World Economic Outlook and the Impact on Global Copper Demand, Trade and Inventories

Paul Settles, Principal Consultant – Copper Team, CRU
ICSG Thirty-second Regular Meeting
Lisbon, 26 April 2012
Structure of presentation

1. Economic outlook
2. Semi-fabricated demand outlook
3. Refined and Scrap Supply outlook
4. Inventory and price outlook and risks
# World GDP Growth, %

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<td>4.3</td>
<td>3.9</td>
<td>3.3</td>
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<td>India</td>
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<td>8.2</td>
<td>8.4</td>
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<tr>
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<td>World</td>
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GDP measured at year 2005 prices and market exchange rates.

Data: CRU
The scope for Chinese and Indian economic catch-up remains substantial

GDP per capita, USA = 100

Note: GDP measured at Purchasing Power Parity (PPP)
Data: IMF, CRU
In developed economies urbanisation is 70% or more – China & India have a long way to go

% of population that is urban

GDP per capita, US$'000 at PPP

Note: Countries with a population greater than 5mn
Data: UN, Taiwan National Statistics, IMF, CRU. Data are for 2010.
Risks: not all one way

• Downside risks:
  – Confidence in Eurozone firewall misplaced, other peripherals engulfed in wake of Greek default
  – Middle East tensions boil over, sending oil skywards
  – Policy gaffe in China

• Upside risks:
  – Monetary policy is powerful counter to fiscal retrenchment
  – Animal spirits revitalised in USA, prompting investment boom
  – Policy prescriptions for Europe boost confidence, especially in Germany, and encourage consumer-led revival
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China continues to spur global growth in 2012-16

Refined copper consumption of selected country groupings, 2010-2016

Data: CRU * North America, Western Europe, Japan, South Korea, Taiwan, Australasia
Chinese refined consumption rose significantly in H2 2011 as fabricators used cathode instead of scrap copper

Semis production split by raw material type

Data: CNIA, CRU
World economic intensity of copper use to recover and peak in 2025, while per capita intensity grows

Data: CRU
Overall scrap usage share in semis production to rise slightly with direct use falling and refined rising

Share of copper content in semis production by source

Data: CRU
Positive (green) and negative (red) long term risk factors for the refined copper market

Impact on refined copper consumption in forecast period
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Major custom concentrate mines underperformed in 2011

Year on year change in mine output, 2010-2011, ‘000t Cu in concentrate

New capacity brought on stream in 2011

Data: Company reports, CRU
## Disruption risks – resource nationalism and labour unrest are the key threats

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<tr>
<th>Labour</th>
<th>Governance</th>
<th>Ore Grades</th>
<th>Natural Hazards</th>
<th>Mergers &amp; Acquisitions</th>
<th>Infrastructure</th>
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</table>
| • 3-month strike at Grasberg ends but intermittent labour unrest continues.  
• 2-month strike at Cerro Verde ends.  
• Wave of strikes sweeps through Zambia. | • Tax and royalty increases in Poland and Peru.  
• Reko Diq and Tampakan projects blocked by local authorities.  
• Resource nationalism continues, with latest incidents in Zambia and Mongolia. | • Slight uptick in ore grades.  
• We are expecting for ore grades to remain flat in 2012.  
• Low ore grades at projects may deflate future ore grades. | • Unseasonably severe weather in northern Chile disrupts production.  
• Flooding in northern Australia. | • Company takeover activity continues.  
• Increasing interest in copper investment by trading companies. | • Zambia to invest heavily in power infrastructure.  
• Transport network affected by severe weather in Chile and Australia. |

### Likelihood of problems
- **High likelihood** of problems for the next few months
- **Medium likelihood** of problems for the next few months
- **Low likelihood** of problems for the next few months
New smelters mostly going to be located in China in medium term

Expected total blister capacity at all smelters, 2011 and 2016, ‘000t

Data: CRU 1/ Asia except for China, India and Iran

China = 87% of increase
Secondary materials will account for growing share of copper supply

**World production and demand 2011-2035**

(‘000t contained copper in concentrates, SXEW cathode and secondary materials)

Data: CRU
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Prices to peak in 2013, as deficits lower stocks and tighten the market

LME cash price and supply/demand balance*, quarterly, 2005-2013

Data: CRU, *adjusted for estimated SRB and Shanghai bonded warehouse stock changes in 2009-12
Prices to retreat in 2014-2016 as mine supply growth leads to surpluses and higher stocks

LME cash price and global supply/demand balance, 2004-2016

Data: CRU, *adjusted for estimated SRB and Shanghai bonded warehouse stock changes in 2009-12
Price: stock relationship expected to normalise following the gyrations in 2009-11

Data points: historical 1983Q1-2012Q1, forecast 2012Q1-2013Q4, 2014-2016 (annual)

Current Position

Potentially higher trend line due to higher production costs
Key risks to the price outlook

Production: Most supply risks to the price are to the upside. Tight availability of equipment, qualified personnel, water, power, etc. mean that sequencing of projects (at both the company and industry levels) will be a serious challenge. There is some downside risk from production. If our macroeconomic forecast turns out to be too optimistic, then demand could be less and the wave of mine projects could come on just in time to swamp the market and drive down prices sooner than in our base case.

