

12 April 2011

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

Dear Sir,

## **PRESENTATION**

Attached is a copy of the Company's presentation to the BBY Limited Rare Earth Conference in Sydney.

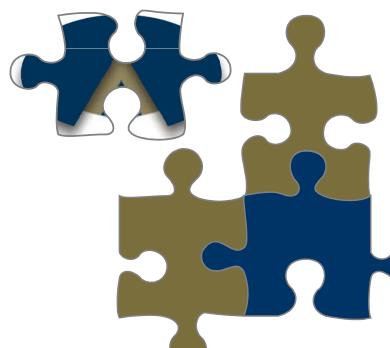
A copy of this presentation will also be available on the Company's website www.alkane.com.au.

Yours faithfully, for ALKANE RESOURCES LTD

D I Chalmers

**Managing Director** 

## ...putting the pieces together



# **Dubbo Zirconia Project**

**NSW Australia** 

An advanced development and strategic supply for the zirconium, niobium and rare earths industries



BBY Limited Rare Earth Conference Sydney 12 April 2011





**Exchanges** 

**Shares** 

No debt

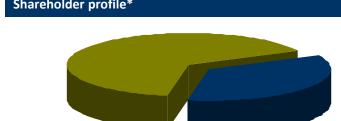
Share Price (9 April 2011)

**Fully Diluted Market Cap** 

Cash (at 28 February 2010)

# **Corporate snapshot**

Charabaldar	f:l-*



■ Retail ■ Institutions

Top 20 ~60%

3%

ALKANE RESOURCES LTD

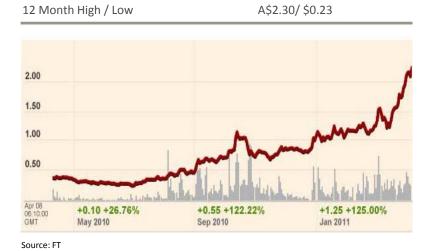
Directors & Management

Abbotsleigh (Gandel Metals) 26%

**Directors & Management** 

\*at 30 june 2010

J. S. F. Dunlop	Chairman
D. I. Chalmers	Managing Director
A. D. Lethlean	Non-Executive Director
I. J. Gandel	Non-Executive Director
L.A. Colless	CFO Joint Secretary
K.E. Brown	Joint Secretary
T W Ransted	Chief Geologist
M D Sutherland	General Manager NSW



ASX:

OTCQX: ANLKY

ALK

A\$2.25

269m

~A\$605m

~A\$22.2m



## **DZP Location**









# **Business Strategy**

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

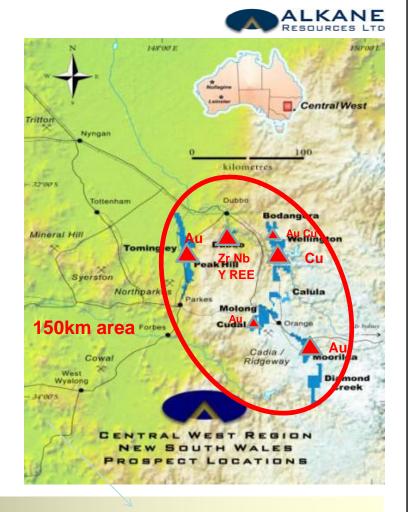
Dubbo Zirconia Project – world class resource of zirconium, hafnium, niobium, tantalum, yttrium and rare earths

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 (~3 million oz)

Joint Venture with Newmont

Develop multiple operations within tight geographic area over next five years







# **Dubbo Zirconia Project**

Zirconium, niobium, yttrium, rare earth elements

## **Definitive Feasibility Study**

**TZ Minerals International Pty Ltd** 

Study managers: Steve Gilman and Gavin Diener

Marketing: Alister MacDonald (TCMS) and Dudley Kingsnorth (IMCOA)

DPP Operations: ANSTO Minerals Group Bob Ring, Doug Collier, Karin Soldenoff, Des

Levins, Adrian Manis, Chris Griffiths, Peter Fletcher, Prakash Rajalingam

Environmental Assessment: R W Corkery & Co Pty Ltd

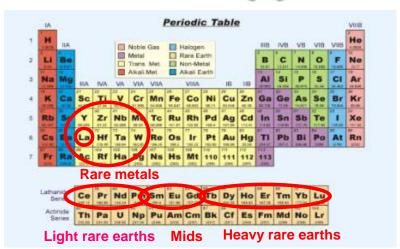


## **Rare Metals - Rare Earths**



## Rare Metals - Rare Earths

- China produces 90% of world downstream zirconium chemicals
- China currently produces 95% of world REE output
- China is limiting the export of raw rare earths materials
- Brazil produces 90% of world niobium





