

RARE EARTHS, AN UPDATE: A Fresh Look at the *Suppliers, the Buyers,* and the Trade Rules

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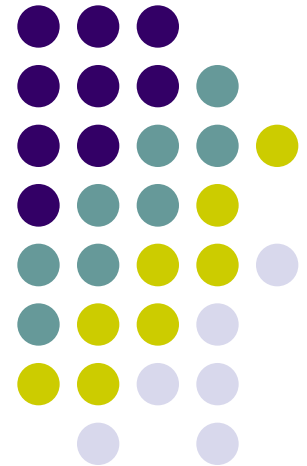


The Global Business Dialogue, Inc.
Changing the Conversation

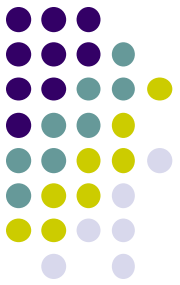














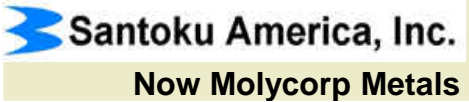




TRANS**A**TLAN**T**IC
BUSINESS**D**IAL**O**GU**E**

June 9, 2011
Washington, DC



REITA Members (as of May 31, 2011)


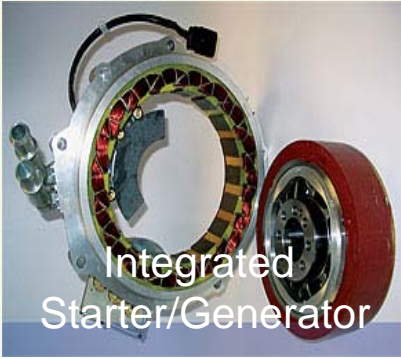



Industry	RE Resource Companies	Academia
 <p>imagination at work</p>		
		
		
		
 <p>Now Molycorp Metals</p>		
		
		

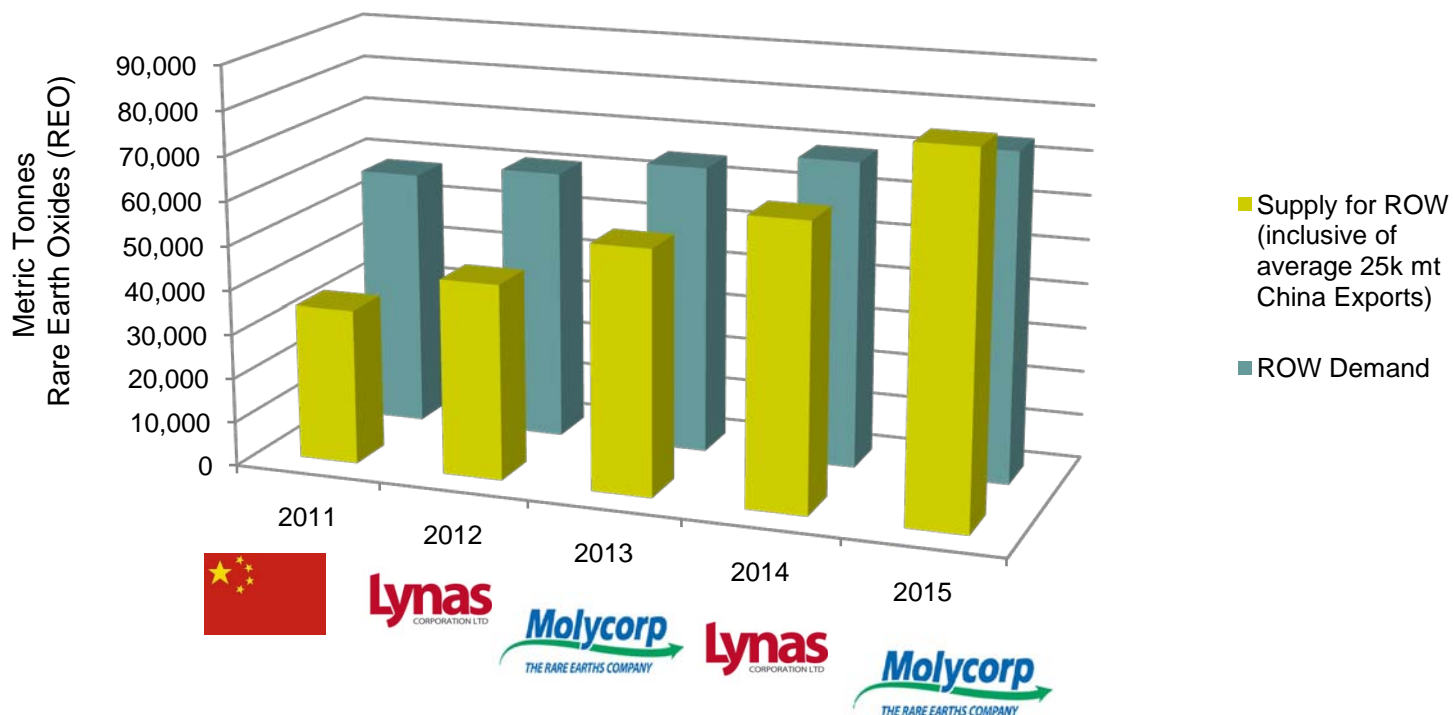
Why are we in this predicament?

