The market and China’s role

Aluminum Association Annual Meeting

20th-21st October, 2015

Paul Williams

Head of Aluminium, CRU Analysis
Structure of presentation

1. Global demand outlook
2. China – growth and policy developments
3. China’s primary smelting sector
4. China’s downstream sector
5. Implications & conclusions
The aluminium market and China

- The good...
  - Global demand remains positive, especially in transport

- The bad...
  - Chinese demand growth slowing, BRICs disappoint

- And the downright ugly
  - China overcapacity in upstream and downstream

Source: CRU
Semis consumption to see solid growth globally

2014 = 76.6 million tonnes  
2019 = 94.5 million tonnes  
+5.9% CAGR growth

Source: Aluminium Market Outlook, September update, 2015
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China – A decade of misconceptions

Primary
• China has high cost power – it will become a big importer of primary
  • WRONG. China has built a surplus of primary capacity and continues to invest. Power costs have fallen on weaker thermal coal and power market reforms

Alumina
• China has poor bauxite and high cost refineries, it will need to import growing quantities of alumina
  • WRONG. China built massive alumina capacity based on local and imported bauxite

Bauxite
• China has limited bauxite reserves of declining quality, imports must rise
  • RIGHT (We expect)

Semis
• China will only export low value products
  • WRONG IN LONG TERM. China is fast improving quality and will penetrate higher value markets such as can stock

Source: CRU
China is suffering from a cyclical downturn whilst managing structural change

<table>
<thead>
<tr>
<th>Divergence of growth rates</th>
<th>Year-to-date change, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rail freight tonnage</td>
<td></td>
</tr>
<tr>
<td>Real estate starts (floor area)</td>
<td></td>
</tr>
<tr>
<td>Real estate sales (floor area)</td>
<td></td>
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<tr>
<td>Car production (CAAM)</td>
<td></td>
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<tr>
<td>Car sales (CPCA)</td>
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<tr>
<td>Thermal power generation</td>
<td></td>
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<tr>
<td>Power consumption</td>
<td></td>
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<tr>
<td>Inbound tourist revenues*</td>
<td></td>
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<tr>
<td>Air passenger numbers</td>
<td></td>
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<tr>
<td>Renewables &amp; nuclear power gen</td>
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<tr>
<td>Govt. health and education spend.*</td>
<td></td>
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<tr>
<td>Insurance premia*</td>
<td></td>
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<tr>
<td>Postal revenues*</td>
<td></td>
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<tr>
<td>Online retail sales*</td>
<td></td>
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<tr>
<td>Movie box office*</td>
<td></td>
</tr>
</tbody>
</table>

Note: * deflated with CPI
Data: CEIC, CPCA, CRU

End-use sector inventory adjustment is weighing on metals demand

High profile indicators

Low profile indicators

Source: CRU
Chinese government policy has made “Value-added products” the main focus

The Chinese government wants to deter exports of ‘pure energy’ in the form of primary aluminium but is it going to enforce it?

<table>
<thead>
<tr>
<th></th>
<th>Domestic expansion</th>
<th>Overseas Projects</th>
<th>Import</th>
<th>Export</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mining</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>Refining</td>
<td>✗</td>
<td>✓</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>Smelting</td>
<td>✗</td>
<td>✓</td>
<td>✓</td>
<td>?</td>
</tr>
<tr>
<td>Rolling and Extruding</td>
<td>✓</td>
<td></td>
<td>✗</td>
<td>✓</td>
</tr>
<tr>
<td>Recycling</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✗</td>
</tr>
</tbody>
</table>

Looking to halt new capacity but with little success

Source: CRU
VAT rebates favour downstream products – but recent tax changes on alloyed primary suggest new direction

- **Primary Al**: Export VAT rebate decreased from 15% to 8%
- **AI Alloys**: Export VAT rebate of 5% removed
- **Primary Al**: Export duty increased from 5% to 15%
- **Bars, Rods and Profiles**: Export VAT increased to 13%
- **Plate, Sheet, Strip (Alloyed and unalloyed)**: Export VAT removed
- **Al Alloys & rod and bar**: Export duty removed

