



18 March 2010

Manager Announcements  
Company Announcements Office  
ASX Limited  
20 Bridge Street  
Sydney NSW 2000

Dear Sir,

**PRESENTATION**

Attached is a copy of a presentation to the Rare Earths, Specialty and Minor Metals Investment Summit being held in London and to investors.

A copy of this presentation will also be available on the Company's website [www.alkane.com.au](http://www.alkane.com.au).

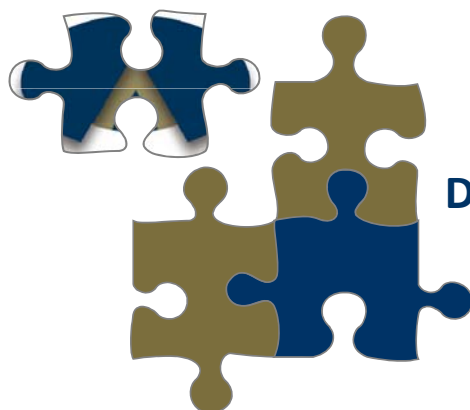
Yours faithfully,  
for **ALKANE RESOURCES LTD**

A handwritten signature in black ink, appearing to read 'D I Chalmers'. The signature is written in a cursive, flowing style.

D I Chalmers  
**Managing Director**

# Rare Earths, Specialty & Minor Metals Investment Summit

London 18 March 2010



## Dubbo Zirconia Project

NSW Australia

objectivecapital



## Corporate snapshot



Exchanges ASX: ALK

Share Price (16 March 2010) A\$0.32

Shares 249m

Fully Diluted Market Cap ~A\$80m

Cash (at December 31 2009) ~A\$4.5m

Investments (BCI) ~A\$6.5m

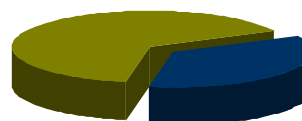
No debt

12 Month High / Low A\$0.48/ \$0.18



Source: FT

### Shareholder profile\*



Retail	Top 20	~60%
Institutions	Directors & Management	3%
	Abbotsleigh (Gandel Metals)	29%

\*at 30 June 2009

### Directors & Management

J. S. F. Dunlop	Chairman
D. I. Chalmers	Managing Director
I. R. Cornelius	Non-Executive Director
A. D. Lethlean	Non-Executive Director
I. J. Gandel	Non-Executive Director
L.A. Colless	CFO Joint Secretary
K.E. Brown	Joint Secretary



## DZP Location



Central West  
New South Wales



## Business Strategy



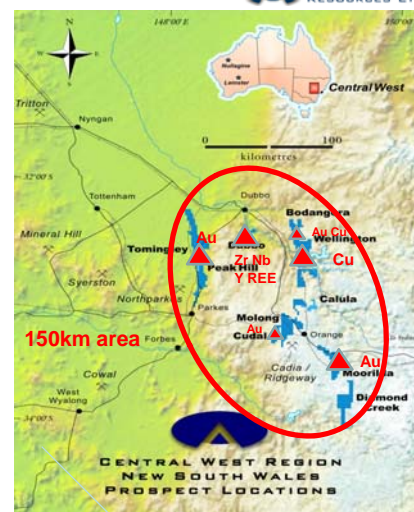
Multi commodity explorer and miner, focussed in the Central West of New South Wales, Australia

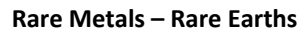
Dubbo Zirconia Project – world class resource of zirconium, hafnium, niobium, tantalum, yttrium and rare earths

Gold production from Peak Hill mine 1996 – 2005.  
New gold development planned at Tomingley based upon 800,000 oz resource

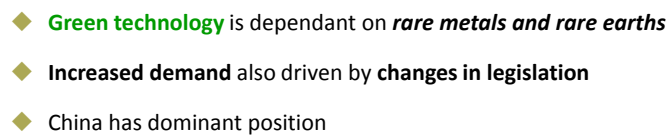
Major gold discovery at McPhillamys (2 to 4 million oz)  
Joint Venture with Newmont

Develop multiple operations within tight geographic area over next five years





- 
- Periodic Table**
- Legend:
- Noble Gas
  - Metal
  - Hydrogen
  - Rare Earth
  - Trans. Met.
  - Non-Metal
  - Alkali Earth
- Lanthanide Series**
- Actinide Series**
- Rare metals**
- Light rare earths**
- Heavy rare earths**



