



Price Driver #3

Chinese Steel: Inside the Labyrinth

Pat McCormick's "takeaways" from a research trip to China.

Perspectives from WSD's steel pricing forensic scientist



Hosted by Shanghai SteelHome, forty of Shanghai's top steel traders were invited to discuss steel industry trends with WSD's Pat McCormick.

The meeting was animated on the following subjects:

1. China's changing price trends on steel and raw materials.
2. Global market trends and China's participation and impact.

The Shanghai steel traders have a huge influence on China's domestic steel price trends and play a major role in exporting steel from the country.

It doesn't take a steel pricing forensic scientist to conclude that China is a global price driver. *Chinese Steel: Inside the Labyrinth* explores some of the dynamics of China's steel developments and implications for the global steel market.

Our takeaways from the embodied report are as follows:

1. The single most important element for a steel producer or buyer to understand is how developments in the Chinese steel industry impact the global steel market.
2. China's steel industry is a complex labyrinth that behaves and changes in ways not well understood by many outside of China. Understanding how to navigate through the labyrinth can enhance a firm's competitive situation. For example, it may provide a deeper understanding into how market developments in China are threatening or enhancing business opportunities. We have recently observed how the retreat in steel exports from China in the 2nd half of 2007 helped tee-up the global export price surge in the 1st half of 2008.
3. Steel company strategists need to consider how Chinese market developments will impact their performance. (*Note: WSD's presence in China is growing and stands ready to help evaluate Chinese market developments and consider the global market implications*).

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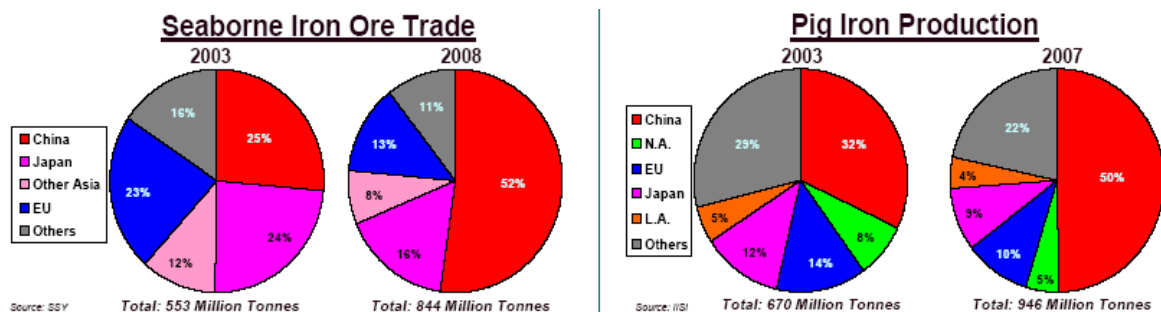
Background

Pat McCormick was keenly aware of the Chinese steel market prior to joining World Steel Dynamics in October 2006. His prior Chinese experiences in market analysis, supplier development, and negotiations provided great background for his recent WSD research trip to China. This report contains Pat's insights into China's changing steel market situation, the evolving industry structure and the special relationships between buyers and sellers.

China remains among the most dynamic steel markets given its growth, size and complexities. It continues to have many profound influences on the global steel market.

Consider these facts:

- China's massive growth in steel production has exceeded its rapidly growing steel demand.
 - Steel production hit a 571 million tonne annualized rate in June of this year prior to its collapse to only a 423 and 428 million tonne annualized rate in October and November, respectively.
 - Steel imports peaked in 2004 at 33 million tonnes and were about 16 million tonnes in 2008.
 - Steel exports hit a high point in 2007 at 68 million tonnes and were about 59 million tonnes in 2008 (including a 98 mmtpy rate observed in April 2008).
 - Indirect steel-containing exports are reported to be 60 million tonnes in 2008.
- In just four years, 2003 – 2007, China's pig iron production has increased 255 million tonnes. This expansion represented 93% of the global growth in pig iron production.
 - Pig iron production in China increased from 32% of the global total in 2003 to 52% in 2008.
 - China's share of global seaborne iron ore trade rose from 25% in 2003 to 52% in 2008.



