The global outlook for borates

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IM 21 Congress – Budapest, Hungary
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Agenda

• 2011 in review
• Global demand projections for borates
• Key regional and end use drivers
• Supply and demand outlook
• Rio Tinto Minerals’ plans and response to industry demand
• Some final thoughts
• Questions
2011 in review and 2012-2016 outlook...

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<td>1.7</td>
<td>1.9</td>
<td>2.0</td>
<td>2.1</td>
<td>2.2</td>
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<td>1.8</td>
<td>1.9</td>
<td>2.1</td>
<td>2.2</td>
<td>2.4</td>
<td>2.6</td>
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<tr>
<td>Roskill YOY change</td>
<td>13.3%</td>
<td>10.6%</td>
<td>4.6%</td>
<td>4.6%</td>
<td>4.6%</td>
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<tr>
<td>RTM YOY change</td>
<td>20.3%</td>
<td>7.2%</td>
<td>8.8%</td>
<td>7.5%</td>
<td>7.8%</td>
<td>6.9%</td>
<td>7.2%</td>
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- 2011 demand rebound led by Southeast Asian Agriculture, Indian Ceramics & Borosilicate Glass, Asian TFT/LCD and China Glass (Textile Fiberglass, Insulation, Borosilicate Glass)
- Non-sodium and sodium demand rebounded at the same rate from 2010 to 2011 (7% increase).
- Global agriculture 2011 demand saw the largest increase YOY (17%)
- 2011 Insulation rebound was led by Asia, with Europe and North America sectors lagging.
- 2010 – 2014 CAGR = 6.0% – 7.8%
- 2011 – 2014 CAGR = 4.6% – 8.1%
- 2011 – 2016 CAGR = 7.6%

Review trends by key end use

Historical and future borate demand by key end use 2008 – 2016 (B₂O₃ MT)

Source: RTM Estimates

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Shift in global GDP – the cornerstone for growth

Borate Demand and GDP Growth Rates
(borate demand % based on $\text{B}_2\text{O}_3$ MT, GDP % based on real GDP annual billions of 2005 PPP$)

Source: Global Insight Data Insight Services, February 22, 2012, RTM Estimates

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## RTM responding to borate world demand via 3 strategic pillars

### Energy Efficiency
- **Increasing Insulation standards**
  - Higher R Values
  - Gov’t Incentives
  - Building Practices

**Wind Energy**
- Location of plants strategic to TFG / Boron Alloys

**Alternative Fuels**
- Biofuels = Ag
- Hydrogen work

### Global Urbanization
- **Building in Emerging cities (AP, MEA/I)**
  - IFG
  - Frits / Ceramics
  - Wood Preservation

**Increased Consumer Demand**
- LCD TVs
- Durable goods (TFG)
- BSG Glass

### Food Crisis “Need to Feed”
- **Agriculture Demands**
  - Yields improvements
  - Expansions into new regions

**Regional strategies to capture:**
- Complimentary B product offerings
- New crops using B
Regional look at insulation fiberglass: 2011 – 2016

Global industry CAGRs by region: 2011 – 2016 (total borates)

<table>
<thead>
<tr>
<th>REGION</th>
<th>CAGR (2011-2016)</th>
</tr>
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<tbody>
<tr>
<td>North America</td>
<td>8.3%</td>
</tr>
<tr>
<td>South America</td>
<td>4.2%</td>
</tr>
<tr>
<td>China</td>
<td>9.7%</td>
</tr>
<tr>
<td>Asia Pacific Less China</td>
<td>3.7%</td>
</tr>
<tr>
<td>Europe</td>
<td>3.3%</td>
</tr>
<tr>
<td>Middle East, Africa, India</td>
<td>17.7%</td>
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<tr>
<td>TOTAL</td>
<td>7.3%</td>
</tr>
</tbody>
</table>

- The stage is set for incremental demand increases for 2012.
- Existing residential home sales are increasing while the inventory and months of supply continue to decline.
- Primary drivers:
  - Energy codes
  - Future construction methods
  - Building refurbishment
- Upside for Insulation is building refurbishment
  - Insulation is the most cost effective way to reduce global CO₂ emissions.
  - In EU and NAM there are ~50 million under-insulated homes.

Source: RTM Estimates
US housing projections & EU Refurbishment Plans

US housing start projections (millions)

- 2012 full year US housing starts ~700 K growing 25% to ~870 K in 2013.
- Forward projections stabilize in 2015-2020 around 1,700 K (similar to 2007 levels).