- **Primary Al**: Export VAT rebate increased to 15%
- **Extrusions, Castings and FRPs**: Export VAT reduced from 13% to 8% or 11%
- **Extrusions and castings**: Export VAT rebate removed (11% and 8%)
- **Al Alloys**: Export VAT increased to 15%
- **Plate, Sheet, Strip (Alloyed and unalloyed)**: Export VAT removed

Source: CRU
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Regions of low cost greenfield capacity growth:
- Xinjiang
- Inner Mongolia
- Shandong
China production still increasing due to a small group of large scale (low cost) expansions

8 projects dominate Chinese production growth

- Projects in Xinjiang, Inner Mongolia and Shandong drive growth

Source: Aluminium Market Outlook, September update, 2015
China Cash Costs show swathe of capacity losing money – another 4.1 Mtpy of capacity expected to shut 2015-2017

- Blue shading – indicates new low cost smelters in Xinjiang

- At SHFE cash price of $1820/t - RMB11,500/t – nearly 40% of capacity with costs above price

- Costs have fallen significantly through fall in coal prices, power market reforms, lowering power costs. Also decline in raw material inputs such as alumina. These declines have not been enough to cover for decline in price

- Companies are supported by provinces to remain open to provide employment and maintain provincial GDP growth

- However, new capacity in Xinjiang, Inner Mongolia, Shandong with captive coal and power are low cost and are located in the lower half of the cost curve. These producers are still expanding capacity
Over 76% of Chinese production was wholly dependent on coal-fired electricity in 2014.

An additional 11% of Chinese production is partially dependent on coal-fired power making 87% of total production dependent on coal.

Source: Aluminium Costs, 2015
Aluminium fundamentals continue to soften in China – and stocks will rise further in 2016, even with closures

Stocks include reported inventory at SHFE warehouses, state stockpiles and unreported stock

Source: Aluminium Market Outlook, September update, 2015
Primary metal will continue to come out of China in one form or the other

- Likelihood of billet exports, especially if VAT rebates are added to 7604 codes

Source: Aluminium Market Outlook, September update, 2015
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Top 15 Chinese aluminium rolling mills

Henan and Shandong are the largest producing regions

1. Nanshan Aluminum, 700k
2. Shandong Weiqiao, 533k
3. Henan Mingtai, 450k
4. Chinalco SWA, 400k
5. Chinalco Ruimin, 400k
6. Asia Aluminum, 400k
7. Luoyang Longding, 350k
8. Zhenjiang Dingsheng, 350k
9. Gongyi Wanda, 300k
10. Henan Xintai, 300k
11. Luoyang Al, 200k
14. Luoyang Wanji, 200k
15. Henan Xichuan, 200k

Source: Aluminium Rolled Products Market Outlook, August 2015
China will be a major can stock player

Chinese total can stock capacity to exceed 1.9m tpy by 2019, from around 550,000 tpy in 2011

Source: Aluminium Can Stock and Auto Body Sheet Market Outlook, 2015
Exports of aluminium from China in various forms

China’s net export position, ('000t)

Other selected final goods includes wheels, air conditioners etc.

Source: Aluminium Market Outlook, September update, 2015
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Main points

Chinese demand is slowing but capacity is still rising – China is looking to export its growing surplus

We expect fake primary to continue to exit and more billet to emerge

Semis exports will grow, especially in rolled products

Still a risk of other tax changes to promote primary metal exports – the weaker the economy gets the greater the risk

Source: CRU
Game changers – what could see flow of Chinese exports stop?

- Escalating debt sees significantly higher closures and halt to new capacity
- Environmental clampdown – on alumina red mud, CO$_2$ emissions carbon trading schemes and burning of high sulphur cokes could see significant reduction in primary output
- More trade restrictions – more anti-dumping suits – particularly on fake semis and on specific semis

Source: CRU
<table>
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<th>Event</th>
<th>Probability</th>
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<td>Escalating debt sees significantly higher closures</td>
<td>Probability: low-medium risk, but increasing</td>
</tr>
<tr>
<td>Environmental clampdown – on alumina red mud, CO₂ emissions, carbon trading schemes and burning of high sulphur cokes could significantly reduce primary output</td>
<td>Probability: low.. for now</td>
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<tr>
<td>More trade restrictions – more anti-dumping suits – particularly on fake semis and on specific semis</td>
<td>Probability: increasing</td>
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For more information about CRU products and services...

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Or visit www.crugroup.com