- Green technology is dependent on rare metals and rare earths
- ♦ Increased demand also driven by changes in legislation
- China has dominant position

...not so rare, but increasingly valuable



# **Dubbo Zirconia Project Location**



**Dubbo region pop 80,000** 

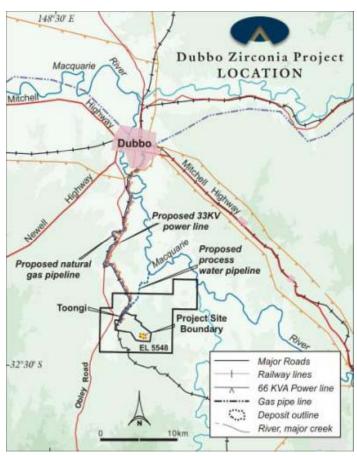
State power grid

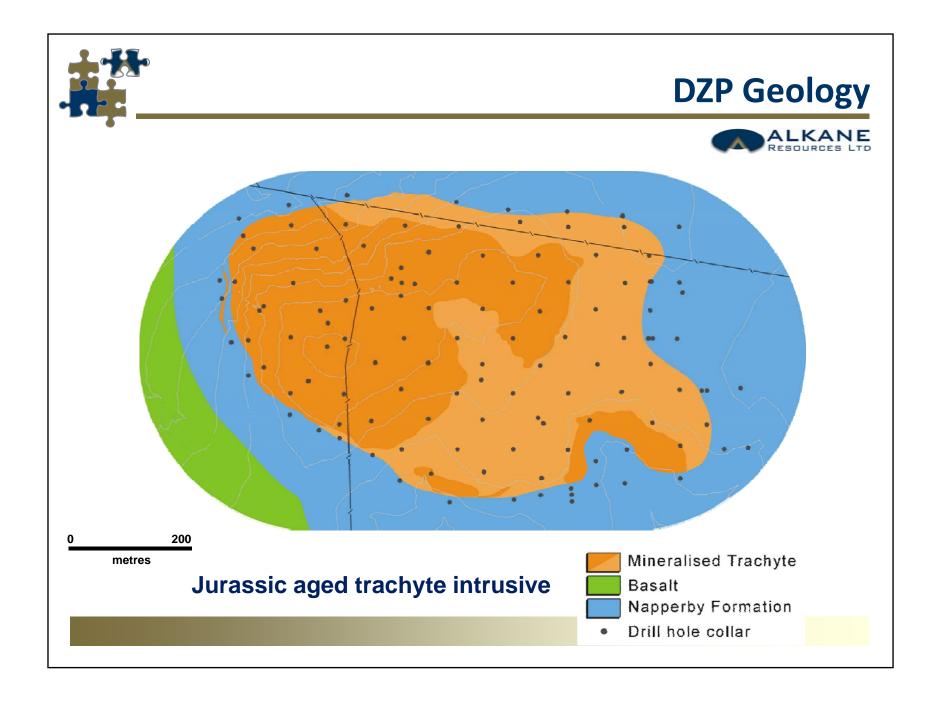
State gas grid

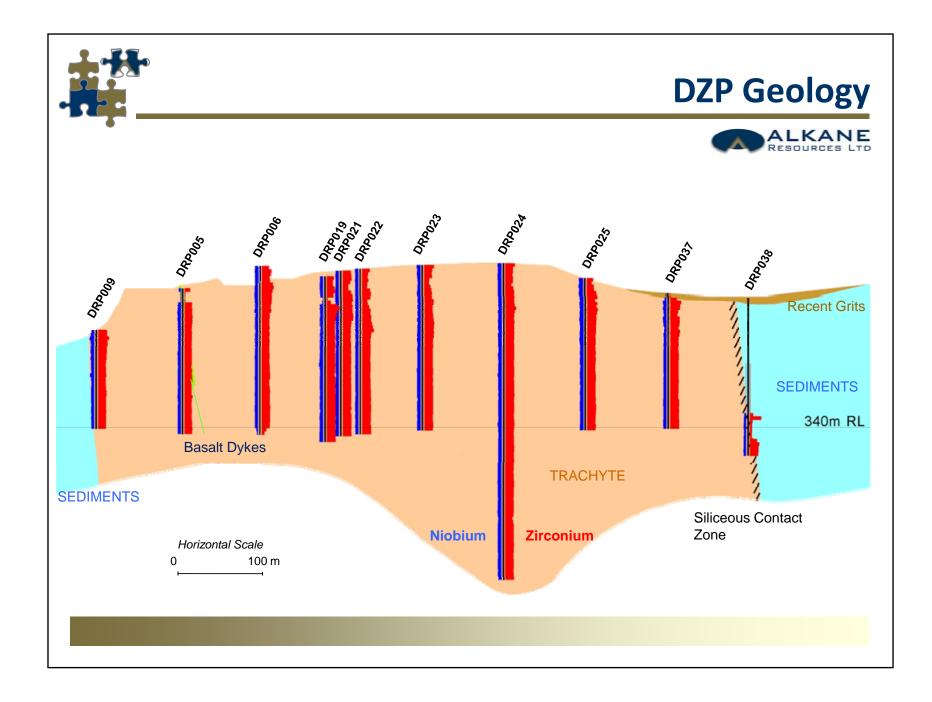
Major mixed agriculture

**Transport hub** 

**Substantial light industry** 











## **DZP Resources**



Measured Resource : 35.7 million tonnes grading

0 - 55 metres 1.96%  $ZrO_2$ , 0.04%  $HfO_2$ , 0.46%  $Nb_2O_5$ ,

 $0.03\% \text{ Ta}_2\text{O}_5$ ,  $0.14\% \text{ Y}_2\text{O}_3$ , 0.75% REO

and 0.014% U<sub>3</sub>O<sub>8</sub>

Inferred Resource : 37.5 million tonnes at similar grades

