



# Globe Metals & Mining

## Investor Update



**Africa Down Under Conference – Perth, Australia**

4 September 2009

# Disclaimer

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*This presentation should be read in conjunction with the Company's release to Australian Stock Exchange of 18 May 2009.*

**Competent Persons:** *The contents of this report relating to geology and exploration results are based on information compiled by Dr. Julian Stephens, Member of the Australian Institute of Geoscientists and Executive Director for Globe Metals & Mining Limited. Dr. Stephens has sufficient experience related to the activity being undertaken to qualify as a "Competent Person", as defined in the 2004 edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources & Ore Reserves, and consents to the inclusion in this report of the matters compiled by him in the form and context in which they appear.*

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## COMPANY OVERVIEW

# Investment Highlights

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- ✓ Production of ferro-niobium (FeNb) to commence in 2012 - Kanyika Niobium Project
- ✓ Project NPV (post-tax): ~US\$200m
- ✓ Modest capex.: US\$152m; annual revenue: US\$152m; operating margin: 49%
- ✓ Capital payback: 2.1 years
- ✓ 20+ year mine life based on known resources/40+ year mine life on exploration target
- ✓ Malawi a mining friendly and stable African nation
- ✓ Niobium a critical additive into sophisticated steels (90% of consumption) – Nb consumption growth ~2x steel over last 20 years (7.9% v 4.1% p.a.)
- ✓ BFS commenced August 2009 – to be completed by December 2010
- ✓ JV partner Thuthuka Group (SA) to earn 25% of Project via US\$10.6m spend (~85% of BFS cost)
- ✓ FeNb price historically stable
- ✓ Market capitalisation ~A\$20m; 70m shares on issue

# Corporate Overview



## Strategy Summary

- To become a multi-commodity producer by 2012
- Low capital cost, high margin, quick capital payback
- +20 year mine life, significant exploration upside
- Kanyika Niobium Project NPV (post tax) ~US\$200m
- In demand products (US\$ revenue p.a.):

FeNb (\$117m)



Ta205 (\$23m)



U308 (\$13m)



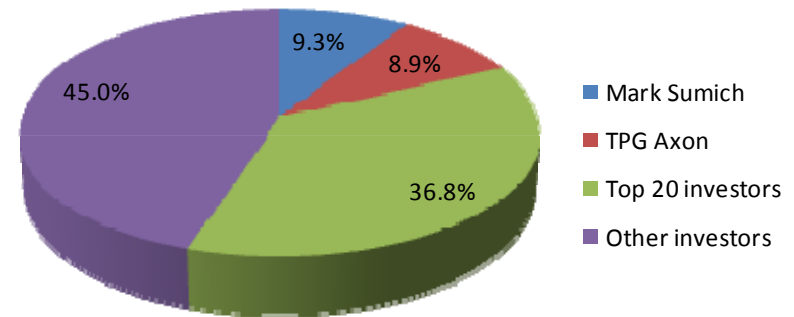
## Capital Structure (ASX :GBE)

Ordinary shares	70.3m
Current Price	A\$0.29
Market Capitalisation	A\$20m
Options (unlisted)	3.0m
Cash (at 30 June 2009)	A\$2.85m
12 month share price range (High/Low)	\$0.38 - \$0.07

## Board and Management

David Sumich	Chairman
Mark Sumich	Managing Director
Julian Stephens	Executive Director – Exploration
Ian Cowden	Consulting Geologist
Andries Kruger	General Manager – Africa
David Tullberg	GIS/Database Manager

