



Publisher's Statement

The following white paper is written by Tom Stundza of *Purchasing Magazine*. Tom Stundza is a well-known writer and expert in the metals industry, and one of the sources used by the White House to determine the direction of this industry. We are pleased to bring you an exclusive document of his forecast in *Looking Ahead to Metals through 2010*, a discussion of materials, pricing and volatility for the next three years.

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Looking ahead to metals through 2010

By TOM STUNDZA
Purchasing Magazine

CHAPTER 1

Metals prices are, will remain, erratic

Commodity metals prices have increased significantly in recent years. This has boosted the economies of resource-rich nations but has added to the import bill in such consuming regions as North America, Europe and Asia. Metals have a strong business-cycle component; so, as economic growth has boosted world metals demand, prices have risen by 180% in the 2002-2006 timeframe; 200% from the cyclical low-pricing year of 2001.

Looking ahead through the end of the decade, global metal prices are likely to retreat from their current high levels as new mining and smelting output boosts supplies. Still, the key word for industrial metals is *erratic* when buyers are mapping long-term acquisition plans and risk management programs. From aluminum to zinc, market economists say metal prices tend to respond sharply to relatively minor changes in demand and supply conditions. That's why they believe prices of industrial metal commodities will maintain their volatility in the 2007-2010 timeframe as the markets slide in and out of supply tightness.

Until recently, metals prices tracked historical patterns—never increasing more than 75% during previous cyclical upturns—but the continued run-up in metals prices last year made the cumulative price increase significantly larger than usual. The drivers of the

unusually strong run-up in metals prices are well known. On one side there is roaring Asian (especially Chinese) demand and the prospect of continued short-term supply shortages. There was low investment throughout the metals sector in the late 1990s and the early 2000s that followed a period of earlier price declines.

Some analysts have also suggested that the intensity of the price upswing in this recent cycle has been amplified by new factors—the increasing weight of rapidly growing emerging markets (especially China and India) in the world economy and activity of financial investors (especially fund managers) in commodity markets.

Between 2002 and 2005, according to the IMF, China accounted for literally all the global growth of zinc and lead consumption, and more than 80% of the increase in tin and nickel consumption. At the same time, the lack of investment and increased political risk has combined to constrain the supply of many key commodities.

The real question to ask about metals isn't whether prices will go up or down. The complex interplay of these variables means that prices will almost certainly go up *and* down. Even economist Raghuram G. Rajan and financial analyst Randy Cousins now suggests that while recent record-high metals prices “are fairly valued given supply constraints, they won't be sustained” in coming years. However, they also caution buyers not to expect pricing collapses either.

Now the Eric J. Gleacher Distinguished Service Professor of Finance at the University of Chicago's Graduate School of Business, Rajan e-mails Purchasing.com that “price declines for metals over the next five years will be a result of current high prices damping demand at a time of expanding mine and smelter production.” Meanwhile, Cousins, an analyst at BMO Capital Markets in Toronto, tells Purchasing.com that widespread speculation of continued high steel prices from industry consolidation in coming years “largely ignores the historical cycle of expansion, deterioration, expansion and deterioration in marketplace fundamentals.”

In a late-2006 speech while he still was serving as economic counselor and director of research for the International Monetary Fund, Rajan said: “There is limited supply of a number of metals and a lot of demand (yet) current tight supply-elevated price conditions are unlikely to be permanent. Since demand for metals seems to be rising due to higher global growth and rapidly increasing income and industrial production in large countries such as China, the speed and costs of supply additions will determine how much metals prices retreat from the current high level in the medium term.”

Meanwhile, IMF economist Martin Sommer suggested at a press briefing last September—to mark the publication of the semi-annual briefing book known as *The World Economic Outlook*—that “a lot of supply is in the works through higher investment and, therefore, the supply-demand balance (eventually) will lower prices.” Looking at the two most widely traded base metals, copper and aluminum, the IMF economic team sees major reduction in future pricing.

For example, the IMF has forecast a world copper price around \$1.50/lb in 2010, or about half the \$3.05 annual average price of 2006. Global mine production in 2006 fell short of expectations owing to production problems in Indonesia, Chile, and the U.S., as well as labor disruptions in Chile and Mexico. No such problems are expected in the future. So, “it is clear that copper prices will come down in the future,” Sommer said, “though not necessary to the 2002 level (of 78¢) to the extent that energy costs are likely to remain high and they make up a significant part of the cost of making copper.” The

IMF forecaster also predicted the average price of London Metal Exchange aluminum would decline to 75¢ in 2010 from \$1.16 last year. “Again, rising supply will be able to meet demand growth and create falling prices,” the IMF economist asserted.