55 - 100 metres

TOTAL : 73.2 million tonnes

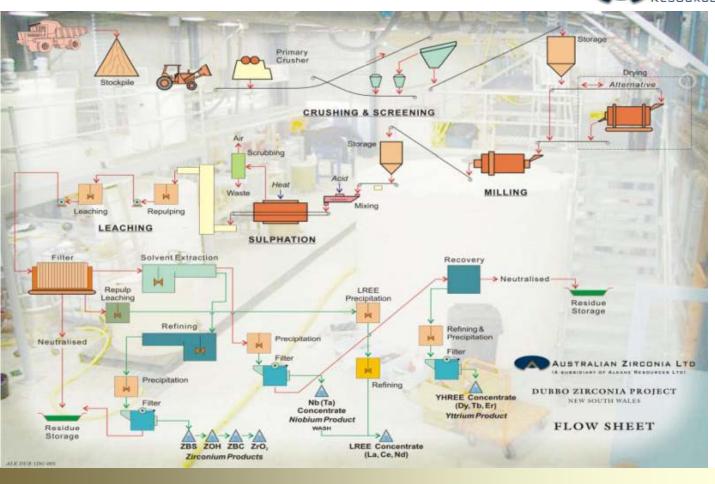
Major world resource of zirconium, hafnium, niobium, tantalum, yttrium and rare earth elements

The ore is not classified as a radioactive deposit, and production of uranium is currently prohibited in NSW



## **DZP Flow Sheet**



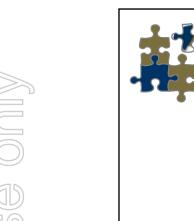




# **DZP Demonstration Pilot Plant**







# **Zirconium Applications**





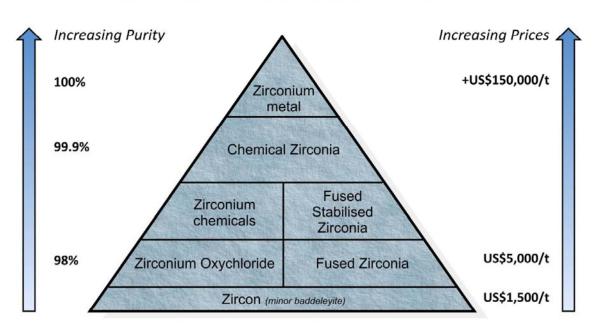




# **Zirconium Industry**



## ZIRCONIUM MATERIALS PYRAMID



Zirconium silicate ZrSiO<sub>4</sub> Primary Zr mineral source Value

2010 1.4 million tonnes ~US\$1.6 billion → US\$2B

Zirconium products Zirconia ZrO₂, Zirconium chemicals, Zr metal 2010 120,000 tonnes ~US\$0.7 billion → US\$1B