*...not so rare, but increasingly valuable*



## State power grid

## State gas grid

## Major mixed agriculture

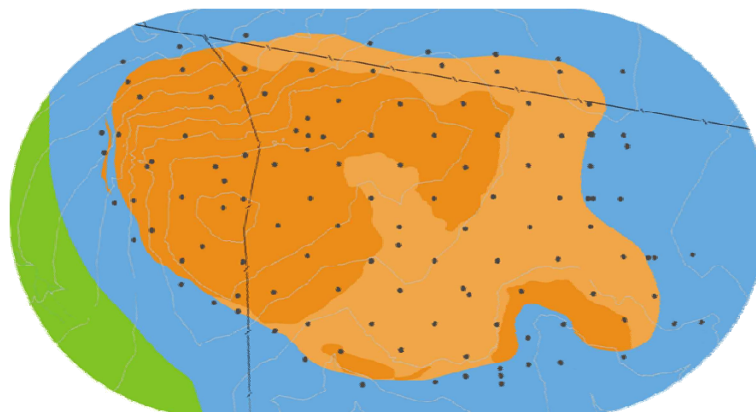
## Transport hub

### Substantial light industry





## DZP Geology



0 200  
metres

**Jurassic aged trachyte intrusive**

- Mineralised Trachyte
- Basalt
- Napperby Formation
- Drill hole collar



## DZP Resources



<b>Measured Resource</b> 0 - 55 metres	:	35.7 million tonnes grading 1.96% ZrO <sub>2</sub> , 0.04% HfO <sub>2</sub> , 0.46% Nb <sub>2</sub> O <sub>5</sub> , 0.03% Ta <sub>2</sub> O <sub>5</sub> , 0.14% Y <sub>2</sub> O <sub>3</sub> , 0.75% REO and 0.014% U <sub>3</sub> O <sub>8</sub>
<b>Inferred Resource</b> 55 - 100 metres	:	37.5 million tonnes at similar grades
<b>TOTAL</b>	:	73.2 million tonnes

Major world resource of zirconium, hafnium, niobium, tantalum, yttrium and rare earth elements

Although the ore is not classified as a radioactive deposit, it contains 23 million lbs (10,200t) of uranium

Production of uranium is currently prohibited in NSW



## DZP Program



Resource drilling completed 2001. Flow sheet developed 1999 to 2002, with trials to mini pilot plant scale. Detailed feasibility study completed in 2002.

AusIndustry Commercial Ready Grant of A\$3.29M in April 2006 on dollar for dollar basis to complete process optimisations, and construct and operate the Demonstration Pilot Plant (DPP).

Laboratory program commenced at ANSTO Lucas Heights (Australian Nuclear Science and Technology Organisation) July 2006, with Demonstration Pilot Plant commissioned March 2008

Substantial product samples from DPP distributed in second half of 2009

Continual market update – strong growth predicted in most products

Revise and update the 2002 feasibility study by Q3 2010. DFS managed by Perth based consultants **TZ Minerals International Pty Ltd (TZMI)**.



## DZP Feasibility Team



DFS study manager: Steve Gilman TZ Minerals International Pty Ltd  
Gavin Diener - Engineering TZMI

Marketing: Alister MacDonald TCMS  
Philip Murphy TZMI

Special Marketing Consultant: Dudley Kingsnorth IMCOA - REE

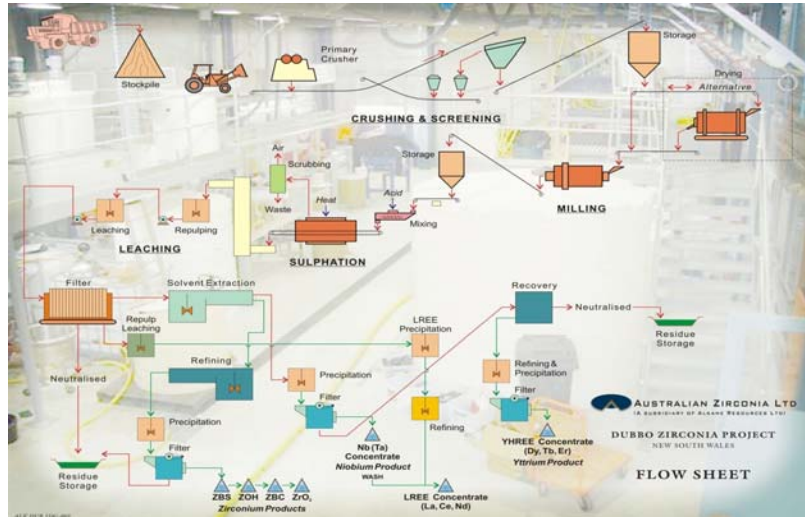
ANSTO Minerals: Bob Ring, Doug Collier, Karin Soldenoff, Des Levins, Chris Griffiths  
DPP Operations: Adrian Manis, Peter Fletcher, Prakash Rajalingam + the crew

