SUMMARY OF THE OECD/CHINA WORKSHOP ON STEEL MARKETS, TRADE AND STRUCTURAL ADJUSTMENT

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OECD/CHINA WORKSHOP ON STEEL MARKETS, TRADE AND STRUCTURAL ADJUSTMENT

Main Findings

1. Under the auspices of the Ministry of Foreign Trade and Economic Co-operation, the State Economic and Trade Commission and the China Iron and Steel Association (CISA) on the one side and the OECD Steel Committee on the other, a joint OECD/China Workshop on Steel Markets, Trade and Structural Adjustment was held in Shanghai, China, on 10-11 May 2001. The workshop was attended by some 230 participants, among them around 80 from abroad. The programme of the workshop and the list of participants are attached as Annex 1 and Annex 2 respectively.

2. In their opening statements, Mr. Liu Jie, Vice-Chairman of CISA and Chairman and CEO of Anshan Steel, Mr. Wu Xichun, Chairman of CISA, Mr. Wolfgang Hübner, Head of Division, OECD Secretariat, and Ambassador Hans Colliander, Sweden, Chairman of the OECD Steel Committee, welcomed the initiative to hold such a joint workshop. They underlined the timeliness of this event, which would address a broad range of front-burner issues of the current steel policy debate. Moreover, all speakers stressed the mutual benefits of intensifying the relations between the Chinese Government and steel industry and the OECD Steel Committee.

3. The workshop discussed selected market and steel policy developments in OECD, China and other steel producing countries. In particular, discussions focused on the development of China's steel industry, China's steel trade policies and the possible impacts of its accession to the WTO. Furthermore, participants exchanged views and clarified the restructuring of the steel industries in OECD and China, addressed the environmental impact of steelmaking and highlighted efforts to facilitate the implementation of cleaner and more energy-efficient production technologies. Presentations made available to the Secretariat in disc form are attached as Annex 3.

4. During the session on "Current Trends in Steel Production, Consumption and Trade" it was highlighted that global steel demand reached record levels in 2000, but despite the excellent global performance market conditions deteriorated in the second half of the year and the price for many steel products declined dramatically. In 2001, while steel consumption is expected to decline, lower steel production and reduced inventories may lead to a recovery in prices for steel products and a better performance of steel companies as long as trade remains fair and unrestricted. In China, crude steel production and apparent consumption also hit record levels in 2000 and continued to grow in the first quarter of 2001. While the strong growth of exports was not sustained in the first quarter of 2001, imports still were on the up resulting in net imports of around 3 million tonnes in this three-month period. The market statements presented by the United States, the Commission of the European Communities, Japan, Korea and Brazil pointed to an ongoing high import pressure on European steel markets, a record inventory build-up and an increasing number of bankruptcies in the steel sector of the United States, low export prices and signs of declining shipments for Japanese steelmakers, a Korean steel market which is expected to contract both on the demand and supply side and, finally, an estimated growth of apparent consumption by 7% in Brazil for 2001.
5. Discussions in the session on "Steel Trade Policies" stressed that, while the legal frameworks for international steel trade have become more liberal, there was increasing use of trade remedies worldwide. Participants complained particularly about an abuse of anti-dumping measures, which, as the Russian representative mentioned, would rarely reflect actual economic conditions in the investigated country. Discussants from other steel exporting countries shared this view and raised doubts about the conformity with WTO regulations of anti-dumping law in some OECD Member countries. It was felt that the underlying causes of trade frictions should be addressed and multilateral solutions sought. A statement made by the Canadian Delegation clearly called for such a multilateral approach. Furthermore, participants were informed about the implementation and reform of China's foreign trade policy and noted that the accession of China to the WTO would go far beyond the reduction of tariffs and will greatly affect trade and development of the Chinese steel industry. Participants in particular welcomed the positive attitude the Chinese industry is taking in order to cope with the opportunities and challenges of the country’s accession to the WTO. The Chinese steel industry pushes very hard to implement with no delay the reforms necessary for achieving compliance with the established rules of the game. In this context, the firm strategy of the Baosteel Group, which aims at becoming a "Fortune 500" company over the next five to ten years, was considered as a challenging response to the entry of the Chinese steel industry into a globalising world economy.

6. "Structural Adjustment of the Steel Industry" was the heading of session three. Participants in the workshop took note of the developments of the Chinese steel industry in the late nineties and the reform targets established under the 10th Five Year Plan, which puts emphasis on privatisation, a change in the production structure towards a higher value-added product mix, the elimination of non-viable small entities and a further strengthening of big companies through mergers and acquisitions. The example of the industry restructuring in the European Union demonstrated that successful restructuring should put an industry in a more competitive position and able to undertake the changes that are required without depending on governmental supports. There was agreement that restructuring of the steel industry remains an issue in most parts of the world.

7. Session four on "Improving Energy Efficiency and Environmental Performance" addressed the environmental efforts undertaken by the Japanese, Chinese and German steel industries and the respective targets for further action. The experience in these countries shows that the rate of innovation and energy efficiency improvements was increasingly meeting with diminishing returns and increasing investment. In the case of Japan and Germany voluntary agreements between government and industry had proven to be successful environmental policy tools in advance of and as a supplement to regulatory approaches. Participants agreed that energy conservation, waste reduction, recycling and the move towards cleaner production technologies are priority objectives of the steel industries in China and the OECD area and voiced concern that future environmental improvements may only be achieved at a slower pace.

8. With regard to a possible follow-up to this joint workshop, OECD Delegations encouraged the Chinese Delegation to continue its efforts to seek observer status in the OECD Steel Committee as one of the most appropriate means to intensify co-operation. According to the Chinese Government this workshop should be regarded as a milestone for establishing dialogue and co-operation between China's Government and steel industry and its OECD counterparts, and the government would engage to make all efforts to deepen such dialogue and co-operation. In addition, participants stressed the importance of bilateral contacts between the government and industry representatives of OECD Member countries and China. Furthermore, participants agreed to hold a similar workshop on issues of common concern in the not too distant future.

9. The co-chairmen of the workshop, Mr. Wu Xichun, the leader of the Chinese Delegation, and Mr. Hans Colliander, the chairman of the OECD Steel Committee, both expressed their satisfaction with the success of the two day meeting.
ANNEX 1

WORLD STEEL FORUM 2001

– OECD/China Workshop on Steel Market, Trade and Structural Adjustment

9 – 11 May, Hua Ting Hotel & Towers, Shanghai

PROGRAMME

Wednesday, 9 May

18:00 Early registration and reception banquet in the Grand Ballroom

Thursday, 10 May

07:45 Registration

09:00 Workshop will be opened by Mr. Liu Jie, Vice-Chairman of CISA, Chairman and CEO of Anshan Steel Group. He will chair the opening and the first session.

Opening Speech: Wu Xichun, Chairman of CISA

Opening Speech: Mr. Wolfgang Huebner, Head of Division, OECD Secretariat

Opening Speech: Mr. Hans Colliander, Chairman of the OECD Steel Committee.

Session one: Current Trends in Steel Production, Consumption and Trade

09:30 Global steel market situation and perspectives, Mr. Franco Mannato, Administrator, OECD Secretariat

09:50 Steel market situation and perspectives of China, Mr. Huang Jingan, Director General of Market Research Department, CISA

10:10 Steel markets in selected OECD Member countries: European Community, United States, Japan and Korea
10:30 Coffee Break

10:50 Discussion
- How have steel consumption, trade and production developed at the global and regional level?
- What are the perspectives for the major steel-consuming sector?
- How have steel prices developed and what is the short-term outlook?
- What are the steel making capacities of the major steel producing countries?
- What are the longer-term expectations for steel demand, production and trade?

12:00 Lunch

Session Two: Steel Trade Policies

Chairman: Mr. Hans Colliander, Chairman of OECD Steel Committee

13:30 Trade policies in China, Mr. Yu Jianhua, Division Director International Department, Ministry of Foreign Trade and Economic Co-operation, China

13:50 Steel trade policies: patterns and developments of steel trade policies, Mr. David Fife, Steel Sector Specialist, Industry Canada

14:10 China’s rights and obligations under WTO agreement: the potential impact on the steel industry, Ms. Florizelle Liser, Assistant US Trade Representative

14:30 China’s entry into WTO: the potential impact on Baosteel, Ms Xie Qihua, Vice-Chairman of CISA, CEO of Baosteel

14:50 China’s entry into WTO, the impact on Chinese steel industry and trade, Mr. Liu Jinghai, Director, Metallurgical Economic Research Centre, China

15:10 Coffee Break

15:30 Discussion
- To what extent and in which fields are steel trade policies becoming more liberal or more protectionist?
- Is self-sufficiency, the increasing in net exports or the reduction of net imports explicit goals in China and/or OECD Member countries? If so, how are they implemented and how successfully?
- How is international steel trading addressed in China’s or OECD Member countries’ steel trade policy?
- How will China’s steel policy be affected by its accession to the WTO?
- Are steel exports to China expected to increase and/or will Chinese accession to the WTO facilitate its exports to OECD Member countries?
- Do OECD Member countries envisage any changes in their trade policies?

17:00 End
Friday, 11 May

Session Three: Structural Adjustment of the Steel Industry

**Chairman: Mr. Liang Cai, Secretary General of CISA**

09:00 Industry adjustment according to the 10th Five-Year Plan, Mr. Wang Xiaogi, Deputy Director General of the Industry Planning Department, State Economic and Trade Commission, China

09:20 Current mainstream directions of structural change in the steel industry of OECD Member countries, Mr. Salvatore Salerno, Head of Unit, Commission of European Communities

09:40 Discussion
- What are the lessons to be learned from the restructuring of the steel industry in the last two decades?
- Which specific problems hamper the development of the steel sector?
- What are the solutions to the social aspects of the restructuring problem?
- Is globalization a driver of steel industry restructuring?
- Is the capacity issue addressed in restructuring plans?
- How do governments support the restructuring of the steel industry?
- How does privatisation/system reform affect restructuring?

10:20 Coffee Break

Session Four: Improving Energy Efficiency and Environmental Performance

**Chairman: Mr. Hans Colliander, Chairman of OECD Steel Committee**

10:40 Outline of countermeasures by the industry to environmental issues, Mr. Takao Suzuki, Managing Director, Japan Iron and Steel Federation

11:00 Current situation and perspective of the energy-saving and environmental protection in China’s steel industry, Mr. Su Tiansen, Deputy Director General of Technology and Environmental Protection Department, CISA

11:20 Improving energy efficiency and environmental performance: the example of the German steel industry, Mr. Prof. Dr.-Ing. Dieter Ameling, President, German Steel Federation
11:40 Discussion
- How does the steel industry in China and OECD Member countries compare with international energy efficiency and emission benchmarks?
- To what extent are environmental improvements required by legislation?
- What is the role of voluntary commitments at the company or industry level?
- Which priority areas of environmental improvements have been established by steel companies in China and OECD Member countries?
- How high is the share of the costs of environmental protection in total costs of steel companies?
- Do companies benefit from tax exemptions or subsidies for measures aiming at the reduction of harmful environmental effects?
- How successful are specific efforts by the Chinese government and steel industry to reduce greenhouse gas emissions?

Session Five: Conclusion and Discussion on Possible Future Co-operation

12:00 Mr. Yang Zunqing, Deputy Secretary-General and Director of International Co-operation Department of CISA and Mr. Colliander, Chairman of OECD Steel Committee will sum up the workshop and co-chair this session.

Participants may wish:
- To reaffirm the value of the OECD/China dialogue on steel policies and practices and to agree to exchange, on a regular basis, information on policy developments and commercial co-operation in their respective countries via the OECD Secretariat.

- To agree, while not inhibiting bilateral discussions, to meet on an ad hoc basis to exchange views on developments in the global steel market and in international steel trade, on the progress made in the restructuring of the industry and any other upcoming issue of mutual interest.

12:30 End of the workshop, the delegates arrange the lunch by themselves.

14:15 Bus-transfer to Baosteel, visit of Baosteel.

17:00 End of the visit.
ANNEX 2

List of Participants

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ANNEX 3

1. Franco Mannato, OECD Secretariat
STEEL DEMAND

2000

- Global Steel consumption increased by 7.5%, some 51 million tonnes more than in 1999
- OECD: Demand increased by 7.7% (+32 MT)
- Asia: consumption recovery continued (+8.7% or 6 MT)
- NIS: Recovery continued too (+26.5%, or 6.5 MT)
- China: the continuous increase slows to 1.1%
- Other areas: in total an increase by 12.2% or 6.5 MT
### 2001

- World steel demand is expected to remain close to, but slightly below, its 2000 level.
- OECD: a decline by more than 1.5% is expected representing 7 MT less.
  - In Asia growth may continue at a low pace (+2%).
  - Most likely demand may continue to grow also in the NIS (+7.8%) and may then reach 33.5 MT equal to 28% of the 1988 record consumption level.
- In China, growth is expected to continue at a low pace (+1.7%), and in the remaining areas, demand could grow by 1% only.

### 2002

- Global demand may pick-up again (+1%).
- OECD: In total, demand is expected to stagnate.
  - Within the OECD, demand may continue to decline somewhat in North America, stabilize in Europe and could pick up in the Asia-Pacific area after the decline of 2001.
  - Growth in demand may slow somewhat in the NIS (+5%).
  - Steel consumption in the non-OECD Market economies could increase by 2.8%, mainly in Latin America and in Asia.
- In China, steel demand is expected to remain close to the level reached in 2001.
Crude Steel Production In 2000

- World steel production reached the record level of **8 4 7.2 M T**

- OECD Production increased by 30 MT (+6.7%) to 491 MT.

- Production in China grew more slowly +2.7% and reached some 127.2 MT.

- In the NIS, production continued to grow (+14.4%) and reached 98.6 MT.

- Production in the non-OECD Market Economies grew by 11.6%.
2001

• World steel production is expected to remain at a very high level, probably slightly below that of 2000.
• OECD: production is expected to decline by around 1% to about 486 MT.
• China: production is expected to record a moderate Growth.
• In the NIS production may decline slightly by 1%.
• Production is expected to grow by around 1.8% for the total of the remaining areas.

2002

• Like demand, steel production may pick-up by around 1%.
• For the OECD area as a whole, production should remain at its 2001 level.
• In the NIS, increases in production should not exceed 2.5%.
• Chinese steel production may stabilize close to its 2001 Level.
• In the remaining areas, crude steel production may increase by close to 4%, Latin America and the Middle-East being the main engines of this growth.
World Crude Steel Production in 2000

CHINA 15%
CEE Cs & NIS 13%
OECD North America 16%
Non-OECD Mkt Eco 7%
OECD Asia-Pacific 18%
OECD Europe 23%
North America 16%
Other Asia 7%
Other Market Economies 8%

World Crude Steel Production by Area

OECD Europe
OECD Asia-Pacific
NIS & CEECs
North America
Non-OECD Mkt Eco
China
2000

Record year for the steel demand and production

YES

But...