The Scale of Clean Energy Demand



Applications		Typical Quantity of RE Oxides per unit
Traditional Markets i.e. disc drives, personal electronic devices, power tools, etc.		Grams
Hybrid and electric vehicles – direct drives and electric assist motors	 <p>Integrated Starter/Generator</p>	Kilograms
PMG Wind Turbines		Metric Ton

Rest of World Demand¹ for REO and the Sources of Supply Increments 2011 - 2015



¹ Kingsnorth, Dudley, presentation to *The Hague Centre for Strategic Studies, January, 2011*

Clean Energy Buyers' View

For sustained investment in Clean Energy, OEMs must be assured of *reliable* sources of supply of Rare Earth materials / components / devices at *manageable* prices

(As long as there is a *perceived* supply gap, price and availability of REO will continue to remain unstable and problematic to OEM sustained investment)

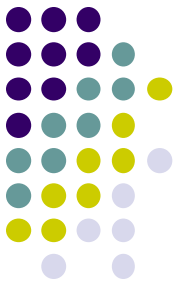


Where Will 2016 – 2020 REO Supply Increments Come From?



Light Rare Earth Resources	Heavy Rare Earth Resources
Arafura Resources 	Alkane Resources 
Rare Element Resources 	Avalon Rare Metals 
Toyota/Sojitz/Govt. of Vietnam 	Great Western Minerals Group  

