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## **BUOYANT PHYSICAL & INVESTMENT MARKETS FOR COPPER**

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### **Resume**

Through 2012, copper will enjoy bullish physical market fundamentals plus strong investment demand. The refined copper market faces a ~700 kt cumulative physical deficit over 2011-2012. Commodity index fund demand for futures is ~200 ktpy and demand for physical stock from ETFs could prospectively amount to ~200 ktpy also. Over 2010 - 2011 the cumulative commercial deficit looks likely to be 1.5 Mt: 700 kt industrial deficit plus 800 kt investment demand. From 2013, copper production will start to exceed consumption, partly offset by continuing investment demand, however.

### **Section one: demand**

**Slide 1: Copper's existing markets.** Wire and cable is the main market. Electrical applications dominate and there, the threat of substitution is small and growth opportunities exist. In telecom and data cable, there have been huge losses to fibre optics, but future losses will be much smaller. Plumbing tube has also already lost out heavily - to plastic. Copper air conditioner tube remains under threat, as do many other non-electrical applications for copper and alloy mill products.

**Slide 2: New applications for copper in tomorrow's world.** Taken together, new applications will account for 1 Mtpy of copper consumption a decade from now. There are three foci, each of which is driven by the need to reduce carbon emissions and create a stable energy future. These are: transport – electric and hybrid vehicles; power infrastructure – distributed and renewable energy, smart and integrated networks; premise and equipment – enhanced wiring, efficient systems and equipment.

**Slide 3: OECD, non-OECD and global industrial production growth to 2015.** Whilst 2010 witnessed very rapid recovery from the global financial crisis, the period from 2011 through 2015 is likely to see more sedate global growth averaging a little over 4% per annum.

**Slide 4: Refined copper consumption, historically and forecast to 2015.** Over the relatively short period from 2000 to 2009, China grew to dominance as the first-stage copper consumer, absorbing in effect all global growth and displacing some copper use in the rest of the world. From 2010 to 2015, American and European consumption will continue to decline and that of China and the rest of Asia to grow. Consumption will rise from under 20 Mt in 2010 to a little over 23 Mt in 2015.

**Slide 5: To consumption, one has to add investment demand.** This slide is where we begin to set out the *new fundamentals* of a commodities market. On top of 20 Mtpy of physical copper consumption there are two further fundamental sources of demand. One is (prospectively) ~200 ktpy of demand for physical stocks from ETFs. The other is continuing demand for ~200 ktpy of futures contracts bought and rolled by index funds. These forms of demand are satisfied respectively: by physical use (less scrap returned); by the sequestering of physical stock for ETFs; and by the growth of structural short counter-parties to the index fund longs. The last of these might come fundamentally from hedge shorts of owners of extra exchange stocks in a contango market or from extra hedge shorts of producers; failing that, index fund longs must find speculative shorts as counter-parties. For commercial equilibrium, 20 Mt of consumption requires 20.4 Mt of production, with ~200 kt of stock going un-hedged into ETFs and ~200 kt going into hedged stocks.

## **Section two: supply**

**Slide 6: Mine production has peaked in many key countries, but not globally.** Global mine production growth rates fell from 4% p.a. over 1991-2000 to 3% p.a. over 2001-2005 and 1% p.a. over 2006-2010. Declining production in many existing producing regions is part of the picture. In the list on this slide, the peak in Chile in 2007 and decline thereafter has been an important short-term influence, but that is probably not Chile's final peak.

**Slide 7: New mining projects 2011-2015.** Another part of the picture of reduced mine production growth has been the few new projects starting up over 2006-2010. As this slide by Intierra shows, the hiatus will continue until 2012, when a surge in project completions is due over the course of the year, and is set to boost full-year production figures from 2013 onwards.

**Slide 8: Countries hosting the mine projects.** Peru, Chile and Canada are the big three players here.

**Slide 9: Mine projects in South America, before and after 2015.**

**Slide 10: Mine projects in Asia (including Siberia), before and after 2015.**

**Slide 11: Mine projects in Australia, before and after 2015.**

**Slide 12: Mine projects in North America, before and after 2015.**

**Slide 13: Mine projects in Africa, before and after 2015.**

**Slide 14: Mine projects in Europe, before and after 2015.**

**Slide 15: Mine production, historically and forecast to 2015.** In this slide one can see a quickening of the pace of mine production growth from 2011, with expansions, re-starts

or ramp-ups at Las Cruces, Aitik, Luanshya, Cananea, Pinto Valley, Andacollo, Esperanza, plus new projects.