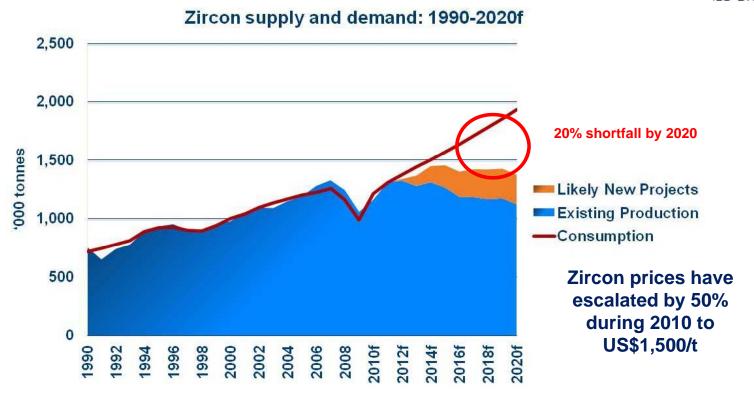
Source: TCMS

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## **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. China has declared zirconium a strategic metal.

Source: TZMI





## **Downstream Zirconium Usage**



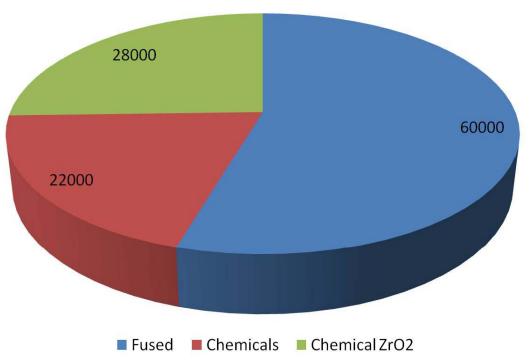
Zircon provides the feedstock for the zirconium industry