CHAPTER 2

Demand showing no signs of recession

The growing vision of leaner, meaner manufacturing operations in North America means that more metalworking companies soon will be producing finished products at fewer facilities made from commodities purchasing through borderless sourcing programs. It no longer is unique to hear CEOs planning to increase manufacturing efficiency by reducing production lines by more than one-third, outsourcing production of low value-added items, and building production plants offshore to meet future marketplace needs.

Over the next five years, metalworking companies in the automotive, industrial, aerospace, consumer goods, medical products, and power generation businesses will undergo further consolidations. “The consolidation of customers, and suppliers or the transfer of manufacturing capacity from the U.S. to foreign countries isn’t about to end,” agrees Dennis M. Oates, senior vice president of the Specialty Alloys Operations at specialty metals giant Carpenter Technology Corp. in Wyomissing, Pa. He and other market analysts and economists also note that changes in domestic demand trends by metalforming firms will continue the reorganizations of domestic and foreign manufacturing capacity for certain metals to remove excess and inefficient capacities.

The auto industry finished 2006 with 16.5 million light vehicles sold, down 2.5%. General Motors’ executive director of market and industry analysis, Paul Ballew, says he is confident that the industry will do about the same in 2007; though, he adds, the second half of the year will be better for sales than the first half. But, he may be overly optimistic. Analysts at Merrill Lynch & Co., for example, see another 2% to 3% drop, to 16.2 million cars sold in 2007. Global Insight analysts are more sanguine, pegging sales at 16.32 million units in 2007 and 16.54 million units in 2008. Improving conditions will allow sales to advance to 16.71 million units in 2009 and 17.21 million units in 2010, suggest motor vehicle analysts at the Lexington, Mass.-based research house. Still, all agree that the days of the steel-intensive, truck-chassis-based sports utility vehicles. In 2006, smaller crossovers surpassed traditional SUVs for the first time and that trend will continue for the rest of this decade. Metals suppliers will be supplying new products in the small-car and crossover segments, as consumers increasingly ditch the gas-guzzlers.

So, as 2007 began, DaimlerChrysler executives have been actively exploring a sale and working with bankers to prepare the detailed financial and operating data potential buyers will need to put a value on Chrysler Group, raising the prospect that the auto maker could auction off its U.S. unit in the coming months. There even has been talk of GM and Chrysler Group considering the possibility of manufacturing alliances. And that’s partly because analysts believe North American light-vehicle production will stay at 15 million to 15.3 million units through 2008, as compared with 15.75 million units in 2005—with a growing percentage being assembled not by the Big Three but by the so-called “new domestics”. Beginning in 2009, as the industry regains its new bearings, analysts at Global Insight see production reaching 15.5 million units and then advancing to 16.3 million units in 2010.

In another major manufacturing sector, aerospace factories world-wide can expect higher production rates through at least 2010—especially with production slots for most of Boeing's airplane models already largely filled for the next three years and a healthy backlog for several Airbus models. The two companies' legions of aluminum, titanium, nickel-based superalloys, copper wiring and specialty stainless steel suppliers are also set to benefit, says aerospace analyst Rob Stallard at Banc of America Securities in New York. What's more, since the major U.S. and European air carriers have yet to join the shopping spree in a meaningful way, purchases of replacement planes soon will boost demand for the thousands of aging jetliners that many of the carriers have elected to keep flying while they shore up their balance sheets.

Truck making has been a manufacturing bright spot for some months with North American sales of heavy trucks at their highest level ever in 2006 around 284,000, double the level for 2001. However, the 2007 heavy truck market in North America is predicted to fall by up to 40% this year because of stringent new federal emissions regulations on new diesel engines. The new rigs cost as much as 10% more and get less gas mileage. They also employ new technology, and few trucking firms have wanted to be the first to try it. Still, analysts says another sales boom is expected to start sometime in 2008 as companies rush to buy in advance of yet another wave of environmental rules in 2010.

Heavy equipment manufacturers, the firms that make backhoe loaders, bulldozers, and natural gas engines and industrial gas turbines are looking for solid sales in 2007 and 2008. Production of machinery and equipment increased by an annual average of 6% in 2005 and 2006 but it could slow to 1% to 2% annually this year and next. After that, purchasing is expected to remain erratic for months to come—and that will cloud the future demand for steel plate, copper wiring and forged metal parts. The recent sharp decline in spot coal prices and slower growth in mine production is causing coal mining companies to reduce machinery purchases. Purchases of machines used in metal mining, however, have remained solid. Continued sluggishness in U.S. housing is having a significant depressing impact on sales of small and compact machines.

