

Base Metals Update

Focus on Costs and Capital
Special Report

Managing in a Slower Growth Environment

China Dominates: China's demand growth, driven by rapid urbanization, has fed the commodities boom. China's efforts to curb property speculation and inflation have resulted in slowing industrial production and metals demand growth. The government's target for 2012 Gross Domestic Product (GDP) growth is 7.5% compared with actual growth of 9.2% in 2011.

Weak Developed Market Demand: The U.S. construction market is showing slow growth from a low base but the overall recovery is tepid. The eurozone financial crisis persists, resulting in a contraction in metals demand. Japan's recovery, post the earthquake and tsunami of 2011, has stalled, resulting from the deflationary effects of its strong currency.

Cost Escalation: Rapid expansion in some mining districts resulted in competition for labor and contractors as well as supply bottlenecks for equipment, which resulted in cost escalation and inefficiencies. Fitch Ratings expects a consolidating phase in the near term where producers concentrate on optimizing operations for cost control and productivity.

Courting Shareholders: Dissatisfaction with large capital budgets at a time of lower commodity prices and softer demand has resulted in a sell-off in equities. Management appears to be safeguarding dividends while deferring capital expenditures.

Other Stakeholders: The mining boom has attracted proposals for increased royalties and taxes, wage hikes and labor actions, and nongovernmental action to resist the use of scarce resources for mining exploitation. Achieving sustainable returns requires managing these relationships as well as operations and capital budgets.

Financial Profile: Curtailed production, in some instances, and lower metals prices coupled with increased cost pressures will result in lower earnings and operating cash flows relative to 2011. Capital is already being rationed with lower spending and divestiture of noncore assets. Strong liquidity and modest leverage going into this period affords time for producers to manage to a lower growth environment.

Positioning for Next Wave: The trend toward urbanization in the emerging markets and globalization in manufacturing should support continued growth in metals demand. Producers will continue to develop projects reflecting low production costs and low capital costs in higher growth markets to take advantage of future tight supply. Projects requiring substantial investment in infrastructure, in regions without a stable legal and regulatory environment, or areas with limited skilled labor will be a lower priority. Projects in markets with persistent oversupply will not attract capital in the short to medium term but may return to better balance in the longer term.

Related Research

China: "Soft Landing", but
Rebalancing Postponed (July 2012)
2012 Outlook: Base Metals
(December 2011)

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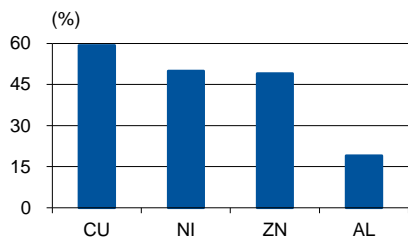
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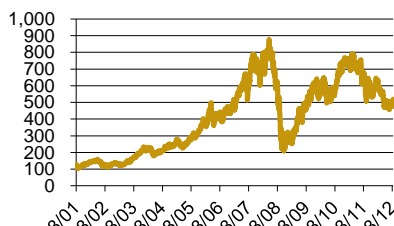
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Difference Between Average and Marginal Cash Costs



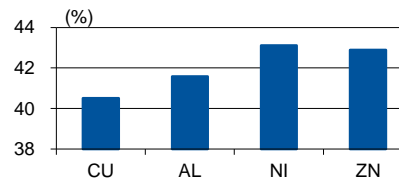
Source: Wood Mackenzie.

HSBC Global Mining Index



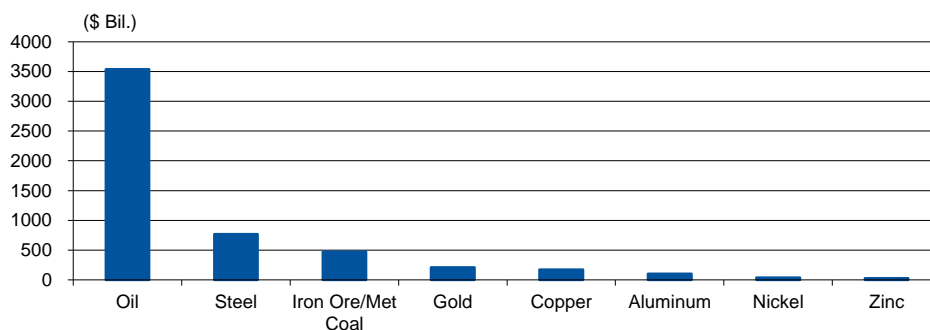
Source: HSBC Global Research.

China's Share of 2011 Global Metals Consumption



Sources: World Bureau of Metal Statistics, International Lead and Zinc Study Group, International Nickel Study Group.

Global Consumption of Select Commodities



Source: Fitch calculations.

Small Markets: Market prices for base metals can be heavily influenced by currency fluctuations, investment demand, and temporary supply disruptions.

Supply Profile Differentiates: Aluminum, zinc, and nickel have excess capacity and prices are currently below marginal cost given excess production. Supply discipline is challenged given dilution in ownership of resources since the advent of the commodities boom.

Steepness of Cost Curve Differentiates: Aluminum has a relatively flat cost curve given the size of new capacity added in China, the Middle East, and Iceland. Nickel and zinc cost curves are somewhat steeper given differentiation in mining and ore characteristics. Copper's cost curve is steeper still given that very high-cost supply is profitable at current prices.