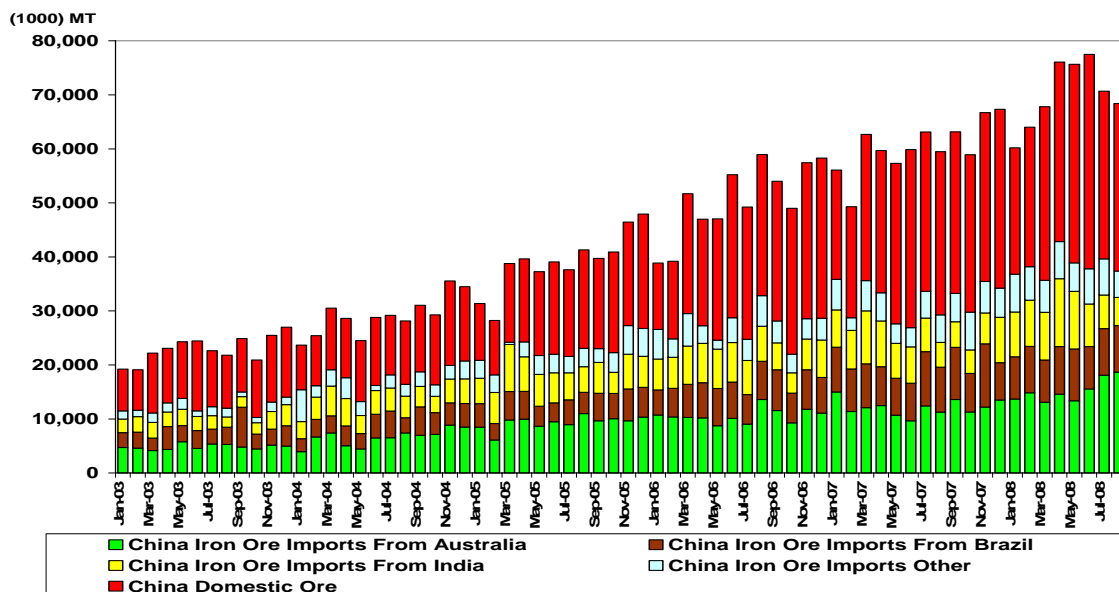
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Observations and Takeaways

- An influential policy advisor provided the following wish list of objectives for the Chinese steel industry:
 - Gain more control over raw material costs.
 - Close obsolete capacity and restrict new capacity investments.
 - The objective is to close about 100 million tonnes of capacity (blast furnaces smaller than 400 cubic meters and BOFs smaller than 30 tonnes).
 - Delay the approval of new steel mill investments. WSD has identified 89.5 million tonnes of new “Greenfield” capacity that has recently been delayed or cancelled. 25.5 million tonnes of completed capacity will cut or stop production due to poor returns (**Exhibit B**, page 11).
 - Not seek to export too much steel – i.e., stick with the current government guideline to export no more than 10% of Chinese steel demand.
 - Improve steel industry structure and downstream efficiency. Minimize logistics costs via better location of outside processing units and improve downstream yield performance throughout the supply chain.

Pat’s comments: More control over the supply and pricing of raw materials is a common wish among steel producers that do not have much self-sufficiency. While the Chinese steel industry benefits from indigenous coking coal reserves its need for iron ore from non-Chinese sources is sizable.

