)</td>
<td>USA (co-chair Japan)</td>
<td>-Compile a comprehensive information document for global and local environment countermeasures as a bible.</td>
</tr>
<tr>
<td><strong>Project-5-2</strong> (Technology Deployment)</td>
<td>Australia</td>
<td>-Flagship project on the basis of plant diagnosis(project-4).</td>
</tr>
</tbody>
</table>

11 Jan 2008

---

The 3rd Symposium of Japan-UK Joint Research Project on Low-Carbon Societies, JISF Wednesday 13 February 2008
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 database, SOACT handbook
- Intensity benchmarking
  - A common Methodology setting for benchmarking

Step-2: Reduction potential

Step-3: Target setting
Development of Mechanism
for Eligible Technology Diffusion
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

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

Energy saving
SOX, NOX etc.

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
Technology Transfer

China site

China (3 plants)

① Taiyuan (太原): JFE
② Jinan (济南): Nippon Steel, Kobe
③ Jiangyin (江陰): Sumitomo

Schedule: Dec. 2007

3 〜 4 Specialists/Experts (from Japan) at each site

The 3rd Symposium of Japan-UK Joint Research Project on Low-Carbon Societies, JISF Wednesday 13 February 2008
Technology Transfer

India site

2007fy

Site: SAIL (Rourkela)


10 Specialists/Experts (from Japan)

*Work shop and Site visit*

Tata Steel Ltd

Ispat Industries Ltd. (Dolvi)

JSW Steel (JVSL)

SAIL (Rourkela)

Rashria Ispat Nigam Ltd

The 3rd Symposium of Japan-UK Joint Research Project on Low-Carbon Societies, JISF Wednesday 13 February 2008
CO2 emissions reduction Potential
127 million t-CO2/year
IISI’s CO2 Breakthrough Program
October 2003~

North American Program

EU
ULCOS
*Ultra Low CO2 Steelmaking

Korea Program

Japan Program
JISF

South American Program

Australia Program

Phase-1: Seeds R&D (until 2008)
Phase-2: Pilot project (2008~)
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 CO$_2$ 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 CO$_2$ 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.
Summary

5. Conclusion

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.
Appendix: Energy efficiency/CO2 intensity benchmarking

**Baseline-2**: Baseline/average or less

**Baseline-1**: Global top-runner (front-runner), “industrial ultimate”

**Baseline-3**: Grandfathered baseline

Challenging target setting

Int. in CO2 emissions (t-CO2/t-steel)

Steelworks 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36

Shut-down
Japan National Total emissions ~1.3bt-CO2/y
China ~6bt-CO2/y
USA ~6bt-CO2/y
EU ~4bt-CO2/y

World-wide emissions ~27bt-CO2/y

“Cool Earth 50” 3 principles
1. Major emitters participation
2. Flexible frameworks
3. Compatibility, environment & economy (technology-based action)

China ~1?bt-CO2/y
AP7 ~1+?bt-CO2/y
Aus/Canada ~0.17bt-CO2/y

Transport ~0.25bt-CO2/y
Household/Office ~0.17bt-CO2/y

Car MP ~0.01bt-CO2/y
El. Appl. ~0.02bt-CO2/y

Global steel industry’s emissions ~2?bt-CO2/y

Keidanren 35 sectors ~0.5bt-CO2/y

Technology Transfer
Cross-sector

The 3rd Symposium of Japan-UK Joint Research Project on Low-Carbon Societies, JISF Wednesday 13 February 2008
Memo

Dutch cow ready for sea level rise?
Europe-Asia Dialogue on Climate Challenge of the 21st Century
The Finnish Parliament Group for Global Issues
Helsinki, 8th September 2006
Dr. Ottmar Edenhofer / Kai Lessmann