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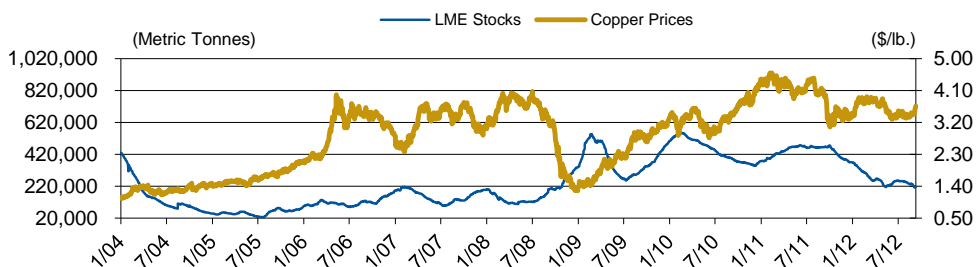
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Related Criteria

[Corporate Rating Methodology, \(August 2012\)](#)

Copper Prices and LME Stocks

(Jan. 2, 2004–Sept. 11, 2012)



Source: London Metal Exchange (LME).

Copper — Supply Constrained

According to the World Bureau of Metals Statistics (WBMS), the global copper market had a deficit of 129,000 tonnes (t) for the first six months of 2012 on consumption of 10.2 million t.

Overall, Fitch expects copper consumption to grow an annual average of 2.0%–3.0% in 2012 increasing to about 4% annually through 2014 based on a soft landing in China and a slow recovery in developed nations.

Fitch expects supply to grow at about 3% annually through 2014 as production recovers from the labor disruptions of 2011 and new projects ramp up, offsetting declining grades in aging mines. Fairly balanced markets are expected for 2012 and 2013, while 2014 could show better supply.

Prices are down from peaks in 2011 following improved supply but prices remain volatile. Longer term, should new supply disappoint while recovery in the industrialized nations strengthens, deficits could persist, requiring higher prices to clear the market. Over the next 12–18 months, prices are expected to remain well above the marginal cost estimated at \$2.15/lb. and EBITDA margins for a medium cost producer should remain above 45%.

China

China’s copper consumption, accounting for about 43% of the world total, has been driven by the building of power-generation facilities, the upgrading of urban infrastructure, growth in automotive manufacture, and opportunistic stocking. China’s copper consumption grew 6% in 2008, 39% in 2009, 4% in 2010, and 7% in 2011. These figures included opportunistic stocking in 2009 given the precipitous fall in copper prices, and destocking in 2010 through May 2011 given very high prices. According to WBMS, Chinese apparent consumption grew by 26% or 905,000 t in the first half of 2012 compared to the same period of 2011. Consumers destocked in the first half of 2011 and restocked in the first half of 2012.

Consumption is expected to grow at an annual rate of about 6% through 2014. While urbanization trends will remain supportive of copper consumption, Fitch expects opportunistic destocking when prices are high.

Fitch expects a period of destocking over the remainder of 2012. Copper importing was being used as a form of short-term trade finance but China is easing its lending restrictions. In addition, the government cut the 3% tax on tolled copper exports in favor of a 17% VAT on the processing fee, which may facilitate exports.

Copper — 2011 Production

	Mil. tonnes	Share (%)
Codelco	1.7	11
Freeport-McMoRan		
Copper & Gold	1.7	10
BHP Billiton	1.0	7
Xstrata	0.9	6
Anglo American	0.6	4
Southern Copper	0.6	4
Rio Tinto	0.5	3

Source: Company figures.

U.S.

The U.S. is the second-largest consumer of copper, accounting for about 9% of world consumption. Roughly 40% of American demand comes from automotive original equipment manufacturers and about 30% comes from construction. U.S. apparent consumption was down 11% in 2008 and a further 18% in 2009, but rebounded by 8% in 2010 and remained virtually flat in 2011. Fitch expects U.S. consumption to grow about 2% annually through 2014, mostly related to the automotive industry.

Europe

Roughly 17% of copper consumption came from the European Union (EU) in 2011. Consumption growth suffered after the advent of the global financial crisis, declining 3% in 2008 and 17% in 2009. Refined consumption in the EU grew 11% in 2010, but was down 3% in 2011 and a similar decline is expected in 2012. Copper consumption in Europe is expected to remain at depressed levels through 2014.

Major Copper Projects Incremental Production

(000 tonnes)	2013	2014
South America	385	511
Africa	215	188
Asia	283	42
North America	25	61
Total	908	802

Source: Fitch analysis, public information.

Supply Constraints

Supply growth has been limited by strikes, natural disasters, declining ore grades, and operating delays. Unplanned disruptions have cut expected mine supply by an average of 6% annually. The world's second largest copper mine, Freeport-McMoRan Copper & Gold Inc.'s Grasberg mine, suffered a work stoppage beginning in mid-September 2011 which lasted three months. In July 2011, the world's largest copper mine, Escondida, owned by BHP Billiton plc, suffered a two-week labor strike. The world's third-largest copper mine, Dona Ines de Collahuasi, owned by Xstrata plc and Anglo American plc (Anglo American), was subject to a 32-day strike beginning Nov. 5, 2010.

Additional mine production of about 1 million t per year is expected in 2013 and 2014 from the ramp-up of new projects in Africa's copper belt, expansion projects, and recovery from operating disruptions. In 2014, substantially all the mine production growth will come from new greenfield projects and these are subject to higher risk of production shortfall. New production from Africa, where infrastructure is less developed, also faces higher risk of shortfall particularly from power disruption.

Fitch expects mine production to be up 2.0%–3.0% in 2012, resulting in a fairly balanced market. Stronger growth thereafter is expected to result in a better supplied market by 2014.

Scrap supply has struggled to fill the gap and is running at 3.5 million t. Scrapage will be limited by the slow turnover of obsolete scrap given the moribund construction market and soft consumer durables markets in the U.S. and Europe.