**Slide 16: Secondary (scrap-based) refined production, historically and base-case forecast to 2015.** This slide shows scrap-based refined production. This is much more quickly and intensely price responsive than is newly-mined copper output. One can see the quite severe downturn in production in 2002 and 2003 and the much sharper downturn in 2009, all price driven. The recovery in 2011 has been spectacular, driven both by the price of refined copper and by low processing charges, the result of severe over-capacity at smelters in China especially. Quite rapid secondary production growth should continue.

**Slide 17: Total refined production, historically and base-case forecast to 2015.** This slide shows the proportionally more modest nature of the price sensitivity of total refined production (very modest downturns in 2002-2003 and 2009). Growth is likely to be faster from 2011-2015 than in 2004-2008, given that mine production should be quickening.

### **Section three: market balance and stocks, under different ETF scenarios**

**Slide 18: Global refined copper balance to 2015 under different ETF scenarios.** As with slide 5, earlier, in slide 18 we are dealing with the *new fundamentals* of a commodities market: how investment-influenced prices will modify the physical production-consumption balance. Whilst the eye tricks one into believing the three scenarios below are very similar, they in fact have very different implications for cumulative shifts in available exchange stocks and for prices.

**Slide 19: Distribution of stocks, assuming rapid ETF success.** Under this scenario, 300 kt of stock is assumed to be owned by ETFs by end 2011 and 450 kt by end 2012. That really needs ETF Securities to expand investment rapidly after its rather modest start-up in late 2010 and for J.P. Morgan and BlackRock to launch successfully (or for their place to be taken by others). This scenario gives the lowest available exchange stocks at end-2012 (150 kt), even assuming substantial stockpile sales by the Chinese SRB, and would stimulate the fastest price take-off. But by 2015 it is likely that price-suppression of consumption and boosting of production would have created the highest available exchange stock figure of all our scenarios (1 Mt).

**Slide 20: Distribution of stocks: base case – assuming modest ETF success.** Our second scenario is for more modest ETF success, with 250 kt assumed to be bought in 2011 and a further 50 ktpy in 2011 and 2012. This is our base-case, as explored in our regular monthly *Copper Briefing Service* and *Quarterly Report on Copper*. Note that with more modest ETF success come lower prices, thus lower production and higher physical consumption.

**Slide 21: Distribution of stocks, assuming ETFs start then fail.** In this slide, ETFs have only a temporary effect on the availability of stock and only temporarily raise prices.

The forecast shift into surplus takes place a year later, in 2014 rather than 2013. SRB disposals are likely to be lower too.

#### **Section four: prices**

**Slide 22: How investor longs in the futures market affect prices.** In slides 18 to 21, we looked at interaction between production, physical consumption and the sequestration of stocks by ETFs. Now we must turn to the other aspect of investment: the buying of futures contracts by commodity index funds, the *second of the market's new fundamentals*. The quick route to a new equilibrium is for investment buying to raise prices until sufficient new speculative shorts or producer hedge shorts are tempted into the market. That raises the price above physical market equilibrium and increases stocks and a longer term equilibration mechanism begins: available stocks increase. Eventually the market shifts into contango and around 80% of exchange stocks are then short hedged by their owners. Those short hedges provide a more stable set of counter-parties to investor longs in the nearby futures market. Given an adequate supply response, investor longs thus initially create higher prices but later create higher stocks, until hedging of the latter returns the market to physical equilibrium.

**Slide 23: Components of the new balance: index fund longs and stock holders' hedge shorts.** These are what BME considers to be the *fundamental* component of the nearby futures market balance. From 2004 the gap was filled initially by producer hedge shorts, but when these became very unfashionable in mid-2005, the gap had to be filled by new speculative shorts. Impact on price was probably there in the background continuously, but was felt most markedly in brief periods when it was immensely hard to find extra speculative shorts: 2009 being a case in point.