## Zr products consumption 2008 ~110,000 tonnes

2012 Global Zircon consumption estimate 1,400,000tpa

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

140,000tpa Zr products

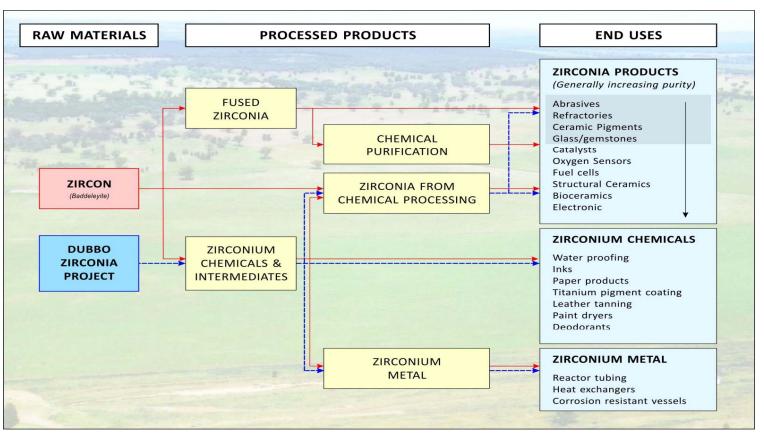


Source: TZMI



# **Downstream Zirconium Industry**





China supplies about 90% of the world's downstream zirconium products

Source: TZMI / TCMS





# **DZP Zircon - Zirconium Chemicals Pricing**



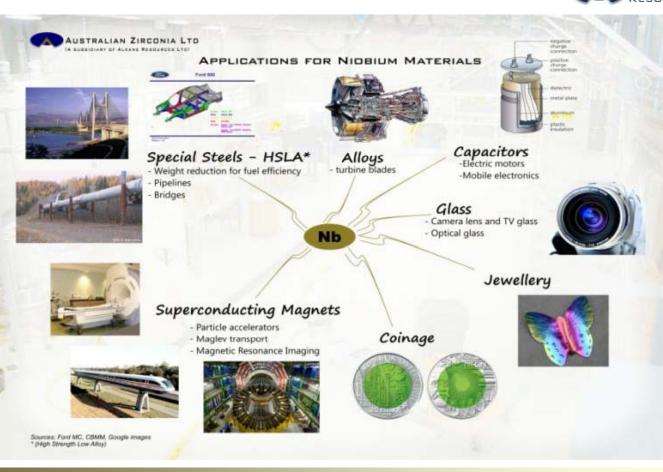
Product	ZrO2	Q2 2010 US\$/T	Q1 2011 US\$/T		
Zircon (miner/trader) (100% ZrO2 basis)	65% 100%	\$900-1150 (\$1,440-1,840)	\$1,500-2,100 (\$2,400-3,360)		
ZOC (zirconium oxychloride) (100% ZrO2 basis)	0% ZrO2 basis) 100% (\$3,750-4,027) (\$6,389) S (zirconium basic sulphate) 33% \$1,770 \$3,000		\$2,300-2,600 (\$6,389-7,222)		
ZBS (zirconium basic sulphate) (100% ZrO2 basis)			\$3,000 (\$9,090)		
ZBC (zirconium basic carbonate) (100% ZrO2 basis)	40% 100%	<b>\$2,100</b> (\$5,250)	\$3,400 (\$8,500)		
Fused Zirconia	98.5%	\$2,900-3,100	\$4,100-4,400		
Chemical Zirconia	99.5%	\$4,300-4,400	\$7,250-7,500		
Chemical Zirconia	99.9%	\$5,300-5,500	\$8,500-10,500		

Source: TCMS



# **Niobium Applications**

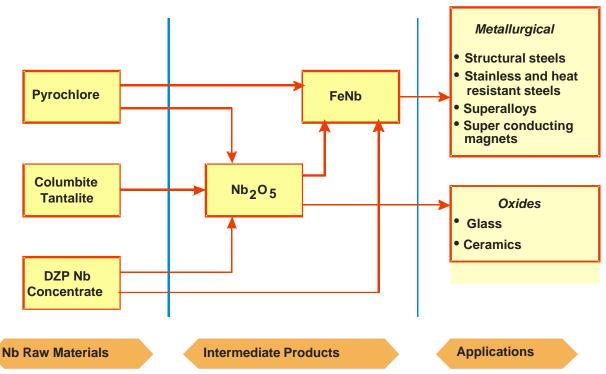




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## **Structure of Niobium Industry**





CBMM in Brazil produces about 90% of world demand.

Early 2011 a Japanese Korean consortium acquired 15% of CBMM for US\$1.95B

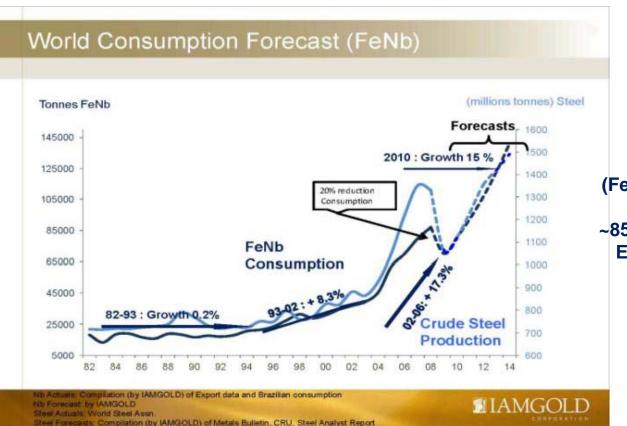
DZP process removes radioactive elements such as uranium and thorium, producing clean concentrate

Ferro-niobium FeNb Niobium pentoxide  $Nb_2O_5$  Value 2010 85,000 tonnes ~US\$2.0 billion  $\rightarrow$  US\$3B

Source: TZMI



## **Niobium Demand**



ALKANE RESOURCES LTD

Niobium 2008 (Ferroniobium units) consumption ~85,000t – 90% Brazil Estimate for 2012 ~100,000t

Ferroniobium price spiralled to US\$60/kg in March 07 and is currently around US\$43/kg