ICSG Outlook for World Copper

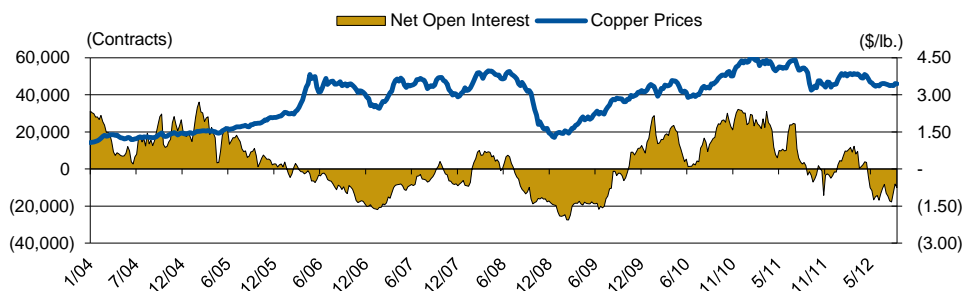
(Thousand t)	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012F	2013F
Mine Production	13,757	14,594	14,922	14,990	15,483	15,524	15,903	16,036	16,035	17,233	18,722
Adjusted Refined Production	15,272	15,918	16,572	17,291	17,933	18,239	18,321	18,957	19,650	20,646	21,760
Copper Usage	15,717	16,833	16,674	17,034	18,196	18,054	18,152	19,384	19,885	20,386	21,188
Refined Production — Usage Balance	(445)	(915)	(102)	257	(263)	185	168	(427)	(235)	(237)	360

t – tonnes. F – Forecast.

Source: International Copper Study Group (ICSG).

CMX High-Grade Copper Futures Commitments Noncommercial

(Jan. 6, 2004–Sept. 4, 2012)



Source: Bloomberg, London Metal Exchange.

Speculation

Speculative demand tends to amplify price moves from supply disruptions (even those of a temporary nature) and thus adds volatility to the market. Hedge fund deleveraging and risk aversion associated with the credit crisis likely contributed to copper’s price slide in the second half of 2008.

Costs

Fitch expects costs to rise with lower grades as well as higher taxes, treatment and refining charges, royalties, and wages. In addition, new supply is being added at the higher end of the cost curve in the African copper belt.

Aluminum — Additional Supply Response Expected

Aluminum’s market dynamics behave more like a processed commodity such as steel rather than another base metal such as copper, nickel, or zinc given the lack of supply-side constraints and short lead times for new capacity. China accounted for 42% of 2011 aluminum consumption and is weighted more heavily to construction use than transportation. The U.S., which accounts for about 10% of world aluminum demand, and the EU, which accounts for about 16%, are more heavily influenced by automotive and other transportation use. Roughly 30%–35% of global aluminum needs are satisfied through the recycling of aluminum.

Production growth has been outsized, resulting in surpluses and high stocks. Going forward, new investment is challenged by low margins, substantial upfront capital costs, and China’s production profile (to remain self-sufficient). Aside from creep, Fitch sees much lower investment in primary aluminum smelters over the next five years compared to the past decade.

Supply has been curtailed most notably in Africa, the Americas, Western Europe, and Australia as a result of low prices. In particular, the marginal cost of aluminum smelting is currently about \$1.13/lb. and the average cost is about \$0.95/lb. With prices to remain below marginal costs, Fitch expects more cuts to be announced over the next six months.

Fitch expects global demand to continue to grow at an average of 5%–6% annually but for the market to show persistent though shrinking surpluses into 2015. Absent meaningful cuts of high-cost capacity, sustained profitability will be at risk.

Aluminum — 2011 Production

	Mil. tonnes	Share (%)
UC Rusal	4.1	9
Chalco	3.9	9
Rio Tinto Alcan	3.8	9
Alcoa	3.8	9
Norsk Hydro	2.1	5
BHP Billiton	1.2	3

Source: Company figures.

BREE Outlook for Aluminum

(Thousand tonnes)	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012F	2013F
Production	27,850	29,821	32,021	33,967	38,046	39,256	37,180	41,093	44,624	45,554	47,981
Consumption	27,425	29,543	31,703	33,970	37,398	37,020	34,811	39,661	42,386	44,601	47,781
Closing Stocks	3,144	3,033	3,010	2,764	2,960	4,672	6,485	6,501	7,098	8,051	8,252
Weeks Consumption	6.0	5.3	4.9	4.2	4.1	6.6	9.7	8.5	8.7	9.4	9.0

F – Forecast.

Source: The Australian Bureau of Resource Energy and Economics (BREE).

Major Aluminum Projects — Incremental Production

(000 tonnes)	2013	2014
China	2,502	2,644
India	411	585
GAC/Gulf Region	181	894
Total	3,396	4,123

Source: Fitch analysis, public information.

China

Henan province produces about 25% of China's aluminum and it is the highest cost province in the country as a result of power costs. Roughly 60% of capacity relies on grid power which is 24% higher than China's average. Currently, 0.8 million t of the 4 million t of capacity is idled and a further 0.5 million t may be cut by year end. The provincial government has offered a 12% discount on power so long as aluminum prices are below RMB 17,500/t (\$1.26/lb. or \$1.09/lb. excluding VAT). The difference would be repaid when prices recover. Some smelters would be under water at \$1.09/lb. and be unable to repay amounts due at such time. In addition, the size of the discount is not sufficient to make the smelters cost competitive so smelter restarts should be muted.