China’s Iron Ore Sources



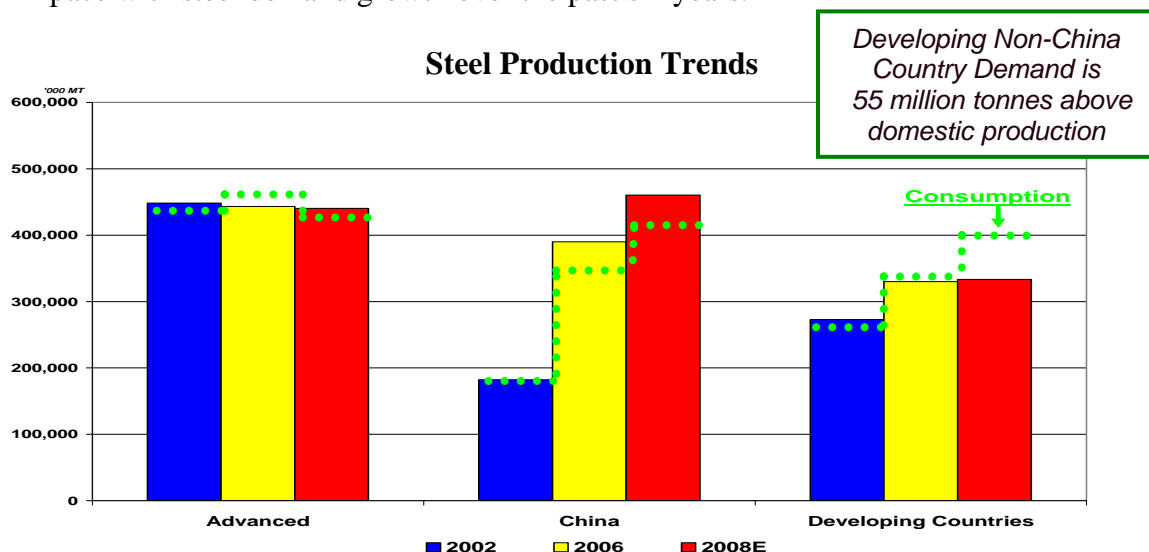
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The current global economic malaise has provided a respite in demand growth for steel and steelmakers' raw materials. Even though this respite may last for several years, many steel mills continue their quest for more self-sufficiency. A driving force in their self-sufficiency quest is the strength of the iron ore mining oligopoly during good economic times. A challenge for China's raw material investment initiative outside of China is justifying the investment cost during a period when raw material prices are falling.

China's closure of obsolete steel capacity, primarily in long products, has accelerated as steel prices fell below the cost of production. A decline in domestic steel demand and steel export shipments further de-leveraged mills. Exports declined 9 million tonnes in 2008 with a high of 98 mmtpy in April and a low of 36 mmtpy in November. High mill production costs, the rapid decline in the world steel export price and China's export tax policy were all contributing factors. November and December's annualized export rate was ~8% of China's 2008 domestic steel demand. This is well within the government's 10% export guideline. December exports of 3.15 million tonnes, an annualized rate of 38 mmtpy, remained within the guideline despite the reduction in China's steel export taxes announced in late October.

Supply chain yield improvement opportunities within China have an interesting implication. If a 5% yield improvement can be accomplished via improved steel processing technologies throughout the supply chain, this would have the equivalent impact of adding ~25 million tonnes in steel production.

- China is the most skilled country when it comes to building integrated steel capacity. Steel plants are built fast, effectively and at a low capital cost. In contrast in the non-Chinese Developing Countries steel production has not kept pace with steel demand growth over the past six years.



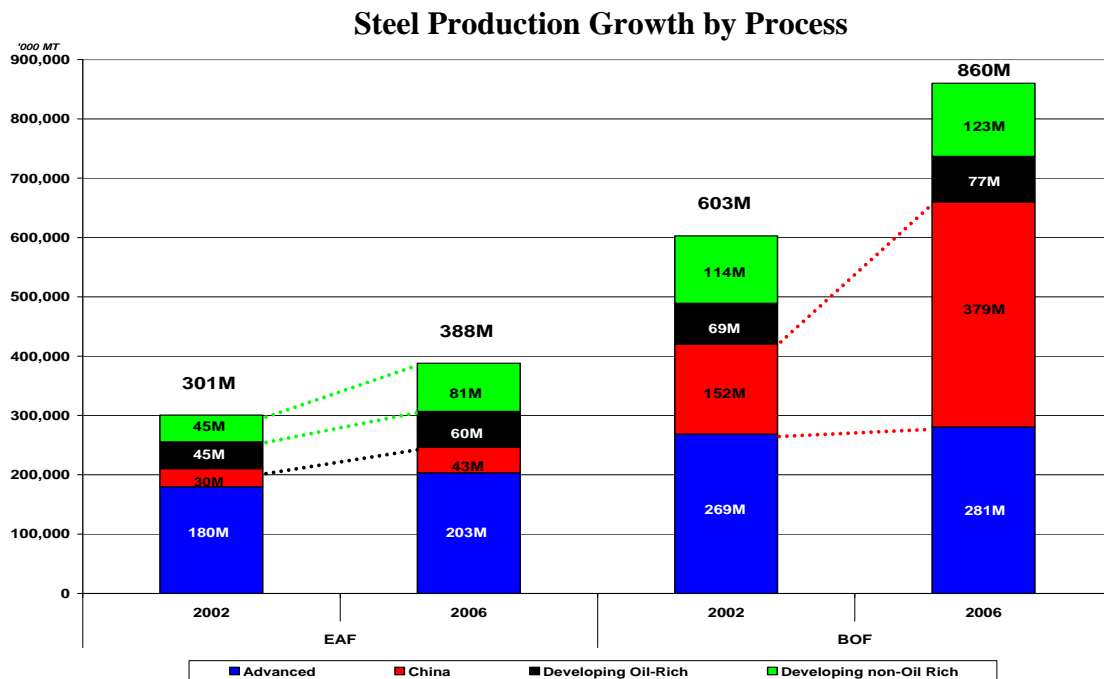
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Pat's comments: Without China, there would not be a sufficient supply of steel in the world today. China's steel capacity additions have filled the void between the rising need for steel in Developing Countries and the long time it takes to build new steel plants outside of China.