Source: Metal Bulletin
Source: Metal Bulletin

Source: Bank of Japan
STEEL TRADE DEVELOPMENTS 2000

• In terms of volume, world steel trade in 2000 increased by 12.6% and reached 208.5 MT representing 28.2% of total consumption

• OECD net steel exports dropped from 4.2 MT in 1999 to only 0.4 MT in 2000 as imports jumped 16.2% (+15 M T ) to 110 MT

• Steel exports from the NIS increased by 7.8% to 46 MT

• Chinese steel exports jumped 98.5% over their 1999 level while imports increased by some 22.5%

• Exports from other Asian countries continued to increase (+3.5%), while imports recovery accelerated (+8.2%).
Steel Consumption and Trade

**WORLD Steel Exports in 2000**
- N.I.S. & CEECs: 25%
- China: 5%
- North America: 8%
- Europe: 23%
- OECD Asia-Pacific: 22%
- Non-OECD Market Economies: 16%

**WORLD Steel Imports in 2000**
- N.I.S. & CEECs: 10%
- China: 10%
- North America: 22%
- Europe: 22%
- OECD Asia-Pacific: 5%
- Other non-OECD Market Economies: 35%
2001

• In terms of volume, world steel trade is expected to decline 6.1% below the 2000 record level.
• OECD steel exports and imports may decline by 3.7% and 6.7% respectively.
• Steel exports from the NIS are expected to decline by around 7% but should remain at a high level.
• Chinese steel imports are expected to drop by some 10%.
• Within the other Asian countries net imports may decline by around 5%.

2002

• World Steel Trade should remain approximately at the same level than in 2001;
• OECD steel exports are expected to decline as well as imports, thus OECD net exports may remain close to the 2001 level;
• Net Steel Exports from the NIS may decline somewhat;
• Chinese Steel Exports could increase by around 10%;
• Steel exports from other Asian countries should decline, while imports could pick-up again;
Major changes in steel trade flows

Asian Steel Imports 1970-2002
World Crude Steel Capacity and Production Developments

Crude Steelmaking Capacity

- China
- Transition Eco.
- Non OECD/Mkt Eco
- OECD
OECD Crude Steel Capacity and Production Development

Capacity and Production Developments in the NIS

Million Tonnes

Capacity
Production

Millions de Tonnes

Capacity
Production
The Context of China's WTO Accession

Over the past twenty years, China has made much progress in opening its market to foreign products and investment. Economic and financial reforms are gradually removing the privileges accorded to state-owned firms, and introducing market forces. China’s accession to the WTO will further open its markets and will support China’s own domestic reform process.

China has completed its bilateral WTO negotiations with all WTO members formally requesting them, except Mexico. The WTO Working Party on China’s accession has made significant progress on drafting of a Protocol and Working Party Report with a view toward completing the accession process as soon as possible.

While China has a more open and competitive economy than 20 years ago, there are still substantial barriers in place that have yet to be dismantled. China’s WTO accession will make important contributions to this process. The Chinese government has undertaken a significant effort to revise its laws and regulations in a manner consistent with WTO rules. WTO accession will bring change but the process will take time and will require significant action by the central, provincial, and local governments to implement the required reforms.

Economic reforms since 1979 have transformed China into a major trading power. In 1979, China exported USD14 billion of goods, which rose to nearly USD195 billion in 1999. Over the same period, imports grew from USD16 billion to USD166 billion, while exports increased from 13.7 billion to 194.9 billion.1 The reforms being implemented by China have enormous potential to change the entire economy of China. These reforms will affect all sectors of the economy, including the steel producing and consuming industries. China’s entry into the WTO will further the integration of the Chinese economy into the global economy.

Summary of key provisions of China’s rights and obligations under the WTO Agreement

It is important to remember that WTO disciplines apply to virtually all sectors of the economy and must be implemented by the central government, as well as by the provincial and local governments. Steel products and other traded goods will be affected by the following rights and obligations:

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The WTO benefits that China’s exports will receive include:

− The right to receive permanent Most Favored Nation status with all WTO members.
− The right to receive National Treatment for the distribution of products imported from China.
− The right to seek binding dispute resolution if China’s market access rights are not honored in accordance with the WTO Agreement.
− The right to seek binding WTO dispute resolution to review disputes arising out of the imposition of antidumping, countervailing duty, or safeguard trade remedies. Vice Minister Sun Zhenyu of MOFTEC recently noted that WTO membership will allow China to better respond to antidumping allegations against China.²

The WTO obligations which will affect industries such as China’s steel industry include:

− **Import tariffs on steel will be reduced.** Nominal tariffs on steel currently range from 3% to 15% for carbon steel products and 2% to 22% for stainless steel. After China’s accession to the WTO, China’s overall average import tariffs on steel will fall from 10.3% down to 6.1%.

− **Import quotas will be eliminated.** Steel is one of 40 categories of products which are currently subject to annual import quota limits established by the central government of China.³ Overall, China has gradually reduced the number of products subject to quotas and other quantitative restrictions, but will be required to eliminate most of them once it accedes to the WTO, with the remainder being eliminated over a short period.

− **Import Licensing Systems will end.** Many products that are subject to import quotas in China also require import licenses. Since the early 1990s, China has eliminated many import license requirements. However, licenses are still required for a number of items including iron and steel products. Although issuance of licenses may be labeled “automatic,” the license applicant must prove that there is “demand” for the import and that there is sufficient foreign exchange available to pay for the transaction. China must eliminate these license requirements upon accession to the WTO.

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² “China Reports Higher Success Rate in Antidumping Lawsuits” *Asia Pulse*, April 12, reprinted in Yahoo News Hong Kong.

− **Import trading rights will be liberalized.** China restricts the types and numbers of entities with the right to trade. Only those firms with trading rights may import goods into or export goods out of China. The Chinese government limits the right to engage in the general trade in steel to approximately 170 designated traders. Restrictions on the type and number of firms with trading rights contribute to systemic inefficiencies in the trading system. China has begun liberalizing the regulation of trading rights and, as part of WTO accession agreement negotiations, China has committed to phase out restrictions on trading rights.

− **Distribution rights will be expanded.** China severely limits the ability of foreign firms to market their products effectively. Distribution in China is largely reserved for domestic companies. Existing restrictions on distribution services limit the ability of foreign firms and importers to market to, service, and support their customers. In general, foreign importers have limited distribution rights, cannot own or operate trucks or warehouses, and must sell and distribute their goods through state-sanctioned foreign trade corporations or import-export agents, who often impose huge markups on the final price. China agreed to phase out such distribution restrictions as part of its bid to join the WTO.

− **Disciplines on subsidies will be established.** Upon accession China has pledged to eliminate two types of subsidies; export subsidies, and import substitution subsidies. Other subsidies will also be subject to WTO disciplines.

Under Article 3 of the WTO Agreement on Subsidies and Countervailing Duties, export subsidies and import subsidies are prohibited subsidies. The obligation to eliminate prohibited subsidies may be enforced by WTO dispute settlement procedures. In a WTO dispute settlement proceeding, a WTO member seeking the elimination of prohibited subsidies need not to allege or prove that the subsidy has caused injury to its domestic industry or has otherwise caused serious prejudice to its interests.

Other forms of government financial support to the steel industry will also be subject to WTO subsidies disciplines. Funding for the steel industry from government-owned banks will be permissible but will be subject to the WTO rules on subsidies. Financing which is not made on commercial terms could be subject to WTO subsidy disciplines if the terms of the financing meet the definition of a subsidy and causes injury or serious prejudice to the interests of WTO members.

**The potential effects of WTO disciplines on China’s steel industry**

As mentioned previously, the Chinese leadership and WTO members believe that China’s accession to the WTO will serve as a catalyst for further economic reform and development. It is difficult to predict how the terms of the WTO Agreement will affect specific sectors of China’s economy, but an analysis based upon fundamental economic principles suggests that WTO accession will increase the domestic demand for steel while subjecting China’s steel industry to more competition and more fully integrating the sector into the global trading system.

4 The “general trade in steel” refers to the importation of steel that is not subsequently re-exported after further processing or manufacturing. See: “Report to the President on Global Steel Trade: Structural Problems and Future Solutions”, U.S. Commerce Department Steel, July 2000, p. 153.
If, as predicted, continued economic reform and WTO accession will lead to increased demand for steel, the most efficient domestic steel producers will profit from sustained growth. Those producers that have been dependent upon a less competitive domestic market or have relied upon state subsidies will face a more uncertain future. If steel producers respond to market signals, the production of lower quality steel will consolidate, and the production of higher quality steel will increase as the demands for those products increase.

Imports may play a larger role in the domestic market as barriers to importation will fall and foreign steel producers will be able to establish sales and distribution networks. Nevertheless, domestic producers will retain the natural advantage of being geographically closer to their customers.

Because steel consumption is generally dependent upon economic growth, China’s domestic steel market will grow along with the projected sustained economic growth as China’s economy benefits from the efficiencies produced by opening up to the global economy. China’s current per-capita steel consumption rates provide significant room for growth in the domestic steel market.

A significant amount of the anticipated growth will be derived from increases in economic efficiency as the economy continues to become more market oriented. By definition, these efficiencies will increase competition between domestic producers, and with imports. This in turn will create pressure on firms to lower their costs in order to prosper in the more competitive environment.

The role of foreign investment

In the past 20 years, China’s economic growth has been fueled by significant capital investment financed by large domestic savings and significant foreign direct investment.

Foreign investment in China has brought with it new technology and processes that boosted efficiency, and this trend is expected to continue upon China’s accession to the WTO. In a recent press interview, Dai Xianglong, the Governor of the People’s Bank of China predicted that overall foreign direct investment will increase by USD45 billion every year for the next four or five years.\(^5\)

Foreign investment has played an important role in promoting exports from China as the growth in exports has paralleled the growing share of exports derived from companies with foreign investors. It is estimated that approximately half of China’s exports come from foreign-invested firms, an increase from the 1% share of exports that these firms accounted for in 1985. If exports from foreign-invested firms are excluded from China’s statistics, China drops from being the 9\(^{th}\) largest exporter, down to the 15\(^{th}\) largest exporter in the world.\(^6\)

Foreign investment in steel consuming industries will accelerate growth in steel consumption, and will also increase demands for quality products at competitive prices. Recent examples of this can be seen in the globalization of the auto industry. In Japan, Renault SA of France became the largest shareholder in Nissan Motor Co. The new leadership of Nissan announced in February 2000 that it was reducing the

\(^{5}\) Quoted in Business Week Online “DAILY BRIEFING -- A Talk with China's Banking Chief” Wednesday April 4, 4:21, republished on http://biz.yahoo.com/bizwk/010404/rwmgesxflty2e0qcdlr0ia.html accessed April 13, 2001.

\(^{6}\) Business Week April 16, 2001, p. 32.
number of its suppliers of steel sheet from five to three producers in an effort to reduce procurement costs.\(^7\) Also in 2000, Volkswagen of Brazil, the largest automaker in Brazil, announced that it would begin importing flat rolled steel from Europe and Asia after the automaker had protested price increases announced by two Brazilian steelmakers. Volkswagen subsequently canceled some of its import orders after reaching an agreement with the domestic producers.\(^8\) These incidents show how the globalization of steel customers places new demands on steel producers.

**Conclusion**

The implementation of the terms of China’s accession to the WTO can bring important changes to the steel industry. It is impossible to predict how economic changes will affect specific firms, but the full implementation of China’s WTO obligations will change the competitive environment of China’s steel industry.

Steel is an important, and trade sensitive, sector of the global economy. The United States and other steel producing WTO members will be watching carefully to ensure that China fully implements its obligations.

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\(^7\) *The Financial Times*, “Why Japan’s steel makers are focusing on a flat market” by Ken Hijino in Tokyo Published: January 30 2001.

3. Salvatore Salerno, Head of Unit, Commission of the European Communities

CURRENT MAINSTREAM DIRECTIONS OF STRUCTURAL CHANGE IN THE STEEL INDUSTRY OF OECD MEMBER COUNTRIES

Introduction

I am very pleased to have the opportunity to take part in this forum and would like to congratulate the organisers - the China Iron and Steel Association and the OECD Steel Committee - on their choice of venue and the interesting topics they have included on the agenda. China is becoming an increasingly important participant in the world steel market. It is therefore good that we have the opportunity to meet in Shanghai to discuss developments taking place in China and in the global market for steel products.

This meeting takes place at a particularly appropriate time. We heard yesterday about general economic developments and their impact on the steel industry. There was also discussion of trade developments including China’s forthcoming accession to the WTO.

Today the topic is structural adjustment. I would like to provide a framework for our discussion, by considering the restructuring that has taken place over the last two decades; focusing primarily, but not exclusively, on developments within the EU. In doing this, I will seek to address the question “What is a successful restructuring?” and examine what lessons, positive or negative, we can draw from past restructuring that might assist in developing future policy.

Special characteristics of steel

Before starting to consider past restructuring and those that are currently ongoing, I would first like to draw attention to certain specific characteristics of steel as a commodity, which mean that the steel market differs from that for many other industrial goods. These differences in turn play an important role in understanding the history of restructuring and the criteria for successful change.

To make my points clearer, it might be helpful to compare steel with another industrial product that most, if not all of us will have in our homes • a television set. Television sets are products with technical requirements that are specific to quite narrow geographical markets • one cannot take a British television and expect it to work in Belgium, far less in Baltimore or Beijing. As a result, if a manufacturer of television sets discovers that an economic slowdown is causing a fall in demand in one country, he is left with little choice, at least in the short run, but to cut production or build up stocks. There is little scope for diverting shipments to a region where demand is increasing.
By contrast producers of steel have far less need to worry about providing instruction books in the appropriate language or meeting country specific technical standards. Steel products can easily be reassigned to markets in a completely different part of the world in response to variations in price or demand. Indeed, one hears tales of shipments that are already on the high seas being diverted to a different port in response to some last minute piece of news.

The homogeneous nature of steel products means that, unlike many other industrial goods, the steel market behaves more like that for agricultural products or raw materials. There is a strong cyclical element to prices and demand, in turn reflecting cycles in overall economic activity. The market situation can change very quickly, forcing the industry to react to periods of downward pressure on prices.

It is difficult for plants to be profitable if their output is not a high percentage of their capacity. This in turn puts a premium on concentration and rationalisation. Companies with worldwide plants can switch markets and production very quickly between regions in response to variations in local prices and demand. By contrast, firms which are heavily dependant on sales in one country or region and whose size means they do not have the financial resources to withstand more difficult economic periods will have greater difficulty in resisting downturns.

What has the EU done to restructure?

There have been two substantial periods of major restructuring of the European steel industry. The first, in the early 1980s, saw a reduction in capacity of 31 million tonnes whilst, more recently, a further 19 million tonnes was removed between 1992 and 1996. There has also been a continuous reduction in the labour force, from almost 1 million in 1973 to around 270 000 today.

The steel crisis 1980-1988

In the eighties, the European steel industry, along with European economies more generally, went through a difficult period with low growth and rising unemployment. In response, the Commission introduced the so-called Davignon plan, which included:

- Production quotas (under article 58 of the ECSC Treaty).
- Minimum price mechanism (under article 61).
- Viability audits and subsidy regulations.
- Massive plant closures.
- Social measures; and
- accompanying measures to protect the market during the restructuring period including Voluntary Restraint Agreements (which were not prohibited by the then prevailing GATT rules).