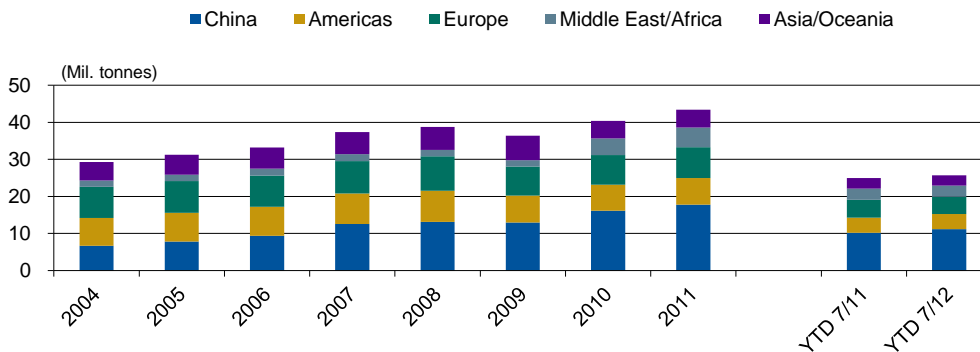
China is building new capacity using stranded coal in the western provinces of Xinjiang, Qinghai, and Gansu. These projects rely on captive power plant builds to reduce operating costs to about the second quartile of the global cost curve. Depending on the timing of the power builds, there is 2 million–3 million t of capacity ramping up annually over the next five years.

China's production is also challenged by reliance on imported bauxite, mainly from Indonesia. The 20% export tax there is expected to push the cost of aluminum up \$30/t.

Middle East

Aluminum production in the Middle East grew 12.5% to 4.1 million t in 2011 as the smelters of Sohar Aluminium in Oman (20% owned by Rio Tinto plc [Rio Tinto]) and Qatalum in Qatar (49% owned by Hydro Aluminium A.S.) ramped up to full production. Emirates Aluminium Co. (EMAL) also started production in 2010 with planned capacity of 750,000 t in 2011. These projects are expected to result in an increase in production to 4.5 million t in 2012. The next projects in the area will be Ma'aden at 740,000 t, due to begin production in 2013, and the second phase of the EMAL project at 700,000 t, due to be completed in 2013–2014.

Global Aluminum Production

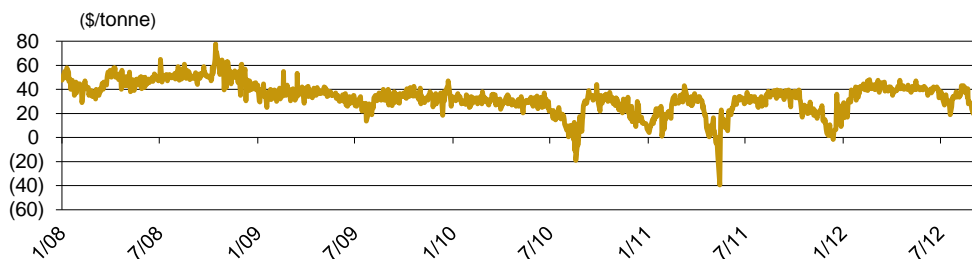


YTD – Year to date.

Source: International Aluminium Institute.

Aluminum Three-Month Spreads

(Jan. 2, 2008–Sept. 12, 2012)



Source: London Metal Exchange.

Financing Deals

Aluminum consumption contracted sharply in the fourth quarter of 2008, resulting in a substantial build in stocks and a precipitous fall in prices. This gave rise to stock financing transactions. The transactions were likely initially put in place as producers sold material to trading houses and banks to raise working capital during the financial crisis. The profitability of these trades is influenced by financing costs, warehouse availability, storage costs, and the spread between the cash price and the price up to 15 months forward. The market has generally been in contango with some short squeezes. An investor buying aluminum for cash and selling it in December 2013 makes over 5% before financing and storage costs.

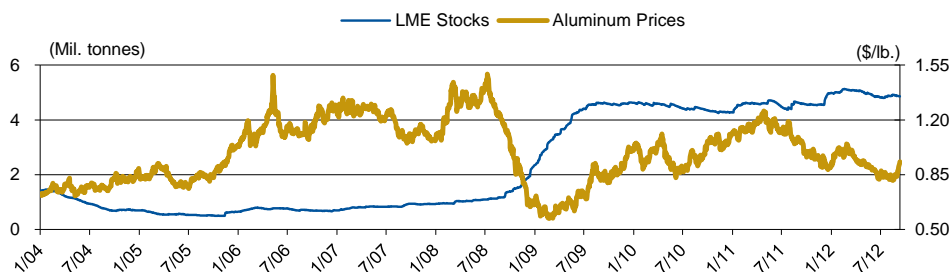
The premium over the LME price for physical metal has increased to over 10%, which should challenge the returns on inventory-financing transactions.

China's imports of aluminum are influenced by the arbitrage between prices on the London Metal Exchange (LME) and the Shanghai Futures Exchange (SHFE). Generally, LME prices have to be roughly 20% lower than SHFE prices to interest importers.

Chinese imports have also been influenced by domestic credit tightness. Traders can use letters of credit to import aluminum and resell the metal for cash, thereby obtaining short-term credit which can be re-lent at much higher rates. As China eases, demand from this source should weaken.

Aluminum Prices and LME Stocks

(Jan. 2, 2004–Sept. 11, 2012)



Source: London Metal Exchange (LME).

High Stocks

Aluminum stocks on exchanges were 4.9 million t at Sept. 12, 2012 and stocks at producers were 2.3 million t at July 31, 2012, representing about nine weeks of current estimated annual consumption. Between 60% and 80% of LME stocks (4.9 million t at Sept. 12, 2012) are estimated to be tied up in financing transactions. While there has been much discussion concerning the short-term stock bottlenecks related to LME load-out regulations, which require the ability to ship a minimum of 3,000 t/day, this metal could become available when interest rates rise, spot prices rally enough to offset the costs of breaking the contracts, or the futures curve flattens to remove the incentives for new transactions.

