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cutting through complexity

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Copper

Daniel Camilleri

Commodity Lead – Copper

KPMG in Chile

E: danielcamilleri@kpmg.com

As we go to print copper prices are steady at about US\$3.70/lb with underlying support primarily driven by demand from continued Chinese government expenditure on construction and infrastructure projects. Overall copper demand is expected to increase 3.6 percent in 2013 and 4.3 percent in 2014.

This paints a rosy picture to support the considerable investment in new and existing project expansion (refer Table 3). But only if it were that easy - We are seeing the investment pipeline putting considerable pressure on labor costs and contractor availability. Added to this, the new mine and expansion projects place an additional burden on supporting infrastructure including electricity and water availability putting further upward pressure on these input costs and attracting a higher social, community and environmental cost.

2013 will be an interesting year where the market balance is expected to shift towards excess of supply (refer Figure 2). Those expansion projects that are burdened with these additional labor, contractor and infrastructure issues will feel further pain as with the overall supply growth, pricing is expected to face downward pressure.

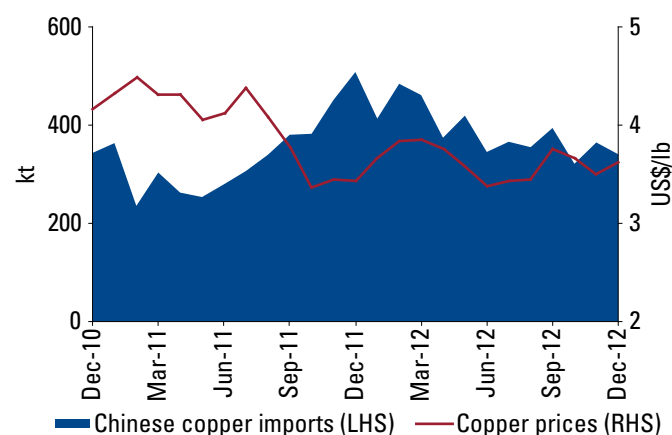
Commodity outlook

During 4Q12, average copper prices increased 2 percent q-o-q to US\$3.56/lb from its 3Q12 average of US\$3.50/lb underpinned by the support offered by positive indicators from the central banks in the US, Europe and Japan. This price appreciation of copper has also partly been driven by increased demand coming from China, US and South Korea which have been the main demand centers during 2012. However, over 2012 as a whole, the copper prices reduced 10 percent y-o-y to average around US\$3.60/lb from its 2011 levels of US\$4.00/lb.

China is expected to continue as the main demand driver globally. Announcements from China that it intends to accelerate infrastructure projects worth US\$157 billion in 2012 along with ongoing monetary easing is expected to help drive improvements in its copper demand. Apparent

consumption of copper in China is expected to increase by 5 percent in 2013 driven mostly by higher demand coming from its building and construction industry. However, this growth rate would be lower than 8 percent growth rate that was seen in the country in 2012; anticipating destocking of copper inventories that China would have built in 2012. Nevertheless, China is expected to remain by far the biggest consumer of Copper.

Figure 1: China copper imports and LME copper prices, December 2010–12

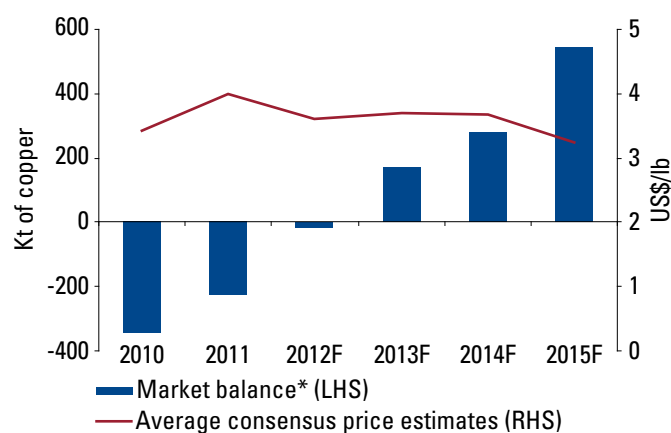


Source: China Customs, EIU, IMF, World Bank

The US market is expected to grow modestly in 2013 driven by demand from the country's automotive sector and ongoing recovery in the domestic housing market. Although the Japanese government has been taking measures to boost the country's economy, Economist Intelligence Unit expects the steps to fall short of reviving the economy from the impact of 2011 earthquake. Besides, with continued weak exports in the semi-conductors and electronic-parts during 2012, the Japanese copper markets are expected to continue their struggle in 2013. Elsewhere in Asia, higher demand is expected from South Korea and India. The Middle East is emerging as an increasingly important region for growth driven largely by the infrastructure development in the region. Demand from the EU is expected to remain subdued in 2013, but is expected to grow modestly in the longer run by 2014.

