A global outlook for borates

Rio Tinto Minerals
April 2014
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• Global demand projections for borates
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• Supply and demand
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US Borax / Rio Tinto Minerals

- World’s leader in supplying refined borates and developing their potential
- 140 years of mining and processing borates with long remaining mine life
- Supplies more than a third of global demand for refined borates
- Unparalleled expertise available to our customers: technical expertise on use of borates, developing new applications and product stewardship
- 20 Mule Team ® Borax brand – symbol of quality, reliability, innovation

RTM Global Footprint

- Tier one mine in California with expansion optionality
- Processing plants and shipping facilities in California, China, Malaysia, France, Spain and the Netherlands
- Global network of warehouses, stock points
- Global/regional HQs in Denver, UK, Singapore
- Additional borates resources in California
- Lithium borate deposit in Serbia
- Potash project in Canada
Borates accelerated demand growth occurs in later stages of economic development.

Inflection point not yet reached for many of our products

Percentage of saturation level*

*Saturation level – point at which consumption per capita does not increase with income levels

Source: Rio Tinto

*2010 2020 2030 2040 2050

World GDP/capita 2000 US$ PPP

- Borates
- Crude steel
- Copper
- Aluminium
- Titanium dioxide
- Diamonds

*2020 2030
The strategic pillars are the inevitable drivers of demand

- **The Need to Feed**
  - Crop Yields
  - Developing middle-class demands better foods
  - Reduction in arable land

- **Urbanization**
  - Frits/Ceramics
  - TFT/LCD
  - Borosilicate Glass
  - Textile Fiberglass

- **Energy**
  - Insulation Fiberglass
  - Oilfield Chemicals

With 9 billion people by 2050, each person will have to live off of a patch of farmland 25 m by 25 m
The key industries and end-uses are…

- Glass, BSG, IFG, TFT, TFG - largest segment for borates - >50%
- Agriculture shows the greatest growth
- Wide variety of end-uses for borates

Source: RTM Estimates
Insulation fiberglass demand is growing

- Primary global growth drivers:
  - US is largest market and residential home sales in the US are increasing
  - Higher Japanese demand due to Olympics and tsunami rebuilding
  - Energy codes – higher standard in Japan require thicker fiberglass
  - Future construction methods
  - Building refurbishment

- Upside for insulation is building refurbishment
  - Insulation is the most cost effective way to reduce global CO₂ emissions.
  - In Europe and North America there are ~50 million under-insulated homes.

Source: RTM Estimates
China is the largest borosilicate glass producer

- Cookware, lighting, pharmaceutical glass, lab ware and solar water heater tubes are the key end-uses
- Pharmaceutical glass will likely see the highest growth.
- Solar water heater tube, primarily used in China.
- Lighting is primarily driven by urbanization in emerging markets.
- BSG cookware is becoming more favorable than other materials due to chemical stability

Source: RTM Estimates
Thin film transistor growth is almost flat in largest markets

- Borates consumption for LCD panels will continue to grow
- Emerging countries will lead the growth as increasing income and lower pricing releases large market potentials
- Rapid and accelerating innovation seen in the electronics industry will likely create new demand and shorten replacement cycle
- Production will continue to concentrate in Japan, Korea and Taiwan, while more mature lines will be shifted to China
- Thinner glass substrate is major headwind for boron consumption
Boron increasingly used to improve crop yields & quality

- Significant soil deficiencies of boron are acknowledged globally
- Oil palm continues to grow in Indonesia, and has a steady presence in Malaysia. Growth seen in Africa and S. America.
  - Oil palm for food consumption and biofuel feedstock
- In India - use of micronutrients with government projects and subsidies
  - National food security mission aimed at increasing crop productivity
- South America becoming one of the leading production areas for the world (soybeans, corn and oil palm)

Source: RTM Estimates

<table>
<thead>
<tr>
<th>Region</th>
<th>CAGR (2012-2018)</th>
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<tbody>
<tr>
<td>Europe</td>
<td>2%</td>
</tr>
<tr>
<td>N. America</td>
<td>3%</td>
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<tr>
<td>S. America</td>
<td>6%</td>
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<tr>
<td>M.E.I.A.</td>
<td>7%</td>
</tr>
<tr>
<td>China</td>
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<tr>
<td>A.P. Less China</td>
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<tr>
<td>Total</td>
<td>6%</td>
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</tbody>
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A.P. Less China: Asia-Pacific (excluding China)
China will be 50% of the tile market by 2015

- Global ceramics growth will be driven by continuing development of emerging economies.
- China, Thailand, Indonesia and Middle East are leading the demand for high end frit and ceramics.
- Increases in new construction in South American (mainly Brazil) will be a growth driver.
- European producers have dramatically increased their exports to North Africa and Middle East.
- Ceramic technology driven by Italian and Spanish Frit and equipment manufacturers.
- New technologies being quickly adopted in emerging countries (i.e. inkjet printing in India/Egypt).

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<tr>
<th>Region</th>
<th>CAGR (2012-2018)</th>
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<tr>
<td>Europe</td>
<td>1%</td>
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<tr>
<td>North America</td>
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<tr>
<td>ME, Africa</td>
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<tr>
<td>China</td>
<td>5%</td>
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<td>A.P Less China</td>
<td>6%</td>
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<tr>
<td>India</td>
<td>6%</td>
</tr>
<tr>
<td>Total</td>
<td>4%</td>
</tr>
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Source: RTM Estimates
Borate supply could become tight in the next few years.

• 2012 – 2018 demand (CAGR) = ~ 4%

• In 2013, global demand increased 3% in particular in Asia (13%) & Americas (9%)

• Strong sodium demand in 2013 tied to agriculture & insulation demand.

• Non-sodium demand driven by high end glass & frits

• Expansions needed for Sodium borate in the 2014/2015 timeframe.

Source: RTM Estimates
Rio Tinto Minerals’ response - strong value proposition

• **Build on Rio Tinto brand and stability**
  – Reliable and consistent product quality
  – Leader in safety and environmental protection

• **Creating strong partnerships with customers**
  – Collaboration on R&D opportunities
  – Industry-leading tech support available
  – Significant product stewardship investment to promote and protect borate markets / products

• Asian Technology Center - to support existing customers and develop fast growing Asian market

• Optimizing global footprint to reduce costs and lead times for customers

• Mine and processing expansion options to meet increasing demand

• Continuing cost discipline through mature business improvement program
  – MDDK reduces costs and balances mine life

• Complementary projects in Serbia (Lithium Borates) and Canada (Potash)
Final thoughts….

- The inevitable drivers of demand, the three pillars, will continue to fuel the need for borates for the foreseeable future.
- Growth and value will be a function of understanding opportunities in the emerging cities and countries where growth is fueled by demand from a stronger middle class.
- Outlook - Overall China GDP growth is slowing, but China demand for borates remains robust. The US is back on the path of growth, and Europe is stabilizing.