Nickel — Cuts to Nickel in Pig Iron

Nickel's primary use is in the manufacture of stainless steel (65%), which in turn is used in kitchen appliances (34%), autos (15%), and construction (12%). The first six months of 2012 produced a 56,000 t surplus according to WBMS. Nickel prices are currently below marginal cost (estimated at \$9.00/lb.) and below average costs for nickel in pig iron (NPI) producers (estimated at \$7.50/lb.).

Demand for stainless steel has been softening since the second half of 2011 and is expected to be fairly flat in 2012. According to the International Stainless Steel Forum, first quarter 2012 global stainless steel production was down 2.7% compared with the first quarter of 2011, which was a record year. Fitch expects stainless steel production to remain at current levels through 2013 absent restocking through the supply chain.

In response to the global financial crisis, an estimated 20% of nickel mine capacity was idled by mid-2009. Mine supply gained over 10% per year in 2010 and 2011 with restarts, resolution of labor actions and new capacity additions. New mine production representing 25% of mine supply by 2017 is expected to come from ferro nickel and laterite deposits currently under development. New development has been dynamic with a willingness to delay in low-price environments.

Fitch believes the nickel market will be fairly balanced through 2013 with NPI production curtailments but the market is at risk of oversupply. There has been a dearth of additions to the project pipeline, which should result in tighter supply beyond 2017. Fitch expects nickel producers at average costs to earn EBITDA margins of 15% on average over the next 18–24 months.

Nickel — 2011 Production

	000 tonnes	Share (%)
Norilsk	295.3	18
Vale	241.5	15
BHP Billiton	144.7	9
Jinchuan Group	130.0	8
Xstrata	105.9	6
Eramet	54.4	3
Anglo American	29.1	2

Source: Company figures.

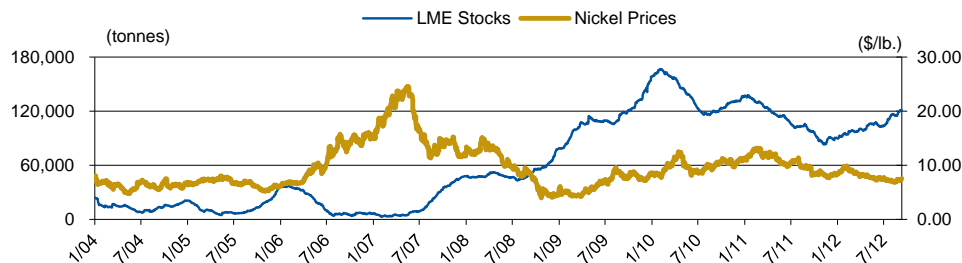
Major New Nickel Projects Incremental Capacity

(000 tonnes)	2013	2014	2015
High Pressure Acid Leach			
VNC (Goro)	11	10	12
Ramu	9	9	3
Ambatocoy	16	14	5
Ravensthorpe	13	6	0
Ferro Nickel			
Onca Puma	17	13	0
Barro Alto	8	6	1

Source: Fitch analysis, public information.

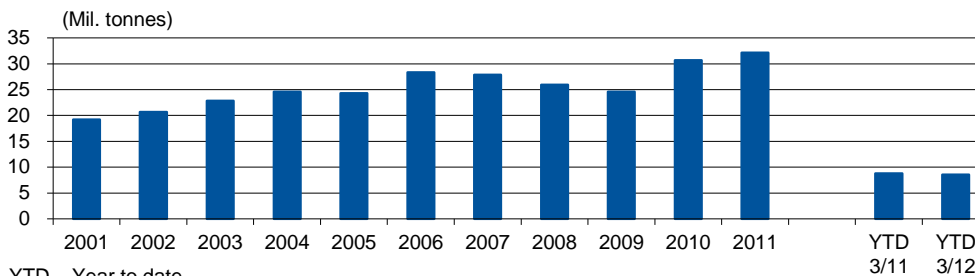
Nickel Prices and LME Stocks

(Jan. 2, 2004–Sept.11, 2012)



Source: London Metal Exchange (LME).

World Stainless Steel Production



Nickel in Pig Iron Dynamics

Roughly 60% of China's nickel production is sourced from NPI. The economics of NPI depend on iron ore prices (currently relatively low) and freight rates (currently relatively low), as well as smelting costs (can involve coking coal, which is relatively stable) and nickel grades. Producers use existing blast furnaces and nickel laterite ore mostly purchased from Indonesia (60%) and the Philippines. Stainless steel produced from NPI is of lesser quality than that produced with nickel metal and is in lower demand when iron prices and steel prices are low as is currently the case.

NPI production has been cut given that prices are below costs for a significant portion of production. Indonesian ore costs have been subject to a 20% export tariff since June 2012 and current plans include a ban on exports in 2014. Ore has been stockpiled ahead so that the impact, especially with reduced production, will be delayed.

Laterite

Laterite projects are expected to account for half of the growth in new nickel supply. Laterite deposits have complex metallurgy and rely on high-pressure acid leaching, which has been problematic and costly to develop. BHP Billiton plc shut its Ravensthorpe nickel laterite mine in Western Australia just months after commissioning. First Quantum Minerals Ltd., current owner of the project, announced commercial production in December 2011 and the project is operating well. Vale SA's (Vale) Vale New Caledonia project (formerly Goro) is the next large-scale laterite deposit to depend on this technology. Ramp-up of the 60,000 mt annual production project has been repeatedly disrupted, most recently by an incident at the acid plant. Operations will be halted until at least the fourth quarter. The Ambatovy project is delayed by delays in obtaining an operating permit.