The global steel supply and demand balance has become more dependent upon China's exports. The price surge that occurred in the 1st half of 2008 was the culmination of global steel demand growth outpacing global steel production growth and the large reduction in China's exports in the 2nd half of 2007 due in part to export tax increases. Now, the current global economic malaise has dramatically reduced steel demand and will provide a respite from the risk of a large price surge over the next couple of years.

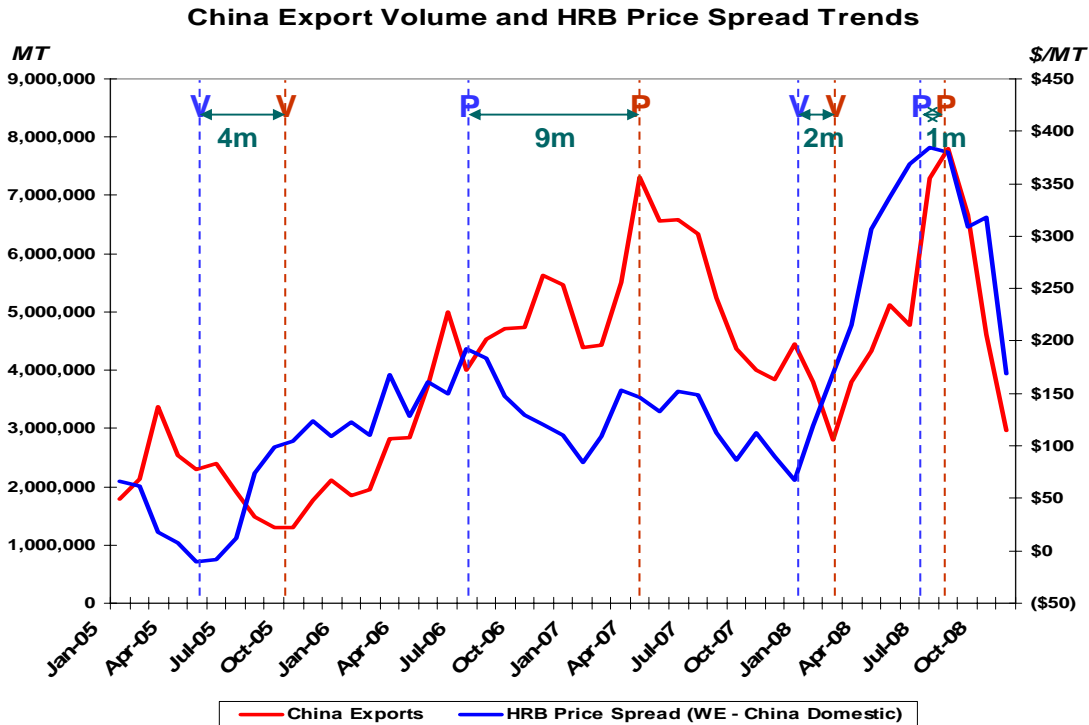
Side benefits: China's use of the Blast Furnace/BOF approach for its huge capacity expansion drove a massive rise in global iron ore mining and shipping capacity. By encouraging huge iron ore mining expansions, China has helped to diminish what would have been an even more acute shortage of scrap. The following chart shows that the non-Chinese Developing Countries (green and black segments of the bar) are primarily growing its steel production via EAF – electric arc furnace capacity which is primarily scrap based.

