Critical Materials

Kim Marshall

Tuesday 20th March 2012

www.emitconsortium.com

Overview of presentation

Introduction to project

What is materials criticality?

Risk metrics

Data product

Demonstration

What's next? Reporting capability

Your feedback

Introduction to project

Part of the SAMULET and in collaboration with Rolls Royce

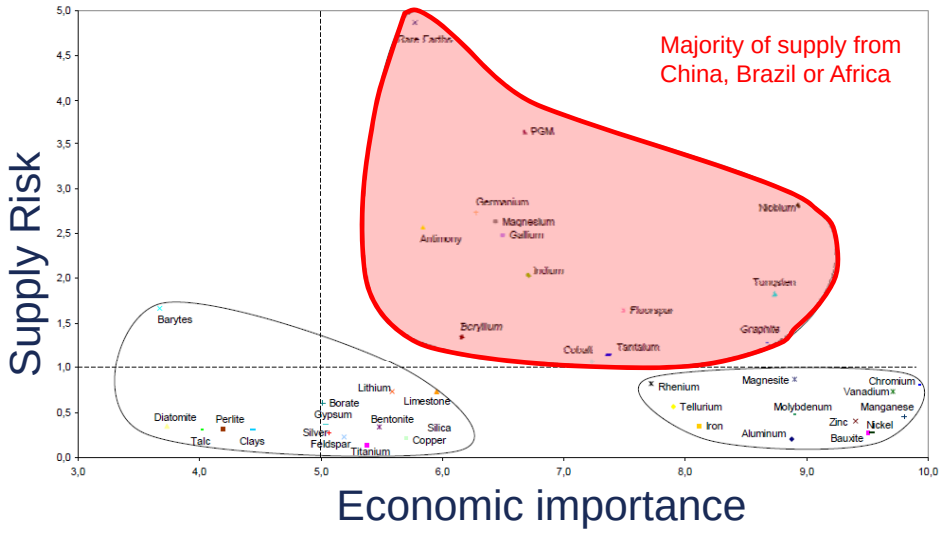
Informed by ADS Design for the Environment Working Group

SAMULET focuses on assessing business risk in the following areas:

- Critical materials
- Restricted substances
- Energy consumption

Materials Criticality -> materials supply and price risk

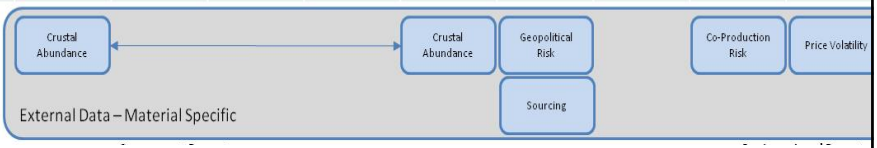
Sustainable use of materials



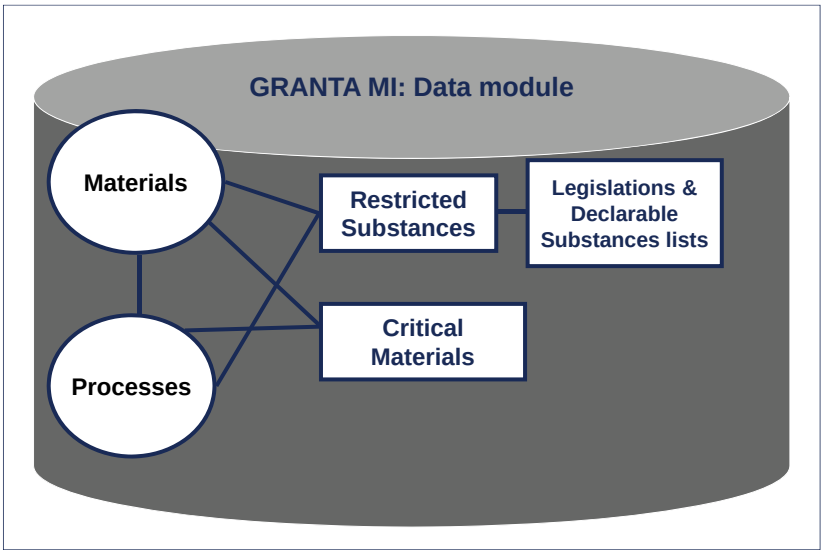
Critical raw materials for the EU – July 2010