INSG Outlook for Nickel

(Thousand t)	2004	2005	2006	2007	2008	2009	2010	2011	2012F
Primary Nickel Production	1,253.4	1,274.1	1,345.3	1,415.6	1,377.7	1,319.9	1,445.6	1,600.0	1,690.0
Primary Nickel Usage	1,246.7	1,248.5	1,401.1	1,322.7	1,286.1	1,240.6	1,463.7	1,570.0	1,640.0
Balance	6.7	25.6	(55.8)	93.0	91.5	79.2	(18.1)	30.0	50.0

t – tonnes. F – Forecast.

Source: International Nickel Study Group (INSG).

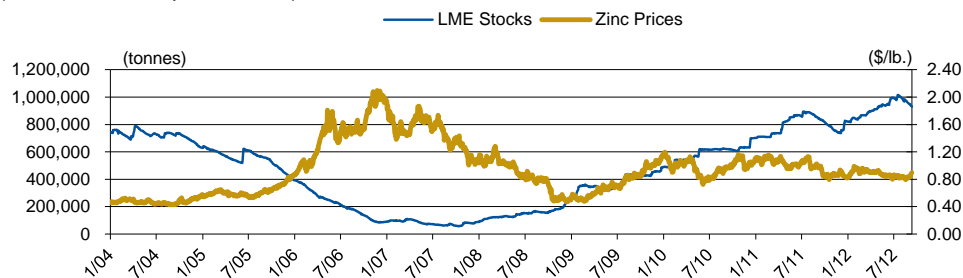
**Zinc —
2011 Production**

	Mil. tonnes	Share (%)
Vedanta Resources	1.4	10
Xstrata	1.0	7
Teck Resources	0.9	7
China Minmetals	0.6	5
Glencore	0.6	4
Anglo American	0.3	3

Source: Company figures.

Zinc Prices and LME Stocks

(Jan. 2, 2004–Sept. 11, 2012)



Source: London Metal Exchange (LME).

Zinc — Balance Longer Term

The primary end uses of zinc are construction (45%) and transportation (25%). China remains dominant at 43% of global demand.

The WBMS reported zinc surpluses of 264,000 t for the first five months of 2012; 551,000 t for 2011; 415,000 t for 2010; and 254,000 t for 2009. Some portion of excess stocks is tied up in financing transactions.

Fitch expects excess capacity to persist through 2013 with a likelihood of surplus production over that period. Longer term, closure of large mines reaching the end of reserves will help bring the market into balance. Fitch expects prices to remain above marginal cost, estimated at \$0.70/lb., and EBITDA margins for average-cost producers of 20%.

Zinc — Mine Closures

	Thousand tonnes	Year
Brunswick	200	2013
Perseverance	110	2013
Century	500	2014
Skorpion	165	2014

Source: Company figures.

Appendix A: Financial Profiles

Issuers

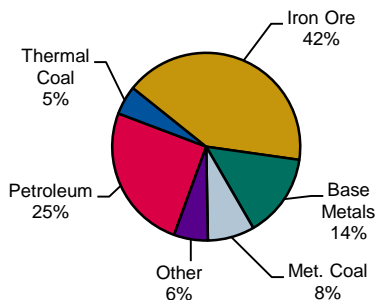
Company	IDR	Operating EBITDAR (\$ Mil.)			Operating EBITDAR Margin (%)			FFO Adjusted Gross Leverage (x)			CFO Margin (%)			FFO Interest Coverage (x)		
		2009	2010	2011	2009	2010	2011	2009	2010	2011	2009	2010	2011	2009	2010	2011
BHP Billiton plc ^a	A+	20,667	25,572	38,748	41.2	48.4	54.0	1.0	0.8	0.5	37.6	33.9	43.3	29.8	38.8	62.8
Rio Tinto plc	A-	11,043	22,748	27,164	26.4	41.2	43.9	2.4	0.8	1.0	23.0	34.0	34.0	8.6	29.1	34.0
Vale S.A.	BBB+	9,359	26,313	33,912	40.1	58.1	57.5	3.5	1.0	0.9	30.6	43.4	41.5	6.1	9.7	23.3
Anglo American plc	BBB+	6,327	10,685	11,687	30.3	38.2	38.2	2.8	1.8	1.5	17.2	25.5	29.1	7.1	10.0	12.2
Aluminum Corporation of China Limited	BBB+	642	1,673	1,520	6.2	9.2	6.6	18.6	7.1	8.9	-5.6	3.4	-1.3	0.9	3.1	3.1
Freeport McMoRan Copper & Gold, Inc.	BBB	7,810	10,260	10,637	51.9	54.1	50.6	1.0	0.7	0.6	27.8	32.7	31.7	7.5	13.1	15.7
Teck Resources Limited	BBB	3,369	4,267	5,590	46.0	45.7	49.6	2.1	1.6	1.5	38.9	29.4	34.4	5.9	5.9	8.3
Southern Copper Company	BBB	1,808	2,927	3,914	48.4	56.8	57.4	0.9	1.3	1.0	25.8	36.9	30.7	14.3	12.8	15.0
Alcoa Inc.	BBB-	608	2,965	3,549	3.3	14.1	14.2	13.5	3.5	3.6	6.6	10.7	8.8	1.0	6.0	4.7
OJSC MMC Norilsk Nickel	BB+	4,382	7,355	7,295	51.3	57.6	49.5	1.3	0.5	1.0	40.3	43.2	33.3	30.3	63.8	55.4
Vedanta Resources plc ^b	BB+	2,296	3,567	4,026	29.0	31.2	28.7	3.7	3.1	4.8	21.3	27.9	15.2	4.2	4.7	3.1

^aJune 30, 2010 fiscal year end. ^bMarch 31, 2011 fiscal year end.