This was also a period of significant subsidies from Member States (some 36 382 Million ECU were paid as a means of encouraging reductions in capacity).
The steel crisis 1992-1996

After a brief recovery between 1989 and 1991, the steel industry faced a new crisis in the early 1990s. The approach adopted on this occasion was not one of direct intervention by the authorities but consisted of a package of measures to encourage the industry to cut capacities further. Based on the BRAUN report, the Commission elaborated a programme of capacity reductions and the necessary supporting measures. The approach agreed by the Council on 25 February 1993, was based on parallel action:

- By the industry, which defined a plan involving sufficient, precisely defined capacity reductions; and
- The Community, which adopted accompanying measures, for a three-year period, to facilitate industry’s task, including:
  - **Social support**: additional funding was made available from the ECSC budget (funded by a levy on firms’ production) to cover the costs of redundancy and early retirement. Other EU programmes continued to support the cost of retraining workers leaving the steel industry so that they could find other careers.
  - **Stabilisation of the market** — the Commission published indicative quarterly sales guidelines under Article 46 of the ECSC Treaty based on information provided by companies. The companies were then free to adapt their production plans in the light of this aggregate data.
  - **External measures** including further VRAs.
  - **State-aid**: under strict conditions aid payments were allowed as a counterpart to capacity reductions of hot rolled products. The conditions included privatisation, viability studies, restructuring plans, freezing of remaining capacity and half yearly reports by the Commission to the Council.

The results of the European steel industry restructuring plan

The closure commitments which were announced by the end of 1994 amounted to about 11 million tonnes of rolled products, made up of:

- 5.4 million tonnes required by the Commission as a counterpart to its approval of state aid payments; and
- 5.8 million tonnes of voluntary closures by the private sector.

During 1994/1995 45 companies notified their intention to close down their steel plants. The Commission authorised 32 cases and refused 13 other cases as incompatible with the steel aid code. Those closures amounted to 5.5 million tonnes of hot rolled product-capacities. Following German reunification, the Commission also imposed capacity reductions of 1.4 million tonnes of hot-rolled products as a counterpart to regional investment aid for steel companies in the new Länder.

Accompanying this restructuring, there was a major change in the ownership of the European steel industry during the 1980s and 1990s. The major steel makers, which had been controlled and supported by the public sector for many decades, were privatised. This led to a major shake-up with:

- Larger firms being created by merger across national boundaries (the world’s ten largest steel producers currently include five European firms).
• Further specialisation agreements (long products, stainless, flat products…); and

• The European steel industry being willing, for the first time, to invest substantial sums outside Europe (including in the United States, South America, China, South Africa and Poland).

During the 1990s, the Commission adopted a rigorous approach to proposals for state aid, blocking restructuring aid for certain German companies in 1995 and adopting 20 negative decisions in 1996. The following year, the sixth Steel Aid Code came into force. This only allows subsidies for research and development, environmental protection and closure. The Commission has continued to enforce the code rigorously to ensure a level playing field for all competitors.

Lessons from European restructuring

If the steel crisis of 1980-1988 was addressed by strong direct intervention by the Commission (quotas, minimum prices, import limitations) and substantial subsidies from Member States, producing a significant reduction in capacity, the 1992-1996 period was characterised by much more limited intervention by governments, widescale privatisations, and the maintenance of the principle of free trade. There was a further significant reduction in over-capacity, totalling about 19 million tonnes, with labour force reductions being accompanied by social measures.

Of course, the changes made in the early 1990s did not end the process of restructuring the European steel industry. In a cyclical industry like steel, downturns are inevitable. This means that the sector needs continuous restructuring for which only the private sector can be responsible. This is illustrated by the latest merger proposal between Usinor, Arbed, and Aceralia, following previous mergers to form ThyssenKrupp and Corus. These mergers will enable the resulting firms to optimise their capacity utilisation over the economic cycle.

In the last few years, we have also seen the new phenomenon of cross continental firms such as the LMN group • the world’s 4th largest steel producer in 2000 with operations in Kazakhstan and Indonesia as well as in India and Europe. Such groups not only use the latest technology in producing steel, but are also at the forefront of commercial practice • including trading steel on electronic market places.

Definition of successful restructuring

In the light of this experience, we might therefore define a successful restructuring as one that puts an industry in a position to resist outside pressures such as economic downturns and to undertake the ongoing changes that are required without needing ongoing intervention by the state. Such an industry will be able to adapt to the evolution of the world steel market and compete in what is, and will remain, a very challenging environment.

I believe that the European steel industry restructuring of the early 1990s meets this test and that the firms that have emerged from the process of privatisation and merger are well placed to respond to future challenges. The most recent illustration of this is the response to the South East Asian crisis. Although this caused European steel imports to increase by over 7 million tonnes between 1997 and 1998 whilst exports fell by 5½ million tonnes, the industry has withstood the shock and continued to restructure.

Of course, it is not possible to give a single recipe for a successful restructuring. Such plans need to take account of the individual circumstances of a particular region and the prevailing economic situation. But I hope my attempt to draw some lessons from past European experience might provide a good basis for an exchange of views.
Consequences of failing to restructure

Before concluding, we should perhaps also consider what happens if an industry fails to restructure successfully. The most obvious consequence, illustrated by the European experience of the Eighties, is that, as soon as the economic situation becomes difficult, the previous “plan” is found to have been insufficient and another one is required.

But, more generally, industries that do not take the necessary steps to respond to the growing challenges of globalisation and technical advances will find themselves with relatively high cost production. This may be profitable during periods of economic boom and high prices, but as soon as the downturn comes such firms will find themselves faced with lower prices, declining capacity utilisation rates and so will slide into the red.

In the modern, international steel market, industries that remain fragmented, with many small companies attempting to compete across a range of products without a strong position in any particular sector, will continue to struggle. I am not, of course, saying that small firms cannot be successful and profitable. But it is certainly easier for larger companies, with a wider geographical spread of plants, to withstand short-term difficulties in particular markets by altering the balance of their production and shipments. Firms that rely exclusively on one regional market, no matter how large, cannot be surprised if they face difficulties when that region’s economy sees a slow down in its growth rate.
4. David Fife, Sector Specialist (Steel), Industry Canada

STEEL TRADE POLICIES:
PATTERNS AND DEVELOPMENTS OF STEEL TRADE POLICIES

Exports, imports and steel trade

The dynamic growth of world steel trade in the early 1990s was not sustained in the following years. Between 1995 and 1999, internationally traded steel increased from 176 to just 183 million tonnes. In 2000, world steel trade may have reached a new record level of around 200 million tonnes and forecasts for 2001 see trade flows of around 195 million tonnes. The buoyant increase of world steel consumption, production and trade in 2000 and the OECD forecast of a further market growth of 2% in 2001 underline the recovery of the global steel market from the steel trade crisis in 1998/1999. However, despite the recent almost two-digit increase, the annual average growth of world trade over a seven-year period from 1995 to 2001 still would lie below 2%.

Graph 1. Global steel exports, 1995 to 2001

Source: OECD
In the 1990s, international trade in manufacturing goods grew more strongly than the global steel trade. The share of world steel exports in total merchandise exports – exports of agricultural products, mining products and manufactures – fell from 3.1% in 1990 to 2.7% in 1998 and a further decline to 2.5% occurred in 1999. At the same time, the proportion of world steel production traded internationally (excluding intra-EU trade) was shrinking from 26.9% in 1995 to perhaps below 25.7% in 2000.

Countries participating in the OECD Steel Committee (27 members and 6 observers) account for a significant proportion of global steel trade. At the peak level reached in 1998, these 33 countries represented 55.7% of world imports and 84% of world exports. In 1999, these same countries had increased their combined imports to 91.4 million tonnes (50.2% of the world total) and their combined exports to 142.6 million tonnes (78.4% of the world total). With Australia probably rejoining the Committee, and China hopefully deciding to participate in Committee meetings, the Committee would represent 93% of world steel production and 96% of world steel trade. (Ambassador Colliander speech.)

Table 1. Members and participants of the Steel Committee

<table>
<thead>
<tr>
<th>OECD Steel Committee</th>
<th>Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>France</td>
</tr>
<tr>
<td>Belgium</td>
<td>Germany</td>
</tr>
<tr>
<td>Brazil</td>
<td>Greece</td>
</tr>
<tr>
<td>Canada</td>
<td>Hungary</td>
</tr>
<tr>
<td>Czech Rep.</td>
<td>Ireland</td>
</tr>
<tr>
<td>Denmark</td>
<td>Italy</td>
</tr>
<tr>
<td>Finland</td>
<td>Japan</td>
</tr>
<tr>
<td>Korea</td>
<td>Luxembourg</td>
</tr>
<tr>
<td>Spain</td>
<td>Sweden</td>
</tr>
<tr>
<td>Sweden</td>
<td>Switzerland</td>
</tr>
<tr>
<td>Switzerland</td>
<td>Turkey</td>
</tr>
<tr>
<td>Turkey</td>
<td></td>
</tr>
<tr>
<td>United Kingdom</td>
<td></td>
</tr>
<tr>
<td>United States</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Observers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulgaria</td>
</tr>
<tr>
<td>India</td>
</tr>
<tr>
<td>Romania</td>
</tr>
<tr>
<td>Russia</td>
</tr>
<tr>
<td>Slovak Republic</td>
</tr>
<tr>
<td>Ukraine</td>
</tr>
</tbody>
</table>
In many of these countries, the increase in trade over the period 1995 to 1999 was accompanied by a high volatility of imports and exports. Among OECD Members and observers, lower shipments to Korea, Russia and Japan were largely offset by growing imports, particularly in the United States and the European Union. As regards exports, significant increases from the Ukraine, Korea and Japan and reduced volumes from Russia and the European Union were largely responsible for exports of OECD Members and observers increasing only 2.0 million tonnes between 1995 and 1999.

Table 2. Steel imports and exports of Steel Committee countries

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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<td>3.5</td>
<td>3.2</td>
<td>3.7</td>
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<td>1.1</td>
<td>0.9</td>
<td>0.9</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
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<td>2.2</td>
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<td>1.4</td>
<td>1.5</td>
<td>0.8</td>
<td>2.0</td>
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<tr>
<td>Japan</td>
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<td>4.8</td>
<td>4.7</td>
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<td>19.2</td>
<td>22.8</td>
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<td>26.0</td>
</tr>
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<td>3.6</td>
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<td>11.1</td>
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<td>5.8</td>
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<td>6.0</td>
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<td>0.6</td>
<td>2.6</td>
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<td>1.3</td>
<td>0.8</td>
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<td>1.5</td>
<td>1.9</td>
<td>2.2</td>
<td>3.5</td>
<td>3.6</td>
<td>4.2</td>
<td>3.2</td>
<td>3.0</td>
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<td>2.0</td>
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<td>27.0</td>
<td>26.2</td>
<td>24.3</td>
<td>22.4</td>
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<td>0.7</td>
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<td>2.9</td>
<td>2.8</td>
<td>2.9</td>
<td>2.7</td>
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<td>2.2</td>
<td>2.1</td>
<td>0.9</td>
<td>0.8</td>
<td>0.9</td>
<td>1.0</td>
<td>1.3</td>
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<tr>
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<td>5.1</td>
<td>5.3</td>
<td>3.7</td>
<td>6.3</td>
<td>6.1</td>
<td>6.9</td>
<td>6.2</td>
<td>7.3</td>
</tr>
<tr>
<td>Ukraine</td>
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<td>0.5</td>
<td>0.3</td>
<td>0.2</td>
<td>0.1</td>
<td>10.9</td>
<td>12.6</td>
<td>15.2</td>
<td>16.0</td>
<td>19.2</td>
</tr>
<tr>
<td>United States</td>
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<td>26.9</td>
<td>28.8</td>
<td>38.3</td>
<td>33.1</td>
<td>6.5</td>
<td>4.7</td>
<td>5.6</td>
<td>5.2</td>
<td>5.2</td>
</tr>
<tr>
<td>Steel Committee Countries</td>
<td>84.1</td>
<td>82.8</td>
<td>90.1</td>
<td>100.3</td>
<td>91.4</td>
<td>140.6</td>
<td>147.9</td>
<td>154.6</td>
<td>151.2</td>
<td>142.6</td>
</tr>
<tr>
<td>World</td>
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<td>185</td>
<td>180</td>
<td>182</td>
<td>177</td>
<td>173</td>
<td>185</td>
<td>179</td>
<td>182</td>
</tr>
</tbody>
</table>

Unit: million tonnes

Source: OECD Secretariat.

While the group of countries participating in the Steel Committee maintained a net steel import balance over the period 1995 to 1999, it shrunk from 56.5 to 51.2 million tonnes. Russia, Japan, Ukraine, Brazil, the European Union and Korea were, by far, the most important net exporters during this period while the United States was the only significant net importer. Hungary, Korea and Norway constituted a group of countries which switched from being a net exporter to a net importer or vice versa over this period.
Table 3. Net trade position of Steel Committee countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Net trade (exports-imports)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>9.4</td>
</tr>
<tr>
<td>Canada</td>
<td>-0.6</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>1.8</td>
</tr>
<tr>
<td>European Union (15)</td>
<td>5.9</td>
</tr>
<tr>
<td>Hungary</td>
<td>0.2</td>
</tr>
<tr>
<td>India</td>
<td>-0.9</td>
</tr>
<tr>
<td>Japan</td>
<td>15.1</td>
</tr>
<tr>
<td>Korea</td>
<td>-1.5</td>
</tr>
<tr>
<td>Mexico</td>
<td>5.4</td>
</tr>
<tr>
<td>Norway</td>
<td>-1.2</td>
</tr>
<tr>
<td>Poland</td>
<td>2.5</td>
</tr>
<tr>
<td>Romania</td>
<td>1.7</td>
</tr>
<tr>
<td>Russia</td>
<td>20.5</td>
</tr>
<tr>
<td>Slovak Republic</td>
<td>2.7</td>
</tr>
<tr>
<td>Switzerland</td>
<td>-1.3</td>
</tr>
<tr>
<td>Turkey</td>
<td>2.3</td>
</tr>
<tr>
<td>Ukraine</td>
<td>10.6</td>
</tr>
<tr>
<td>United States</td>
<td>-16.1</td>
</tr>
</tbody>
</table>

Source: OECD Secretariat.