DPP Ext Engineering: Worley Parsons





## DZP Flow Sheet



## Market Summary



- Zirconium:** drying agent in paints; primer coat of vehicle metalwork; ceramic pigments; **engineering ceramics**; **auto catalysts**; electronics; solid oxide fuel cells; **fuel rods in nuclear power plants**; special alloys and glasses
- Hafnium:** alloys, control rods for nuclear reactors; nextgen **microprocessors**
- Niobium:** **HSLA steels**; special alloys and glasses
- Yttrium:** stabilizer in ceramics; **phosphors** for TV/computer screens; lasers; and **compact fluoro lights** = energy efficient bulbs
- Rare earths:** speciality glasses; **phosphors**; fertilizers; catalysts; lasers; **permanent magnets/rechargeable batteries**, particularly for **hybrid vehicle** motors

**Increased demand for many of the metals is driven by environmental legislation to ensure emissions minimisation and energy consumption efficiency**



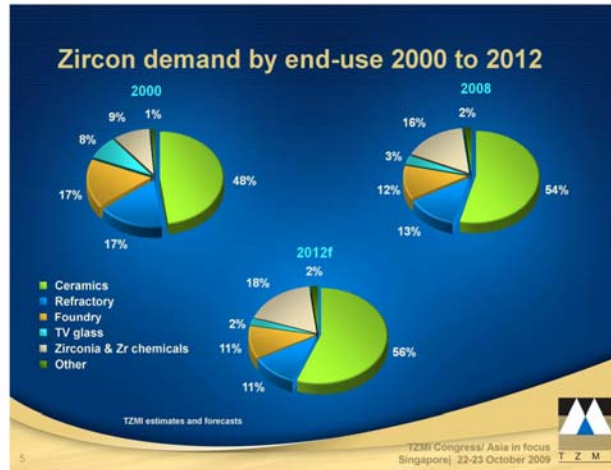
## Zircon Usage

Zircon provides the feedstock for the zirconium industry



**2012 Global  
consumption  
estimate  
1,400,000tpa**

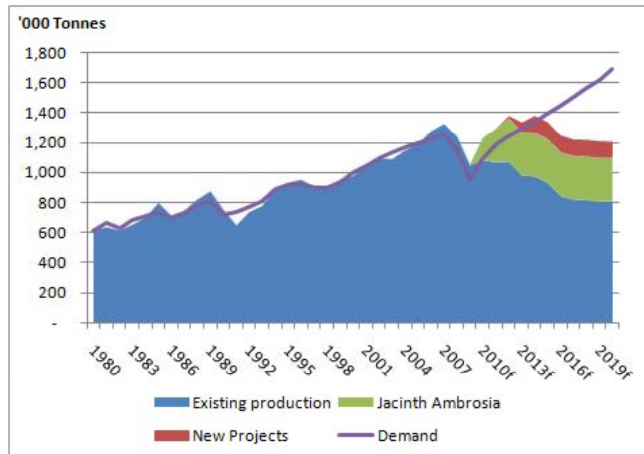
**18% = 250,000t zircon  
for zirconia and  
zirconium chemicals**



Source: TZMI



## Zircon Supply Demand Price



**Zircon price and supply will have a major impact on the cost and availability  
of zirconium chemicals, zirconia and zirconium metal**