Source: Company information, Fitch calculations.

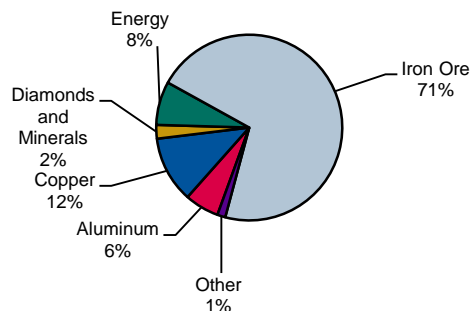
Appendix B: Segment Earnings for Diversified Miners

BHP Billiton — EBITDA
(LTM Ended Dec. 31, 2011)



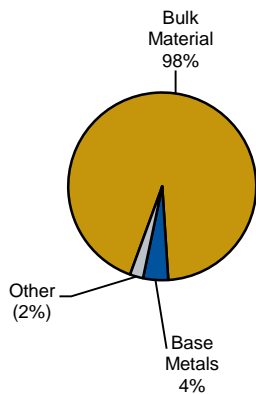
Source: Company information, Fitch calculations.

Rio Tinto — EBITDA
(Fiscal Year Ended Dec. 31, 2011)



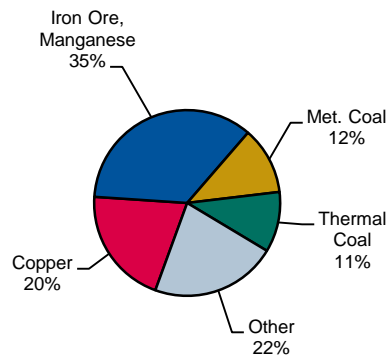
Source: Company information, Fitch calculations.

Vale — Operating Income
(Fiscal Year Ended Dec. 31, 2011)



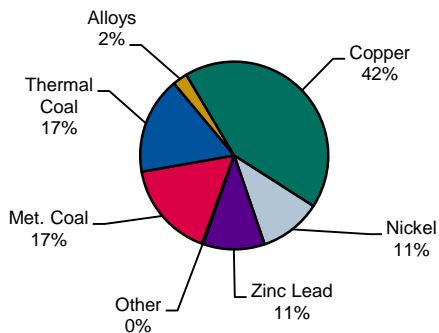
Source: Company information, Fitch calculations.

Anglo American — EBITDA
(Fiscal Year Ended Dec. 31, 2011)



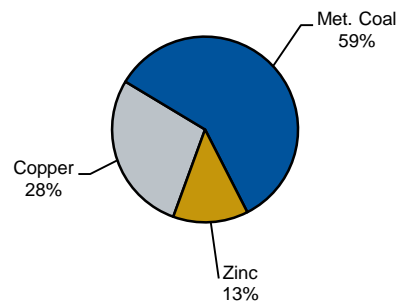
Source: Company information, Fitch calculations.

Xstrata — EBITDA
(Fiscal Year Ended Dec. 31, 2011)



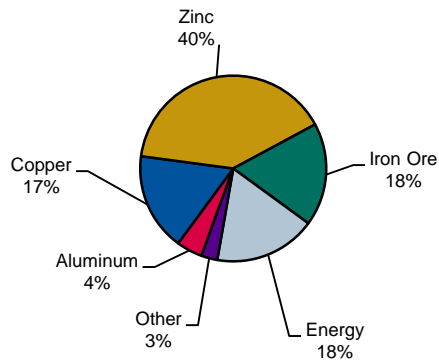
Source: Company information, Fitch calculations.

Teck Resources — Operating Profit before Depreciation
(Fiscal Year Ended Dec. 31, 2011)



Source: Company information, Fitch calculations.

Vedanta Resources — EBITDA
(Fiscal Year Ended March 31, 2012)



Source: Company information, Fitch calculations.

Appendix C:

Capital Expenditures of Mining and Metals Producers

Issuer	2008	2009	2010	2011	2012G
Vale S.A.	8,972	8,096	12,647	16,075	21,411
BHP Billiton Plc	9,152	8,753	9,884	13,883	20,800
Xstrata plc	4,796	3,568	5,819	8,108	7,200
Rio Tinto Plc	8,574	5,388	4,591	12,335	16,000
Anglo American Plc	5,146	4,607	5,280	6,203	5,500
Vedanta Resources Plc ^a	2,800	2,362	2,491	2,796	3,100
Freeport-McMoRan Copper & Gold Inc.	2,708	1,321	1,412	2,534	4,000
Alcoa Inc	3,438	1,622	1,015	1,287	1,350
Teck Resources Ltd. ^b	876	519	786	1,251	2,315

^aFor the fiscal years ended March 31, 2009, 2010, 2011, 2012, 2013. ^bConverted from CAD at USD0.94/CAD1.00 in 2008, USD0.88/CAD1.00 in 2009, USD0.97/CAD1.00 in 2010, USD1.02/CAD1.00 in 2011, and USD0.98/CAD1.00 in 2012. G – Guidance.

Source: Company public information.