Production of construction machinery fell 18% during the four years from 1999 to 2002. Over the next three years production rebounded by 30%, and increased another 19% this year, according to analyst Kenneth Kremer at Global Insight. “Looking ahead, production will decline by about 6% through 2008, stabilize during 2009, and then begin to grow once again in 2010.”

Kremer adds that material handling equipment manufacturers have strung together three very good years, reporting increases in shipments of 15% in 2004, 26% in 2005, and 15% in 2006. Both domestic demand and exports showed healthy increases for the machinery made from ductile iron, aluminum, copper and brass, and carbon, alloy and stainless steels. Looking ahead, he expects shipment growth to slow to 6% in 2007 and 3% to 4% in 2008-2009. Metalworking machinery manufacturers have enjoyed a string of good years, reporting increases in production of 11% in 2004, 7% in 2005, and 5% in 2006. Analyst Kremer anticipates a winding down of the domestic capital spending cycle so that production of metalworking machinery may expand by 4% in 2007 but then by only 1.5% annually thereafter through 2009-2010.

CHAPTER 3

“Buy America” politics keep complicating markets

Quiet but intense battles have erupted between metals suppliers and manufacturers over "Buy American" provisions for titanium and other specialty metals used in military equipment. On one side are some metal producers, pushing for strict enforcement of a law that requires the use of U.S.-made metal in military hardware. On the other are the companies that source materials worldwide to make parts for planes, bombs and tanks.

Until recently, the "Buy America" provision for specialty metals was largely ignored by the network of mostly small companies that make everything from nuts and bolts to electronic equipment for large military contractors. But that changed when defense contractors began acknowledging in 2005 and early 2006 that they were delivering hardware to the Pentagon containing parts that violated the law. The Defense Department has responded with new guidelines on how such parts should be treated, including a system for withholding payment based on the value of the offending parts.

In effect, all of these regulations trace their origin to the Berry Amendment, which originally was passed by Congress in 1941 to promote the purchase of certain U.S.-made goods. The law was extended in 1972 to cover such specialty metals as certain steel, titanium, zirconium and other specialty metal alloys. Over time, the law's implementing regulations were adopted to require specialty metals incorporated in products delivered under Department of Defense (DOD) contracts to be smelted in the U.S. or an approved "qualifying country" unless one of a few narrow exceptions applies.

There already are numerous procurement processes and supply chain systems already in place creating a crazy-quilt of do's and don'ts when buying or supplying original equipment manufacturing (OEM) firms. For those metals producers, processors or distributors dealing with the U.S. government, there also is the recent consolidation of the policies under the Federal Acquisition Regulation (FAR), the Defense Federal Acquisition Regulation Supplement (DFARS) and a companion resource known as PGI (Procedures, Guidance and Information) containing supplemental mandatory and non-mandatory internal Department of Defense policies.

The "specialty metals" provision of the Berry Amendment became law long before most people could conceive of today's global metals and materials marketplace. Today, most specialty metals covered by FAR, DFARS and PGI are important components of commercial products on which the DOD depends. But the law and its downstream regulations limit the ability of DOD to acquire commercial components vital to nearly all modern weapons and other sophisticated systems. And that's why changes may be made in coming years, which will do nothing but make DFARS and the other regulations even more cumbersome to suppliers and buyers.

Sourcing of specialty metals is global. Often it's difficult or even impossible to identify the source of every component of every product at every link in the supply chain. The result is that many companies doing business in this market cannot strictly comply with the Berry Amendment's specialty metals requirements. Efforts are under way to change this aspect of the law's application in Congress even as the DOD has signaled its intent to increase Berry Amendment enforcement.

The Defense Contract Management Agency (DCMA) published interim instructions in March 2006 for "conditional acceptance" of non-compliant products by DOD agencies "until a long-term departmental remedy can be implemented." Conditional acceptance, which places the burden of disclosing noncompliance or potential noncompliance on prime contractors, creates significant administrative burdens for prime contractors and

subcontractors. It also directs purchasing agencies to “withhold the cost of the lowest auditable non-compliant specialty metal part plus appropriate burden from payments due against the contract.”

A subsequent department-wide memo in June 2006 from the undersecretary of defense for acquisition, technology, and logistics endorses DCMA’s conditional acceptance approach. The memo also requires all offending contractors to submit a “comprehensive corrective action plan” no later than 180 days after conditional acceptance. An August 2006 memo from the director of defense procurement and acquisition policy instructs DOD contracting officers to address Berry Amendment compliance “prior to contract award to avoid non-compliance during performance.”

These enforcement guidelines threaten to further hinder DOD acquisition of commercial products at a time when flexibility and technological superiority are critical to the success of efficient purchasing. Fortunately, the Senate recognized the problem and has passed important reforms in its version of the fiscal 2007 defense authorization bill (Senate 2766).