In 1999, the United States and the European Union, together accounted for 56% of Steel Committee imports. Canada, Korea and Japan together accounted for 18.3% and the remaining countries accounted for the balance (22.7%) of Steel Committee imports.
Table 4. Imports of Steel Committee countries in 1999

<table>
<thead>
<tr>
<th>Country</th>
<th>Imports (in million tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>33.1</td>
</tr>
<tr>
<td>European Union</td>
<td>20.9</td>
</tr>
<tr>
<td>Canada</td>
<td>6.3</td>
</tr>
<tr>
<td>Korea</td>
<td>6.2</td>
</tr>
<tr>
<td>Japan</td>
<td>4.7</td>
</tr>
<tr>
<td>Turkey</td>
<td>3.7</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>2.3</td>
</tr>
<tr>
<td>India</td>
<td>2.2</td>
</tr>
<tr>
<td>Mexico</td>
<td>2.2</td>
</tr>
<tr>
<td>Poland</td>
<td>2.2</td>
</tr>
<tr>
<td>Switzerland</td>
<td>2.1</td>
</tr>
<tr>
<td>Norway</td>
<td>1.4</td>
</tr>
<tr>
<td>Russia</td>
<td>1.2</td>
</tr>
<tr>
<td>Hungary</td>
<td>1.1</td>
</tr>
<tr>
<td>Slovak Republic</td>
<td>0.7</td>
</tr>
<tr>
<td>Brazil</td>
<td>0.7</td>
</tr>
<tr>
<td>Romania</td>
<td>0.4</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>0.2</td>
</tr>
<tr>
<td>Ukraine</td>
<td>0.1</td>
</tr>
</tbody>
</table>

NB: China 13.0

That year six countries accounted for 78.9% of the Steel Committee’s exports. Japan, the European Union and Russia were the leading exporters, accounting for over 20 million tonnes each with the Ukraine, Brazil, and Korea each accounting for over 10 million tonnes.
### Table 5. Exports of Steel Committee countries in 1999

<table>
<thead>
<tr>
<th>Country</th>
<th>Export (in million tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>26.0</td>
</tr>
<tr>
<td>European Union</td>
<td>22.8</td>
</tr>
<tr>
<td>Russia</td>
<td>22.4</td>
</tr>
<tr>
<td>Ukraine</td>
<td>19.2</td>
</tr>
<tr>
<td>Korea</td>
<td>13.2</td>
</tr>
<tr>
<td>Brazil</td>
<td>10.0</td>
</tr>
<tr>
<td>Turkey</td>
<td>7.3</td>
</tr>
<tr>
<td>Mexico</td>
<td>6.0</td>
</tr>
<tr>
<td>United States</td>
<td>5.1</td>
</tr>
<tr>
<td>Canada</td>
<td>4.2</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>3.7</td>
</tr>
<tr>
<td>Poland</td>
<td>3.0</td>
</tr>
<tr>
<td>Slovak Republic</td>
<td>2.7</td>
</tr>
<tr>
<td>India</td>
<td>2.0</td>
</tr>
<tr>
<td>Romania</td>
<td>1.9</td>
</tr>
<tr>
<td>Switzerland</td>
<td>1.3</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>1.3</td>
</tr>
<tr>
<td>Hungary</td>
<td>1.1</td>
</tr>
<tr>
<td>Norway</td>
<td>0.8</td>
</tr>
<tr>
<td><strong>NB: China</strong></td>
<td><strong>4.5</strong></td>
</tr>
</tbody>
</table>

If we look at total trade, exports and imports, the largest volumes in 1999 were in the European Union followed by the United States, Japan, Russia, Korea and the Ukraine. Whereas in the United States, Japan, Russia and the Ukraine steel mainly flowed in one direction, there were significant flows of exports and imports in both the European Union and Korea.
Table 6. Total steel trade of Steel Committee countries in 1999

<table>
<thead>
<tr>
<th>Country</th>
<th>Trade (in million tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>European Union</td>
<td>43.7</td>
</tr>
<tr>
<td>United States</td>
<td>38.2</td>
</tr>
<tr>
<td>Japan</td>
<td>30.7</td>
</tr>
<tr>
<td>Russia</td>
<td>23.6</td>
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<tr>
<td>Korea</td>
<td>19.5</td>
</tr>
<tr>
<td>Ukraine</td>
<td>19.3</td>
</tr>
<tr>
<td>Turkey</td>
<td>11.0</td>
</tr>
<tr>
<td>Brazil</td>
<td>10.7</td>
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<tr>
<td>Canada</td>
<td>10.5</td>
</tr>
<tr>
<td>Mexico</td>
<td>8.2</td>
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<tr>
<td>Czech Rep.</td>
<td>6.0</td>
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<tr>
<td>Poland</td>
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<tr>
<td>India</td>
<td>4.2</td>
</tr>
<tr>
<td>Slovak Rep.</td>
<td>3.4</td>
</tr>
<tr>
<td>Switzerland</td>
<td>3.4</td>
</tr>
<tr>
<td>Romania</td>
<td>2.3</td>
</tr>
<tr>
<td>Hungary</td>
<td>2.2</td>
</tr>
<tr>
<td>Norway</td>
<td>2.2</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>1.5</td>
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<tr>
<td>China</td>
<td>17.5</td>
</tr>
</tbody>
</table>

When looking at import penetration and export coverage levels over the period 1995 to 1999, average import penetration rates tended to be highest in the smaller steel markets (Norway, Switzerland, Slovak Republic, Hungary and Czech Republic) due to re-exporting activities and/or high levels of specialization in steel production there. However, some mid sized markets (Turkey and Canada) had import penetration levels over 40%. Large steel markets, by contrast, tended to have significantly lower import penetration levels (China, European Union and Japan) while the United States had above average import levels (27.6%) in this group of countries. Generally, Steel Committee members from Central and Eastern Europe or the former Newly Independent States (NIS) of the former USSR or in developing countries (not previously mentioned in this paragraph) also tend to have relatively low import penetration rates in their domestic markets. Export coverage is also highest for the same countries (Norway, Switzerland, Slovak Republic, Czech Republic and Hungary – for the same reasons) although major exporters (Russia and the Ukraine), also had high export coverage. The European Union and Japan tended to have relatively low export coverage, though not as low as for the United States or China which are also major steel producers and consumers. Several countries (Brazil, Canada, Korea, Mexico and Turkey) had average export coverage in a mid range from a low of 24.2% to a high of 52.8%.
Table 7. Import penetration and export coverage

<table>
<thead>
<tr>
<th></th>
<th>Average rates 1995-1999 (in %)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Import penetration</td>
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<tr>
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<tr>
<td>Japan</td>
<td>7.7</td>
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<tr>
<td>Korea</td>
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<td>Mexico</td>
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<tr>
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<tr>
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<tr>
<td>India</td>
<td>11.4</td>
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<td>Romania</td>
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<td>Russia</td>
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</tr>
</tbody>
</table>

The financial crisis that hit certain Asian countries in 1997 and the crises in Russia and Latin America in 1998, led to a marked deterioration in steel markets in many parts of the world. These events led to unprecedented shifts in traditional trade flows from 1997 to 1999 which had disruptive effects on steel markets, particularly in North and South America, and the European Union. Prices for key steel products (HR coil, CR coil and wire rod) plummeted and the employment situation deteriorated. Whereas before the crisis, Asia had absorbed steel exports from the NIS and the European Union, and North America absorbed much of the European Union’s export surplus, this scenario was no longer true. The collapse in steel demand in Asia re-directed NIS exports to North America and the European Union and it forced producers in Japan and Korea to extend extra-regional exports to sustain exports.

In 1999, steel trade flows appeared to revert to their pre-crisis regional pattern. However, in 2000, global steel trade was marked by surging exports to the United States, Canada and the European Union and stronger exports from Japan, Korea and the NIS. That year United States imports totalled 34.997 million tonnes, up 5.8% over 1999 levels. Canadian imports amounted to 8.336 million tonnes, up 33.2% and European Union imports were 23.940 million tonnes in the first ten months of 2000, up 31.1% from the same period a year earlier. In Korea, imports totalled 11.423 million tonnes, up 29.1% in 2000 while in Japan imports totalled 5.043 million tonnes, up 7.4%. In 2000, Japanese steel exports totalled 28.425
million tonnes, up 9.3% while NIS exports may reach 44.5 million tonnes, up 4.5%. Korean steel exports were 13.690 million tonnes, up 0.1%, United States exports amounted to 6.077 million tonnes, up 20.0% and exports from Canada totalled 4.607 million tonnes, up 5.1%. Exports from the European Union were 22.415 million tonnes in the first ten months of 2000, up 23.0% over the same period in 1999.

**Multilateral framework**

In the Uruguay Round of trade negotiations, progress was achieved in improving the multilateral framework for steel trade. Strengthened international disciplines in steel trade related to anti-dumping; subsidies and countervailing duty measures; safeguards and import licensing measures.

**Tariffs**

Legally bound steel tariffs, the maximum rate countries can impose on steel imports, are applied to an increasing number of steel trade items. At the same time though, those tariffs are becoming increasingly irrelevant to an analysis of the trade effects of steel tariffs. This is because the tariffs applied on a most-favoured-nation basis by countries participating in the Steel Committee exercise on steel trade and trade-related issues are much lower than their bound rates. For 20 countries (European Union (15), United States, Japan, Korea, Canada and Australia) steel tariffs applicable as of January 1, 1998 will be reduced step by step and be finally eliminated in 2004.

**Figure 1. Applied steel tariffs as from 1 January 1998**

(1) Until 31 December 2000, these duties are increased by three points  
(2) As of 1 January 1999  
(3) As of 1 April 1999  
(4) As of 1 January 2000

**Source:** OECD Secretariat.
For most countries participating in the Steel Committee, applied steel tariffs range from 0 to 10%, depending on the product. In Norway, all steel imports are duty-free. However, Turkey, Ukraine, Romania, Brazil, Poland and Mexico applied significantly higher steel tariffs to protect their domestic industries against international competition.

Many states have multilateral or bilateral trade agreements that provide duty-free or concessionary access to their domestic steel markets. In Poland, the Slovak Republic and Switzerland, almost all imports entered duty-free or at concessionary rates. In the European Union (58%), Canada (33%), the United States (25%) and Brazil (16%), the share of such imports in 1998 also played an important role.

**Safeguard measures**

In the period 1995 to 1998, safeguard measures against steel imports were applied by the European Union and the Slovak Republic. The European Union measures applied to steel imports from the Czech Republic and the Slovak Republic from 1 June 1993 to 31 December 1995 pursuant to bilateral agreements. In August 1997, the Slovak Republic introduced a safeguard measure. Due to the deteriorated trade balance, an import surcharge of 7% was applied to consumer goods, foodstuffs and some industrial products including steel. The surcharge was reduced, step by step, and finally phased out in September 1998.

The United States in 1999 and 2000 invoked safeguard actions under section 201 of the Tariff Act of 1974 dealing with imports of two products: certain steel wire rod and circular welded carbon quality line pipe. In both cases global quotas covering imports of such goods from all countries except Canada and Mexico were established lasting three years. Canada and Mexico were excluded, as per the NAFTA provision which stipulates that imports from NAFTA members may be excluded if they do not contribute importantly to the injury suffered by the domestic industry of the country taking such action.

There is the possibility of another, global safeguard action in the United States covering all steel products that could result in the application of import restrictions as well as an adjustment period. However, the United States industry appears divided on this proposal with some firms believing that it will provide the industry with the time needed for adjustment while other firms apparently believe that a safeguard action is not warranted or not preferable to anti-dumping or countervailing duty actions.

**Anti-dumping and countervailing duty measures**

According to the report, “Anti-dumping Anti-Subsidy Statistics Covering the Year 2000”, published by the European Union, in 2000 the European Union initiated seven new investigations involving iron and steel products compared to 25 in 1999 and 19 in 1998. As of 31 December 2000, the European Union had definitive anti-dumping duties in place for nine iron and steel products, definitive anti-subsidy measures in place for four such products and undertakings in place for four such products.

In 2000, Canadian authorities had four unfair trade investigations underway (corrosion resistant sheet, concrete rebar, stainless steel rebar, and hot rolled carbon steel plate), one of which was an anti-dumping case and three of which were combined anti-dumping and countervailing duty investigations. These four investigations involved a total of 23 countries (or 15 different countries if those involved in more than one investigation are eliminated from the total). As of April 2001, Canada had 12 measures in place covering steel products subject to injury findings in anti-dumping and countervailing duty investigations as well as goods subject to undertakings. These 12 measures consisted of three injury determinations involving hot rolled carbon steel plate (three separate cases), three injury determinations involving stainless steel round bar (three separate cases), one injury determination involving corrosion resistant sheet, one injury determination involving cold rolled carbon steel sheet, one injury determination involving hot rolled
carbon steel sheet, one injury determination involving concrete rebar, one undertaking involving oil and gas well casing and one injury determination involving carbon steel welded pipe.

In addition, as of April 2001, Canadian authorities had four unfair trade investigations underway. Those four consisted of two investigations begun in 2000 which have continued into 2001 (corrosion resistant sheet and concrete rebar) and two new investigations (cold rolled sheet and hot rolled carbon steel sheet). Those four investigations consisted of two anti-dumping cases and two combined anti-dumping and countervailing duty investigations. The four investigations involve a total of 36 countries (or 23 different countries if those involved in more than one investigation are eliminated from the total).

In the United States, as of 31 December 2000 there were 35 different steel products covered by anti-dumping orders which involved a total of 95 countries. It should be noted that the 95 countries consists of 24 different countries, many of these countries were involved in more than one anti-dumping order and for more than one steel product. In addition, as of the same date, there were 18 countervailing duty orders in effect which involved a total of 27 countries. Again, the 27 countries consists of 18 different countries, some of these countries were involved in more than one countervailing duty order and more than one steel product. The United States also had suspension agreements in place covering four different products from five different countries as of 31 December 2001. In 2001, United States authorities have initiated investigations as a result of petitions filed by US steel producers.

Over the period 1995 to 2000, anti-dumping and countervailing duty investigations were underway by other countries involving steel imports. Increasingly, non-traditional users of the trade remedy provisions of the WTO are resorting to these measures. In fact, this outcome was predictable since in the Uruguay Round countries were asked to bind their tariff rates. Consequently, countries which may, in the past, have dealt with an influx of unfairly traded steel products by sharply raising their import tariffs no longer have this option available to them. Instead, they must resort to the use of “WTO sanctioned” means of dealing with import surges, providing of course that such imports are causing injury to domestic production of like goods. Therefore, developing nations in Asia (such as Indonesia, Thailand, India, and Philippines) as elsewhere (Egypt and Venezuela) have initiated trade remedy cases. In addition, non WTO member states such as China, Russia, and Chinese Taipei have initiated unfair trade investigations against injurious imports or are considering quotas or other arrangements to limit imports of certain steel products into their domestic markets in response to complaints filed by domestic producers. At the same time other steel producers are pressing their governments for action in dealing with rising imports and low prices in their domestic markets, including Iran, Bulgaria, and Pakistan.

This brief summary of recent trade remedy action by various countries, all dealing with the issue of steel imports, clearly indicates that this is a real problem. What’s more, the large number of countries taking action and their wide geographic dispersion should dispel the view, commonly held in some quarters, that this problem – to the extent that it exists – is one restricted to a few countries or a few products. Clearly this is not the case! What’s more, if one were to offer up a prediction of what the future holds for international steel trade, it seems likely that such actions will become more frequent and not less frequent unless something is done to alter the present course of events.

**Subsidies**

Countries participating in the Steel Committee exercise “Steel Trade and Trade-Related Issues for the period 1995 to 1998” reported 48 subsidy programmes which provided government financial assistance to steel companies. Such programmes were offered at the national and state or local level. Of the 48 programmes and measures reported, 16 could be considered as government interventions which exclusively support the steel sector or single steel companies. Fourteen of the programmes were initiated
in the context of national restructuring plans for the steel industry in various countries. Typically, such programmes linked the granting of support to the total or partial closure of plants. What’s more, a considerable portion of public assistance was devoted to payments to workers who were made redundant in the restructuring process.

Most of the measures reported qualify as programmes that were also accessible to other manufacturing industries. In 18 instances, the primary policy objective of the programmes was regional policy. Eight programmes served environmental purposes and five were R&D programmes.