From 2013, increase in production is expected to outpace the increase in demand for copper leading to an accumulation of global copper stocks. As per market balance estimates, global copper stocks are expected turn positive by 2013 and onwards on account of supply exceeding the copper demand. This market surplus for copper is expected to drive global copper prices down from 2014 onwards.

Figure 2: Market balance and prices of copper, 2010–15F

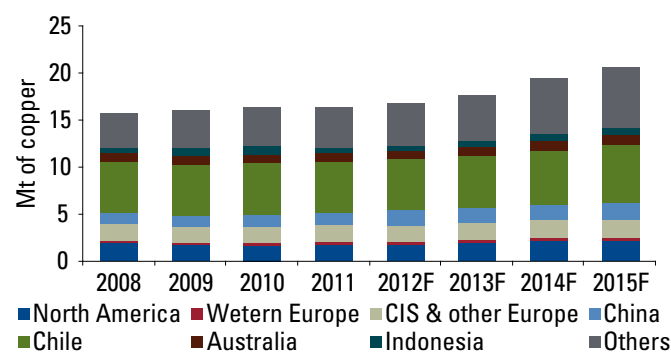


Source: Credit Suisse, Consensus price estimates of Macquarie research, Deutsche bank, JP Morgan, BREE and Credit Suisse

*Market balance represents the difference between the supply and demand of Copper. A positive market balance indicates the supply is more than the demand whereas a negative market balance indicates demand exceeding supply.

Supply and demand

Figure 3: Global production of mined copper, 2008–15F

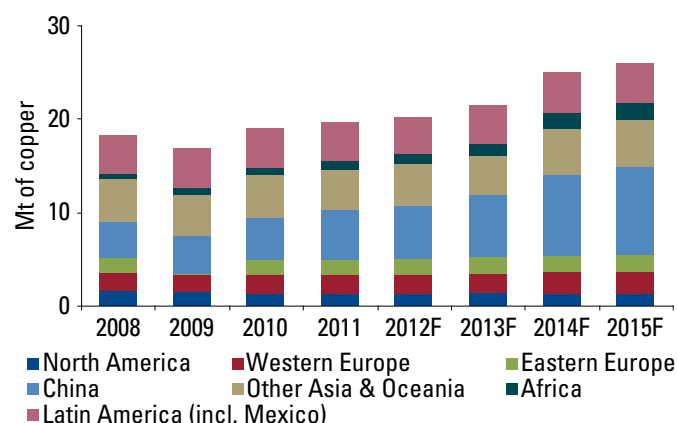


Source: Credit Suisse, KPMG analysis

- World copper mine production increased 2 percent y-o-y to 16.60Mt in 2012. Production from Chile, the world's largest copper producer, increased 4 percent y-o-y to 5.48Mt, after a lower mine production in 2011 due to a series of labor disputes, extreme weather and declining ore grades.
- World refined copper production increased 3 percent y-o-y to 20.26Mt in 2012. China's refined copper production increased 9 percent y-o-y to 5.66Mt in 2012 due to continued expansion in refining capacity. Japan's production of refined copper is also expected to have grown due to its domestic industry recovering from the effects of the 2011 tsunami. However, copper production from Zambia is expected to have decreased 6 percent y-o-y to 0.82Mt in 2012.
- A substantially higher production was observed at existing Chilean copper mines such as BHP Billiton's Escondida and Anglo American's Los Bronces mine in 2012. Vale SA's Salobo mine in Brazil (0.10Mt annual production) and Xstrata's Antapaccay Mine (0.14Mt annual production) in Peru also commenced production in 2012. In addition, commissioning activities started at Boseto Copper mine, which would be the largest copper mine in Botswana and is expected to produce 0.36Mt of copper annually.

- Global mine production in 2013 is expected to increase 6 percent y-o-y to 17.61Mt. Mine production from Chile is expected to increase 1 percent y-o-y to 5.53Mt in 2013 and then 4 percent y-o-y to 5.75Mt in 2014. Asian mine production is expected to increase due to the commissioning of Turquoise Hill's Oyo Tolgoi mine in Mongolia and the mining of higher ore grades at Freeport McMoran's Grasberg mine in Indonesia. Zambian mine production is expected to increase due to production ramp-up activities at Vedanta's Konkola and Nchanga mines. In 2013, increased availability of copper concentrates is expected to support higher global production of refined copper. Production is expected to increase 6 percent y-o-y to 21.38Mt.