## Ownership Structure



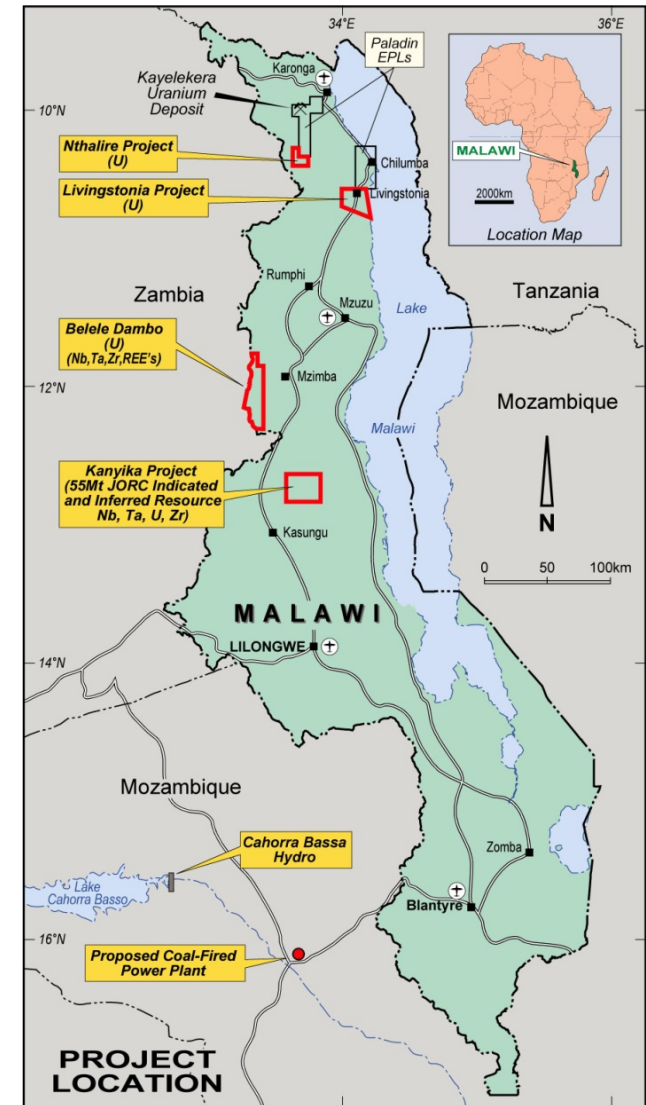
# Kanyika Niobium Project



- ✓ 55.3Mt Indicated and Inferred JORC resource/24Mt high grade
- ✓ 100-110Mt exploration target/40-50Mt high grade
- ✓ 20+ year mine life on JORC resources/40+ year mine life expl. target
- ✓ 3,000tpa Nb metal production (+ credits)
- ✓ 1.7 - 2.3Mtpa\* throughput
- ✓ Open pit, low strip ratio (w:o) - 0.6-1.9:1\*
- ✓ Mini-pilot metallurgical program well underway to produce steel-grade FeNb – results due Q4 2009
- ✓ Formal discussions with Govt. of Malawi commenced
- ✓ Convenient road and port infrastructure; assessing hydro power option
- ✓ Marketing advisers appointed – two customer MOUs signed

Metal	55.3 Mt <u>Indicated &amp; Inferred Resource</u> (1,500ppm Nb <sub>2</sub> O <sub>5</sub> cut-off)		24.0 Mt <u>Indicated &amp; Inferred High-Grade Component</u> (3,000ppm Nb <sub>2</sub> O <sub>5</sub> cut-off)	
	Tonnes	Grade (ppm)	Tonnes	Grade (ppm)
Nb <sub>2</sub> O <sub>5</sub>	165,980	3,000	91,170	3,800
U <sub>3</sub> O <sub>8</sub>	4,430	80	2,400	100
Ta <sub>2</sub> O <sub>5</sub>	7,750	140	4,080	174

\* Range of figures are for years 1 and 10.



# Path to Production



<b>Sept 2008</b>	Commence Pre-Feasibility Study	
<b>March 2009 – Nov 2009</b>	Mini-pilot metallurgical program to produce FeNb (and provide samples for customers)	
<b>March 2009 – June 2010</b>	Development Agreement with the Govt. of Malawi – determine fiscal regime for Project	
<b>March 2009 – Sept 2009</b>	Secure US\$10.6m BFS funding (and strategic investor in Project)	
<b>August 2009</b>	Commence BFS	
<b>Sept 2009 – Dec 2010</b>	Binding customer off-take agreements	
<b>Sept 2009 – Dec 2010</b>	Complete BFS	
<b>Nov 2010 – Feb 2011</b>	Finalise BFS; grant of Mining Licence; project funding	
<b>Jan 2011 – March 2011</b>	Commence construction	
<b>June 2012</b>	Commence production	



# Project Valuation



US\$ million	Initial Outlay	Year 1	Years 1-20
<b>Capex</b>	151.7		93
<b>Revenue</b>			
- FeNb		117.0	2,340
- Ta <sub>2</sub> O <sub>5</sub>		22.7	457
- U <sub>3</sub> O <sub>8</sub>		12.8	246
<b>Total</b>		152.5	3,043
Royalties (3%)		4.6	91
<b>Net Income</b>		147.9	2,952
<b>Operating Costs</b>			
- Mining		7.7	312
- Upstream processing (to conc.)		19.8	448
- Weak acid processing		4.9	98
- Strong acid processing		32.2	644
- Smelter		2.1	43
- Other		6.9	177
<b>Total</b>		73.6	1,722
<b>Operating Margin</b>		74.3	1,230
<b>Project Valuation</b>			
- Discount rate applied (% pa)			10%
- Net present value (post-tax)			US\$200M