European Building Refurbishment

- Target of 80% reduction in CO₂ emissions by 2050
- Refurbishment of existing buildings is just as important as the energy efficiency of new buildings

Source: Global Insight Data Insight Service, APA Housing Starts January 2012 (email permission obtained 2/29/12); Knauf 2010 sustainability Report
### Regional look at borosilicate glass (non-TFT): 2011 – 2016

Global industry CAGRs by region: 2011 – 2016 (total borates)

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<th>REGION</th>
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<tbody>
<tr>
<td>North America</td>
<td>4.9%</td>
</tr>
<tr>
<td>South America</td>
<td>4.8%</td>
</tr>
<tr>
<td>China</td>
<td>12.2%</td>
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<tr>
<td>Asia Pacific Less China</td>
<td>3.9%</td>
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<tr>
<td>Europe</td>
<td>3.2%</td>
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<tr>
<td>Middle East, Africa, India</td>
<td>14.2%</td>
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<tr>
<td>TOTAL</td>
<td>10.7%</td>
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- Cookware, lighting, pharmaceutical glass, lab ware and solar water heater tubes are the key end-uses
- Technology and consumer demand will continue to drive this end use into 2016
- Solar water heater tube technology is driving demand growth in China
- Pharmaceutical glass and thin glass tube demand is growing in MEAI
- Aging population in mature countries is driving pharmaceutical glass demand

Source: RTM Estimates

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Global industry CAGRs by region: 2011 – 2016 (total borates)

- LCD TV demand area will continue to grow in the outer years driven by design differentiation, continued moves to larger screen sizes, handheld technology and 3D TVs.
- Short term growth is still seen in CRT replacement in developing economies
- Long term growth will be seen in shorter purchase cycle (replacements) and continued growth in emerging regions.
- Upsides: Cover Glass for touch screens on consumer electronics, flexible glass, OLED lighting.

<table>
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<tr>
<th>REGION</th>
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<tbody>
<tr>
<td>North America</td>
<td>6.0%</td>
</tr>
<tr>
<td>China</td>
<td>19.5%</td>
</tr>
<tr>
<td>Asia Pacific Less China</td>
<td>8.1%</td>
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<tr>
<td>TOTAL</td>
<td>8.7%</td>
</tr>
</tbody>
</table>

Source: RTM Estimates, Display Search; “New Sizes Increase LCD TV Area Demand Outlook”, Jan 23, 2012 (email permission obtained 2/29/12)

- Global ceramics growth will be driven by continuing development of emerging economies.
- World tile production will be 14bn m2 by 2015, (6% CAGR from 2010)
- World B demand in Frit & Ceramics will be 461 B₂O₃ KMT in 2015 (8.3% CAGR from 2010)
- China, Thailand, Indonesia and Middle East are leading the demand for high end frit and ceramics
  - China is already 60% of the global market.
- Increases in new construction in South American (mainly Brazil) will drive ceramic frit growth.
- 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)

Source: RTM Estimates

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Frits & Ceramics key growth messages

Asia:
- China’s 5 year plan will support the on-going growth in ceramics demand
- Shift from low cost to high quality
- China will be a fertile ground for innovative ceramics technologies

Middle East / India / Africa:
- Egypt and India will continue to show some of the highest global growth
- Northwest Africa will be the next growth area of frit production
- RTM Serbia location will be well positioned to serve this market

Italy / Spain:
- Spanish domestic market will be constrained by construction
- Spanish export markets will likely be affected as Middle East and N Africa continue to develop
- This region is important for developing next generation technologies

Source: RTM Estimates

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Regional look at agriculture: 2011 – 2016

Global industry CAGRs by region: 2011 – 2016 (total borates)

<table>
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<tr>
<th>REGION</th>
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<tbody>
<tr>
<td>North America</td>
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<td>21.5%</td>
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<td>Europe</td>
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<td>Middle East, Africa, India</td>
<td>15.1%</td>
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<tr>
<td>TOTAL</td>
<td>10.5%</td>
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</tbody>
</table>

