China and the Global Copper Market

Paul Dewison of Bloomsbury Minerals Economics

ICSG Meeting – September 26th to 28th 2011
China has become a dominant force in global copper use:

- China’s share of global refined Cu use 9% in 1995, 37% in 2010
- Further gain likely, though the pace of growth may be slowing

China is just as important in copper materials trade:

- A dominant importer of concentrates, scrap and refined metal

China’s market specifics central to global Cu market dynamics:

- This is partly a function of pure size
- ... but also a function of factors specific to China
  - counter cyclic market development
  - investment behaviour
  - internal copper pricing
  - stocking / destocking cycles
CHINA AND GLOBAL COPPER USE
China’s Cu use grows, rest of world static
China’s share 9% in 1995, 37% in 2010, 41% in 2015?

Consumption Tonnes

Consumption Change

Key

- Latin America
- NAFTA
- Other Asia / Australasia
- North East Asia
- Africa / M.East / S.Asia
- Europe / FSU
- China
China’s Cu use per head now above average

Rapid growth continues, other big markets static or declining

Refined Copper Use and GDP per Head 1995-2015

- Europe & FSU
- Africa, M, East & S.Asia
- China
- Other Asia & Oceania
- NAFTA
- L. America

GDP per Head in 2005 US$'000

kg per Head

1995 2015
China’s use relative to GDP also grown but has it reached its peak?

Refined Copper Use per Unit of GDP and GDP per Head 1995-2015

kg per 2005 US$ billion GDP

1995
2015

- 5  10  15  20  25  30  35  40

GDP per Head in 2005 US$’000

Europe & FSU
Africa, M, East & S.Asia
China
Other Asia & Oceania
NAFTA
L. America
## Apportionment of Copper Use by Application in 2010 (million tonnes)

### China

<table>
<thead>
<tr>
<th></th>
<th>WIRE &amp; CABLE</th>
<th>MILL AND OTHER PRODUCTS</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Energy Cable</td>
<td>Comms Cable</td>
<td>Winding Wire</td>
</tr>
<tr>
<td>CONSTRUCTION</td>
<td>1.6</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>INFRASTRUCTURE</td>
<td>1.0</td>
<td>0.1</td>
<td>0.3</td>
</tr>
<tr>
<td>Power</td>
<td>0.9</td>
<td>0.0</td>
<td>0.3</td>
</tr>
<tr>
<td>Other</td>
<td>0.0</td>
<td>0.1</td>
<td>0.0</td>
</tr>
<tr>
<td>MANUFACTURING</td>
<td>0.7</td>
<td>0.0</td>
<td>1.1</td>
</tr>
<tr>
<td>Electrical/Electric</td>
<td>0.4</td>
<td>0.0</td>
<td>0.5</td>
</tr>
<tr>
<td>Other</td>
<td>0.3</td>
<td>0.0</td>
<td>0.6</td>
</tr>
<tr>
<td>TOTAL</td>
<td>3.2</td>
<td>0.1</td>
<td>1.4</td>
</tr>
<tr>
<td>% of Total</td>
<td>37%</td>
<td>1%</td>
<td>17%</td>
</tr>
</tbody>
</table>

### Rest of the World

<table>
<thead>
<tr>
<th></th>
<th>WIRE &amp; CABLE</th>
<th>MILL AND OTHER PRODUCTS</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Energy Cable</td>
<td>Comms Cable</td>
<td>Winding Wire</td>
</tr>
<tr>
<td>CONSTRUCTION</td>
<td>4.5</td>
<td>0.2</td>
<td>0.0</td>
</tr>
<tr>
<td>INFRASTRUCTURE</td>
<td>0.5</td>
<td>0.6</td>
<td>0.3</td>
</tr>
<tr>
<td>Power</td>
<td>0.5</td>
<td>0.0</td>
<td>0.3</td>
</tr>
<tr>
<td>Other</td>
<td>0.0</td>
<td>0.6</td>
<td>0.0</td>
</tr>
<tr>
<td>MANUFACTURING</td>
<td>1.7</td>
<td>0.1</td>
<td>1.3</td>
</tr>
<tr>
<td>Electrical/Electric</td>
<td>0.6</td>
<td>0.1</td>
<td>0.4</td>
</tr>
<tr>
<td>Other</td>
<td>1.1</td>
<td>0.1</td>
<td>0.9</td>
</tr>
<tr>
<td>TOTAL</td>
<td>6.7</td>
<td>1.0</td>
<td>1.6</td>
</tr>
<tr>
<td>% of Total</td>
<td>40%</td>
<td>6%</td>
<td>10%</td>
</tr>
</tbody>
</table>
China and Global Copper Materials Trade
China and the Global Supply Chain in 2000
Significant at all levels, especially in refined Cu use