Source: TZMI



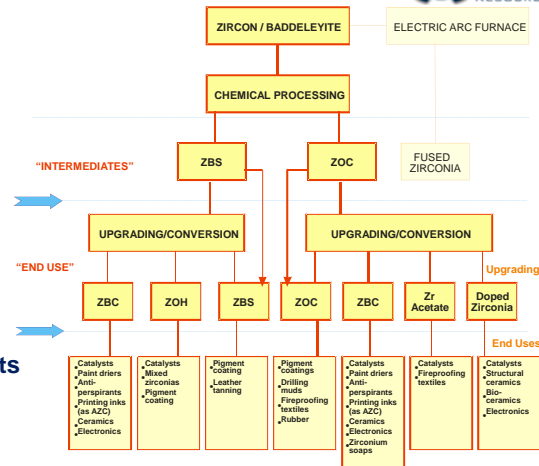


## Zirconium Chemicals Industry



### Zirconium Chemicals Industry Structure and Market Entry Points

2008 ~ 160,000t zircon converted to 96,000t of zirconia (equivalent) products and 10,000t Zr metal



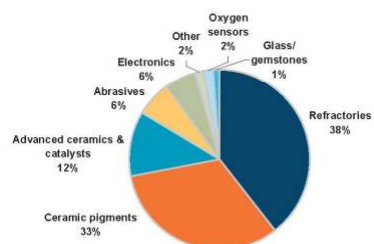
Source: TZMI



## Zirconium Chemicals



### Current Zirconia Zirconium Chemical Uses



2015 Estimated

150,000 tonnes with industry growth rate of 4.5%pa

High growth areas:

Advanced ceramics and catalysts 13.0%pa

Ceramic pigments 8.0%pa

Zirconium metal for nuclear applications ?

Products range from US\$4/kg to US\$20/kg

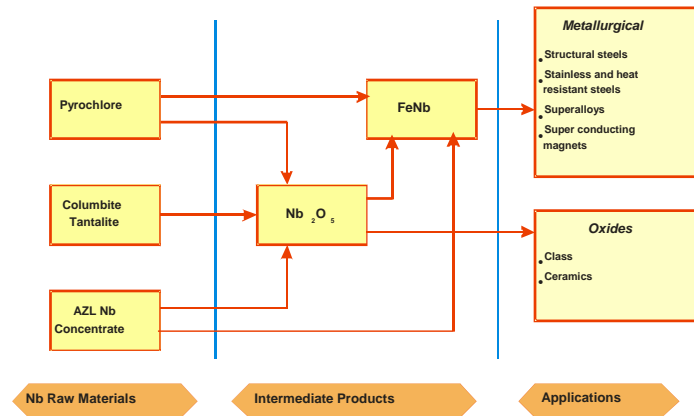
Metal US\$200/kg



Source: TZMI



## Structure of Niobium Industry



DZP process removes radioactive elements such as uranium and thorium, producing clean concentrate

Source: TZMI



## Niobium Demand

Global demand for niobium units: 1980 to 2006



© TZMI 2007

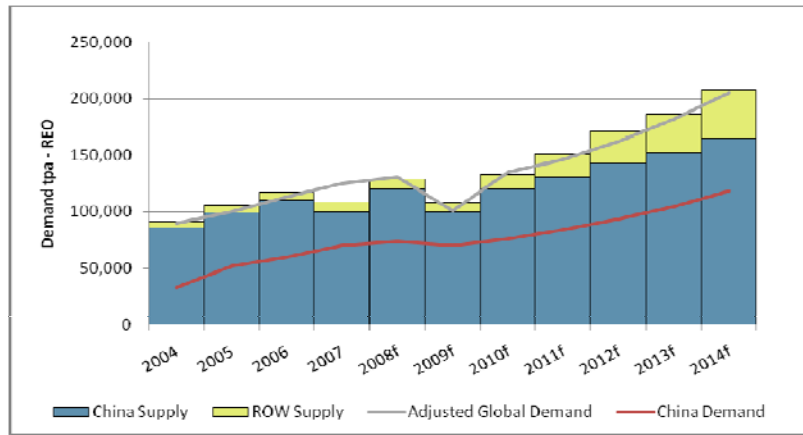
Niobium 2007  
(Ferroniobium units)  
consumption  
~63,000t – 90% Brazil  
Estimate for 2012  
~100,000t

Ferroniobium price spiralled to US\$60/kg in March 07 and is currently around US\$35 - 40/kg  
Long term expected to be in US\$25 - \$35/kg