China's seaborne demand on iron ore promoted the expansion of the bulk shipping fleet, which until a number of years ago had concentrated on building container and LNG ships.



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- Swings in China's export volume reflect variations in the spread between the World Export price and the domestic Chinese market price.



Pat's comments: The response time to changes in the export/domestic price spread is in part a function of the strength of the Chinese domestic market demand. When Chinese domestic steel demand softened in 2008, its steel exports were quick to rise once there was an increase in the price spread. The drop in Chinese exports in late 2008 was in good part a function of reduced orders from foreign buyers.

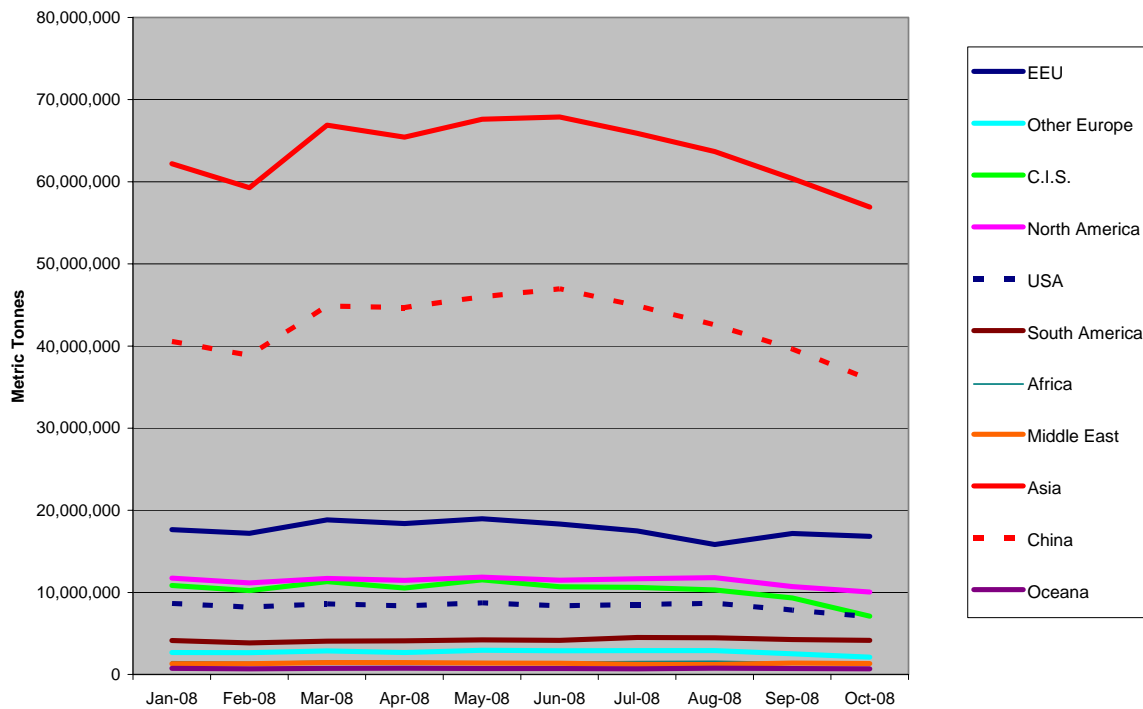
Government export tax policy changes affect the floor price at which exports become attractive to Chinese steel producers.

Does China's current steel capacity surplus limit the amount that world export prices can surge? Might this development help to maintain a relative favorable price value for steel versus other competing materials?

- China's steel production cuts came sooner and were more severe versus many other steel producing-regions. From June 2008 to November 2008 there was a 26% fall in steel production – June's annualized rate of 571 million tonnes dropped to 423 million tonnes in October.

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2008 Regional Steel Production



Pat's comments: The speed of China's rational, perhaps one might say "economic," behavior to aggressively reduce steel output has been a shock to most people in the industry. The current financial crisis, along with low prices, is presenting an excellent opportunity for the Chinese government to shut down obsolete capacity – most of which is located in the long products segment of the industry.

Traditional economic theory during times of weak demand expects commodity prices to fall to the marginal cost of the highest cost producers. Higher cost producers are forced to cease production, which eventually firms-up market prices.