Figure 4: Global production of refined copper, 2008–15F

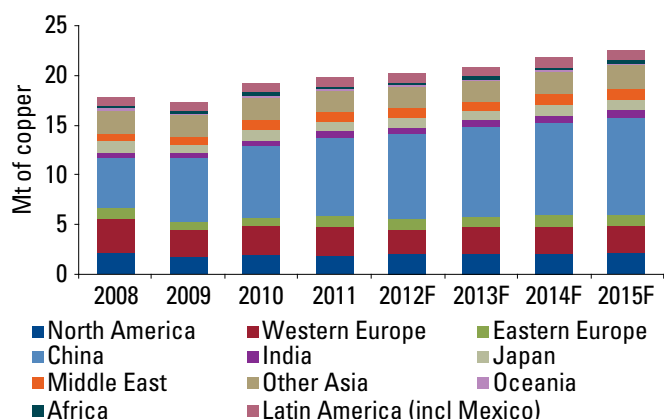


Source: Credit Suisse, BREE, KPMG analysis

- Global consumption of copper increased 2 percent y-o-y to 20.38Mt in 2012, led by China where the refined copper consumption increased 8 percent y-o-y to 8.53Mt in 2012. Copper consumption in North America increased 6 percent y-o-y to 2.01Mt. Together these two economies contributed towards higher world copper consumption in 2012. By contrast, refined copper consumption in Europe declined 9 percent y-o-y to 3.64Mt in 2012 due to the existing economic conditions in the region.
- Global consumption of copper is expected to grow 3 percent y-o-y to 20.93Mt in 2013. Chinese refined copper demand in 2013 is expected to increase 5 percent y-o-y to 8.96Mt driven by expected acceleration in infrastructure project development and the current ongoing monetary easing in the country. This is expected to support the real copper demand in China during 2013. Refined copper consumption in North America is expected to increase 1 percent y-o-y to 2.04Mt.
- The US housing sector is expected to drive the copper demand in the country. The sector has shown strong signs of recovery in the previous quarters, with building permits and housing prices increasing through 2012. Given the current rates of construction and depressed household formation rates in recent years, the demand from copper is expected to grow in the US in 2013 and 2014.
- Many important emerging copper consuming markets such as Brazil, Korea and Taiwan saw weakened demand in 2012. However, most of these economies are expected to show signs of sequential improvement in 2013. Such economies tend to be quite sensitive to conditions in the

US, Europe, and China. Thus, with expected improvement in demand from the US and China, a significant demand improvement from these countries may be expected in 2013.

Figure 5: Global consumption of refined copper, 2008–15F



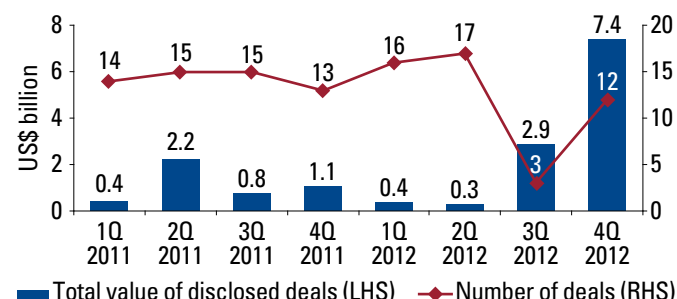
Source: EIU, BREE, KPMG analysis

Key developments

Ownership changes

During 4Q12, the total value of announced deals in the copper industry was US\$7.4 billion, compared to US\$2.9 billion in 3Q12, representing a q-o-q increase of about three times. (Refer to Figure 6). The number of deals in 4Q12 increased to 12, compared to three in 3Q12.

Figure 6: Value of announced deals in copper industry



Source: Intierra, Mergermarket, KPMG analysis

Table 1: Copper deals in 4Q12

Date announced	Target	Target nation	Acquirer	Acquirer nation	Status	Value of transaction (US\$ million)	Stake (%)
20-Dec-12	Mt. Angelo North copper deposits	Australia	Cazaly Resources	Australia	Closed	0.1	1.5
17-Dec-12	Interest in Iron Blow, Mount Bonnie, Mount Evelyn, Maud Creek, Mt. Ellison and Yeuralba properties of Crocodile Group Corp.	Australia	Pitchblack Resources Ltd.	Canada	Announced	4.6	90.0
17-Dec-12	Inmet Mining Corporation	Canada	First Quantum Minerals	Canada	Announced	5100.0	100.0
16-Dec-12	Stuart Shelf Joint Ventures	Australia	Straits Resources Ltd	Australia	Announced	0.4	100.0
16-Dec-12	Treasure Development Ltd.	Cyprus	Brazilian Metals Group Limited	Brazil	Announced	1.7	100.0
13-Dec-12	Mount Suckling project	Papua new guinea	Suckling Minerals Limited	Papua New Guinea	Announced	0.1	90.0
11-Dec-12	Altair project	Chile	Estrella Resources Limited	Australia	Announced	NA	100.0
10-Dec-12	Kagara Ltd (North Queensland Central assets)	Australia	Snow Peak Mining Pty Ltd	Australia	Announced	40.0	100.0
6-Dec-12	A consortium led by the Industrial Development Corporation of South Africa Limited and Hebei Iron & Steel Group Co. Ltd	South Africa and china	Palabora Mining Company Limited	South Africa	Announced	630.0	74.5
6-Dec-12	Eurasian Natural Resources Corporation Plc	UK	Camrose Resources Limited	Congo	Announced	550.0	49.5
2-Nov-12	Anglo American Sur S.A.	Chile	Mitsui & Co., Ltd.	Japan	Announced	998.0	4.5
24-Oct-12	Cupric Canyon Capital, LLC	Canada	Hana Mining Ltd.	Canada	Announced	67.5	81.5