**Slide 24: The new balance: index fund longs minus exchange stock holders' hedge shorts.** After producer short hedging became deeply unfashionable in mid-2005, this new futures market balance approximated to the requirement for speculative shorts. What price would be needed to tempt them into the market – and keep them in – depended to a certain extent on traditional physical market fundamentals, but also very much on each day's financial news, as willingness to take on risk, or an urge to shed risk, become such powerful competing forces. Speculative shorts are skittish.

**Slide 25: The effect of investment longs in the futures market on price to (available) exchange stock relationships.** Three successively higher price to stock relationships can be seen: that lasting until July 2005; that seen from May 2006 through July 2009; and that seen from November 2009 to now. Between these were two phases of rapid transition as the curves moved upwards and to the right, in periods when speculative shorts were very hard to find. The overall shift to the right has been by about 600 kt, roughly the same as the increase in requirements for speculative shorts since mid-2005.

**Slide 26: Side issue: prices are already behaving as if not all exchange stocks are available.** In the final quarter of 2010, according to the BME Copper Price Model, the cash to three months spread and absolute price levels have begun to behave as if perhaps 250 kt of exchange stocks were no longer available. BME interprets this as the sequestering of stocks ahead of ETF launches, combined with the launch of one (so far small) copper ETF. Whether this ‘sequestering’ is by the planned managers of ETFs or whether it is a very large scale position taken by other players, maybe in anticipation of the effects of ETFs, is less clear. Interestingly, the resulting backwardation in the market increases the attractiveness of commodity index fund investments, as it creates a positive roll yield for them.

**Slide 27: The BME Copper Price Model’s forecasts through 2015 using four scenarios of ETF success – or failure.** The BME copper price model allows one to vary both the industrial balance and investments. In this slide we have explored three different degrees of ETF success or failure, corresponding to the figures set out in slides 19 to 21. Basically, the quicker and more complete ETFs’ success, the more rapid the short-term price rise, but the further the subsequent price fall. Our fourth scenario “No ETFs” is also very interesting. It shows immediate downside risk to below \$8,000 if ETFs advance no further than one small fund and if the large tonnage of stock that has apparently been sequestered in advance of ETF launches has to be disposed of.

**Slide 28: Conclusions on short-, medium- and long-term price levels.**

In the short term, too few mine projects will be starting up, resulting in physical deficits and falling stocks. Combined with ~200 ktpy of buying of futures by CIFs and perhaps ~200 ktpy of buying by ETFs, this will keep prices in the \$7,500 – 15,000 range in 2011 – 2012, BME reckons.

After 2012, the balance of probability is that enough new mines will start up to create physical copper surpluses which will, BME believes, bring ETF buying to a halt, but probably not CIF buying. BME believes that prices would fall to the \$5,500 – 7,500 range as a result.

If CIF buying were also to halt, prices would fall to what we believe to be the forward-looking long-term equilibrium: around \$5,500 per tonne. There would still be cyclical risk to below \$5,500, as well as risks resulting from disinvestment by ETFs or CIFs.

## **Section five: Services that BME and Intierra can provide you with**

**Slide 29: BME – provider of fresh insights.**

BME is for the moment your only potential supplier of a fully modern analytical service in base metals, quantifying not only production and consumption, but also competition for physical stocks from ETFs, and modelling the impact on prices of investor longs in the nearby futures market.

BME can provide you with a newsletter-style monthly report, the *Copper Briefing Service*, which can be read end-to-end in thirty or forty minutes, and which forecasts one year ahead based on physical and investment forces.

BME can also provide you with a book-style *Quarterly Report on Copper*, which includes forecasts through 2015, besides analysis of the main copper companies and the world's most thorough copper statistical database.

Backing up both of these reports, but also available as a stand-alone service, is BME's new *Interactive Price Model for Copper*.

### **Slide 30: Intierra – provider of business intelligence for the mineral resource sector.**

Intierra provides a Business Intelligence Service that delivers information in context to those focused on the mineral resource industry and associated markets. Typical core users of Intierra's insight and analysis are the world's largest mining and exploration companies, fund managers, investment bankers and analysts as well as several hundred other exploration companies.

Intierra's database contains over 40,000 projects, over 35,000 companies including 3,500 listed companies.

Intierra monitors all commodities and all projects from grass roots through production.

Intierra Mapping is the global leader in hard copy map production; from global commodity maps to localized "Hot Play" maps.

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