Capex*	US\$M
- Upstream plant	85.9
- Acid plant	36.0
- Alloy plant	7.0
- General & other	22.8

\* Excludes working capital

Production	tpa	Mlbpa
- FeNb	3,000	6.6
- Ta <sub>2</sub> O <sub>5</sub>	194	0.43
- U <sub>3</sub> O <sub>8</sub>	117	0.26

Project Valuation	
- Ownership	100%
- Tax rate	30%
- IRR	33%
- Capital payback	2.1 years

# Why Globe?



In April 2007, Globe raised A\$8m to pursue grass-roots exploration in Malawi. In the subsequent 28 months at Kanyika:

<b>July 2007</b>	Commenced drilling (total 18,000m of drilling to date at Kanyika)
<b>March 2008</b>	Initial 56Mt Inferred JORC resource
<b>June 2008</b>	Scoping Study released
<b>Sept 2008</b>	Commenced Pre-Feasibility Study
<b>Jan 2009</b>	First customer off-take MOU
<b>March 2009</b>	Commenced discussions with the Govt. of Malawi – determine fiscal regime for Project
<b>April 2009</b>	Upgraded 55Mt Indicated and Inferred JORC resource
<b>May 2009</b>	Updated financial forecast and flow sheet
<b>June 2009</b>	Second customer off-take MOU
<b>August 2009</b>	Funded BFS via JV with Thuthuka Group
<b>Sept 2009</b>	Exploration Target – 100-110Mt (incl. 55Mt Indicated and Inferred resource)