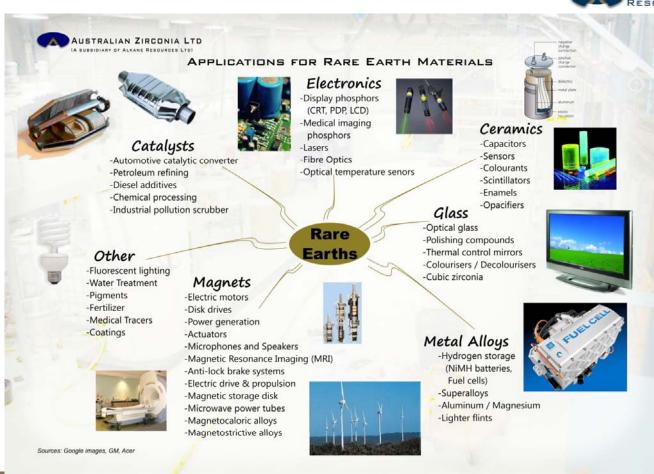
Sources: IAMGOLD / TZMI





## **REE Applications**



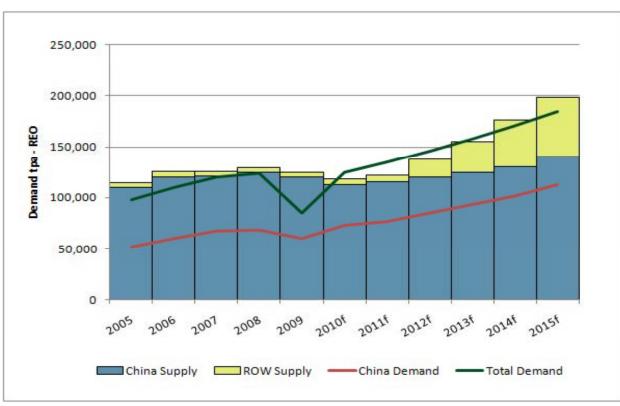


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# **Rare Earth Supply - Demand**





Will rare earth supply demand be in balance from 2015 with Lynas and Molycorp producing?

High probability for LREE but not HREE

The DZP has a 75% LREE - 25% HREE split which gives it a demand advantage

Separated rare earth products 2010 130,000 tonnes

Value ~US\$2.0 billion → US\$4B

Source: IMCOA



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## **REE Demand Drivers**



Growth

10 – 15%

5 - 10%

5 – 10%

4 - 8%

8 -12%

4 – 8%

# **Key Drivers of Demand**

Application	Rare Earths	Demand Drivers
Magnets	Nd, Pr, Sm, Tb Dy	Drives for computers, mobile phones, mp3 players, cameras. Hybrid vehicle electric motors. Electric motors for luxury vehicles. Mag-lev trains.
LaNiH Batteries	La, Ce, Pr, Nd	Hybrid vehicle batteries. Hydrogen absorption alloys for re-chargeable batteries
Phosphors	Eu, Y, Tb, La, Dy, Ce, Pr, Gd	LCDs. PDPs. LEDs. Energy efficient fluorescent lights/lamps.
Fluid Cracking Catalysts	La, Ce, Pr, Nd	Petroleum production – greater consumption by 'heavy' oils and tar sands
Polishing Powders	Ce, La, Nd	Mechano-chemical polishing powders for TVs, monitors, mirrors and (in nano-particulate from) silicon chips.
Auto Catalysts	Ce, La, Nd	Tighter NO× and SO₂ standards – platinum is re-cycled, but for rare earths it is not economic
Glass Additive	Ce, La, Nd, Er	Cerium cuts down transmission of uv light. La increases glass refractive index for digital camera lens.
Fibre Optics	Er, Y, Tb, Eu	Signal amplification

## **IMCOA**

Source: IMCOA



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# **DZP Rare Earth Pricing**



**Spot 1 April** 

\$121 \$121 \$196 \$201 \$106

\$940 \$150 \$990 \$640

.....\$140......

\$139 .....\$182...... \$97 \$127

## Rare Earths Prices 2010 (US\$/kg REO)

(Source: Metal Pages©)

(Course: Metal rages )									
Limbt Dava Fauth	DZP	Q2 Average	Q3 Average	Q4 Average	Q1 Average				
Light Rare Earth	Distribution	2010	2010	2010	2011				
Lanthanum Oxide	19.5%	\$7.13	\$25.75	\$53.00	\$95.00				
Cerium Oxide	36.7%	\$5.58	\$24.50	\$50.00	\$96.00				
Praseodymium Oxide	4.0%	\$30.60	\$48.25	\$77.00	\$155.00				
Neodymium Oxide	14.1%	\$31.13	\$49.50	\$80.00	\$170.00				
Samarium Oxide	2.2%	\$4.50	\$22.25	\$34.00	\$95.00				
Heavy Rare Earth									
Europium Oxide	0.07%	\$521.67	\$570.00	\$625.00	\$820.00				
Gadolinium Oxide	2.15%	\$8.25	\$28.75	\$44.00	\$130.00				
Terbium Oxide	0.34%	\$545.00	\$570.00	605.00	\$830.00				
Dysprosium Oxide	2.05%	\$196.67	\$275.00	\$295.00	\$520.00				
Ho, Er, Tm, Yb, Lu	2.9%								
Yttrium Oxide	15.8%	\$11.42	\$26.25	\$56.00	\$125.00				
DZP LREE	76.68%	\$12.06	\$30.58	\$57.20	\$112.00				
DZP YHREE	23.32%	\$42.23	\$62.34	\$78.70	\$157.00				
DZP LREE Concentrate Value		\$8.44	\$21.41	\$40.04	\$79.00				
DZP YHREE Concentrate Value		\$29.59	\$43.64	\$55.09	\$110.00				
	<del></del>		<del></del>						