Mine Output

Refined Output

Key
- Western Europe
- Central Europe
- FSU
- Africa
- M. East & S. Asia
- China
- North East Asia
- South East Asia
- Other Asia
- Australasia
- NAFTA
- Latin America

Blister Output

Refined Use
China and the Global Supply Chain in 2010

Mine output grown relatively little. Huge gains in refined output.
China has a huge deficit in refined copper growing year by year, matched mainly by surplus in Latin America.
DEFICIT IN CONCENTRATES/BLISTER NEARLY AS BIG
...AND GROWING MORE RAPIDLY

Balance Tonnes

Balance Change

Key

Latin America
NAFTA
Other Asia / Australasia
North East Asia
Africa / M.East / S.Asia
Europe / FSU
China
REST OF THE WORLD
China and World Trade in Copper Materials

China’s share of imports in all materials has risen quickly.

China’s Net Imports of Cu Materials

% World Share
China Central to Copper’s Market Mechanisms
**China Leads in Output, Use and Imports**

*...and its influence is still growing*

### China and the Global Supply Chain

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Output and Use</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concentrates Output</td>
<td>435</td>
<td>593</td>
<td>762</td>
<td>1,156</td>
<td>1,507</td>
<td>4.9%</td>
<td>5.5%</td>
<td>6.2%</td>
<td>9.0%</td>
<td>9.7%</td>
<td></td>
</tr>
<tr>
<td>Blister Output</td>
<td>798</td>
<td>1,188</td>
<td>2,252</td>
<td>3,715</td>
<td>4,831</td>
<td>7.7%</td>
<td>9.9%</td>
<td>16.8%</td>
<td>24.9%</td>
<td>27.2%</td>
<td></td>
</tr>
<tr>
<td>Refined Output</td>
<td>1,089</td>
<td>1,371</td>
<td>2,605</td>
<td>4,573</td>
<td>6,352</td>
<td>9.0%</td>
<td>9.3%</td>
<td>15.7%</td>
<td>23.9%</td>
<td>27.9%</td>
<td></td>
</tr>
<tr>
<td>Refined Use</td>
<td>1,169</td>
<td>1,869</td>
<td>3,862</td>
<td>7,120</td>
<td>9,127</td>
<td>9.5%</td>
<td>12.3%</td>
<td>22.8%</td>
<td>36.6%</td>
<td>41.3%</td>
<td></td>
</tr>
<tr>
<td><strong>Imports</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concentrates</td>
<td>144</td>
<td>600</td>
<td>1,077</td>
<td>1,745</td>
<td>2,433</td>
<td>5.5%</td>
<td>14.7%</td>
<td>21.1%</td>
<td>30.6%</td>
<td>33.1%</td>
<td></td>
</tr>
<tr>
<td>Blister</td>
<td>115</td>
<td>105</td>
<td>129</td>
<td>399</td>
<td>597</td>
<td>15.8%</td>
<td>13.3%</td>
<td>12.8%</td>
<td>41.9%</td>
<td>48.6%</td>
<td></td>
</tr>
<tr>
<td>Scrap</td>
<td>245</td>
<td>392</td>
<td>1,326</td>
<td>1,528</td>
<td>2,066</td>
<td>20.5%</td>
<td>23.4%</td>
<td>40.5%</td>
<td>31.9%</td>
<td>32.6%</td>
<td></td>
</tr>
<tr>
<td>Refined Copper</td>
<td>115</td>
<td>687</td>
<td>1,271</td>
<td>2,920</td>
<td>3,048</td>
<td>2.2%</td>
<td>9.5%</td>
<td>16.7%</td>
<td>32.8%</td>
<td>33.4%</td>
<td></td>
</tr>
</tbody>
</table>
China Market Often Counter Cyclic to ROW