David Fletcher, an associate in the government contracts practice of DLA Piper Rudnick Gray Cary global law firm’s office in Washington says Section 822 of Senate 2766 would exempt commercial items that contain specialty metals from the Berry Amendment’s domestic sourcing requirement. “Section 822 would let prime contractors and first-tier subcontractors commingle foreign and domestic specialty metals in their production lines,” he says, “if they have contractually committed to acquire a specific minimum amount of domestic specialty metal.”

Meanwhile, Section 842 of the John Warner National Defense Authorization Act for Fiscal Year 2007 recodifies the Berry Amendment requiring that certain strategic materials be purchased from U.S. sources. This provision would repeal the former Berry Amendment giving DOD new flexibility in addressing non-compliant materials delivered under contracts entered prior to the date of enactment. It also contains waiver provisions giving the DOD flexibility with regard to contracts entered after the date of enactment.

These reforms would help preserve DOD’s access to necessary commercial metals no matter where they are made but it’s not at all clear that they will become law. The House version of the 2007 defense authorization legislation (H.R. 5122) would reinforce the current Berry Amendment sourcing regime and, through the establishment of a “Strategic Materials Protection Board,” would create a new layer of Berry Amendment-like issues. The differences between the bills now must be sorted out in conference.

During the Senate hearings last December prior to being accepted as the new Secretary of Defense, Robert M Gates admitted he was “not familiar with the intricacies of the Berry Amendment,” but added: “I believe it is important that the Department (of Defense) be afforded necessary flexibility to procure and acquire capabilities needed for national defense in today’s global marketplace.”

CHAPTER 4

China, India will set the trend for world metals

In recent years, the global marketplace for metals has intensified. Though China, India and Eastern Europe have been in the sourcing spotlight recently, companies in the U.S. actually import industrial metals and finished parts and components from 229 nations, according to Census Bureau data. Looking ahead, economists expect nations in

Southeast Asia, West Africa and Central America to expand their role as global suppliers of steel, the base metals and specialty alloys.

Rapid industrial output growth, construction activity and infrastructure needs could sustain above-average growth in demand for metals from emerging economies through 2010. But, North American buyers probably will see more supply (as in, imports) from these countries than shipments to them (as in, exports). That's because most reports still look to North America, the European Union, China, India and as the centers of production or key industrial materials.

Analysts also have written that companies can realize significant direct material savings — up to 40% percent or more in purchase price — when they successfully access and rely on low-cost sources in the emerging regions. But, the problem for metals buyers in industrialized nations in search of new low-cost country suppliers is that only a limited number of these nations are traditional producers of high-quality mill products. Most of them already are longstanding suppliers of certain mined, smelted and processed ores. Brazil, Russia and India have been making steel for import into the U.S. for years, for example. Tin comes from a limited number of nations, so it isn't news to find domestic supply (via traders) from Indonesia, Singapore, Malaysia and Thailand in Asia and Peru and Bolivia in South America.

So, the key to foreign supply and demand will continue to be China, whose more-than-10% economic growth has become the key driver of demand and price dynamics in the global metals markets. China has become the largest consumer of several key metals, generating about one-quarter of the total world demand for aluminum, copper, and steel. China consumes 25% of the world's aluminum, 22% of copper, 18% of nickel, 44% of iron ore and 31% of steel. India is a close second with an economy that is expanding at a clip of more than 9% annually. Economists say a growth rate of 9% to 10% is probable for China for the rest of the decade while they say 7% to 8% is sustainable in India.

During 2002–2005, China contributed almost all of the increase in the world consumption of nickel and tin. In the cases of lead and zinc, China's contribution even exceeded net world consumption growth. For aluminum, copper and steel, the contribution of China to world consumption growth was about 50%. The relative contribution of China to global demand for commodities has increased considerably, as a result of both its rising weight in the world economy and its particularly rapid industrial production growth—including manufacturing exports—which is closely linked to the demand for metals. Other emerging market countries also have contributed significantly to demand in specific metals markets.

Economists believe China's demand for metals won't be reduced by Beijing's efforts to rebalance economic growth from investment to consumption. "For an economy at China's level of income, the kinds of things that the Chinese will consume or use will be material intensive--more housing, more cars, more hard goods," according to Professor Rajan at the University of Chicago Graduate School of Business. "If domestic demand in China picks up even more than the recent levels, there would be even more demand for these metals." Economists believe that the intensity of China's metals demand will surge until per capita gross domestic product reaches \$15,000 but it will be the middle of the next decade at least before China hits that target, at which point India's growth story is expected to kick in.