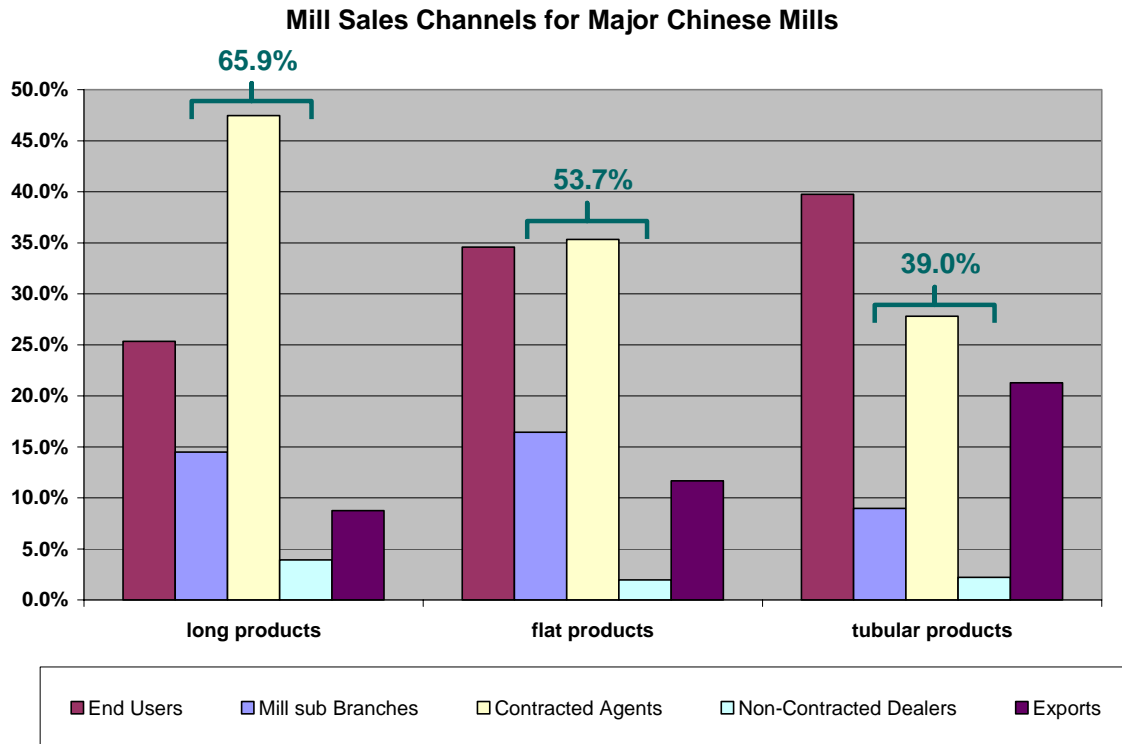
Considering that China now has the world's largest steel production surplus and it on balance is a mid-cost steel producer as ranked on the global cost curve (due to high raw material costs), it is not surprising that China turned down steel production sooner than most regions.

- China's recent steel price recovery which began in late November and has carried on into January has led other regions. The following *SteelBenchmarker™* chart for hot-rolled band shows China's domestic market prices bottomed in early

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domestic market, this reduction would have had a sizeable impact on some steel-intensive product markets outside of China.

- Steel traders in China have a commercial status that is much more equal to OEMs, especially for long products, than in most markets outside of China.



*Pat's comments: Results from a 2008 sales study of major Chinese mill sales to end users, three types of steel traders, and exports are shown above. Sales channel data for tons by product within each category is in **Exhibit A** (page 11). The aggregated percentage of major Chinese mill sales made to mill sub branches, contracted agents, and non-contracted dealers highlights the tremendous share that steel traders have in the Chinese market: 65.9% of long products, 53.7% of flat products and 39% of tubular products.*

The Chinese steel distribution system is still “old style” – i.e., it is a function of the conditions in the “command economy” days when the Chinese steel companies shipped directly to the end user only a small portion of their steel production. Today, there may be about 150,000 traders and 650 depots in the country. The traders often speculate on the price trend which significantly impacts market prices. In January 2009, traders are purchasing offshore steel (semis and finished products) because of the lower price opportunity than what is available within China’s domestic market. One of these opportunities has been the extremely low price offerings from steel producers in the CIS.