Very evident in 2009, but also before then

Change in Tonnes

% Change

Key

Rest of the World

China
China Investment – Processing & Offshore Mines

China process capacity & world oversupply, now focus offshore

### Investments in Offshore Mining

<table>
<thead>
<tr>
<th>Mine</th>
<th>Country</th>
<th>Company</th>
<th>Start Date</th>
<th>Type</th>
<th>Capacity (ktpy)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anyak</td>
<td>Afghanistan</td>
<td>MCC / Jiangxi</td>
<td>2015</td>
<td>Concs</td>
<td>220</td>
</tr>
<tr>
<td>Mirador</td>
<td>Ecuador</td>
<td>Togling et al</td>
<td>2015</td>
<td>Concs</td>
<td>250</td>
</tr>
<tr>
<td>Galeno</td>
<td>Peru</td>
<td>Minmetals/Jiangxi</td>
<td>2014</td>
<td>Concs</td>
<td>145</td>
</tr>
<tr>
<td>Toromocho</td>
<td>Peru</td>
<td>Chinalco</td>
<td>2014</td>
<td>Concs</td>
<td>220</td>
</tr>
<tr>
<td>Chambishi / Luanshya etc</td>
<td>Zambia</td>
<td>CNMC</td>
<td>Ongoing Expansion</td>
<td>Concs &amp; Smelter</td>
<td>250</td>
</tr>
</tbody>
</table>

Additional Notes: Recent acquisition of Meterox by Jinchuan with interests in Zambia & D.R. Congo, exploration & infrastructure agreements in D.R. Congo, exploration agreements with Codelco, Rio Tinto etc., major investments in Kazakmys mines Atogay & Boschchekul in Kazakhstan.
CHINA MARKET PRICING AND IMPORTS

REFINED IMPORTS RELATE CLOSELY TO LME-SHFE PRICE DIFFERENTIAL, ITSELF PARTLY A FUNCTION OF ABSOLUTE LME PRICES
China The Focus of Refined Stock Movements
Changes hard to measure and difficult to predict

China & World Stock Change

Location of All Non-Working Stocks

Note: Excludes all working and transit stocks
SOME CONCLUSIONS
Some Conclusions

China is Central to Our Understanding of the Copper Market Because Of:

- Its Size
  - A dominant consumer of copper
  - A dominant processor of copper
  - A dominant importer of copper in all forms

- Its Growth
  - Since the late 1990s, China has grown rapidly in its copper use while much of the rest of the world is virtually static or declining

- Its Specific Nature
  - China developments can have a disproportionate effect on Cu market as
    - market trend can run counter to the rest of the world
    - China has become a major investor in copper
    - Specific price arbitrage and copper import dynamics
    - China stocks large, volatile and unpredictable
**ABOUT BME**

**Bloomsbury Minerals Economics** is a specialised consultancy engaged in base metals market and price analysis, focussing in particular on copper. Our analysis and advice relates to all sectors of the industry from mine to thorough and detailed coverage of end markets for products containing base metals.

**A foremost provider of base metals single client consultancy**

Our consulting work relates to fundamental supply-demand market analysis, price forecasting, mine project appraisals, intermediate product market dynamics and end market analysis, forecasting and project appraisals. Clients include mining companies, metals processors, fabricators, traders, financial institutions and industry bodies.

**A complete service provider for copper**

Other product and service offering encompasses the following:

- Monthly and quarterly copper market service publications
- Groundbreaking copper price modelling

For more information contact: **Paul Dewison**, Head of Consultancy
Phone: +44(0)207 529 8914
Email: pd@bloomsburyminerals.com

*Or visit: [www.bloomsburyminerals.com](http://www.bloomsburyminerals.com)*