Outlook for the global tantalum market

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- The information in this presentation is based on publicly available sources, subscription databases, industry contacts and Roskill analysis.

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- I will be more than happy to hear any dissenting views on the supply, demand and price forecasts presented today (and so will the journalists in the audience)
Overview

• Primary tantalum supply and outlook
• Tantalum demand and outlook
• Tantalum supply/demand balance forecast
• Tantalum price outlook
Primary tantalum supply and outlook
Primary tantalum supply, 2012 (000lb Ta$_2$O$_5$)

Source: Roskill
What factors will influence future primary supply?

• What happens in Central Africa
• The extent and timing of inventory drawdowns, particularly if there is a sharp upturn in Ta demand
• Availability of financing for development of greenfield projects
• Potential exploitation of slag dumps
• Pricing levels
Central Africa

- Central Africa is a wild card in tantalum supply
  - Much of it is conflict tantalum but, equally, much of it is not

- How to address the problem of conflict tantalum?
  - Top-down or bottom-up?
  - A blanket ban on tantalum from Central Africa would hurt the local populations
Inventories

- Inventories are very important in the tantalum supply chain
- The extent and timing of inventory drawdowns
  - Very large drawdowns expected over the next two years
  - Potential crunch if tantalum demand picks up more sharply than expected
New hard-rock sources?

- There are few greenfield tantalum projects in the pipeline
- None is GAM-sized
- Many are dormant, including the mega-projects
- The project-economics of others often relies on the market for other commodities
- All projects need external financing to proceed
Slag dumps

- Tin slags are an important part of primary tantalum supply (~10%)
- There are three types
  - Slags from smelting
  - Low-grade slags
  - Large slag dumps
Pricing levels

- Current market prices for tantalum are not a great incentive to new producers
- The comparative prices of tin and tantalum are key to artisanal supply. What is the trigger price?
- Contract prices and long-term contracts
Primary tantalum supply forecast

Source: Roskill
Tantalum demand and outlook
Tantalum demand by application, 2012

Total = 1,680t Ta

- Powder/wire: 39%
- Superalloys: 19%
- Carbides: 9%
- CPI/mill: 11%
- Oxides/chems.: 10%
- Targets: 12%

Source: Roskill
What factors will influence future demand for tantalum capacitors?

Tantalum capacitor consumption (units)

Sources: TIC: Roskill
What factors will influence future demand for tantalum elsewhere?

- **Other electronics (thin films etc)**
  - Steady growth likely

- **Superalloys**
  - Aerospace growing strongly (aircraft deliveries expected to continue to grow through 2030) but substitution for Ta by ceramics is a possibility in the longer term. The same may be true in land-based gas turbines.

- **Others**
  - No dramatic increases in Ta demand likely. Some applications may see demand fall.
Tantalum demand forecast (t Ta)

Source: Roskill
Tantalum demand forecast continued (t Ta)

Source: Roskill
Tantalum supply/demand balance forecast
Tantalum supply/demand balance forecast (Mlb Ta₂O₅)

Source: Roskill
Tantalum supply/demand balance forecast continued (000lb Ta$_2$O$_5$)

Source: Roskill
Tantalum price outlook
Tantalum concentrate spot prices (Ta$_2$O$_5$ 30% cif China, US$/lb)

Source: Asian Metal
Long-term agreements at prices normally much higher than spot prices (guaranteed supply)

Some hard-rock miners have started to behave like swing producers, however. They are expensive operations and need a minimum price to produce economically.

GAM appears to be paying at least US$130/lb for Brazilian material.
Tantalum concentrate contract prices outlook

• No hard-rock mine will be interested in anything other than multi-year agreements at contract prices well above US$100/lb.

• A minimum of US$120 is reasonable to expect.

• GAM probably needs US$150-160 to restart in Australia.

• "A good question to ask is, 'what is the downstream industry more afraid of ... the price of tantalum or not being able to get hold of any tantalum?'"
Thank you.
Any questions?

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