Like China, India boasts one billion consumers. Yet, somewhat scarily, it accounts for less than 3% of global metals—at least now. That will change by 2010; having rung in 2007 with two major acquisitions in the metals space, India Inc. already has become a major global player in steel and aluminum. First, Tata Steel won the auction of Anglo-Dutch steel maker Corus Group for \$12 billion and, second, aluminum producer Hindalco Industries is spending \$3.5 billion to acquire Canadian company Novelis. Earlier, Mittal Steel continued its capacity-expansion program by buying Arcelor of Luxembourg. The company now supplies virtually every grade of carbon, alloy and stainless steel from plants in 60 countries worldwide.

CHAPTER 5

Supply worries aren't in the base metals picture

As the decade progresses, chronic shortages aren't expected for any manufacturing raw materials. Consolidation of international mining companies isn't about to slow growth in the smelting and refining of base metals, according to analyst William Adams at BaseMetals.com. And that could deflate some of the price volatility and the record or near-record highs recorded in 2006.

Copper is the predominant nonferrous metal. In pure form, copper is drawn into wires or cables for power transmission, building wiring, motor and transformer wiring, wiring in commercial and consumer electronics and equipment; telecommunication cables; electronic circuitry; plumbing, heating and air conditioning tubing; roofing, flashing and other construction applications; electroplated coatings and undercoats for nickel, chrome, zinc, etc.; and miscellaneous applications. As an alloy with tin, zinc, lead, etc. (brass and bronze), it is used in extruded, rolled or cast forms in plumbing fixtures, commercial tubing, electrical contacts, automotive and machine parts, decorative hardware, coinage, ammunition, and miscellaneous consumer and commercial uses. Copper is an essential micronutrient used in animal feeds and fertilizers.

In a normal year, copper is mined, smelted and refined in Arizona, Utah, and New Mexico but it's more likely that the red metal used by the OEM was produced in Australia, Canada, Chile, China, Mexico, Russia, Peru or Indonesia. Recycled copper, predominantly from scrap metal, supplies approximately one-third of the annual copper needs in the U.S. In 2006, regional and world supply was tightened by production problems in Indonesia, Chile, and the U.S., as well as labor disruptions in Chile and Mexico.

Though volatile, prices remained at unprecedented levels, and subsequent record-high profits led to consolidation of international copper mining companies.

That won't slow production, though, since a recent assessment of U.S. copper resources indicated 550 million metric tons of copper in resources, more than double the previous estimate. A preliminary U.S. Geological Survey assessment similarly indicates that global land-based resources exceed 3 billion tons, about double the previously published estimate. Deep-sea nodules were estimated to contain 700 million metric tons of copper.

Preliminary projections from the International Copper Study Group and such analysts as Brook Hunt in London and Merrill Lynch & Co. in New York indicate the potential for a red metal surplus this year, growing well ahead of demand through 2010 due to expected new production coming on stream. In 2006, the market was in deficit but new supply this year will create a surplus of 491,000 metric tons that will grow to 754,000

metric tons in 2008—and still be in the 500,000 metric ton range when demand reaches a record high of 20 million metric tons in 2010.

Stainless steel has been selling at stratospheric levels because of the recent explosion in costs of nickel, chromium molybdenum and titanium, which combine to make steel resistant to staining and corrosion. The Mineral Information Institute says that in the U.S., 42% of nickel is used to make stainless steel and related alloys, 38% is used in superalloys (metal mixtures designed to withstand extremely high temperatures and/or pressures, or to have high electrical conductivity) and in nonferrous alloys (or mixed with metals other than steel). Nickel coatings account for 14% of nickel's use. The remaining 6% of the annual nickel use is for a variety of purposes including the production of coins, nickel-cadmium and nickel-metal hydride batteries; as a catalyst for certain chemical reactions; and, as a colorant, nickel is added to glass to give it a green color. Rechargeable nickel-hydride batteries are widely used for cellular phones, video cameras, and other electronic devices. Nickel-cadmium batteries are used primarily to power cordless tools and appliances.

The world reserve base of nickel, compiled by the U.S. Geological Survey in 2005, is 140 million metric tons, which is around 100 times the annual production in 2004. The largest global nickel reserves are in Australia (19%), Cuba (16%) and Canada (11%) while Indonesia, New Caledonia and South Africa each have around 9%. Norilsk Nickel in Russia controls 18% of world mine production, CVRD Inco in Canada and Indonesia (13%) and WMC (now part of BHP Billiton) in Australia (9%) were the main producing companies. World nickel mine production was at an all-time high in 2006, but was barely keeping up with demand from makers of stainless steel, which accounts for two-thirds of global primary nickel use. Analysts reckon that demand and supply will stay in balance through 2009 and then slip into a slight surplus of just 4,000 metric tons.