Source: Intierra, Mergermarket, KPMG analysis

Regulatory updates

Table 2: List of recent regulations in copper industry

Country	Regulation	Description
Brazil	Extraction tax reduced by two thirds	Brazil's northern state of Para has reduced the extraction tax on mining activity from three UPFs (Standard tax unit) to one UPF for each extracted tonne of ore.

Future projects

Table 3: Cross-section of major copper projects**

Project	Country/ Region	Operators/Owners	Commodities	Start year	Stage	Copper production (ktpa)	Capex (US\$ million)
Oyu Tolgoi¹	Mongolia	Ivanhoe Mines Ltd.	Copper, gold	2013	Construction	NA	6,197
Tampakan Deposit	Philippines	Xstrata plc	Copper, gold	2016	Feasibility study	375	5,900
Las Bambas Mine	Peru	Xstrata plc	Copper, molybdenum	2015	Construction	400	5,200
El Pachon Deposit	Argentina	Xstrata plc	Copper	2016	Feasibility study	400	4,000
Cobre Panama Deposit²	Panama	Inmet Mining Corporation	Copper, molybdenum, gold, silver	NA	Construction	NA	6,181
Sierra Gorda Project³	Chile	KGHM Polska Miedz S.A.	Copper, molybdenum, gold	2014	Construction	220	2,877
Rio Blanco Deposit	Peru	ZiJin Mining Group Co., Ltd.	Copper, molybdenum	NA	Feasibility study	191	1,440
Relincho Deposit	Chile	Teck Resources Limited	Copper, molybdenum	2017	Feasibility study	180	3,900
Ministro Hales Mine project	Chile	Codelco	Copper, silver	2013	Construction	170	2,300
Galeno Mine⁴	Peru	China Minmetals Corporation	Copper, gold	2014	Feasibility study	144	2,500
El Teniente	Chile	Codelco	Copper	NA	Construction	NA	3,200
Chuquicamata (Underground)	Chile	Codelco	Copper	NA	Feasibility	NA	3,828
El Morro Project	Chile	Goldcorp Inc.	Copper, gold	2015	Feasibility study	91	4,692
Northparkes (step change expansion)	Australia	Rio Tinto	Copper	2016	Approved	90	500-1000
Hillside	Australia	Rex Minerals	Copper, Gold	2015	Approved	70	800
Rosemont Deposit	United States	Augusta Resource Corporation	Copper, molybdenum, gold, silver	2014	Feasibility study	NA	1,226
Cerro Casale Deposit	Chile	Barrick Gold Corporation	Gold, copper, silver	2014	Feasibility study	NA	6,000
Escondida organic growth project 1	Chile	BHP Billiton	Copper, gold, silver	2015	Under Development	Replace Los Colorados concentrator	3,800
Escondida oxide leach area project	Chile	BHP Billiton	Copper, gold, silver	2014	Under Development	Replace existing capacity	721
Bozshakol Copper Deposit	Kazakhstan	Kazakhmys PLC	Copper, Silver	2015	Construction	75	1,800
Aktogay Copper Project	Kazakhstan	Kazakhmys PLC	Copper	2015	Approved	104	2,000

Note: Project names are hyperlinked to source links.

*The above table includes projects with capex exceeding US\$500 million

The list is not exhaustive and contains only a limited number of projects

Source: Intierra, company data

1 The capital cost includes only the cost for Phase 1 (100ktpd) and excludes US\$5,115 for expansion (160ktpd) and US\$1,892 of sustaining capex.

2 The capex of US\$6,181 million includes only the initial capex and does not include sustaining capex (US\$2.92 billion).

3 Technical Report for Sierra Gorda project, 8 June 2011. The capex of US\$2,877 million includes only the initial capex and does not include sustaining capex (US\$975 million) and expansion capex (US\$818 million).

4 Includes the cost of 40Mtpa Copper mine + 260 km Concentrate Pipeline

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