Factors affecting the demand outlook for aluminium

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Macro economic factors support the sustained growth in aluminium demand

Demand growth is supported within the individual segments

**Light Vehicle Cars production**
- CAGR 4%

**Boeing & Airbus Projected Aircraft Deliveries**
- CAGR 3%

**Beverage cans production**
- CAGR 3-4%

**Electricity demand by sector, TWH**
- CAGR 4%

**Growth in Construction Output**
- By value

**Percentage Contribution to Growth in Global Construction Output 2010-2020**
- China 28%
- US 16%
- India 16%
- Others 34%
- Russia 3%
- Australia 3%
- Canada 3%
- Indonesia 4%

Source: UC Rusal, OICA, IHS, Brook Hunt, ExxonMobil, Global construction perspectives, Oxford Economics, REXAM, IAAE Canada Conference June 6th 2012
China’s influence on global demand is significant across all segments

Key drivers

**Transportation:** Making weight of car lighter to meet CO₂ emission target. Aluminium content in car should be increased by 11-14% in 5 years

**Construction:** Urbanization of developing countries (China, India), recovering USA and European construction market

**Electrical:** Electricity demand growth projected by 4% YoY within 2010-2015

Source: Brook Hunt, July 2012 edition, UC Rusal modeling
The market balance is still defined by the “haves” and “have nots”

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<th>Deficit</th>
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- **Deficit**
  - 2014: Japan & S.Korea, Other Asia, Europe, N.America
  - 2013: Japan & S.Korea, Other Asia, Europe, N.America
  - 2012: Japan & S.Korea, Other Asia, Europe, N.America
  - 2011: Japan & S.Korea, Other Asia, Europe, N.America
  - 2010: Japan & S.Korea, Other Asia, Europe, N.America
  - 2009: Japan & S.Korea, Other Asia, Europe, N.America

- **Surplus**
  - 2014: Middle East, CIS, Oceania, Africa, S.America
  - 2013: Middle East, CIS, Oceania, Africa, S.America
  - 2012: Middle East, CIS, Oceania, Africa, S.America
  - 2011: Middle East, CIS, Oceania, Africa, S.America
  - 2010: Middle East, CIS, Oceania, Africa, S.America
  - 2009: Middle East, CIS, Oceania, Africa, S.America

- **Balance?**
  - 2014: India, China
  - 2013: India, China
  - 2012: India, China
  - 2011: India, China
  - 2010: India, China
  - 2009: India, China

- European and N American markets are expected to double their deficit position by 2014
  - Smelter closures the main driver
- Asia (ex China) short position grows but offset by smelter development in Malaysia
- Middle East emerges as the strongest growth region outside China
- S America returns to balance
  - Implications for N America deficit
- China and India remain the wild cards where both markets have potential to be in significant surplus by 2014

Source: Brook Hunt, August 2012 addition, UC Rusal
China’s supply demand balance after 2014 becomes uncertain

China has a significant influence on global aluminium industry through:

- its potential as a significant net importer of metal,
- the further development of semi-fabricated product exports to the world

Assuming a constant 10.5% annualised rate of consumption growth, China’s balance is most heavily impacted by:

- Capacity relocation/development in Xinjiang
- Operational economics for lower amperage cells
- Average rate of capacity utilisation within current smelters
- Ability to overcome social implications for capacity closures
Centers of supply and demand are shifting from traditional regions

- **Primary metal exporter**
- **Downstream industry growth**
- **Turkey and Eastern Europe:** Automotive production hub, Development down-stream industry
- **ME and India:** Automotive production hub, Development down-stream industry
- **China:** Development automotive production hub (expansion of Japanese and Korean automakers mainly and shifting production from domestic facilities to the low cost markets)
- **Australia:** Sizable increasing of VAP production and down-stream industry
- **Middle East:** Sizable increasing of VAP production and down-stream industry
- **India:** Biggest spares-part producers in a region Going to be primary metal exporter
- **Brazil:** Development production facility in low energy-cost regions (Persian Gulf, India, Russia) together with curtailment in High cost regions (Europe, Australia, NA)
- **S. Africa:** Development down-stream industry in low labor cost regions close to primary aluminium producers (Persian Gulf, India, ASEAN-5, Turkey)
- **Russia:**
- **ASEAN-5:** Automotive production hub, Development down-stream industry

Indonesia will be World's 6th Largest Construction Market by 2020

International trade increasing, longer and more expensive supply chains

Source: UC Rusal, news-stream
Aluminium finance deals are set to remain a key feature of the industry for the medium term.

- Cancelled warrants have been a key feature of the market since early 2012, representing 38% of total stocks.
- Nevertheless, shipments ex warehouses are at historical highs on new load-out rules.
- Aluminium financial deals continue to be a significant part of investments into aluminium irrespective of warehouse dynamics.
- Current positive forward curve, low interest rates and growing premiums create a strong return well above US treasures and other fixed income assets.

Financial deals tying up inventories remain profitable as interest rates remain at historical lows.

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1. Cost of Carry (2) calculations are adjusted for rise or fall in NW European spot ingot premiums on a three-month rolling basis.
Regional premiums have responded to the market demand and accessibility signals.

Aluminium is at its lowest price since late 2009 when considering LME + premium.

However, premium as a % of underlying price has risen to 10 – 12%, as the market moves back into operating balance.

Premiums today represent the non-speculative end of our market as they remain “off exchange” transactions.

However, implications are significant for price risk management and premium negotiations, since premiums were historically offered as a fixed component of the price when only 3% of total revenue.

We expect to see a tendency to “float” premiums and thus fix the margin over cast house costs. This secures the producers return on capital, whilst recognising the consumer has avoided these upfront risks.
Distribution of smelter costs favour further curtailments

Global smelters capacity distribution by cash cost

- High Risk Zone for Curtailment
- Losses

USD/mt Cash Cost
- 1500-1700
- 1700-1900
- 1900-2100
- 2100-2300
- 2300-2500
- 2500-2700
- >2700

Millions mt
- 0
- 2
- 4
- 6
- 8
- 10
- 12
- 14

World without China
- China

10% of Global capacity or 4'900 kmt of production capacity (excl China) is in the RED ZONE, mostly Australia, North America and Europe

FURTHER CURTAILMENT

Anticipating 800 kmt before the end of the 2012

Source: Brook Hunt 1Q2012