Non-tariff trade measures

Import/export surveillance systems reported by Steel Committee participants was the most frequently reported type of non-tariff trade measures in international steel trade. Canada, the Czech Republic, member states of the European Union, Romania, the Slovak Republic, and Turkey all reported using such measures. The US industry has been pressing its government to adopt a system modeled after that used in Canada.

For at least part of the period 1995 to 1999, quantitative restrictions were applied to steel imports by various states. The European Commission applied such restrictions autonomously on steel imports from Kazakhstan and, in bilateral agreements, on steel imports from Russia and the Ukraine. Hungary applied quotas on steel imports from the NIS and Korea and Turkey have a tariff quota system in place which provides concessionary tariffs on certain steel products up to a limited volume. In 1999, the United States negotiated a bilateral agreement with Russia to provide limited access to the US market for specific volumes of steel, by product category. This arrangement grew out of several trade actions initiated by US industry which were suspended.

Preferential treatment clauses have been established in public procurement codes of the Czech Republic, Russia and the United States. For the latter, this applies at both the federal and state level. Such clauses either exclude foreign suppliers or provide a bonus of up to 25% for domestic suppliers in the United States or up to 10% in the Czech Republic.

Three countries, Canada, the Czech Republic and Turkey, reported on technical standards or certificates and marking requirements for steel products, which were equally binding for imports. These countries reported that these standards do not create trade obstacles.

Other actions taken by governments

Among the other actions taken by the US Administration or the Congress that have aroused interest on the part of countries exporting steel (or other products) are:

1. “The Continued Dumping and Subsidy Offset Act of 2000”, commonly called the Byrd Amendment which was part of the Agricultural, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2001 signed into law by President Clinton on 28 October 2000. This amendment provides that domestic producers who support petitions for anti-dumping and/or countervailing duty investigations may be eligible to participate in the distribution of duties collected as a result of the imposition of anti-dumping or countervailing duty orders. Several countries have suggested that the Byrd amendment is inconsistent with the WTO but have not formally launched an appeal. Canada believes, and has informed the Administration, that the provision does not apply to goods from Canada (or Mexico) because both countries are specifically not identified in the provision as required under NAFTA. Therefore, if applied to goods from Canada (or Mexico), the provision would be inconsistent with NAFTA. However, if it becomes clear that imports from Canada are
included, then dispute settlement under NAFTA will be initiated. Action under the WTO may also be considered.

2. The Steel Revitalization Act of 2001 (HR808) was introduced into the US House of Representatives in February 2001. The proposed bill would limit imports of finished steel products for five years so that, during any month, the import share of domestic consumption of each product group could not exceed the average monthly import share of domestic consumption of that product during the period July 1994 to June 1997. The bill would authorize USD500 million in grants for the consolidation of steel companies if certain workforce and capacity thresholds are met. The bill would also establish steel import notification and monitoring system, modify the steel loan guarantee programme by increasing funding for the programme and increasing the government’s guarantee to 95%, and create a 1.5% excise tax on all steel sold in the United States to fund steelworker retiree health care benefits. So far the bill has not gone anywhere in Congress and it unclear if it ever will.

The Canadian government has met with its industry a couple of times since the fall of 2000. The issue of rising import volumes and unfair trade were discussed. In addition, the government has promised to work with the industry in attempting to pursue a multilateral solution to the structural problems facing the steel industry globally. To that end, Canada has submitted a statement about the current steel industry situation to the Steel Committee and has forwarded it via Canadian embassies to over 60 governments around the world. Its objective is to determine if there is a consensus among steel producers and governments to work together in an attempt to find a solution to the underlying structural problems that are affecting the global steel industry, problems that all too often manifest themselves in unfair trade disputes.

It is Canada’s view that the use of trade remedy measures, as have been detailed above, can only offer a short term response and that the underlying problems facing the global steel industry can not be addressed solely through the application of such measures. That is why Canada supports the pursuit of a multilateral initiative to develop solutions to current steel trade problems. We believe that such an initiative could address the underlying causes of current trade friction.

Other governments may have different trade policy initiatives that they are pursuing which they may wish to comment on. My comments have been restricted to information at my disposal at the time I prepared these remarks from sources such as the Steel Committee of the OECD, United States, European Union or Canadian government sources, as well as the WTO, all accessible via the Internet, and from public sources (typically print media).

**Information sources consulted for this presentation:**

1. Steel Committee of the OECD
   
   b) Quantitative Features of the International Steel Trade
   d) Continuous Information System


   a) Listing of products subject to dumping or countervailing duties or subject to an undertaking (SIMA Monthly Index) located at http://www.ccra-adrc.gc.ca/customs/business/sima/monthly-e.html
   b) Listing of documentation for Current Investigations and Recently concluded investigation (Statements of Reasons), located at http://www.ccra-adrc.gc.ca/customs/business/sima/sor-list-e.html

5. World Trade Organization (WTO), Trade Topics, located at http://www.wto.org/english/tratop_e/tratop_e.htm

6.
5. Takao Suzuki, Managing Director, The Japan Iron and Steel Federation

OUTLINE OF COUNTERMEASURES BY THE JAPANESE STEEL INDUSTRY TO ENVIRONMENTAL ISSUES

1. CHANGES IN CRUDE STEEL PRODUCTION IN JAPAN

a. Crude steel production in Japan hit a peak at 120 million tons in fiscal 1973 and has been around 100 million tons since then. It will remain at the present level in the foreseeable future.

b. World crude steel production has been around 700 million tons over the years. In 2000, it rose to 846.18 million tons, exceeding the 800-million-ton mark. Production in Japan represented 12.6% of the world's total.

Changes in Crude Steel Production in Japan

Source: Ministry of Economy, Trade and industry (METI).
2. CHARACTERISTICS OF ENERGY CONSUMPTION BY THE JAPANESE STEEL INDUSTRY

a. The steel industry accounts for 11.1% of Japan’s total final energy consumption.

b. At present, 81% of the total energy used by the steel industry is coal-based. The bulk of the coal-based energy is used to reduce iron ore by the integrated steelmaking process (involving the blast furnace and the basic-oxygen furnace). As a reducing agent, coal cannot be substituted for by any other raw material.

(Note) In this report, the energy consumption amount includes coal used as a reducing agent.

c. About 90% of all energy consumed by integrated steelworks is coal-based. Effective use is made of all blast-furnace, basic-oxygen-furnace and coke-oven gases – by-product gases generated by the reducing-reaction and other processes – as fuels for electric power generation, etc.

d. At electric arc furnace operators, electric power is the main energy source and represents about 70% of total energy consumption.
e. Since the first oil crisis, the steel industry has been cutting oil consumption through energy saving, thus contributing to the implementation of Japan’s long-standing energy policy to promote the shift away from dependence on oil.

**Final Energy Consumption in Japan and Share of the Steel Industry (FY1998)**

- Energy Source: Coal 46.3%
- Other Sources: 53.7%
- Industry sector (including Steel Industry) 11.1%

**Energy-Source Composition in the Steel Industry (FY1999)**

- Oil 7.7%
- Electric power 11.3%
- Coal 81.0%

Source: Compiled by JISF from "Oil Consumption Statistics," METI.

**Changes in Energy-Source Composition in the Steel Industry**

Source: Prepared by The Japan Iron and Steel Federation (JISF) based on the "Consumption Trend Survey of Oils, etc." and other materials.

Source: Compiled by JISF from "Oil Consumption Statistics," METI.
3. ENERGY-SAVING MEASURES TAKEN BY THE JAPANESE STEEL INDUSTRY

(1) Trend of energy-saving measures in the steel industry

a. Since the first oil crisis, the steel industry has been actively and continuously implementing energy-saving measures, such as improvement of operations, elimination and concatenation of production processes and recovery of waste energy. As a result, the industry achieved energy savings of about 20% from fiscal 1973 to the present.

b. As a consequence of the accumulated results of such energy-saving efforts, there is very little room left for further energy saving. Nevertheless, the steel industry intends to carry out further energy saving by taking such steps as wider adoption of waste heat recovery equipment and replacement of old facilities with those with higher energy efficiency.

Trends of Energy Consumption and Real Specific Energy Consumption Index

<table>
<thead>
<tr>
<th>Year</th>
<th>FY 1973</th>
<th>75</th>
<th>80</th>
<th>85</th>
<th>90</th>
<th>95</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy consumption (10 thousands of kJ heavy oil equiv.)</td>
<td>9000</td>
<td>8000</td>
<td>7000</td>
<td>6000</td>
<td>5000</td>
<td>4000</td>
</tr>
<tr>
<td>Energy consumption index</td>
<td>100</td>
<td>98</td>
<td>89</td>
<td>80</td>
<td>80</td>
<td>79</td>
</tr>
</tbody>
</table>

Source: JISF.
Note: The energy consumption index of each year was adjusted according to fiscal 1973 production conditions.
(2) Trend of energy-saving measures taken by the Japanese steel industry

<table>
<thead>
<tr>
<th>Period</th>
<th>Energy-saving measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st oil crisis</td>
<td>1973&lt;1st period&gt;</td>
</tr>
<tr>
<td>2nd oil crisis</td>
<td>1979&lt;2nd period&gt;</td>
</tr>
<tr>
<td>3rd period</td>
<td>1986&lt;3rd period&gt;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Energy saving mainly by operational improvement and small-scale waste heat recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel saving at reheating furnace for rolling mill</td>
</tr>
<tr>
<td>BF top gas recovery</td>
</tr>
<tr>
<td>Increased BOF top-pressure recovery</td>
</tr>
<tr>
<td>Blast stove waste heat recovery</td>
</tr>
</tbody>
</table>

| Intensified energy-saving operation                                               |
| VVVF                                                                               |
| Improved sintering                                                                  |

<table>
<thead>
<tr>
<th>Energy-saving measures of Electric Arc Furnace</th>
</tr>
</thead>
<tbody>
<tr>
<td>Productivity improvement by large-scale equipment</td>
</tr>
<tr>
<td>Appearance of largest furnace (200t) in Japan</td>
</tr>
<tr>
<td>UHP operation</td>
</tr>
<tr>
<td>Water-cooled furnace wall and cover</td>
</tr>
</tbody>
</table>

| 1st-phase energy saving in EAF                                                    |
| Oxygen enriched operation                                                          |
| Scrap pre-heating (SPH)                                                            |

| Resource and energy saving by CC                                                   |
| Wide application of CC                                                              |
| Introduction of LF to carbon-steel EAF operation                                    |

| 2nd-phase energy saving in EAF                                                    |
| Advancement of DC fumace (shaft fumace, etc.)                                      |

<table>
<thead>
<tr>
<th>Energy-saving measures of Electric Arc Furnace</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy saving in processes</td>
</tr>
<tr>
<td>Large-scale waste-energy recovery</td>
</tr>
<tr>
<td>Process elimination</td>
</tr>
<tr>
<td>Process concatenation</td>
</tr>
<tr>
<td>Innovation in energy supply-demand structure</td>
</tr>
</tbody>
</table>

| Improvement of productivity and yield                                             |
| Continuous caster (CC)                                                             |
| Continuous annealing line (CAL)                                                    |

| Improvement of energy conversion                                                  |
| Oil-less BF operation                                                              |
| High-efficiency power generation                                                   |
| Centralized energy management                                                      |
| High-efficiency oxygen production                                                  |

| Utilization of economical non-coking coal                                          |
| Increased pulverized coal injection into BF                                       |
| Coal humidifiers                                                                    |

| FY73 | FY74 | FY75 | FY76 | FY77 | FY78 | FY79 | FY80 | FY81 | FY82 | FY83 | FY84 | FY85 | FY86 | FY87 | FY88 | FY89 | FY90 | FY91 | FY92 | FY93 | FY94 | FY95 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
|      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
(3) Capital investment for energy-saving by the Japanese steel industry

a. The cumulative total of capital investment for energy-saving by the Japanese steel industry since the second oil crisis exceeds ¥2 trillion.

b. Such investment from 1990 through 2000 exceeded ¥1 trillion. This represented about 14% of total capital investment by the industry.

c. Energy-saving investment by the Japanese steel industry up to the present has been made for measures that have a high cost-performance ratio. Consequently, most of the energy-saving measures that have yet to be taken have an inferior cost-performance ratio.

Trend of Energy-Saving Investment by the Steel Industry

Source: METI.
4. THE STEEL INDUSTRY’S VOLUNTARY ACTION PROGRAMME

Measures to prevent global warming being taken by the steel industry under its voluntary action programme can be broadly classified into the following four categories:


b. Efficient use of energy through co-operation with regional communities.

c. Contribution to energy-saving in society through steel products and by-products.

d. Contribution to energy-saving through international technological co-operation

(1) Numerical target for reduction of energy consumption

The steel industry’s energy-saving target is a 10% reduction in energy consumption by 2010 compared with the 1990 level.

The industry is going to take additional energy-saving action. On condition that a waste collection system is completed, the industry intends to cut energy consumption by 1.5% from the 1990 level through effective use of waste plastics in blast furnaces, etc.

**Numerical Target for Energy Reduction by the Steel Industry**

![Graph showing energy reduction targets]

The total energy-saving target is 5.72 million kiloliters crude oil equivalent. This is 1.6% of fiscal 1990’s total energy consumption in Japan and 3.1% of energy consumption by all industries in the same year.
Numerical Target for Energy Reduction by the Steel Industry

Source: The consumption figures of 1990 and 1995 were prepared by the JISF based on the "Consumption Trend Survey of Oils, etc." and other materials.
(2) Basic concepts behind the voluntary action programme

The coming energy-saving efforts by the steel industry will be made through accelerated adoption of energy-saving measures for which technological development has been basically completed – recovery of waste energy and use of enhanced-efficiency production equipment – and increased use of next-generation iron and steelmaking technologies.

Energy-saving measures taken so far have been based on an economic rationale. The current voluntary action programme includes energy-saving measures with a low cost-performance ratio. To attain the target, it is important to carry them out systematically while considering such factors as the timing of equipment replacement.

Energy Saving in Production Processes — Numerical Target for 1995-2010

![Energy Saving Diagram]

Accelerated introduction of next-generation iron- and steelmaking technologies

The next-generation iron- and steelmaking technologies that the steel industry is endeavouring to develop by 2010 still have a host of problems to be overcome, but the industry will do its utmost to put them into practical use ahead of schedule, if possible.