Macroeconomic and financial: The key risk to the copper price is the uncertainty of how the global economy will perform. The apparent improvement in the US could prove short-lived and China could possibly not see a return to growth in H2 2012. The Eurozone crisis could also still prompt more financial market turmoil. On the other hand, economic growth in both the US and China could prove stronger than forecast in the base case. This would be positive for growth directly, but also in those emerging markets which export to these two large economies.

Consumption downside: We now expect that aluminium will make more inroads into the insulated power cable market as a result of an increase in aluminium wirerod capacity available to target this segment by 2015. CRU forecasts that the ratio of the copper price to that of aluminium will average close to 4:1, which will weigh on consumers’ strategic decision-making.

Consumption upside: In 2012, the wire and cable manufacturers may start to find aluminium wirerod harder to get hold of, and may be forced to use greater quantities of copper wirerod as a raw material. Any scrap shortage for direct use would lead to higher refined consumption. A double-dip recession in the developed world would accelerate the de-coupling of emerging markets and favour copper-intensive domestic demand. Any substantial fall in the price could also lead to buying by the SRB or some Chinese consumers or speculators that rate copper as a bargain.
CRU Analysis Copper and Wire & Cable team

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<tr>
<th>Name</th>
<th>Position</th>
<th>Contact Information</th>
</tr>
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<tbody>
<tr>
<td>Vanessa Davidson</td>
<td>Group Manager Copper and Wire &amp; Cable, ext. 2207</td>
<td></td>
</tr>
<tr>
<td>Paul Settles</td>
<td>Principal Consultant, Copper Market, ext. 2227</td>
<td><a href="mailto:paul.settles@crugroup.com">paul.settles@crugroup.com</a>, +44 (0)20 7903 2227</td>
</tr>
<tr>
<td>Christine Meilton</td>
<td>Principal Consultant, Copper Production, ext. 2098</td>
<td></td>
</tr>
<tr>
<td>Rob Daniels</td>
<td>Principal Consultant, Copper Semis, Wire &amp; Cable, ext. 2118</td>
<td></td>
</tr>
<tr>
<td>Rich Mack</td>
<td>Principal Consultant, Copper Semis, Wire &amp; Cable, USA</td>
<td></td>
</tr>
<tr>
<td>Lisa Morrison</td>
<td>Principal Consultant, Copper Market, USA</td>
<td></td>
</tr>
<tr>
<td>Wan Ling</td>
<td>Manager, China Nonferrous Metals, Beijing +86 10 6510 2183</td>
<td></td>
</tr>
<tr>
<td>Patrick Fay</td>
<td>Senior Consultant, Copper Semis, Wire &amp; Cable, USA</td>
<td></td>
</tr>
<tr>
<td>Alicia Polo y La Borda</td>
<td>Senior Consultant, Copper Prod &amp; Market, Santiago +56 2 2313 900, ext. 12</td>
<td></td>
</tr>
<tr>
<td>Vivienne Lloyd</td>
<td>Senior Consultant, Copper Production and Mine Costs, ext. 2182</td>
<td></td>
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<tr>
<td>Sushila Colquhoun</td>
<td>Senior Consultant, Copper Production, ext. 2016</td>
<td></td>
</tr>
<tr>
<td>Ruth Chapman</td>
<td>Editor, Cables Industry Analyst, <a href="mailto:ruth.chapman@crugroup.com">ruth.chapman@crugroup.com</a></td>
<td></td>
</tr>
<tr>
<td>Brennan DiBasilio</td>
<td>Consultant, Copper Market, USA</td>
<td></td>
</tr>
<tr>
<td>Piotr Ortonowski</td>
<td>Consultant, Copper Market, ext. 2325</td>
<td></td>
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<tr>
<td>James Wright</td>
<td>Consultant, Copper Market, ext. 2052</td>
<td></td>
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<tr>
<td>Miljan Sladoje</td>
<td>Research Analyst, Copper Production and Mine Costs, ext. 2062</td>
<td></td>
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<tr>
<td>Catherine McKee</td>
<td>Administrator, Base Metals, ext. 2043</td>
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In the first instance, clients should address any enquiries to:
Paul Settles: paul.settles@crugroup.com, +44 (0)20 7903 2227
To contact other team members: Email: firstname.lastname@crugroup.com, Tel: +44 (0)20 7903 + ext.