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China's steel traders are the key sales channel for the steel mills' long products as they represent two-thirds of sales. They may use their depots to hold large physical inventories for construction customers in order to hedge steel price volatility. In fact, the practice of traders holding large physical inventories for end customers is perhaps only common in China. It is supported by the large number of depots located close to the mills and the low cost of money (only about 6%).

Commercial terms vary by mill. For example, the length of time that a price is fixed had been 3 months for BaoSteel and one to two months for other producers. This price approach is no longer the case for BaoSteel; all sellers now adjust to frequent changes in market price direction.

A billet/bar producer located in the Tangshan area (150km NW of Beijing) said large direct customers were treated very well in 2008. They benefited from fixed price agreements when prices were rising and when prices fell, they got the reductions. The producers' action to reduce contract prices was viewed simply as what was required to maintain the business. On balance, the Chinese mill management of contractual pricing commitments seems more flexible and favorable to the buyer than the circumstance in most steel markets. Changes in contractual pricing commitments in other markets often carry more emotional baggage into future transactions.

Both end users and traders in China can purchase steel on a "contractual" basis from mills. In contrast, in the USA it has become more difficult for steel distributors to get fixed prices for time periods beyond a calendar quarter unless the purchase is tied to an identified end user. Both markets are similar in that large volumes may be needed to get some reduction in the prevailing market price.

- *China's surging growth of steel production has fostered an immense mill equipment industry. The enormous quantity of mill investments has helped drive mill equipment technology advancement by offering numerous equipment deployment opportunities.*

Pat's comments: In China the steel mill equipment companies are low cost. Some foreign firms have located manufacturing facilities in China. They claim to be able to build 70-80% of their equipment technologies in China with low cost labor, materials and overhead. The manufacturing of higher-end technology mill equipment for foreign firms remains outside of China. The leading global steel mill equipment firms worry about the protection of their intellectual property.

The current global slowdown in steel mill investments will create a more competitive environment for mill equipment manufacturers. China's mill equipment makers are increasing their marketing efforts outside of China.

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Exhibit A

China Steel Product Marketing Statistics Jan - Oct, 2008

Major China Domestic Steelmakers (~75% of total China steel production)