Compiled by IMCOA

## DZP REE Concentrates expected to return 70% of separated prices

Q4 average prices currently used in revenue projections

Source: IMCOA



## **DZP Product Output and Revenues**



## Base case model of 400,000 tonnes pa and expanded 1 million tonnes pa of ore processed

	Poter	ntial Production and Reve	enues		
Product	400,000 tonnes per annum		1,000,000 tonnes per annum		
ZBS, ZOH, ZBC, ZrO <sub>2</sub>	6,000tpa	US\$42.0M*	15,000tpa	US\$105.0M*	
Nb -Ta concentrate	1,400tpa	US\$42.0M*	3,500tpa	US\$105.0M*	
LREE concentrate	1,415tpa	US\$56.7M**	3,540tpa	US\$141.7 <b>M</b> **	
YHREE concentrate	425tpa	US\$23.4M**	1,070tpa	US\$63.1M**	
TOTAL	9,240tpa	US\$164.1 <b>M</b> pa	23,110tpa	US\$414.8 <b>M</b> pa	

<sup>\*</sup>Zr @ US\$7.00/kg and Nb @ US\$30/kg as intermediate average prices

## Current spot price revenues approximately US\$370M and \$970M for the two development alternatives

Base Case Operating costs ~ A\$60m Open pit life 200 years Capex ~ A\$200m Expanded Opex ~ A\$120m Open pit life +80 years Capex ~ A\$400m

- ZBS = zirconium basic sulphate; ZOH = zirconium hydroxide; ZBC = zirconium carbonate
- Nb-Ta concentrate = ~70% Nb₂O₅ + Ta₂O₅ calcined basis
- LREE = La, Ce, Nd, Pr
- Equivalent ~99% ZrO<sub>2</sub> + HfO<sub>2</sub>
   YHREE = Y, Gd, Dy, Tb

<sup>\*\*</sup> Price average of Q4 2010 for REO basket and assumes concentrate at 70% of total separated REO value REO output based on average 50% recovery





## **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.

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

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.

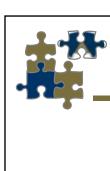


# **Development pathway**



		-> 2009	20	10	201	1	2012	2013	2014
DZP	Resource definition 2001 - 2002	$\checkmark$						,	
	Flow sheet development 2002	<b>√</b>							
	Laboratory Zr – Nb 1999 – 2002	<b>√</b>							
	Pilot plant Zr – Nb 2002	<b>1</b>							
	Mine Plan & Scheduling 2002								
	Plant Design & Engineering 2002								
	Laboratory Y & REE 2009 -	<b>✓</b>							
	Demonstration Pilot Plant 2008 -								
	Zr – Nb Product Distribution	$\checkmark$	<b>√</b>		$\checkmark$				J.
	Y - REE Product Distribution								
	Secure Offtake Agreements								
	Definitive Feasibility Study	2002							
	Environmental Impact (EA)	2000 ->							
	Detailed Design								
	Project Financing / Consent								
	Construction								
	Production								





## **Disclaimer**



## Disclaimer

This presentation contains certain forward looking statements and forecasts, including possible or assumed reserves and resources, production levels and rates, costs, prices, future performance or potential growth of Alkane Resources Ltd, industry growth or other trend projections. Such statements are not a guarantee of future performance and involve unknown risks and uncertainties, as well as other factors which are beyond the control of Alkane Resources Ltd. Actual results and developments may differ materially from those expressed of implied by these forward looking statements depending on a variety of factors. Nothing in this presentation should be construed as either an offer to sell or a solicitation of an offer to buy or sell securities.

## **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.