As the world continues to industrialize, the consumption of zinc is increasing: 47% is used for galvanized steel, 19% for brass, and 16% for zinc alloys. Zinc consumption is largely dependent on construction (48%) and automobile industry (23%). The metal is used mostly as a protective coating on steel, for galvanizing iron, as die casting, as sheet zinc, as an alloying metal with copper to make brass and for electroplating automotive parts, roof gutters, engravers' plates, cable wrappings and organ pipes, plus as sacrificial anodes used to protect ship hulls from galvanic action. Zinc resources worldwide are estimated to total more than 1.9 billion metric tons. The mineral is mined in about 40 countries with China the leading producer, followed by Australia, Peru, Canada, and the U.S.

In the U.S. mine production mostly comes from Alaska, Tennessee, and Missouri. The rapid price increase in 2006 was the result of several factors: a 15-year low in London Metal Exchange stocks of zinc, increased world demand, tight world supply, and investment buying. World mine and refinery production both increased in 2006, driven primarily by China and India, yet world refined zinc consumption outpaced supply. The high prices have resulted in the reopening and expansion of zinc mines worldwide in 2006 with more planned in 2007. One of the two primary zinc smelters in the U.S. closed in late January 2006, removing 100,000 metric tons of annual production capacity but a new owner plans to reopen the facility to recover 30,000 metric tons/year of zinc from steel mill electric-arc furnace dust in addition to zinc concentrates from a zinc mine in New York that was restarted in 2006 after a 5-year closure. Three zinc mines in

Tennessee, which have been closed since 2001, now are scheduled to reopen in the second quarter of 2007.

The U.S. remains one of the leading consumers of zinc and zinc products. However, aluminum, uncoated steel and plastics can and do substitute for galvanized sheet. Aluminum, plastics, and magnesium are major competitors as die-casting raw materials. Plastic coatings, paint, and cadmium and aluminum alloy coatings can replace zinc for corrosion protection; aluminum alloys are used in place of brass. And this has the long-term demand trend curving down in most industrialized nations. In China and other developing nations, the demand outlook is sustained growth, causing 2010 global demand to be more than 20% higher than it was in 2006. With all the new production capacity expected to be installed, though, analysts at Brook Hunt and elsewhere see the market moving from deficit in the 2004-2006 period to surpluses averaging 237,000 metric tons in 2009-2010.

<<BOX>>

NORTH AMERICAN BASE METALS DEMAND

(annual, metric tons)

	ALUMINUM	COPPER	NICKEL	ZINC	LEAD
'03	6,655,000	2,497,000	224,800	1,950,000	1,842,000
'04	7,141,000	2,737,000	224,900	2,123,000	1,816,000
'05	7,318,000	2,449,000	232,200	1,891,000	1,858,000
'06	7,408,000	2,610,000	240,000	2,013,800	1,841,000
'07	7,435,500	2,470,000	239,600	2,016,000	1,816,500
'08	7,530,500	2,550,000	239,300	2,006,000	1,733,000
'09	7,731,100	2,559,000	239,600	1,981,000	1,679,000
'10	7,713,700	2,512,000	231,800	1,909,000	1,601,000

Source: CRU, Merrill Lynch, Brook Hunt, UBS, U.S. Geological Survey

Forecast: Brook Hunt, purchasing.com

CHAPTER 6

Steel trading could become a factor

The surge and volatility in steel pricing over the past several years has widened budget misses among steel buyers across a broad range of industries. The industry has responded by a wave of consolidations. And now, there is renewed interest in such steel price risk management tools as exchange-traded steel futures contracts:

- The New York Mercantile Exchange (NYMEX) hopes to soon launch a hot-rolled sheet steel futures contract based on World Steel Dynamics' SteelBenchmarker pricing quotes.
- The London Metals Exchange (LME) hopes to launch a steel futures contract based on a Platt's steel pricing series.
- The Chicago Mercantile Exchange hopes to launch a steel futures contract using CRU pricing indices—which Koch Metals Trading in London already uses for its “over the counter” (OTC) steel futures.
- The Shanghai Futures Exchange is considering steel futures contracts.

In a nutshell, the steel marketplace may look and act a lot differently by 2010. Of course, the obstacles to trading include the multitude of products and grades, associated

cash liquidity issues and the challenges of offering “physical deliveries” of the mill products. “Also, many steel producers in 2007 remain reluctant to see the development of a transparent exchange-based pricing system (which invites the bogeyman speculator into the equation), preferring instead to offer direct forward-contract pricing (with raw material surcharges in some cases) to their customers,” says a report by Dave Rusate at GE Commercial Finance.