Appendix D:

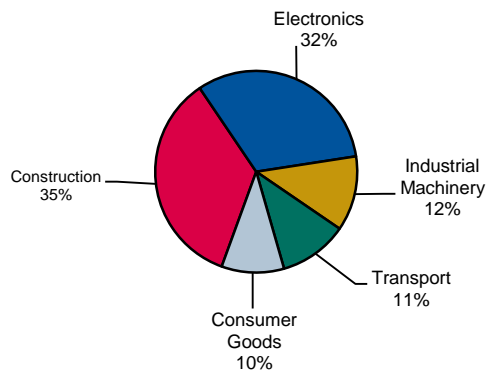
Metals Price Expectations

(\$/Lb.)	Spot	2H 2012	2013	2014 ^a	2015 ^a
Copper	3.67				
Consensus Median		3.57	3.67	3.40	3.18
Fitch Base Assumption		3.40	3.40	2.72	2.72
Forward		3.58	3.67	3.65	3.63
Aluminum	0.95				
Consensus Median		0.92	1.02	1.11	1.09
Fitch Base Assumption		0.86	0.98	1.07	1.07
Forward		0.91	0.97	1.02	1.06
Nickel	7.55				
Consensus Median		7.99	8.56	9.07	9.98
Fitch Base Assumption		7.71	8.16	8.39	8.39
Forward		7.43	7.61	7.69	7.73
Zinc	0.92				
Consensus Median		0.91	1.00	1.11	1.25
Fitch Base Assumption		0.82	0.86	0.93	0.93
Forward		0.88	0.93	0.96	0.97

^aFitch's base assumptions for the long-term copper price.
Source: Fitch, Bloomberg as of Sept. 13, 2012.

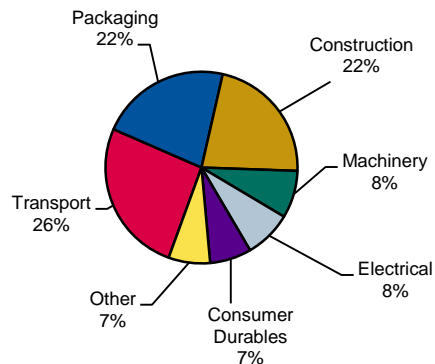
Appendix E: Uses of Base Metals

Uses of Copper



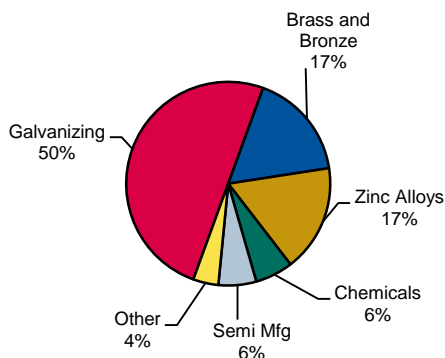
Source: Brook Hunt Database; RMG.

Uses of Aluminum



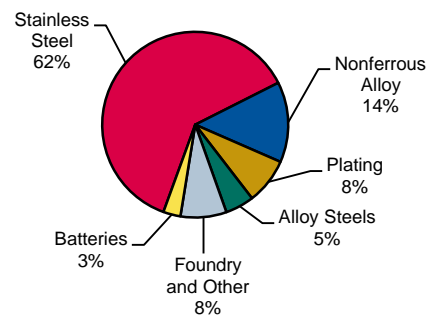
Source: London Metal Exchange.

Uses of Zinc



Source: International Lead and Zinc Study Group.

Uses of Nickel



Source: London Metal Exchange.

Appendix F:

China's Net Imports

(000 tonnes)	2008	2009	2010	2011	YTD July 31	
					2011	2012
Aluminum	12	1,451	36	143	69	265
Aluminum Alloy	(592)	(21)	(426)	(576)	(319)	(255)
Alumina	4,542	5,072	4,255	1,805	1,033	2
Scrap Aluminum	2,154	2,625	2,852	2,684	1,479	1,460
Bauxite	25,929	19,802	30,360	45,235	24,614	27,032
Copper	1,360	3,112	2,882	2,679	1,128	1,931
Copper Scrap	5,574	3,996	4,362	4,686	2,628	2,654
Copper Concentrate	5,194	6,144	6,475	6,391	3,399	3,949
Nickel	107	214	109	180	93	67
Nickel Concentrates	12,369	16,572	25,079	48,256	21,326	32,887
Zinc	143	753	280	571	147	247
Zinc Concentrates	2,396	3,847	3,242	2,932	1,621	1,016

Source: Bloomberg, China's General Administration of Customs.

Appendix G:

Fitch Ratings' Public Ratings of Mining and Base Metals Producers

Issuer	Long-Term Rating	Outlook	Watch	Analyst
Alcoa Inc.	BBB-	Stable	—	Monica Bonar
Aluminium Corporation of China	BBB+	Stable	—	Su Aik Lim
Americas Mining Corporation (AMC)	BBB	Stable	—	Jay Djemal
Anglo American Plc	BBB+	Stable	—	Peter Archbold
BHP Billiton Plc	A+	Stable	—	Peter Archbold
Clarendon Alumina Production Limited (CAP)	B-	Stable	—	Jay Djemal
Corporacion Nacional del Cobre de Chile (Codelco)	A+	Stable	—	Jay Djemal
Freeport-McMoRan Copper & Gold Inc.	BBB	Stable	—	Monica Bonar
Grupo Mexico, S.A. de C.V. (Grupo Mexico)	BBB	Stable	—	Jay Djemal
Molibdenos y Metales S.A. (Molymet)	BBB	Stable	—	Jay Djemal
OJSC MMC Norilsk Nickel	BBB-	Stable	—	Peter Archbold
Rio Tinto Plc	A-	Stable	—	Peter Archbold
Southern Copper Corporation	BBB	Stable	—	Jay Djemal
Teck Resources Ltd.	BBB	Stable	—	Monica Bonar
Vale S.A.	BBB+	Stable	—	Joseph Bormann
Vedanta Resources Plc	BB+	Positive	—	Tahera Kachwalla

Source: Fitch Ratings.

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