In order to effectively use the increasing volumes of steel scrap in the future, the steel industry will promote even more effective use of scrap compared to present levels while heeding the supply-demand balance.
Direct Iron Ore Smelting Reduction Process

<table>
<thead>
<tr>
<th>Outline</th>
<th>Target in voluntary action program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology to produce molten iron by using fine or lump coal and iron ore directly without going through conventional coking and sintering processes</td>
<td>5% of total pig iron production by 2010</td>
</tr>
</tbody>
</table>

New-Type Ironmaking Furnace:
DIOUS (Direct Iron Ore Smelting Reduction Process)

Compared with BF process:
1. Construction cost: —35%
2. Production cost: —19%
3. Energy consumption: —3-4%
4. CO₂ emissions: —3.5%
5. Coal consumption: 730-750 kg/t

Next-Generation Coke Oven

<table>
<thead>
<tr>
<th>Outline</th>
<th>Target in voluntary action program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology to carbonize coal at relatively low temperatures by heating it quickly before charging into the coke oven</td>
<td>To introduce 20% of process requirements by 2010</td>
</tr>
</tbody>
</table>

SCOPE21 Cokemaking Process

As the productivity of the SCOPE21 process is three times that of the conventional process, the plants could be one-third the size of the conventional model and still assure the same production volume. This would contribute to reducing the construction cost.
(3) Additional energy-saving efforts (the present status of waste plastics and problems for the future)

a. As already noted, the steel industry intends to cut energy consumption by another 1.5% between 1990 and 2010, on top of the 10% reduction it is expecting to achieve by its Voluntary Action Program, through increased use of waste plastics in blast furnaces, etc., assuming the completion of the waste collection system.

b. The steel industry utilizes the waste plastics contained in industrial waste and general waste as a material. Waste plastics are injected into blast furnaces as a substitute reducing agent for coke. In coke ovens, waste plastics are cracked into petrochemicals (tar and diesel oil), coke used as a blast furnace reducing agent, and coke oven gas. All of these are effectively used, contributing to cutting coal consumption by the steel industry.

c. With the Packaging Material Recycling Law coming into full effect in April 2000, it became possible to use waste plastics totalling 200 000 tons (consisting of container and packaging waste plastics from general waste and waste plastics from industrial waste). But only 80 000 tons of waste plastics were collected in fiscal 2000 (40 000 tons of industrial waste and 40 000 tons of general waste); this was far short of the processing capacity. The steel industry plans to increase the waste plastics processing capacity to 270 000 tons in fiscal 2001.

d. With the co-operation of local autonomies, which collect and sort waste, and the national government, which is in charge of enforcing the Packaging Material Recycling Law, the steel industry is taking measures to stabilize the quality and quantity of collected waste plastics (removing foreign matter, etc.), complete a large-area collection set-up and build a waste plastics collection and processing system.

Utilization of Waste Plastics Injected into Blast Furnaces, Etc.

Source: Compiled by JISF from the data on The Association for Plastics Treatment Promotion.
Flow of Utilization of Waste Plastics Injected into Blast Furnace

- Use of plastic products
- Plastic materials
- Chemical plant
  - Petrochemicals
  - Coke oven gas
  - Blast furnace gas

- Waste plastics
  - Preliminary treatment
  - Acceptance and storage
  - Pre-handling before injection

- Coke oven
- Coke
  - Acceptance and storage
  - Pre-handling before injection

- Blast Furnace

Utilization of waste plastics injected into blast furnaces, etc.
(4) Other measures to prevent global warming

(a) Basic concepts

a. Efforts by the steel industry to prevent global warming are not limited to the reduction of energy consumption in production processes. The industry is endeavouring to serve the areas around steel plants by supplying untapped energy, supply steel products that contribute to energy-saving by the public, and extend international co-operation by making energy-saving technologies available beyond national borders. In this way, the steel industry is striving, on several fronts, to prevent global warming.

b. The steel industry believes that such measures to prevent global warming will produce effects not inferior to those of energy-saving in production processes. The industry expects these effects to progress steadily supported by the understanding of a wide range of interests.

c. However, it is difficult to implement these measures through the isolated efforts of steelmakers alone. The desired effect will not be attained without the co-operation and understanding of such parties as the national government, local autonomies and steel users.

(b) Contributions to energy-saving in society through products

The steel industry has been not only implementing energy-saving measures in its production processes but also, by developing higher-quality steel products, it has been supplying products that contribute to energy-saving in the application stage. For example, the industry has developed high-strength steel sheets — thin yet strong steel sheets that allow production of lighter-weight automobiles and thus help automakers reduce the fuel consumption of their products; electrical steel sheets, which reduce the loss of electric power in power transformers; and boiler tubes which excel in heat transfer efficiency.

Production of these energy-saving products consumes more energy than the production of their conventional counterparts because their production requires more processes and therefore more energy, but from the viewpoint of society as a whole, they contribute to energy-saving.

By capitalizing on its product development resources, the steel industry will continue to develop and popularize products that make it possible to produce lighter motor vehicles, thinner steel sheets for cans, lighter steel products for construction and such products as elimination for production processes in steel-using industries. The steel industry will thus contribute to energy saving in society through the supply of energy-efficient products.
## Major Contributions to Energy Saving in Society by Steel Products

<table>
<thead>
<tr>
<th>Properties of steel products</th>
<th>Steel products</th>
<th>Contribution to energy saving</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduction of weight</td>
<td>High-strength steel sheets, steel products</td>
<td>Improvement of fuel efficiency of motor vehicles, reduction of steel used for motor-vehicle manufacturing</td>
</tr>
<tr>
<td></td>
<td>High-strength steel plates</td>
<td>Improvement of fuel efficiency of ships, reduction of steel used for shipbuilding</td>
</tr>
<tr>
<td></td>
<td>Thin steel can material</td>
<td>Reduction of steel used for can manufacturing</td>
</tr>
<tr>
<td>Elongation of useful life</td>
<td>Coated steel sheet</td>
<td>Reduction of steel use</td>
</tr>
<tr>
<td>Improvement of high temperature strength</td>
<td>Steel tube for high-temperature boiler</td>
<td>Improvement of power generation efficiency</td>
</tr>
<tr>
<td>Improvement of heat resistance</td>
<td>Fire-resistant steel</td>
<td>Elimination of fire-resistant coating</td>
</tr>
<tr>
<td>Improvement of electro-magnetic property</td>
<td>Highly-oriented magnetic steel sheet</td>
<td>Reduction of power loss</td>
</tr>
</tbody>
</table>
Cars built of high-strength steel

Lighter cars built of high-strength steel consume less gasoline. Thanks to the use of high-strength steel, today’s cars are about 5% lighter than their counterparts of 20 years ago, and so they are more fuel-efficient. By raising the proportion of high-strength steel used, their weight can be reduced by almost 10%.

<table>
<thead>
<tr>
<th>Energy saved</th>
<th>Weight</th>
<th>Kilometer per unit of fuel consumed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970s</td>
<td>(Reference level)</td>
<td>100</td>
</tr>
<tr>
<td>Today</td>
<td>2.76 million kl/year</td>
<td>95.5</td>
</tr>
<tr>
<td>Tomorrow</td>
<td>5.88 million kl/year</td>
<td>91.0</td>
</tr>
</tbody>
</table>
(c) **Contribution to global energy-saving through international technological co-operation**

<table>
<thead>
<tr>
<th>Year</th>
<th>Energy Saving</th>
<th>Environment Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>1971</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>1972</td>
<td>6</td>
<td>8</td>
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<tr>
<td>1973</td>
<td>7</td>
<td>9</td>
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<tr>
<td>1974</td>
<td>8</td>
<td>10</td>
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<tr>
<td>1975</td>
<td>9</td>
<td>11</td>
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<tr>
<td>1976</td>
<td>10</td>
<td>12</td>
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<tr>
<td>1977</td>
<td>11</td>
<td>13</td>
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<td>1978</td>
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<td>1980</td>
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<td>16</td>
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<td>1981</td>
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<td>20</td>
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<td>1985</td>
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<td>1986</td>
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<td>1987</td>
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<td>1989</td>
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<td>25</td>
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<tr>
<td>1990</td>
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<td>1991</td>
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<tr>
<td>1992</td>
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<td>28</td>
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<td>1997</td>
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<td>1999</td>
<td>33</td>
<td>35</td>
</tr>
<tr>
<td>2000</td>
<td>34</td>
<td>36</td>
</tr>
</tbody>
</table>

- **a.** Based on its wealth of technology and experience in energy-saving and environmental protection, the steel industry has been extending technological co-operation to many countries throughout the world. (From 1970 through 1999, the industry was involved in 518 instances of co-operation in energy-saving and 332 instances in environmental protection.) In particular, the industry has actively co-operated in projects undertaken by the national government, such as the Green Aid Plan (GAP), and in Activities Implemented Jointly (AIJ).

- **b.** Since 1995, seven projects undertaken in China and Thailand as model projects under GAP were completed. The industry is now carrying out four projects in those countries. Of these model projects, two each in China and Thailand have been approved by those countries as AIJ, so they are officially recognised international projects.

- **c.** Regarding the joint research projects of the Japanese government undertaken by the New Energy Industrial Technology Development Organisation (NEDO) since fiscal 1998, the steel industry was commissioned to carry out seven feasibility studies in fiscal 1998, 14 in fiscal 1999 and four in fiscal 2000, to explore the possibility of taking part in joint execution of such projects as the Clean Development Mechanism (CDM).
### Energy-Saving Model Projects Already Implemented

<table>
<thead>
<tr>
<th>Name of model project</th>
<th>Host country</th>
<th>Commissioned company</th>
<th>Year of completion</th>
<th>Energy-saving effect (kl of crude oil/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blast Furnace Hot Stove Waste Heat Recovery</td>
<td>China</td>
<td>Nippon Steel Corp.</td>
<td>1995</td>
<td>6 300</td>
</tr>
<tr>
<td>Coal Moisture Control</td>
<td>China</td>
<td>Nippon Steel Corp.</td>
<td>1996</td>
<td>6 020</td>
</tr>
<tr>
<td>Sinter Cooler Waste Heat Recovery</td>
<td>China</td>
<td>Sumitomo Metal Industries</td>
<td>1997</td>
<td>5 390</td>
</tr>
<tr>
<td>Blast Furnace Top Pressure Recovery Power Generation</td>
<td>China</td>
<td>Kawasaki Steel Corp.</td>
<td>1998</td>
<td>8 105</td>
</tr>
<tr>
<td>Effective Utilisation of Energy in Re-heating Furnace in Steel Industry (AIJ)</td>
<td>Thailand</td>
<td>Kobe Steel</td>
<td>1999</td>
<td>2 000</td>
</tr>
<tr>
<td>Coke Dry Quenching (AIJ)</td>
<td>China</td>
<td>Nippon Steel Corp.</td>
<td>2000</td>
<td>35 000</td>
</tr>
<tr>
<td>Energy Conservation in Electric Arc Furnace Used for Ferro-Alloy Refining (AIJ)</td>
<td>China</td>
<td>NKK</td>
<td>2000</td>
<td>6 810</td>
</tr>
<tr>
<td><strong>Total energy saved</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>69 625</strong></td>
</tr>
</tbody>
</table>

### Energy-Saving Model Projects Now Under Way

<table>
<thead>
<tr>
<th>Name of model project</th>
<th>Host country</th>
<th>Commissioned company</th>
<th>Term of project implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Efficiency Combustion Control System in Re-heating Furnace for Iron and Steel</td>
<td>China</td>
<td>Sumitomo Metal Industries</td>
<td>1999-2001</td>
</tr>
<tr>
<td>Utilisation of Waste Heat from Incineration of Industrial Waste at Industrial Estate (AIJ)</td>
<td>Thailand</td>
<td>NKK</td>
<td>1999-2001</td>
</tr>
</tbody>
</table>
### The Number and Content for Feasibility Studies (FS) on Activities Implemented Jointly (AIJ) Projects of Japanese Steel Industry

<table>
<thead>
<tr>
<th>Fiscal year</th>
<th>1998</th>
<th>1999</th>
<th>2000</th>
<th>Substance of research</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>China</strong></td>
<td>1</td>
<td>5</td>
<td>1</td>
<td>TRTs, facility to recover waste heat from sintering machines, coal humidifiers, lime kilns, reheating furnaces, energy-saving research</td>
</tr>
<tr>
<td><strong>Russia</strong></td>
<td>4</td>
<td>2</td>
<td></td>
<td>Waste heat recovery, gas recovery</td>
</tr>
<tr>
<td><strong>Ukraine</strong></td>
<td>1</td>
<td>2</td>
<td></td>
<td>Rehabilitation of gas pipeline, Waste heat recovery from hot blast stoves, BOF gas recovery</td>
</tr>
<tr>
<td><strong>Kazakhstan</strong></td>
<td>1</td>
<td></td>
<td></td>
<td>Basic research for energy saving</td>
</tr>
<tr>
<td><strong>Poland</strong></td>
<td>1</td>
<td>1</td>
<td></td>
<td>Waste heat recovery, gas recovery</td>
</tr>
<tr>
<td><strong>Romania</strong></td>
<td>1</td>
<td></td>
<td></td>
<td>Improvement of reheating furnace efficiency</td>
</tr>
<tr>
<td><strong>Slovakia</strong></td>
<td>1</td>
<td></td>
<td></td>
<td>Coal humidifier, facility to recover sintering waste heat, TRTs</td>
</tr>
<tr>
<td><strong>Bulgaria</strong></td>
<td>1</td>
<td></td>
<td></td>
<td>Energy-saving technology</td>
</tr>
<tr>
<td><strong>Malaysia</strong></td>
<td>1</td>
<td></td>
<td></td>
<td>EAF scrap preheating equipment, hot billet charging, improvement of reheating furnace efficiency</td>
</tr>
<tr>
<td><strong>Pakistan</strong></td>
<td>1</td>
<td></td>
<td></td>
<td>Energy-saving technology</td>
</tr>
<tr>
<td><strong>Vietnam</strong></td>
<td>1</td>
<td></td>
<td></td>
<td>Energy-saving technology</td>
</tr>
<tr>
<td><strong>Bangladesh</strong></td>
<td>1</td>
<td></td>
<td></td>
<td>Rehabilitation of gas pipeline</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>7</td>
<td>15</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>
5. HOW THE STEEL INDUSTRY IS TAKING VOLUNTARY ACTION PROGRAMME

The Japanese steel industry so far has conducted follow-up research on voluntary action programmes three times, and has compiled a report on the results of efforts to prevent global warming.

The research was conducted with the cooperation of all 65 member companies (with 127 steelworks) of The Japan Iron and Steel Federation and the Non-Integrated Steel Producers Association. The research covered 97% of the nation's total crude steel production and 98% of energy consumption by the steel industry.

(1) Crude steel production

Crude steel production in Japan totalled 98 million tons in fiscal 1999, up 7.7% over the preceding year. The increase was led by strong exports, particularly to Asian countries. However, compared with fiscal 1995, the base year for the steel industry's energy-reduction target, production dropped 2.0%.

Japanese Crude Steel Production
(2) Energy consumption by the steel industry

Energy consumption by the steel industry is on a downward trend as a result of, among other things, the progress of energy-saving efforts.

Due to the recovery of production, energy consumption by the industry in fiscal 1999 increased 3.9% over the preceding year, to 53.73 million kiloliters crude oil equivalent. But compared with 57.22 million kiloliters in fiscal 1990, the base year for energy-saving efforts, energy consumption in fiscal 1999 was down 6.1%.

Energy Consumption: Current Levels and Future Prospects

Note: Figures in parentheses are cumulative totals of reductions achieved by energy-saving measures since fiscal 1995.
(For reference)

Trend of CO₂ emissions discharged by the steel industry and their reduction

The JISF estimates CO₂ emissions discharged by the Japanese steel industry in fiscal 1999 at 45.7 million tons carbon equivalent. This was 3.8% less than the 47.5 million tons recorded in fiscal 1990.