Overview of impact and risk

	Potential Business Impact				Supply & Price Risk				
Risk Level	% World Supply	Impact on Revenue	Ability to Substitute	Ability to Pass Through Cost	Crustal Abundance	Sourcing & Geopolitical Risk	~~Demand~~ Risk	Co-Production Risk	Historic Price Volatility
Very High	Extremely Significant >X%	>£Y Bn	Very Unique, No substitute expected	Nearly Impossible	Very Rare <0.01 ppm	Concentrated High Risk	~~New applications could significantly increase demand~~	Co-produced but extraction method in jeopardy	>500%
High	Very Significant 0.25X – X%	£0.25Y - £Y Bn	No known substitute, extensive research	Difficult	Rare 0.01 – 1 ppm	Concentrated and/or Significant Risk	~~New applications could increase demand~~	Co-produced and economically insignificant	200% - 500%
Medium	Significant 0.05X – 0.25X%	£0.05Y – 0.25Y Bn	Possible substitutes known but not tested	Partially Possible	Less Common 1 – 100 ppm	Some Diversity and/or Risk	~~No new applications: Growth faster than GDP~~	Co-produced but economically significant	100% - 200%
Low	Low 0.01X – 0.05X%	£0.01Y – 0.05Y Bn	Substitute known but not designed in	Relatively Easy	Common 100 – 10,000 ppm	Very Diverse and/or Stable	~~No new applications: Growth at GDP~~	Primary Product	50% - 100%
Very Low	Very Low <0.01X%	<£0.01 Bn	Substitute design ready for production	Done Automatically	Very Common >10,000 ppm	Domestic Source	~~No new applications:~~ Growth less than ~~GDP~~	-	<50%

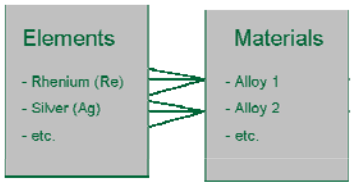


Date product overview



Risk levels for critical materials

- 5 metrics each with categories/thresholds for risk levels
  - Abundance in the earth's crust (ppm)
  - Sourcing and political risk (World Bank Governance Index for countries)
  - Environmental country risk (Yale Environmental Performance Index for countries)
  - Coproduction type
  - Price volatility (%)
- Risk levels
  - Very high,
  - High,
  - Medium,
  - Low,
  - Very low…

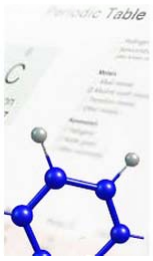


Each element has a roll-up rating for Material Criticality based on worst case risk indicator

Each material has a roll-up rating for Material Criticality based on worst case element it contains

Demonstration

Critical Materials



Welcome to Granta's Demo Critical Materials Database

Granta's Critical Elements and Materials data (demo/test database)

Search for Elements Go

What's next?

- **Finishing off Critical Materials models and database**
- **Developing Critical Materials BoM reporting capability (next slide)**
- **Beta testing for SAMULET project (by RR)**

Mock-up report (for feedback)

Critical Materials Report

Product name / code: Wiring harness
Report generated: 2012-02-16
Report by: GRANTADESIGN\Kim.Marshall

Summary: Risk level by Part

Part	Part ID	Maximum Risk Level
Insulated copper wire	1234	Medium
Contact pins	5678	Very low

Details: Critical materials in Parts

Copper

Part	Part ID	Material	Maximum Risk level	Reason (s)
Insulated copper wire	1234	Copper, C10100, wrought, hard	Medium	Abundance; Price volatility

Any questions?

Thank you

Kim Marshall
Eco Design Technical Lead
Granta Design Limited