| Tonnes (~10 months) | | | | | | | |
|------------------------------|------------------------------|-----------------------|------------------------|-----------------------------|----------------------------------|--|-------------------|
| Product | Sales Total Jan-Oct, 2008 | End users (direct) | Total Steel Traders | Mill sub-branch sales | Sales to contracted agents | Retail sales to non- contracted dealers | Exports |
| billet/slab | 15,635,619 | 9,727,746 | 5,784,715 | 1,064,017 | 3,656,681 | 1,064,017 | 656,289 |
| billet | 8,957,426 | 4,809,545 | 3,604,310 | 162,767 | 2,457,797 | 983,746 | 543,573 |
| slab | 5,311,249 | 4,055,661 | 1,142,872 | 41,070 | 1,062,464 | 39,338 | 112,716 |
| Other | 1,366,944 | 862,540 | 1,037,533 | 860,180 | 136,420 | 40,933 | 0 |
| long products | 135,106,499 | 34,255,128 | 89,013,658 | 19,583,769 | 64,134,410 | 5,295,479 | 11,828,715 |
| railway products | 2,650,400 | 1,202,974 | 1,187,946 | 29,789 | 1,029,714 | 128,443 | 259,480 |
| large section | 6,554,382 | 834,873 | 4,804,085 | 536,186 | 3,551,422 | 716,477 | 915,424 |
| medium & light section | 2,926,031 | 1,277,547 | 1,640,283 | 563,938 | 897,630 | 178,715 | 8,202 |
| bar products | 23,935,542 | 10,185,770 | 12,170,756 | 3,854,459 | 7,365,576 | 950,721 | 1,579,016 |
| rebar | 48,637,608 | 6,778,286 | 38,844,811 | 7,175,749 | 29,652,598 | 2,016,464 | 3,014,511 |
| wire rod | 42,291,934 | 11,394,304 | 26,659,691 | 6,033,390 | 19,486,112 | 1,140,189 | 4,228,940 |
| hard wire rod | 8,110,602 | 2,581,374 | 3,706,086 | 1,390,258 | 2,151,358 | 164,470 | 1,823,142 |
| flat products | 149,540,196 | 51,690,308 | 80,363,748 | 24,589,244 | 52,836,153 | 2,938,351 | 17,447,214 |
| super heavy plate | 3,472,244 | 1,441,612 | 1,524,490 | 140,246 | 1,345,319 | 38,925 | 506,142 |
| heavy plate | 14,752,196 | 5,101,477 | 7,500,991 | 1,380,669 | 5,596,355 | 523,967 | 2,149,727 |
| medium plate | 22,955,163 | 7,525,210 | 12,515,028 | 1,818,709 | 10,316,085 | 380,234 | 2,914,925 |
| HR sheet | 1,729,948 | 959,723 | 333,519 | 82,474 | 250,976 | 69 | 436,706 |
| CR sheet | 3,773,261 | 918,928 | 2,664,558 | 1,061,592 | 1,599,347 | 3,619 | 189,775 |
| wide & medium strip | 52,795,596 | 14,812,950 | 31,087,311 | 9,666,755 | 20,354,330 | 1,066,226 | 6,895,336 |
| HR thins & wide strip | 12,726,919 | 4,219,777 | 7,004,308 | 2,004,096 | 4,359,221 | 640,991 | 1,502,835 |
| CR thins & wide strip | 13,576,989 | 4,247,121 | 7,935,846 | 4,245,724 | 3,594,113 | 96,009 | 1,394,021 |
| HR narrow strip | 12,212,022 | 7,785,575 | 4,423,501 | 1,034,582 | 3,195,571 | 193,348 | 2,946 |
| CR narrow strip | 277,447 | 141,258 | 136,151 | 24,272 | 108,373 | 3,506 | 39 |
| plated sheet/strip | 6,783,475 | 1,892,565 | 3,866,818 | 2,398,828 | 1,460,580 | 7,410 | 1,024,092 |
| coated sheet/strip | 1,053,162 | 422,260 | 391,156 | 82,177 | 291,508 | 17,471 | 239,745 |
| electric silicon steel/strip | 3,431,774 | 2,221,852 | 1,018,996 | 649,120 | 364,375 | 5,501 | 190,925 |
| tubular products | 15,430,354 | 6,132,086 | 6,015,065 | 1,384,509 | 4,288,560 | 341,996 | 3,283,204 |

Exhibit B

China's New Greenfield Steel Plants Status

New steel plants in the planning phase:

| Company | Project name | Planning | Government approval | Situation |
|----------------|-----------------------|---|----------------------|---------------------------|
| Baosteel | Zhanjiang plant | 20 mtpy, 2014 | Not approved | Delayed |
| Baosteel | Brazil, Victory plant | 10 mtpy slub, | No approval required | Canceled |
| Baosteel | Luojing area | 3 mtpy (2 COREX lines) | Approved | 1 line (1.5mtpy canceled) |
| Anshan Steel | Fujian coast area | 10 mtpy | Not approved | Canceled |
| Wuhansteel | Guangxi plant | 20 mtpy, 2014 | Not approved | Delayed |
| Kunming Steel | Expansion | 5 mtpy, 2010 | No approval required | Delayed |
| Kunming Steel | Lianyungang Plant | 10 mtpy | Not approved | Canceled |
| Ma'amshan | Hefei plant | 3 mtpy to replace 2 mtpy older facility | No approval required | Delayed |
| Shandong Group | Rizhao Steel | 10 mtpy | Not approved | Delayed |
| Total | | 91 mtpy | | |

New steel plants which have completed construction:

| Company | Project name | Capacity | Completion time | Production situation |
|----------------|--------------------|--------------------------------|-----------------|---------------------------------|
| Handian | New area | 5 mtpy | 2008 | Losing money, cut production |
| Baosteel | Luojing, No1 COREX | 1.5 mtpy | Phase I 2008 | Costs too high, stop production |
| Capital Steel | Caofedian Plant | 10 mtpy now, 20 mtpy in future | Phase I 2008 | High cost, stop production |
| Anshan Steel | Bayuquan Plant | 5 mtpy | 2008 | Losing money, cut production |
| Hangzhou Steel | Ningbo Plant | 4 mtpy | 2008 | Losing money, cut production |
| Total | | 25.5 mtpy | | |

Source: WSD estimates

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