Ideas for a sustainable global aluminium balance

21 November 2012
- The global aluminium industry: a time of imbalance
- The China factor
- The Gulf region: a new global player
Despite a healthy growth in aluminium consumption...

Global aluminium consumption outlook remains positive...

...with China accounting for a substantial part(1)...

... and key consuming industries growing at a steady pace

Aluminium consumption is set to grow at c. 7% CAGR over 2012-2015

Sources: UC RUSAL, OICA, IHS, Brook Hunt, REXAM, IAAE Canada Conference June 6th 2012, Ducker Worldwide June 2012
Notes: (1) Aluminum consumption forecast by region in 2012
low metal prices continue to hit the industry…

The metal price is well below the pre-crisis level…

…while production costs have risen significantly

31 October 2012 LME off. price

Unprofitable production LME+premium: ~20% (1)

LME + average premium US$200

+15-20%

Approximately 20-30% of global capacity ex. China is unprofitable at the current aluminium price, depending on premium level

Source: Bloomberg, Brook Hunt
Note: (1) Unprofitable production amount varies subject to level of premium paid
Historically, production cuts have supported the price

- Historically, a drop in capacity utilization rate below 75% of global production, or a drop of at least 7% from preceding production levels, has generally been followed by an aluminium price increase by 20-35%

- Since June 2011, all major producers have executed production cuts of around 1.5 mtpa (more than 3.2% of global production) to date

- The current global aluminium capacity utilization rate holds at 82% level

**Global producers have reacted to adverse economic climate by idling inefficient production capacity**

*Sources: Bloomberg, Brook Hunt, CRU, Companies announcements*

*Notes: (1) World ex. China production cuts since 1 June 2011*
- The global aluminium industry: a time of imbalance
- The China factor
- The Gulf region: a new global player
It stands out that Chinese aluminium production is not in line with global industry

Despite the unfavorable price dynamics, China has seen its aluminium production rising in 2011-2012

\[ \text{Cumulative Production, kt} \]

Sources: Bloomberg, Aladdiny, Brook Hunt, CRU
China’s 12th Five-Year Plan: addressing China’s aluminium needs…

What the ‘12th Five-Year Plan (FYP) for National Economic and Social Development’ says:
- It calls for rebalancing economy away from exports and investments, towards consumption and efficient, value-added industry and services
- It projects national GDP growth of ~7% p.a.
- It aims to close the urban/rural divide, income gap and narrow regional development differences (Western Region Development Program)
- And it aims at greater environmental protections and increasing energy efficiency

What MIIT guidelines for the non-ferrous metals industry for the 12th Five-Year Plan state:
- Aims for aluminium demand growth of 8.6% p.a. to 24mtpa in 2015
- For smelting capacity to be capped “at the level sufficient to meet domestic demand”
- Targets industry consolidation: 90% of China’s smelting in 10 companies
- Targets 800ktpa of inefficient capacities earmarked for closure with the rest of outdated capacity being subject to modernization
- Encourages relocation of smelting to the West, with no new smelting projects to be approved in Central and Eastern regions
- And encourages the establishment of overseas aluminium capacities

The 12th Five-Year Plan calls for raising efficiency while stimulating increased aluminium consumption

Sources: World Bank, MIIT, Brook Hunt, UC RUSAL research
Notes: (1) notional GDP growth of ~7% p.a. as per 12th Five-Year Plan; (2) based on China Govt. reports; (3) based on MIIT guidelines; (4) UC RUSAL projections
…while migrating the aluminium industry to Western provinces…

- The share of western provinces in China’s aluminium production is expected to increase from 51% in 2010 to 66% in 2015 (including ~22% from Xinjiang alone)

- China will actively replace outdated capacities in the Central provinces with new ones in the Western provinces, supplied with cheaper electric power.

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**Xinjiang smelters effective power price vs. China**

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<thead>
<tr>
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<th>Xinjiang average RMB320/$43</th>
<th>China average RMB475/$64</th>
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<tbody>
<tr>
<td><strong>Mt</strong></td>
<td></td>
<td></td>
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<tr>
<td><strong>US$/ton</strong></td>
<td>US$16/ton</td>
<td>US$57/ton</td>
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<tr>
<td><strong>US$/MW*h</strong></td>
<td>US$18/MW*h</td>
<td>US$38/MW*h</td>
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<td><strong>US$/MW*h</strong></td>
<td>US$48/MW*h</td>
<td>US$82/MW*h</td>
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<tr>
<td><strong>US$/ton</strong></td>
<td>US$1,950/ton</td>
<td>US$2,540/ton</td>
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**Xinjiang vs. Henan**

- Coal production costs
- Power production costs
- "Public" tariff for smelters
- Average smelting cash costs

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Production capacity are set to move towards regions with lower costs, coupled with higher energy efficiency

**Sources:** Aladdiny, Brook Hunt, CRU, UC RUSAL research

**Notes:** (1) capacity numbers as per CRU estimates; (2) As per Aladdiny monthly reports
...and focusing Central China production on downstream opportunities

- Between 2003 and 2011, aluminium semis production delivered 30% CAGR compared with 17% for primary aluminium.