## **KANYIKA NIOBIUM PROJECT**

# Resource

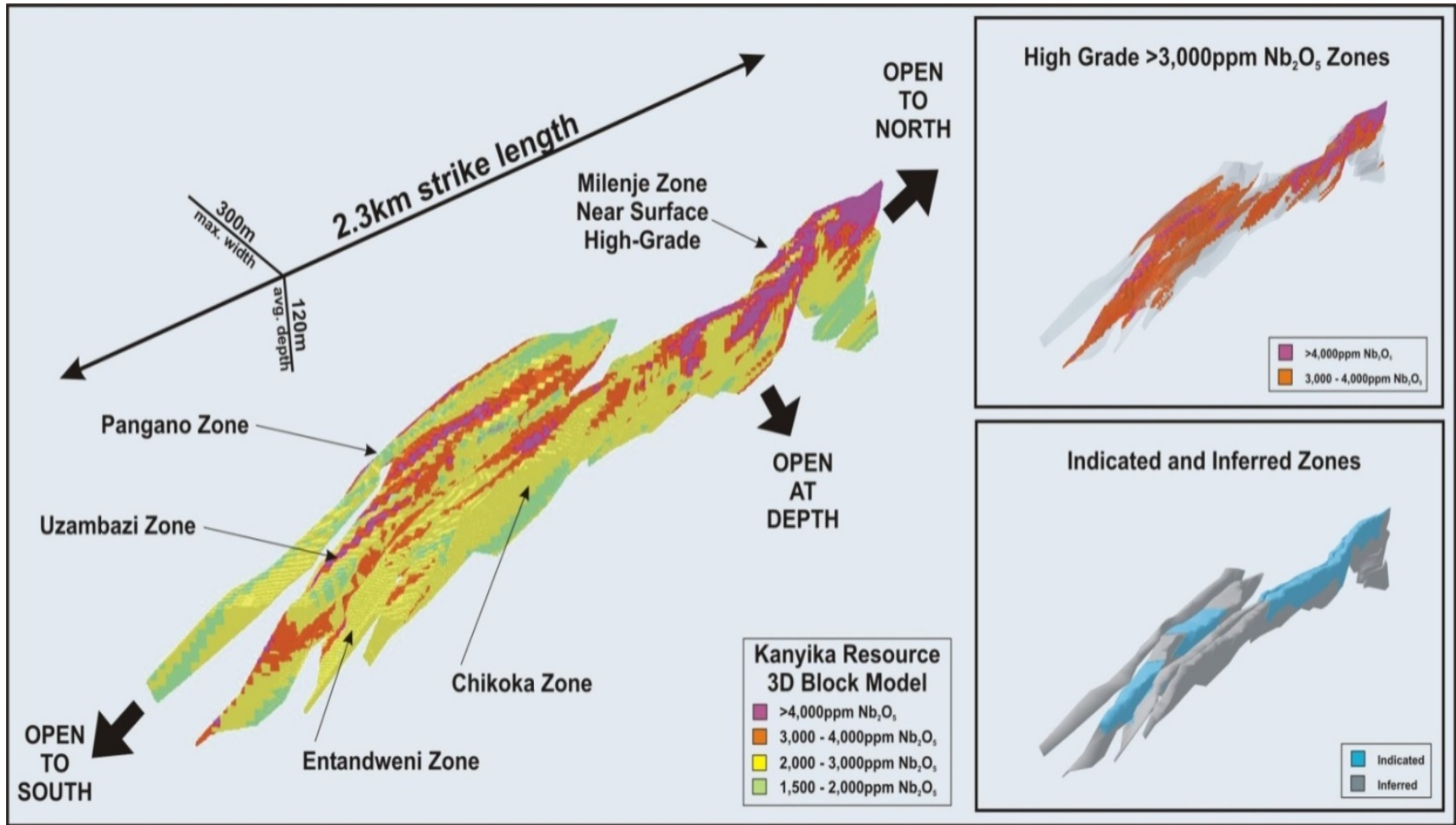


Metal	Indicated Resource			
	13.2Mt (1,500ppm Nb <sub>2</sub> O <sub>5</sub> cut-off)		Incl. 8.5Mt High-Grade (3,000ppm cut-off)	
	Tonnes	Grad2e (ppm)	Tonnes	Grade (ppm)
Nb <sub>2</sub> O <sub>5</sub>	48,590	3,600	35,730	4,200
U <sub>3</sub> O <sub>8</sub>	1,320	100	940	110
Ta <sub>2</sub> O <sub>5</sub>	2,120	160	1,620	190

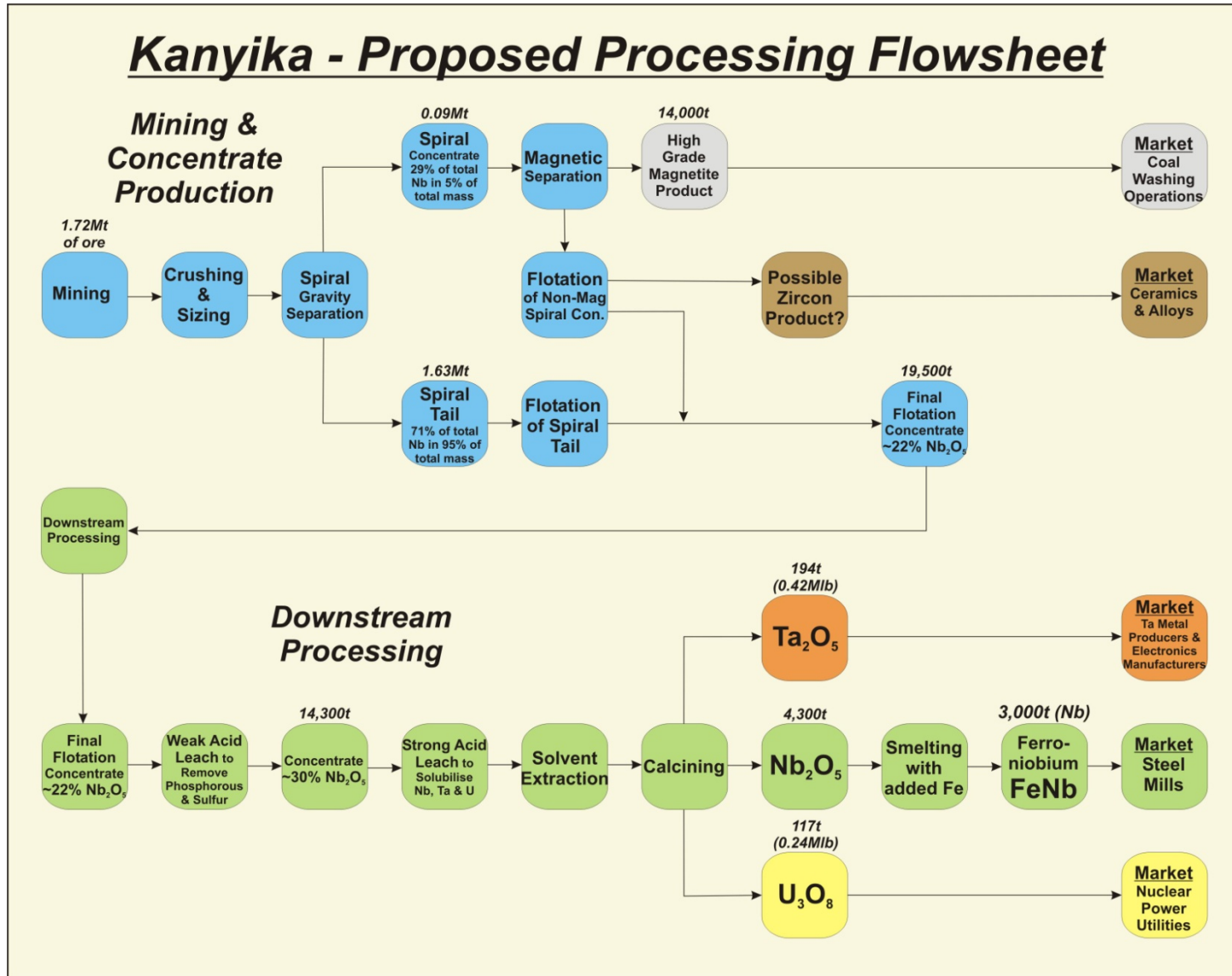
Metal	Inferred Resource			
	42.1Mt (1,500ppm Nb <sub>2</sub> O <sub>5</sub> cut-off)		Incl. 15.5Mt High-Grade (3,000ppm Nb <sub>2</sub> O <sub>5</sub> cut-off)	
	Tonnes	Grade (ppm)	Tonnes	Grade (ppm)
Nb <sub>2</sub> O <sub>5</sub>	117,900	2,800	55,740	3,600
U <sub>3</sub> O <sub>8</sub>	3,370	80	1,390	90
Ta <sub>2</sub> O <sub>5</sub>	5,470	130	2,630	170