CO₂ emissions are expected to total 43.2 million tons in 2010, the target year for the voluntary action programme. This will be a decrease of 4.3 million tons, or 9.0%, from the fiscal 1990 level.

The additional reduction in CO₂ emissions resulting from the injection of waste plastics into blast furnaces, etc. is calculated at 700,000 tons.

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**CO₂ Emissions**

<table>
<thead>
<tr>
<th>Year</th>
<th>CO₂ Emissions (Millions of tons carbon equiv.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>47.5</td>
</tr>
<tr>
<td>1995</td>
<td>45.0</td>
</tr>
<tr>
<td>1996</td>
<td>46.2</td>
</tr>
<tr>
<td>1997</td>
<td>47.0</td>
</tr>
<tr>
<td>1998</td>
<td>45.7</td>
</tr>
<tr>
<td>1999</td>
<td>43.3</td>
</tr>
<tr>
<td>2010</td>
<td>43.2</td>
</tr>
</tbody>
</table>

CO₂ reduction through additional measures: 1.5%
6. Madame Xie Qi Huan, Vice-Chairman of CISA, CEO of Baosteel

STAY CALM WITH CHINA’S ACCESSION INTO WTO – MOVE FORWARD TO CHALLENGES

Ladies and Gentlemen,

In the warmth of spring, I am very pleased to discuss with you the growth of the steel sector after China’s accession to the WTO.

With the largest output of steel in the world, China’s entry into the WTO will bring about a significant influence on the world steel industry. Under the circumstance of a glut of supply and deflation worldwide, China’s access into the WTO indicates undoubtedly the enlarged space and increased opportunities for the trade of steel as well as more intense competition for the steel market.

China’s entry into WTO will help facilitate the liberalisation of markets for trade and investment and will help eliminate the barriers for bringing international technical capital to the Chinese market, creating substantial business opportunities. By then, Chinese enterprises will be more accessible to international collaboration, be more directed to learn and introduce international state-of-the-art technology, management concepts and methods, and be able to keep up with the advances of international companies through technical upgrading and management innovation, thus resulting in the all-round improvement of management and stepping on the way of ‘win-win’ and ‘all-win’. However, we have recognised clearly that the existing system of the world economy has been far from true and fair and that the transnational tie of economies appears so powerful, profound and complicated. As for many enterprises in China, a developing country, to be in line with and to catch up with international practices will be a great challenge.

As a traditional business, the steel industry has shown its maturity in the aspects of long-term surpassing offer, co-existence of short and long processes, wide application of automation and information. Up-roar in cross-border international trade and investment in production facilities. But the development of the world steel industry is unbalanced. Compared with a developed economy, a developing country is still lagging behind in technical innovation, process equipment and enterprise size. In the face of the forthcoming WTO entry, the Chinese steel industry, which is now in the transition of restructuring, will be in a position of disadvantage for competition due to very limited time and space for adjustment. The disadvantages will be embodied in four aspects:

Firstly, the relative independent pricing system in the domestic market for steel products will not exist anymore. The price of common steel products will be more in line with that of the international market. After entry into the WTO the domestic steel market will gear into the international market in all aspects, and the pricing system especially will create more pressure for steelmakers of common products.

Secondly, the production of high value-added products which has not been developed in China or whose costs are high will be facing a substantial challenge. Over the past ten years, the competition of high-tech
and high value-added products in the global market has been intense. After acceptance into the WTO, non-tariff measures will recede from the current field with protective policy, a tough test for the enterprises producing high-tech and high value-added products.

Thirdly, with no large-scale economy, the Chinese steel industry, whose concentration is low, has been incomparable with those adopting merger and acquisition on a large scale.

Fourthly, the inflexible operation mechanism of steel companies makes it very hard to retain talents.

The continuity of those unfavourable factors in the Chinese steel industry will lead to the patterns of low-end product mix and brink-orientation of industry structure.

After China’s entry into the WTO, the steel industry will be required to change in accordance with the shift of downstream industry. Generally speaking, the most direct challenge for steel enterprises or enterprises of any other industries will come from strong multinational companies.

The dominance in the world economy order is the multinational company, whose core edge lies in the advanced technology with sustained innovation. The way multinational companies take hold of their international competitiveness is to retain talents and to control resources and especially technology R&D. The global oversupply of steel has facilitated the integration of the world market. As a result, the focus of competition in steel companies has shifted from the level of variety, quality and price to that of complex competitiveness in a global market. The consolidation and strategic alliances among major steel companies have gradually led to market structure. In addition to the export of products and technologies, multinational companies have been seeking long-term strategic market presence in China through capital investment.

The production of high-end products and development of technology in the Chinese steel industry will be orbited into the global job division system of multinational company by its large amount of investment instead of the original free trade job division system. The Chinese steel industry could possibly be excluded from the core technology of manufacture and design. In other words, the ongoing tendencies of trade and investment integration, facilitation of technology advancement, and influence on the law and policy environment by investment from abroad are likely to be strengthened after access to the WTO.

In the face of the progressive competition pressure and internal structural conflicts, the Chinese government and enterprises have taken active measures in macro and micro senses respectively. In macro terms, the government has launched two programmes for the fostering of economic growth, promoted strategic adjustment for the pattern of national economy and the optimisation of assets structure. With the gradual improvement of the market-oriented economic system and the integration of markets both at home and abroad, the state has channelled many industries including steel industry into the status of perfect market competition through adjustment of industry policy. In the 90s, China has reduced tariffs successively four times. Up to now, domestic steel companies have almost eliminated the pressure generated by the reduction of tariffs. In micro terms the control of cost, decrease of consumption, improvement of efficiency and environmental protection were addressed in a long-term strategy. In the last two years, the state has compulsively carried out the policy of ‘control total output, adjust structure’ to correct the competition order of steel enterprises effectively. The above-mentioned measures have reflected the active attitude of Chinese government and enterprise for the forthcoming access to the WTO.

Certainly, different steel companies will have different countermeasures for the problems due to their own circumstances. Shanghai Baosteel Group Corporation also has its own situation and thoughts.
As the largest and the most modern steel conglomerate in China, Baosteel has been attaching great importance to international competition and collaboration. In the intense global competition, Baosteel has realised preliminarily market-oriented operation and transmitted gradually into a globalised environment with strong competitiveness. In the very beginning the company introduced the policy of ‘introduce, digest, track and innovation’ as the guide for technology advancement and put forward the strategic objective of ‘striving for the world first class with high quality, high efficiency and high profit’, it established the management strategy of market-centered operation, customer-oriented marketing, financial-centered management and capital-centered finance. The target of ‘to be leading domestically, to be first class internationally’ has almost been achieved.

The major products of Baosteel are plates, sheets and tubes which have a leading position on the domestic market. Now we are implementing the plan of six excellent steel products for automobiles, appliance steel, seamless tubes for petroleum and power, stainless steel, electrical steel and special steel, steel for ships, pipeline, new architectural steels. Analysing the variety of features and positions in the market after China's accession to the WTO, with the tariffs lowering and the progressive elimination of non-tariff barriers the impact on Baosteel probably will be greatest within the Chinese steel sector. From this point of view, Baosteel is dedicated to be a first level world player and will face large-scale transnational corporations as its direct competitors. All impacts of the accession to the WTO will come out during competition and co-operation with transnational corporations.

In view of this, and based upon this advantage, Baosteel has put forward strategic goals of entering Fortune 500 in the next five to ten years. Fortune 500 are outstanding representatives of transnational corporations, not only on scale, but also leading the world trends on technology, capital, mechanism, management and enterprise image. To enter Fortune 500, Baosteel will emulate technology, management and mechanism of Fortune 500, instead of only emphasising on mode and scale. With the basic principle of enhancing competition ability, driving mechanism innovation with concept change and advancing industrial structure with technology innovation, we will maximise the scale and value by integrating the production and capital operation.

Joining Fortune 500 requires a globalisation view and strategy and involves bringing itself into line with the system of global division and market arrangements. Baosteel has drawn up its complete and clear global competition strategy step by step, which is a course of initiative quality change starting from import substitution under the pressure from outside. From "high efficiency, high profit, high quality and first level enterprise" after start-up and "two kinds of resources and two markets" to "marching to Fortune 500", which is a strategic selection of Baosteel to change from willing competition to initiating competition by means of a specific business strategy, highlighting technology innovation, industry upgrading, capital operation, international marketing and strategic alliances to form its core competition ability.

From the point of view of technology, Baosteel insists that import and innovation is a high starting point for technology advancement. At present, Baosteel is speeding up technology integration and industrialisation to construct an iron and steel industry development base of new processes, technology and material, industrial automation and information technology. To strengthen production, study and research is being carried out with colleges, universities and research institutes, especially strengthening the co-operation with well-known international research centres to obtain new world technology. This forms the complete development and implementation system of Baosteel's core technology and scientific research, speeding up development of products of high demand, import, technical content and added value. Within three to five years, we will be possessing some of the world’s first level technologies; by the end of 2010, possessing our own significant patented technology and unique technology in world iron and steel industry to bring along enhancing the level of iron and steel industry of China, thus becoming the most competitive iron and steel enterprises globally.
The industry upgrading of Baosteel has two aspects: one is the implementation of an excellent product strategy. Quitting the normal product market and concentrating on developing excellent steel products which have a greater market requires strategic investment in the iron and steel industrial structure of our country and being able to contend with the top products in international competition. Currently, structure, quality and cost of Baosteel products are in the leading position in China. Even comparing with the international first level iron and steel enterprises, Baosteel still has its own competitive advantages. However, from the view of international competition tendency, the competition between contemporary enterprises is not only on cost, quality and price. "Value advantage" will surpass cost, even quality advantage. For manufacturing enterprises, competition pressure is not only from products, but also from other external factors and added value, such as sale, material flow and service, etc. It can be anticipated that the value competition in future Chinese markets will exceed the level of product competition itself. After accession to the WTO, Baosteel will face the "integral products" value competition. The competition advantages of foreign products are mostly reflected on brand, service and customer satisfaction with super value. The focus and crux of market competition will be based on comparison between good and bad marketing models. Therefore, continuing the perfecting of Baosteel’s trading system, establishing an overall marketing concept, carrying out "integral products" value competition will become the important measure for Baosteel to gain advantages over international and domestic markets in the future.

The second is the implementation of a diversification strategy. As a starting point forming Baosteel core competition ability will include major industry structure upgrading, and drive iron and steel industry technology upgrading by fostering the implementation of information technologies. Moreover, this also includes innovation and development. Combining information technology with modern management technology to enhance the comprehensive competition ability of iron and steel industry; promoting the information technology at the same time, thus forming mutual interference between product export and technology exports. Investigating a soaring path of Chinese features for enterprise is always a target Baosteel will be pursuing. In other words, the developing course of Baosteel for more than 20 years is also a course of creating world first level, structure adjusting, upgrading conventional industry, stepping to information industry and cultivating enterprise core ability.

In 2000, Baosteel founded "Baoshan Iron and Steel Co. Ltd.", and successfully issued shares of 1.877 billion and is currently planning the listing in the overseas markets. This is a significant turning point of capital operations for Baosteel. Baosteel will convert the marketing mechanism and regulate the operational behaviour by listing. We will comprehensively make use of stock equity, bond, project finance, listing in other company's name and investment funds for capital operation, and develop increment, liquidating inventory. De-regulating the main company and subsidiaries system further will result in adjusting the organisation structure and providing more space for Baosteel's international development, and enhancing the comprehensive international competition ability of Baosteel.

The international operation of Baosteel is only at the starting stage, limiting its international trade, transportation and agency business of steel and relative products. For more than ten years, Baosteel has kept steel products export rate around 15% to confirm the quality of products. However, I don't think it is enough. In future, Baosteel will actively investigate the advantages of using equipment, technology and funds etc. developing transnational technology trade, and foreign direct investment.

Strategic alliances are seen as a higher level co-operation measure to fully develop the potential of quality, defects management and capital reorganisation. Whether alliances will be concluded with competitors or with long term customers, a new approach to thinking and commercial operation will be brought along, including new structure, strategy, value conception and new prospects. On 20 March 2001, Baosteel signed strategic co-operation intention agreements with Capital Steel and Wuhan Steel, which is a significant strategic move in the new century. They will be based on the principles of mutual sharing of advantages,
mutual favour and benefits, developed co-operation in research, purchasing, transportation, investment, finance and management.

Facing the changes in the internal and external operation environment, caused by factors such as the accession to the WTO, Baosteel has to make strategic adjustments. As OECD proposed, co-operation will still be one of the important items of Baosteel’s development strategy. Therefore, we sincerely hope to establish mutual trust, mutual beneficial communication and a good relationship with members of the OECD, related associations of iron and steel, foreign and domestic iron and steel peers and customers; developing hand-in-hand during co-operation; and maintain fair competition orders together. Pursuing requires confidence; surpass comes from wisdom. I believe that global iron and steel enterprises will have a brighter future by having equal and active competition and co-operation.
Effect of Entering the WTO on the Trade and Development of the Steel Industry in China

Direct Effects of Entering the WTO on Trade and Development of The Steel Industry in China

- The average tariff of steel products will be reduced from 10.5% to 8.07% in 5 years, which means an average reduction of 0.5% each year.
- Adverse regulations will be gradually eliminated in 5 years.
- The steel market will be liberalised all over.
Indirect Effects of Entering the WTO On Trade and Development of the Steel Industry in China

- The economy in China will be challenged by the international economy and the economic system reform will be speeded up. Therefore, the steel industry must reform accordingly to adjust to the change in the economic system.
- In the opening up of the steel market in China, the steel trade system and market price will change according to the international market. The steel market in China, therefore, must fit in the future changes and the industry must take an active part in the international competition.
- In order to take part in the international competition, the management system in state-owned steel company must be reformed and the management must be improved.

Analysis of the Direct Effects

- Effect of adjustment of steel tariffs
- Effect of Elimination of Adverse Appointed Regulations
- Effect of the Opening of the Steel Market
Effect of Adjustment of Steel Tariffs

- In order to meet the requirement of the WTO, the average reduction of steel tariff was 1.27% per year during 1999 to 1998, higher than the level of the WTO, which was 0.5%. The current preferential tariff on steel import is on average 8.8%, close to the 8.07% level.
- In recent years, the real average tariff of steel import is only 2-3%, far below 8.07%. As a result, the reduction of average tariff won't have too much influence.
- However, the tariff reduction of stainless steel, silicon steel strip and other high-grade steel products is relatively high, which will affect the structural adjustment of steel production.

Effect of Elimination of Adverse Regulations

- The import and export of steel will be liberalised all over, so the trade companies both at home and abroad can trade products. There will be a fast growth in the number of steel trading companies.
- The current pattern and channel of steel import and export will change accordingly, in order to meet the international trade cycle.
- Many Chinese steel companies and trading companies are not very familiar with the disciplines of the WTO, and they also lack experience in the international trade, therefore, it is hard to adapted in the short term.
Effect of the Opening of the Steel Market

- Due to the lack of a mature trade system and the trade mechanism already existing in developed counties, the steel market price will completely meet the international market price.
- Due to the lack of monitoring and warning system for import and export and the lack of directing and adjusting measures, the steel market may be shocked by over-import during a short time after entering the WTO.
- After entering the WTO, the information requirements in companies trading and producing steel products will greatly increase. However, the international information exchange and the access of the Chinese steel industry to these channels is by now far below these requirements.