- The 12th FYP targets 9.1% CAGR of semis through focus on value-added products: alloy plate for aerospace, high-performance alloy semis and components, 6-series alloy plate for automobile, etc.

- A move towards semis would see a positive impact on energy efficiency and employment:
  - typical rolling mill employs 2-3 times more people than a similar-size primary aluminium smelter...
  - ...while energy consumption averages just 244kWh per employee vs. 5,400kWh\(^{(1)}\), respectively

- China’s export/import duties policy encourages domestic production and exports of value-added aluminium products vs. primary aluminium:
  - 5-6% import duty and 11% export VAT rebate for fabricated aluminium
  - 7% import duty for aluminium alloys
  - 15% export tax duty for primary aluminium, scrap and bauxite

- Shifting focus to downstream can increase value-added and improve energy-efficiency in overall aluminium sector.

Sources: Antaike, CNIA, UC RUSAL Research
Notes: (1) based on UC RUSAL estimates for typical 500ktpa smelter and typical 500ktpa rolling mill (hot-rolling, cold-rolling, finishing, casting)
The Chinese government resumes its stock-piling scheme: an instrument of market support with potential profit

- The start of the global financial crisis in 2H 2008 led to a drastic decrease in aluminium consumption, followed by a 37% slump in the SHFE price and active stockpiling.
- In order to support the Chinese aluminium industry, the Government Strategic Reserve Board (SRB) purchased 590kt of primary aluminium in December 2008-February 2009 out of 1mln t it originally planned to buy.
- From March 2010, demand for aluminium in China recovered and even exceeded supply. In response, in November 2010 the SRB sold c. 213kt of aluminium, withdrawing from earlier purchases, but retaining 370kt in storage.
- At the time, investment in aluminium was profitable for the government as the selling price was c. 20% higher than purchase price.
- The SRB has confirmed that the program is to be resumed in November-December 2012 with plans to purchase 400kt of primary aluminum ingots to support aluminium market again facing a SHFE price decline and growth of metal stocks.
- Local governments have begun similar initiatives: in September 2012, Yunnan's provincial government announced it would buy 200 kt of aluminum before the year-end to support primary aluminum producers in the province.
- As aluminium prices are set to recover sooner or later, this form of market support will again be profitable for the Chinese government.

Source: Bloomberg, Harbor, Alladiny
• The global aluminium industry: a time of imbalance

• The China factor

• The Gulf region: a new global player
GCC is actively ramping up its aluminium production…

- The Gulf Cooperation Council (GCC) region is dominated by six smelters, out of which five are currently operational.
- In 2011, the smelters’ combined production reached 3.5mt of aluminium, accounting for 7.7% of total global production.
- Ma’aden, a sixth smelter in Saudi Arabia, will produce its first metal in December 2012 while Emal’s robust expansion is scheduled for completion by 2014. As a result, the GCC is poised to become a leading aluminium production powerhouse with the expectation that the region will contribute to over 8% of the world’s aluminium production by 2015.
- The emergence of aluminium smelting across the Gulf, driven by industrial policy and supported by government-set gas prices for the industry, is a key contributing factor behind soaring gas demand and imports into the region.
- Lack of bauxite reserves poses additional risks for GCC aluminium producers.

**Aluminium production growth 2006-2011**

- USA: (2.7%)
- Canada: (0.5%)
- Australia: 0.1%
- Russia: 1.3%
- China: 15.4%
- GCC: 16.2%

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**Production timeline**

- **1980**
  - 2 smelters present in the GCC – Alba (Bahrain) and Dubal (UAE)
  - < 1%

- **2006-2007**
  - Market dominated by Dubal and Alba smelters
  - 5%

- **2008-2010**
  - Sohar smelter (Oman), Quatalum (Qatar) and Emal (UAE) start operations
  - 5-7%

- **2011-2013**
  - Saudi Arabia based smelter Ma’aden expected to become operational
  - 8%

- **2014-2015**
  - Commissioning of Emal’s Taweelah project and Alba production expansion
  - 8%

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As of H1 2012 aluminium production in GCC region reached 1,827kt, resulting in 8.7% growth YoY.