What isn’t in question, though, is that world steel demand will remain robust through 2010, production will keep expanding and that the ownership consolidation of the steel supply base will continue. “The economic gains of China and India require large amounts of steel for infrastructure building and industrial output, and there is little reason to expect this growth to falter,” says John Anton, steel economist at Global Insight’s offices in Washington, D.C. Chinese growth slowed slightly in 2006, but still added the equivalent of 70% of total U.S. production in just the one year (in 2005, the Chinese added the equivalent of 80% of U.S. production). “Lukewarm growth in 2007 in Japan, Western Europe and North America are the dim spots on steel’s horizon,” says Anton, “but they are posting merely slow growth, not recession.”

Parr is just one of several analysts who see further business mergers or combinations ahead, “driven by the increasing credibility of a more rational supply emphasis and stronger, more sustainable global growth dynamics.” That fits with the projection by the International Iron and Steel Institute’s Economic Committee forecast of an annual 5% increase in steel demand through 2010. Steel demand in India is seen growing by 7% annually between now and then while it will increase in China by 8.4% per year. Not surprisingly, China was the largest steel producing country in 2006—34% at 492,456,000 metric tons in a world—that poured 1,239,500,000 metric tons of crude steel. All of Asia accounted for 53.7% of world crude steel production.

According to World Steel Dynamics, an industry monitor, 2000-2010 (and maybe 2015) could turn out to be the third longest period of sustained growth in steel consumption in history. The previous two occurred during the surge in industrialization in Europe and North America in 1875-1900 and the postwar reconstruction of 1950-70.

As for North America, when prices went into a cyclical freefall in late 2006, local steel mills reduced supply by almost 3 million tons between early October and mid-February 2007 compared to the previous year. So, analyst Mark Parr at KeyBanc Capital Markets in Cleveland sees “the likelihood of a more aggressive focus on vertical combinations in North America, both upstream into raw materials and downstream into the service center sector, in order to minimize volatility of these sectors due the effects of improving mill supply discipline.”

Analysts at World Steel Dynamics suggests that the world market may become less dependent on China in coming years, though, as local production to meet revived demand in Japan, India continues to boost production and demand solidifies in South America and eastern Europe. Hopes of expanding steel production for home use and export into North America and Europe actually are focusing on India, where potential for growth remains considerable. The world's second most populous country accounts for annual steel demand per person of only 30 kilograms, compared with 250 kilograms in China, 600 kilograms in Singapore and 400 kilograms in the European Union and the U.S. But if the country's ambitious expansion plans in manufacturing, transport and power infrastructure

are realized, steel output and demand will surge to 100 million metric tons a year by 2010 from just 35 million metric tons now.

B. Muthuraman, chief executive of India's Tata Steel, says: "The opportunities are huge. It is fairly easy to see how China and India between them could some time soon account for 60% of world steel demand and output." Tata Steel alone is planning to quadruple its steel production in five years to 20 million metric tons at plants in India, Iran and Bangladesh. Mittal Steel and Posco of South Korea, the world's fourth biggest steelmaker, are committed to building big new steel plants in India. So, too, are a number of smaller Indian private-sector steel producers.

Steelmakers scattered across Southeast Asia, Latin America, South America, Eastern Europe and anywhere else where many plants are hampered by relatively high fixed costs are also becoming more optimistic about their chances of survival. The reason is a shift towards higher-value products that are more useful to customers since they provide extra corrosion-resistance to the exteriors of cars or appliances, for example. That in turn will reduce their reliance on low-priced commodity steel easily matched by competitors.

As for stainless steel, there are no guarantees that supply will keep pace with demand. Even high raw material costs haven't dampened strong world demand, which grew by better than 6% last year. However, the International Stainless Steel Forum (ISSF) says the fastest growing types of stainless now are the grades that don't contain nickel. Still, the continued high volatility of raw material prices—such as nickel's 166% price explosion in 2006—"will be a limiting factor for sustainable future growth in demand," say ISSF economists. That may be a good thing for buyers, though, since stainless steel production of 27,800,000 metric tons in 2006 was close to using effective capacity. Estimates for capacity growth through 2010 are sketchy but ISSF says "more new melting capacity is in the commissioning process" for 2007 to match the global stainless crude steel demand growth 5%. Again China will take the lead in growth rates within a growing Asian region. ISSF believes Western Europe be the second largest stainless steel producing region, followed by the Americas and Central and Eastern Europe.