Other High Profile RE Resource Project Companies



Heavy Rare Earth Resources

Matamec Resources



Mitsubishi / Neo Material Technologies



Quest Rare Metals



Sumitomo / Kazatomprom

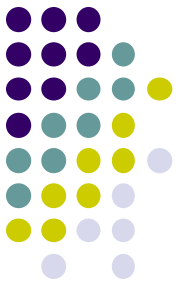


Toyota/Indian Rare Earths JV



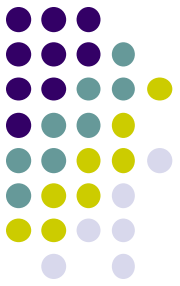
Ucore Rare Metals





RE Project Companies' Issues

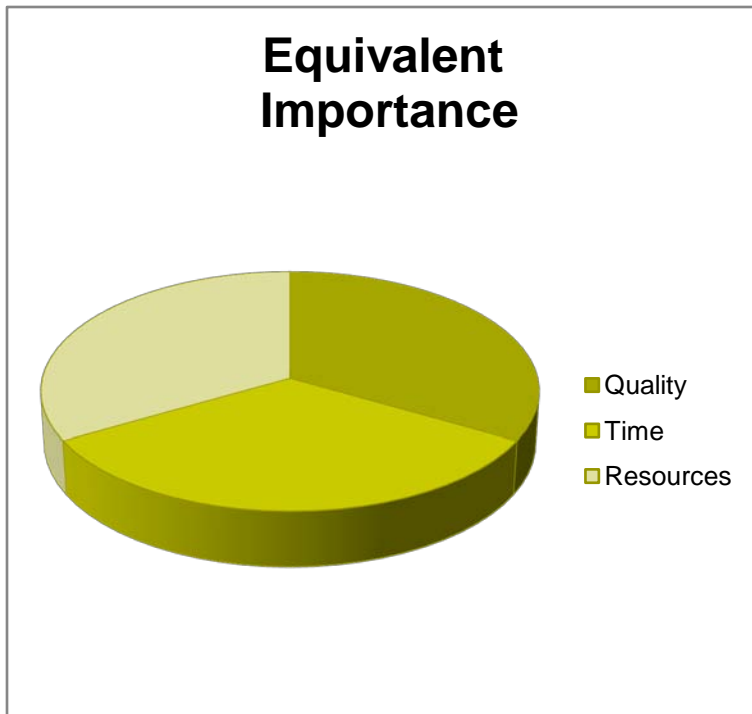
Reliable Supply	Manageable Pricing
<p>Lack of accurate demand forecasts – <i>huge error bars.</i></p> <p>Limited marketing reach</p>	<p>Cost minimization – variable and fixed</p>
<p>Adequate development funding to accelerate the 5-12 year process to develop and commercialization process</p>	<p>New profitable markets for Ce / La</p>
	<p>Enough RE properties in the queue so that ROW production capacity <i>tracks with demand</i></p>



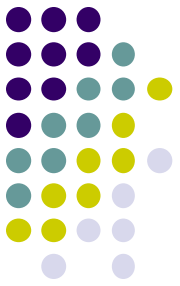
Reducing New RE Project Timeline

Project Management Lesson:

Spend Extra Resources to Save Time While Maintaining Quality



Reducing New RE Project Timeline When Resources are Tight

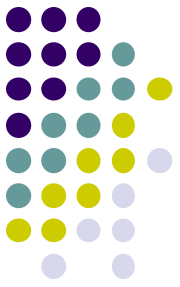


Single Project Companies with limited track records

Credit is tight in general – long payback for these investments is problematic

Technical talent scarcity?

New RE Project Funding / Support Sources



Lending Markets

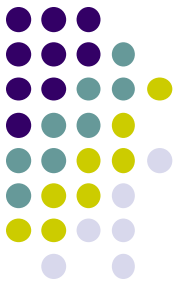
Capital Markets

Trading Companies – Sumitomo example

OEMs – Toyota, Sojitz and Mitsubishi

Governments – JOGMEC example

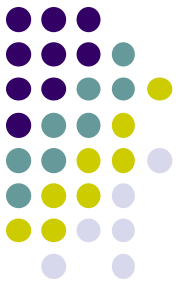
Two Areas Ripe for Global Collaboration - Extending the Life of RE Resources



**Recycling of end-of-life products:
technologies needed / business
opportunities / best practices**

**Manufacturing efficiencies and reduced
waste of raw materials at and
downstream of RE processers**

The Process Yield Opportunity in the RE Magnet Supply Chain



	Unit Op 1	Unit Op 2	Unit Op 3	Overall Yield
Chemical Industry Standard	90%	90%	90%	73%
Not Untypical	62%	70%	65%	28%

What Should OEMs Be Doing?

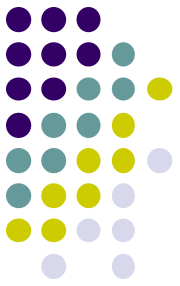


Understand the vulnerabilities within its individual supply chains. Address vulnerabilities and plan for diversification of supply.

Engage in conversations with RE property developers and the rest of its downstream supply chain.

Agree on means to transparently communicate and protect proprietary forecasts of RE requirements

What Should OEMs Be Doing?

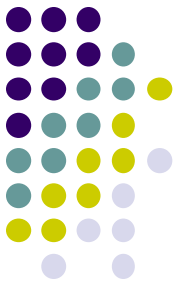


Demonstrate Commercial Commitment

- LOIs
- Off-take agreements
- Loans
- JVs

(Capital sources prefer to see “Demand Pull” as the market driver and not a technology push by suppliers)





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