**We are witnessing an ever-increasing share of GCC producers in global aluminium output**

**Sources:** GAC, CRU, Deloitte Research and Analysis, UC RUSAL research
...aiming to become one of the leading aluminium producers through the implementation of new projects ...

On the consumption side:

- The Middle East will increase its real consumption of primary aluminium between 2011 and 2016, mainly due to an increase in semi-fabrication capacity in GCC countries building mega-projects such as pipe-lines, particularly in Saudi Arabia and Qatar.
- Real consumption of primary aluminium is estimated to increase 7.7% in 2012 – 2016 (CAGR), with Saudi Arabia being a major driver of this growth.

While on the production side:

- Primary aluminium production in the Middle East is estimated to grow at 8.6% in 2012 – 2016 (CAGR) mainly due to the realization of large aluminium smelters projects in Saudi Arabia, the UAE and Bahrain.
- The surplus of primary aluminium in the Middle East is expected to grow at 9.5% in 2011 – 2016 (CAGR), from about 2.0mt in 2011 to more than 3.0 Mt in 2016.
- The GCC aluminium industry will remain export-oriented becoming an important source of primary aluminium supply to consumers globally.

GCC producers’ plans for capacity expansion risk being at odds with the current global market, while pricing consequences will inevitably impact margins and returns.

Sources: GAC, CRU, Deloitte Research and Analysis, UC RUSAL research.
...while investment opportunities in new aluminium capacity projects become less certain

Margins of aluminium production compared to other natural gas applications

- Despite the low cash costs, the impact of necessary upgrading and investment across the region as a whole is now feeding through into the performance of individual producers.
- Other natural gas applications like LNG, petrochemical (SABIC) and fertilizers (SAFCO) continue to show much better margins in comparison to aluminium smelting.
- This suggests that, as competition for natural gas and global demand for its derivatives rises, GCC aluminium producers will find it harder to secure cheap gas prices.

Dropping margins and soaring gas prices may significantly reshape future plans for capacity expansion in the region

Sources: Companies reports, UC RUSAL research
Notes: SAFCO – Saudi Arabian Fertilizer Company, SABIC – Saudi Arabian Basic Industries Corporation, ALBA – Aluminum Bahrain
Solving the alumina puzzle – a partnership with UC RUSAL

GCC producers have no proprietary bauxite and alumina base. As a result, all the alumina used for smelting is imported, predominantly from Australia, Brazil and India. This leaves producers exposed to changes in alumina market conditions driven by soaring hydrocarbons prices.

As a response to this risk GCC producers have recently reiterated their interest in investing into bauxite and alumina capacities abroad.

Given UC RUSAL’s strong position in both bauxite and alumina, there are opportunities for GCC partners to discuss possible partnerships to transit UC RUSAL’s Italian and Jamaican operations to coal-fired energy sources.

Such partnerships could serve to improve the Gulf producers’ self-sufficiency in alumina and allow them to secure the raw materials for their smelting operations at a very competitive price.

Large bauxite reserves and spare alumina capacity make UC RUSAL a partner of choice for GCC producers.

Sources: Wood Mackenzie, UC RUSAL research
Notes: (1) Based on primary aluminum production estimates and conversion factor 1.956 (2) On equity attributable basis
Conclusion

1. Global demand for aluminium is growing at a healthy pace. However, overcapacity and overproduction require consistent restructuring and presents a real obstacle to future aluminium industry growth.

2. To date, the response of global players has been to cut production significantly. However, China still suffers from overproduction as it tackles overcapacity, with inefficient smelters supported by local governments, and policy initiatives.

3. Overcapacity and distortion in the global primary aluminium market threatens to hit Gulf producers' plans for future expansion, as margins drop faster than the price of metal and natural gas is used for applications with more compelling economic returns than smelting. Gulf producers might explore ways to mitigate these risks.

4. Coupled with these energy and pricing risks, GCC producers could mitigate the risks posed by regional scarcity of bauxite and alumina. UC RUSAL is happy to start a dialogue with interested parties to provide secure long-term access to its spare bauxite and alumina capacities.

5. At its core, the industry worldwide faces challenges and opportunities. The ideas presented highlight the potential benefits from strengthening the dialogue between producers, consumers, investors and policy makers, to consider these together and formulate responses that deliver more sustainable growth in the future.
Thanks for your attention