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Steel Demand 2006 – 2010

(average annual growth rate)

European Union (25 nations)	2.5%
CIS	5.0%
NAFTA	1.9%
South America	3.9%
Japan	0.4%
India	7.0%
China	8.4%
South Korea and Taiwan	3.1%
Rest of world	4.9%

Source: International Iron and Steel Institute

CHAPTER 7

Prices will back off record highs but stay elevated

Volatility in metals commodity markets is not unusual but it was extremely pronounced in 2006. The impact of such supply shocks as bad weather or natural disasters has been reduced by growing geographical diversification of production and technological advances. Still, with old-fashioned supply tightness and new-fangled investment interest by speculators, world metals prices increased by 56% in 2006 mostly on the strength prices of spiked copper, zinc, and nickel. As a group, world prices of aluminum, copper, zinc, lead, nickel and tin closed 2006 some 200% higher than the average in the cyclical low-pricing year of 2001.

The minerals that become manufacturing metals are abundant—for example, aluminum accounts for 8%-plus of the earth's crust while iron ore is 5% . The resource base for many metals could, therefore, last hundreds of years; however, prices are high because only a fraction of these supplies can be extracted profitably using the current technology. If recycling was more prevalent worldwide, prices could be dampened since these metals are not destroyed when used and can be transformed into usable products.

Demand remains strong in early 2007 so supply concerns will continue to contribute to high and volatile prices in the near term. Many producers, particularly of copper, zinc, and nickel, have been affected by deteriorating ore quality, production disruptions caused by outages and earth slides, and labor disputes. Moreover, global inventories remain at historically low levels, while the introduction of new capacity has been delayed because of high energy and equipment costs and labor shortages. A surge in investor interest in commodities has come hand in hand with the tightening of market conditions. Looking ahead, despite an expected capacity increase in metals this year, the tight market situation will probably continue through 2008, until sufficient new capacity comes into operation.

A central question is whether the recent run-up in prices will prove lasting, or whether a downward price trend eventually will reassert itself. A review of commodities futures markets by IMF analysts suggest that the current high prices may not be sustained through 2010. The IM economist Sommer projects that “over the next five years, the futures prices of metals will retain only about one-half of the increase accumulated since 2002 (in real terms, metals prices fall by 45% percent from current levels).” Of course, there are differences within the group of metals—for example, aluminum futures prices are seen declining less over time (by 31%) than copper futures prices (49%).

Analysts at Merrill Lynch & Co. see sustained slippage ahead in nickel, as well, because of reduced demand for stainless steel production caused by substitution by nickel-free stainless and heat-treated aluminum. Stainless steel sheet prices rose by better than 20% in 2006 and are expected to rise by 34% more this year. Then, a projected slippage is expected. “We believe there will be an ongoing fall in the usage of nickel in stainless steel (and indeed an impact on the usage of stainless steel itself),” says analyst John Normand in J.P. Morgan's London offices. And that will trigger a falloff in prices by as much as 25% by 2010, forecasts analyst Anton at Global Insight. Interestingly, no such slippage is expected for nickel-based superalloys or titanium—which are seen growing by yet another 8% through 2010 because of elevated demand from buyers in the aerospace and commercial aviation sectors.

The key issue for carbon, alloy and specialty steel is whether supply will remain sufficient to meet rising demand in an environment of continued strong global metalworking growth. No slowdown in offshore supply is expected in coming years. In fact, there are several new steel mills already under development or announced for North

America—from the SeverCorr carbon steel mill in Mississippi to ThyssenKrupp's carbon and stainless mill in the Southeast to North American Stainless' expansion in Kentucky. Based on long-term projections, it appears that global demand is expected to maintain a growth path until 2009 and then slip slightly as the decade ends. Between 2006 and 2010, analysts Anton sees a 5% to 6% slippage in North American market prices for a market basket of nine steel mill products tracked by Purchasingdata.com.

<<BOX>>

Has Speculation Contributed to Higher Commodity Prices?

Investor interest in commodity futures as assets has increased significantly in recent years. Most analysts believe that higher prices induce an increase in speculation. In this scenario, excessive speculation in the commodity futures markets pushes up futures prices and (through arbitrage opportunities) spot prices above levels justified by fundamentals. However, International Monetary Fund economists Sergei Antoshin and Hossein Samiei have written that an alternative view is that increased investor activity, by providing the necessary liquidity, is simply a vehicle to translate changing views about fundamentals into changing prices. In other words, higher prices would be the cause (rather than the effect) of increased investor participation. Actually, nobody is quite sure which position is the most accurate. Look at the copper market, where speculative interest actually has fallen steadily over the past year, during which time sales prices have reached record highs, suggesting that contrary to common perceptions, speculation may not have played a major role in the recent price run-up. For most other commodities, some correlation does appear to be present in the investment activity and pricing peaks or trending turning points. But, there has been more volatility in sales prices in other metals commodities, with no discernible common trend between future prices and the amount of anticipated speculation. So, more study obviously is needed.

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