Source: TZMI



## Rare Earth Supply - Demand



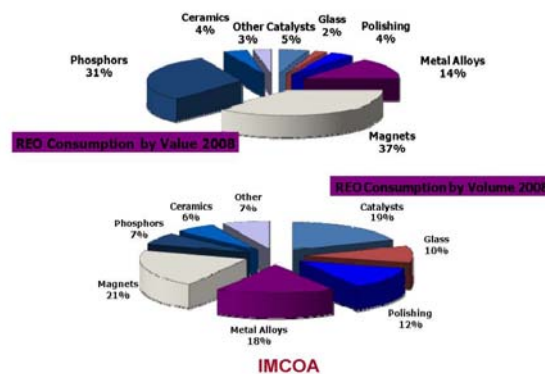
Source: IMCOA



## Rare Earth Consumption



### 2008 REO Consumption



14

Source: IMCOA



## DZP Product Output



Base case model of 400,000 tonnes per year of ore processed

Ore processed	400,000tpa	1,000,000tpa "Blue sky"
ZBS, ZOH, ZBC, ZrO <sub>2</sub>	15ktpa (6ktpa ZrO <sub>2</sub> )	37ktpa (15ktpa ZrO <sub>2</sub> )
Nb-Ta concentrate	2ktpa (1.4ktpa Nb <sub>2</sub> O <sub>5</sub> )	5ktpa (3.5ktpa Nb <sub>2</sub> O <sub>5</sub> )
LREE concentrate	1,980tpa (REOs)	4,950tpa (REOs)
YREE concentrate	600tpa (REOs)	1,500tpa (REOs)

Base case revenues ~US\$100m  
Open pit life 200 years

Blue sky ~US\$250m  
Open pit life 80 years

- ZBS = zirconium basic sulphate; ZOH = zirconium hydroxide; ZBC = zirconium carbonate    Equivalent ~99% ZrO<sub>2</sub> + HfO<sub>2</sub>
- Nb-Ta concentrate = ~70% Nb<sub>2</sub>O<sub>5</sub> + Ta<sub>2</sub>O<sub>5</sub> calcined basis    ▪ LREE = La, Ce, Nd    ▪ YHREE = Y, Gd, Dy, Tb



## DZP YREE Output



Yttrium - Rare Earth Individual Production (assumed 70% recovery)

Ore	400,000tpa	1,000,000tpa "Blue sky"
La <sub>2</sub> O <sub>3</sub>	504	1,260
CeO <sub>3</sub>	950	2,376
Pr <sub>6</sub> O <sub>11</sub>	104	262
Nd <sub>2</sub> O <sub>3</sub>	364	912
Sm <sub>2</sub> O <sub>3</sub>	56	142
Total LREE	1,980tpa	2,475tpa
Eu <sub>2</sub> O <sub>3</sub>	2	4
Gd <sub>2</sub> O <sub>3</sub>	56	138
Tb <sub>4</sub> O <sub>7</sub>	8	22
Dy <sub>2</sub> O <sub>3</sub>	52	132
Ho <sub>2</sub> O <sub>3</sub>	10	28
Er <sub>2</sub> O <sub>3</sub>	30	74
Tm <sub>2</sub> O <sub>3</sub>	4	10
Yb <sub>2</sub> O <sub>3</sub>	26	64
Lu <sub>2</sub> O <sub>3</sub>	4	10
Y <sub>2</sub> O <sub>3</sub>	408	1,022
Total YHREE	600tpa	1,500tpa
Total YREE	2,580tpa	6,450tpa

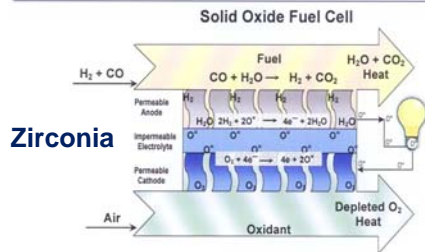


## Zr Applications - ceramics



### Solid Oxide Fuel Cells – clean and efficient electricity

Diagram of a solid oxide fuel cell



**Engineering Ceramics – tough, heat resistant and hard wearing**

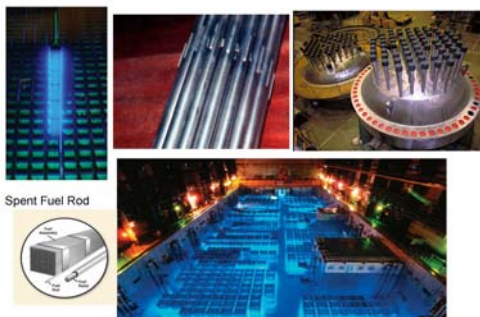


## Zr Applications - metal



### Zirconium metal and alloys for nuclear power plants

#### Fuel Rods - Zirconium Metal Use



*Today there are 436 reactors, with 40 under construction, 110 planned and 272 proposed.*