- Boron deficiency is the most widespread of all crop deficiencies, affecting almost all major crops globally
- Boron increasingly recognized as critical to improve yield
- Dramatic growth of oil palm in Indonesia and Malaysia (15% CAGR from 2011-2016)
- Upsides in India for the use of micronutrients with government projects (national food security mission aimed at increasing crop productivity) and subsidies
- Chinese government agriculture sector grew from $36bn in 2005 to $120bn in 2010
- South America becoming the leading “bread basket” for the world (soybeans, corn and oil palm)

Agricultural Commodity Prices
January 2012- Percentage Price Increase Compared to 2000-2010 Average

Source: World Bank, RTM Estimates
The “need to feed” – fertilizers & micronutrients will play a key role

With 9 billion people by 2050, each person will have to live off of a patch of farmland 25 m by 25 m

Source: http://www.wfp.org/hunger/map

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Global supply and demand – borates

- All announced expansions have been take into account for estimates
- All borates (mineral and refined) are included in estimates
- Consideration for mineral feed stocks production and consumption have been included
- There is a significant divergence of demand for non-sodium borates and sodium borates driven by the housing, construction, agriculture and glass sectors
- Logistics (bulk and containers), input prices (sulfuric acid, energy) and foreign exchange will drive segmentation strategies of all key suppliers
Global supply and demand – borates

Total borate supply and demand – global (Millions $B_2O_3$ MT)

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<tbody>
<tr>
<td>Vol Total (7.6%)</td>
<td>1.7</td>
<td>1.4</td>
<td>1.7</td>
<td>1.8</td>
<td>1.9</td>
<td>2.1</td>
<td>2.2</td>
<td>2.4</td>
<td>2.6</td>
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<tr>
<td>Vol SAM (0.2%)</td>
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<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
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<td>0.1</td>
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<td>Vol NAM (6.3%)</td>
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<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
<td>0.4</td>
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<tr>
<td>Vol MEA/I (9.4%)</td>
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<td>0.1</td>
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<td>0.1</td>
<td>0.1</td>
<td>0.2</td>
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<tr>
<td>Vol EU (3.1%)</td>
<td>0.4</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
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<tr>
<td>Vol China (10.2%)</td>
<td>0.6</td>
<td>0.5</td>
<td>0.6</td>
<td>0.7</td>
<td>0.8</td>
<td>0.8</td>
<td>0.9</td>
<td>1.0</td>
<td>1.1</td>
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<tr>
<td>Vol APAC LC (6.4%)</td>
<td>0.7</td>
<td>0.7</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
<td>0.4</td>
<td>0.4</td>
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<tr>
<td>Marketable Supply Total (7.4%)</td>
<td>2.0</td>
<td>2.1</td>
<td>2.0</td>
<td>2.1</td>
<td>2.2</td>
<td>2.3</td>
<td>2.4</td>
<td>2.4</td>
<td>2.4</td>
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<tr>
<td>85% Capacity Utilization</td>
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<td>1.9</td>
<td>2.0</td>
<td>2.0</td>
<td>2.0</td>
<td>2.0</td>
</tr>
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</table>

Source: RTM Estimates
RTM’s response: a focus on meeting demand and improving response to regional customers and end users

- Expanding our logistics footprint to bring our products closer to emerging and mature markets.

- Developing the next generation products that will provide significant energy savings to the IFG and BSG production sector, and provide new mineral platforms for the next generation of consumer glass.

- Introducing boron compounds for complementary use with NPK producers and distributors globally – for both foliar and soil fortification applications.

- Our Serbian lithium-borate deposit is unique and provides an opportunity to diversify our focus on energy and energy conservation, while improving our response to the Pan-European market.

- The Asia Technical Center (ATC) will be commissioned September 2012. The ATC will provide world class product development and support to existing and new customers and a renewed focus on growing end-uses. (BSG, Agriculture, Frit and Ceramics).
Some final thoughts....

- Urbanization and the “second wave of industrialization”, in mature and emerging countries will continue to drive demand for minerals, although consumer consumption dynamics will vary.

- Growth and value will be a function of understanding opportunities in the “markets of the future” (MOTF) and the “cities of the future” (COTF). These are opportunities just appearing on the horizon. This will drive continued demand for non-commodity industrial minerals like borates, zircon, TiO2, rutile, and glass minerals, well into the next decade.

- Fundamentals for a dramatic rebound in minerals demand in both he US and Europe have not changed. The US is back on the path of latent mineral demand, and Europe will soon join, once liquidity issues are fully resolved, and the focus shifts from austerity to growth.
Thank you

Questions?