Analysis of Positive Effects of Entering the WTO on the Development of the Steel Industry in China

- After entering the WTO, the steel companies will enjoy national treatment as other WTO countries, which will promote the steel export and participation in the international trade.
- After the reform of coming years, the equipment in the steel industry will improve and the competence of product will be enhanced:
  - Continuous casting ratio has reached 85%, meeting the world average level; continuous rolling ratio of bar has reached over 50%; high-speed wire rod ratio is 40%; all these newly built continuous casting mills have reached the advanced world level. Several CSP mills, hot rolling mills and cold rolling mills having been built and being built also met the world level. By further improving quality, these steel products will enjoy a strong competence in the world.
  - The companies will improve their management by listing, so the labor productivity China will contribute to a high level of cost competence.
Analysis of the Indirect Effects

- Effect on the Product Structure Change of the Steel Industry in China
- Effect on the Organisational Structure of the Steel Industry in China.
- Effect on the Steel Trade of China

Effect on the Product Structural Change of the Steel Industry in China

- China has the largest steel production and the largest potential steel market, so its entering into the WTO will greatly influence the global production system of steel.
- The structural adjustment of steel products in China will redirect from meeting domestic demand to the international division of labor and international cooperation.
- The future structural adjustment will be based on the following principles:
  - Emphasize on the development of high added value plate with great potential market increase; participate in international co-operation related to the development of certain high-tech products; take an active part in the international co-operation on the production of bar, wire rod, steel rail and medium plate. The structure will change gradually from inferior product to superior products.
  - Promote the development of new products and pay special attention to competitive in high-tech products.
Effect on the Improvement of Technology Equipment in the Steel Industry in China

- In order to fit in the international competition in steel market, industry in China will speed up the development of improvement of equipment.
- By now, 50% of the technology equipment is still unable to meet the requirements as soon as China enter the WTO. Therefore, those backward equipments should be improved.
- Improve the technology level in the whole process. By using CSP, coke dry quenching, ERP and other technology, secondary refining.
- Increase investment in the R&D of steel technology to acquire a technology system of our own intellectual.

Effect on the Organizational Structure of the Steel Industry in China

- The current organization structure in the steel industry is still unable to meet the competition of entering into the WTO. The main problems are: there are too much companies and most of them are of small scale (number of companies having production of over 350000 tonnes per year are beyond 60) and of low level of Specialization. These companies must be reorganized in order to meet future development.
- Speed up the production specialization of the steel industry by annexation reorganisation between corporations.
- Increase the production capacity of high value added steel products by sharing property and joint ventures.
- Increase the risk-resisting ability by strategy alliances within companies both at home and abroad.
- Improve the operation of steel company and increase the labor productivity by listing and separation of companies.
Effect on the Steel Trade of China

- After entering into the WTO the customer group of the steel companies will change.
- Consumption of some sectors will rise while consumption of the Others will drop; the number of foreign customer will increase.
- Due to the lack of information, experience and a marketing net for China’s foreign trade, the current marketing pattern must be changed, mainly in the following ways:
  - Building the information channels and marketing net;
  - Improving the ability of analyzing international market and the of trading in the whole world.
  - Building a customer management system and steel distribution system; tracing the change of the customer structure; improving quality of after-sales service.
  - Forming co-operations with steel trade companies to stabilize the market.
7. Dr-Ing Dieter Ameling, President German Steel Federation, Chairman German Iron and Steel Institute

IMPROVING ENERGY EFFICIENCY AND ENVIRONMENTAL PERFORMANCE
Stahl-Zentrum

Improving Energy Efficiency and Environmental Performance
The Example of the German Steel Industry

- The Position of the German steel industry in Europe
- Improving energy efficiency
- Improving environmental performance
- Integrated strategy 'Sustainable Development'
- Conclusions
Stahl-Zentrum

World Production 1970/2000
million t/a

Steel 847
Aluminium 595
Magnesium 13
Plastics 33

Source: IISI, Aluminium Zentrale, Metal Statistics, VKE

*) 1998
The European Union

<table>
<thead>
<tr>
<th>No</th>
<th>Member</th>
<th>Total</th>
<th>Steel production 2000 (10^6 t)</th>
<th>Member since</th>
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<tr>
<td>1</td>
<td>Belgium</td>
<td>10.2</td>
<td>11.6</td>
<td>'52</td>
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<tr>
<td>2</td>
<td>FR Germany</td>
<td>82.1</td>
<td>46.4</td>
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<td>3</td>
<td>France</td>
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<td>21.0</td>
<td></td>
</tr>
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<td>4</td>
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<td>26.7</td>
<td></td>
</tr>
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<td></td>
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<td>7</td>
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<td>'73</td>
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<tr>
<td>8</td>
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<td>59.4</td>
<td>15.2</td>
<td></td>
</tr>
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<td>Portugal</td>
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<td>1.1</td>
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<td></td>
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<td>13</td>
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<td>8.1</td>
<td>5.7</td>
<td>'95</td>
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<td>5.2</td>
<td>4.1</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Sweden</td>
<td>8.9</td>
<td>5.2</td>
<td></td>
</tr>
</tbody>
</table>

Source: European Economics 1999 and ISI Statistics 2001

* Millions of inhabitants in 1999
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Specific Reductant and Energy Consumption for Steel Production in Germany

GJ/t finished rolled steel production
(Specific total consumption\(^*)\) relative to finished rolled steel production acc. to ECSC Treaty

GJ/t crude steel production
(Specific total consumption\(^*)\) relative to crude steel production

GJ/t crude steel production
(Fossil energy resources as a share of specific total consumption)

\(^*)\) Including externally purchased electric power and oxygen (evaluated as primary energy)
Development of Blast Furnace Performance 1861 to 1993 in Germany

Gutehoffnungshütte, Duisburg, 1861
Johannishütte, Duisburg, 1910
August Thyssen-Hütte, Duisburg, 1960
Thyssen Stahl, Duisburg, Schwelgern 2, 1993

Volume: 64 m³  610 m³  1424 m³  4769 m³
Production: 25 t/24h  400 t/24h  2000 t/24h  12000 t/24h
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Average Consumption of Reducing Agents of the Blast Furnaces in Germany

Consumption of reducing agents, kg/t HM

Ore beneficitation
Input of overseas rich ores
Blast temperature >1200°C
O₂-enrichment
Top pressure
Burden distribution
Gas flow control
Improvement of Fe burden
Improvement of coke
Small coke in Fe burden

Coal

Coke (dry)

Oil

kg/t:
81.2
33.3
360.3

Year
1950 55 60 65 70 75 80 85 90 95 2000

(Source: VDEh Blast Furnace Committee)
Potentials to Decrease CO₂-Emissions in the BF/BOF Route

I. Improved energy efficiency
- Heat recovery in sinter plants
- New ignition furnace technologies for sinter plants
- BF cowper waste heat recovery
- Top gas pressure recovery turbines
- BOF gas recovery
- Decrease of heat losses

II. Improved material efficiency
- Increase of iron yield in each metallurgical step
- Improvement of ferrous burden properties
- Improvement of coke properties
- Increase of hydrogen in the reducing gas
- Increased shares of granulated BF slag
- Alternatives of top gas utilization
Index Development for CO₂ Monitoring in the German Steel Industry

Voluntary commitment of steel industry on climate protection
Target: 1995 declaration of the German steel industry to the Federal Government to reduce specific CO₂ emissions per ton of crude steel by 16 to 17% until 2005

Additional commitment
Δ -22% until 2012

Rate for steady reduction
Effective reduction of specific CO₂ emissions

Index CO₂ reduction

1990 1993 1995 1997 1999 2001 2003 2005
The Steel Industry's Plan of Action to Increase Energy Efficiency and Reduce CO₂ Emissions

Process innovations, process and structural changes:
- Concentrating and increasing efficiency of hot metal and oxygen steel production
- Process innovations in blast furnace and oxygen steel technology as well as secondary metallurgy
- Modernizing and building new electrical steel plants with increase in electrical steel share
- Process innovations in electrical steel technology including secondary metallurgy
- Introduction of new casting rolling processes for flat products and sections
- Modernizing and building new reheating and heat treating furnaces
- Increased computerization for monitoring and control of processes and plants
- Linking up previously separate production facilities (multi-processing lines)

Energy-related technical and economic actions:
- Continual process optimization of energy facilities
- Optimization of energy coupling and energy network
- Implementation of energy recovery measures
- Implementation of waste heat projects
- Substitution of energy sources to reduce CO₂
Improving Energy Efficiency and Environmental Performance
The Example of the German Steel Industry

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  - Improving environmental performance
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Economic Impact of Environmental Protection for the Steel Industry

- High operating costs of pollution control equipment reduce success of rationalization.
- Capital spending on environmental protection takes place at the expense of investment to strengthen locations.
- Environmental protection is capital-intensive and creates few additional steel jobs.
Crude Steel Production and Dust Emissions at Thyssen Krupp Stahl AG

specific dust emission in kg/t of crude steel


crude steel output in million t/year

Source: Thyssen Krupp Stahl AG
Environmental Protection Measures Integrated into the Production Process in Oxygen Steelmaking

- Reduction of exhaust gas volumes
- Avoidance of waste water discharges through introduction of dry-type electrostatic precipitators for primary dust removal
- Consistent recovery and purification of secondary gas flows

Energy savings of 0.8 GJ/t of crude steel through utilization of converter gas

Dust recycling

Source: Thyssen Krupp Stahl AG
Recording Emission Monitoring with Emission Computers at Thyssen Krupp Stahl AG

Total: 120 recording emission measurements with 28 emission computers

Source: Thyssen Krupp Stahl AG
Emission Measurements at Schwelgern Sintering Plant of Thyssen Krupp Stahl AG

- Belt dedusting 2
- Belt dedusting 3
- Belt dedusting 4
- Belt dedusting 2-4
- Shop dedusting 2
- Shop dedusting 3
- Shop dedusting 4
- Temperature
- Volumetric flow
- Dust concentration
- SO₂ concentration
- NOₓ concentration
- HCl concentration
- CO concentration
- CO₂ concentration

Daily averages in g/m³

<table>
<thead>
<tr>
<th>Time</th>
<th>Dust</th>
<th>SO₂</th>
<th>NOₓ</th>
<th>Vol. flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:30</td>
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<td>0.45</td>
<td>0.38</td>
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<tr>
<td>11:00</td>
<td>45.5</td>
<td>0.44</td>
<td>0.33</td>
<td>875,100</td>
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<tr>
<td>11:30</td>
<td>34.1</td>
<td>0.38</td>
<td>0.29</td>
<td>921,150</td>
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<tr>
<td>12:00</td>
<td>38.7</td>
<td>0.39</td>
<td>0.35</td>
<td>940,320</td>
</tr>
</tbody>
</table>

Source: Thyssen Krupp Stahl AG
Water Management

German Steel Industry
- Specific water intake -

<table>
<thead>
<tr>
<th>Year</th>
<th>Specific Water Intake (m³/t crude steel)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>60</td>
</tr>
<tr>
<td>1970</td>
<td>50</td>
</tr>
<tr>
<td>1980</td>
<td>40</td>
</tr>
<tr>
<td>1990</td>
<td>30</td>
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</tbody>
</table>

Thyssen Krupp Stahl AG
Total water requirement: 0.8 billion m³/a

specific water intake
= 3.2 m³/t crude steel
4 %

96 % recirculation rate

2.5 % discharge
1.5 % in-plant losses (vapour)

Source: Thyssen Krupp Stahl AG
Utilization of Steelmaking Slags in Germany 2000

- Construction material: 47.8%
- Cement: 37.9%
- Recirculation: 7.5%
- Landfill: 4.7%
- Fertilizer: 2.1%

Total production: 13.5 million t

Source: FEHS 4/2001 partly estimated values
Future Potential in Environmental Protection

Integrated approach
- Cross media aspects (air, water and soil)
- Management of resources, energy and waste
- Life cycle assessment (products)
- Innovation and development of production installations
- Combination of emission limitations and environmental quality criteria
Improving Energy Efficiency and Environmental Performance
The Example of the German Steel Industry

- The Position of the German steel industry in Europe
- Improving energy efficiency
- Improving environmental performance
  - Integrated strategy 'Sustainable Development'
- Conclusions
Increasing of Resource Productivity of Steel

Process innovations:
- Saving of raw materials through improved yield from dressing of ore to rolled steel
- Shortening of the course of manufacturing
- Decrease of energy consumption through all production steps

Material innovations:
- Continuous development for all application fields of steel, e.g. high-strength steel

Product innovations:
- Load-adapted product shapes, e.g.
  - tailored blanks
  - sheets, strips and bars with variable thickness
  - sound-deadening sheets

Lightweight constructions with steel:
- High-strength steel, material-compatible design, optimized/new manufacturing techniques, e.g. forming and joining techniques
Increase of the Resource Productivity
Minimizing the material input for the production of 1t cold rolled sheet

~1960/70
- Basic Bessemer
- Slab casting
- Slabbing mill
- Hot strip mill
- Cold strip mill
- Hot metal + Scrap
- Cold rolled sheet: 1.0t

~1970/80
- Oxygen steelmaking
- Ladle metallurgy
- Continuous casting
- Casting rolling
- Hot strip mill
- Cold strip mill
- Casting rolling plant
- 1.27t

Today
- BOF
- Ladle furnace
- Casting rolling plant
- Strip
- 0.8 - 1.5 mm
- 1.12t
Flat Products: Direct Strip Casting (DSC)  
(MEFOS, Salzgitter AG, TU Clausthal)  
(Shorter process, reduced energy consumption, improved productivity and yield)

- Casting ladle
- Primary cooling (spray cooling)
- Negative pressure
- Casting conveyor
- Inertisation
- Caster
- Secondary cooling
- Inline rolling
- Tertiary cooling
- Coil
Strip Casting Plant of Eurostrip at Krefeld
(Shorter process, reduced energy consumption, improved yield)

First cast on December 10th, 1999

Technical data of the plant:

- Heat size: 90 t
- Product: Stainless steel coils of 1.5 to 4.5 mm thickness and 1450 mm width
- Production:
  - 1st step of extension: 100,000 t/a
  - Mid 2001: 2nd step of extension: 400,000 t/a

Diagram:
- Induct. heating
- Rolling stand
- Double coiler
- Drum coiler
- Recoiler
Thyssen Krupp Stahl AG: Coupling of Pickling Line with New Tandem Mill
(Shorter process, improved yield, increased productivity)

Tandem mill: 5 stands, 6-high
Capacity: 2.1 million t/a
Width: 1000 – 2040 mm
Thickness: 0.3 – 4 mm
Investment: 148 million €

Increase of resource productivity: 2.5% higher yield
Conclusions

- Germany is the number one of the steel producers in EU 15.
- Due to a high share of flat products, the share of oxygen steel is as high: 71%.
- The specific reductant and energy consumption per ton of crude steel is ~18 GJ/t.
- The voluntary commitment of the steel industry is targeting 22% CO₂ reduction until 2012.
- The specific dust emission is decreased down to 0.5 kg/t crude steel.
- Improved water management with 96% circulation rate.
- The German steel industry has an integrated concept of 'Sustainable Development'.