*Depending upon reactor type, each uses 10 to 45 tonnes Zr metal.*

*Fuel rod has life of 5 to 6 years, and then must be replaced*



## Applications in the Auto Industry



### Main challenges for the car industry



2008 November - Hana Kono - Rodkil



Source: Rhodia



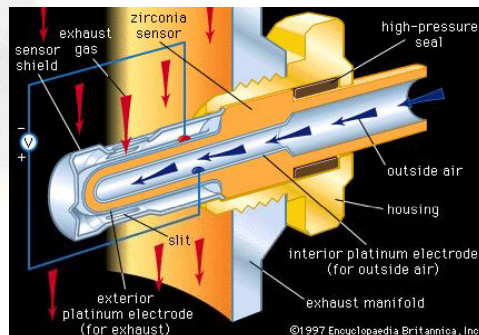
## Zr Applications



### Emission control – zirconia ceramics



Catalytic converter



Oxygen sensors

©1997 Encyclopaedia Britannica, Inc.



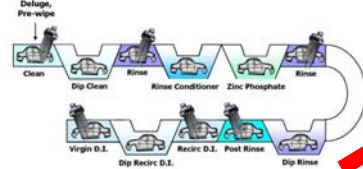
## Zr Applications



**Zircobond™** – zirconium chemical replacement for traditional zinc phosphate metal pretreatment



### Automotive Pretreatment Manufacturing "Foot Print"



- Zircobond™ requires less stages than conventional zinc phosphate pretreatments

### Environmental Benefits

- Energy Savings
  - Ambient temperature operation
- Waste Generation
  - Reduced by over 80%
  - No Nickel or Chromium
- Materials Usage
  - Coating thickness is reduced by at least a factor of ten relative to conventional zinc phosphates

Source: PPG website

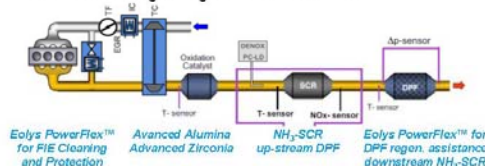


## Zr REE Applications



### Rhodia's Diesel Materials Platform for EURO6

- ▶ **EOLYS PowerFlex™** for Diesel Particulate Filter Regeneration assistance
  - DPF regeneration quality
  - Fuel economy
  - Fuel injection cleaning
  - Cost reduction: ~20% Pt/Pd reduction at the DOC / ~100% Pt reduction at the DPF
  - Fuel flexibility (biodiesels, Sulfur contents)
- ▶ **Acidic Zirconia for NH<sub>3</sub>-SCR Catalysts: ACILYS™**
  - Precious metals savings
  - Fuel efficiency and CO<sub>2</sub> emission reductions
  - Flexibility in exhaust integration
- ▶ **Advanced Alumina/Zirconia for Diesel Oxidation Catalysts: STABILYS™**
  - Highly sulfur resistant support
  - Precious metals saving with high thermalstable materials



\*ACILYS™ is a joint development with MEL Chemicals

2009 November - Hono Kono, Rodill



Source: Rhodia

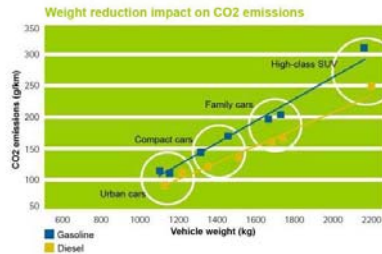




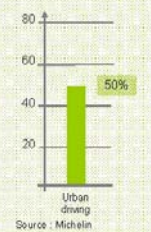
## Nb Applications



### Weight reduction to lower CO<sub>2</sub> emissions



Car weight contribution to CO<sub>2</sub> emissions



Also the addition of 0.15kg of niobium to the steel content of an average car, decreases the weight by 100kg

Joseph Conway CEO Iamgold (Niobec)

Metal is being replaced by polyamide engineering plastics for structural, exterior and under-the-hood parts.  
Electrical motors using NdFeB based magnets

2008 November - Hans Krons Roskill



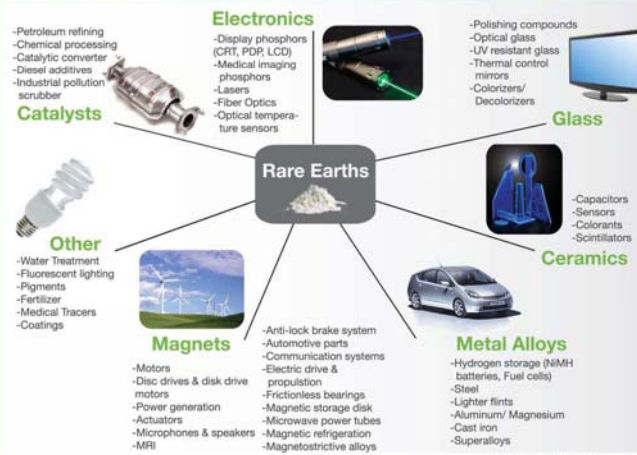
Source: Rhodia



## REE Applications



### Applications For Rare Earth Elements



© 2008 Molycorp Minerals LLC

Source: Molycorp

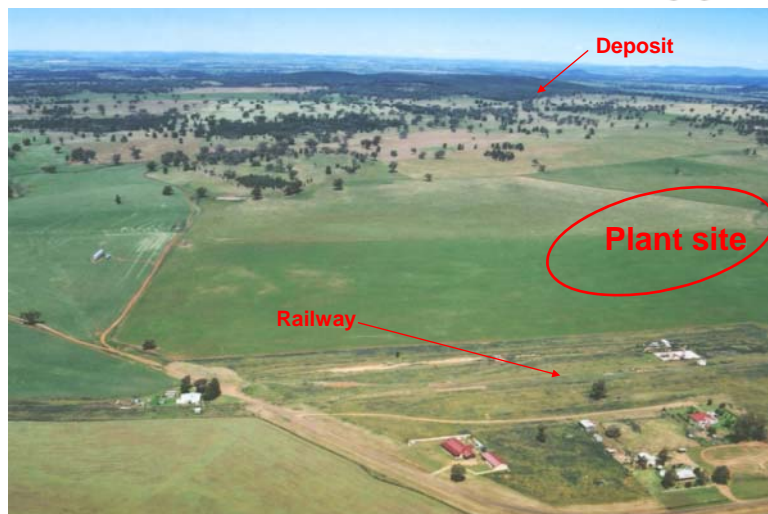




## Demonstration Pilot Plant Movie



## DZP Project Site





## Development pathway



		-> 2009	2010	2011	2012	2013
DUBBO ZIRCONIA PROJECT	Resource definition 2001 -2002	✓				
	Flow sheet development 2002	✓				
	Laboratory Zr – Nb 1999 - 2002	✓				
	Pilot plant Zr – Nb 2002	✓				
	Mine Plan & Scheduling 2002	✓				
	Plant Design & Engineering 2002	✓				
	Laboratory Y & REE 2009 -					
	Demonstration Pilot Plant 2008 -					
	Zr – Nb Product Distribution	✓				
	Y - REE Product Distribution					
	Secure Offtake Agreements					
	Definitive Feasibility Study					
	Environmental Impact (EA) 2000 -					
	Detailed Design					
	Project Financing					
	Construction					
	Production					

CAPEX base case estimated at approximately A\$150



## DZP Strategic Significance



Majority of “downstream” zirconium products are derived from zircon, whose output is governed by ilmenite/rutile from mineral sands mining operations.

China dominates downstream zirconium business at ~90% but feed is zircon.

Niobium production dominated by one company, CBMM in Brazil with 90% of market.

Rare earth and yttrium production dominated by China (95%). DZP offers new source particularly for important Y and HREE.

Production costs are spread across the four metal outputs – zirconium (hafnium), niobium (tantalum), light rare earths and yttrium-heavy rare earths.

Project located in region with very favourable infrastructure and legislative framework, both at a State and Federal level.

The DZP provides an alternative and strategic source for a number of important metals, and is capable of producing for hundreds of years from one ore body.



## Conclusion



### ***Dubbo Zirconia Project***

*A strategic and alternate supply for the zirconium,  
niobium and rare earths industries*

[www.alkane.com.au](http://www.alkane.com.au)



## Disclaimer



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### **Competent Person**

The information in this presentation that relates to mineral exploration, mineral resources and ore reserves is based on information compiled by Mr D I Chalmers, FAusIMM, FAIG, (director of the Company) has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as Competent Person as defined in the 2004 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Ian Chalmers consents to the inclusion in the presentation of the matters based on his information in the form and context in which it appears.