Metal	Total Resource (Indicated + Inferred)			
	55.3Mt (1,500ppm Nb <sub>2</sub> O <sub>5</sub> cut-off)		Incl. 24.0Mt High-Grade (3,000ppm Nb <sub>2</sub> O <sub>5</sub> cut-off)	
	Tonnes	Grade (ppm)	Tonnes	Grade (ppm)
Nb <sub>2</sub> O <sub>5</sub>	165,980	3,000	91,170	3,800
U <sub>3</sub> O <sub>8</sub>	4,430	80	2,400	100
Ta <sub>2</sub> O <sub>5</sub>	7,750	140	4,080	174

# Deposit



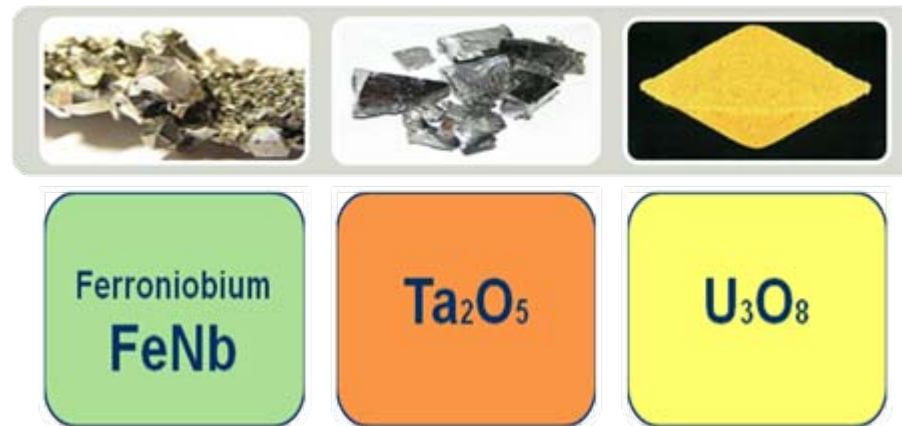
# Flowsheet



- ✓ Thuthuka is a world class private South African multi-disciplinary engineering company, active in the design, manufacture, installation project management and project finance for the chemical, mining, metallurgical and industrial markets
- ✓ The scope of work includes chemical and metallurgical processes, water and effluent treatment, hazardous waste and air pollution control and construction of the civil infrastructure for the above plants
- ✓ In addition to South Africa, representation in Nigeria, Ghana, Namibia, DR Congo, Botswana, Madagascar, Mozambique and Mauritius
- ✓ Thuthuka brings technical expertise extremely relevant to the Kanyika Niobium Project, including metallurgical processing, acid handling, process and civil engineering, and water and chemical treatment
- ✓ US\$10.6m investment represents ~85% of the cost of the BFS and will earn Thuthuka a 25% interest in the Project
- ✓ [www.thuthukagroup.com](http://www.thuthukagroup.com)

# Products & Markets

## Processing

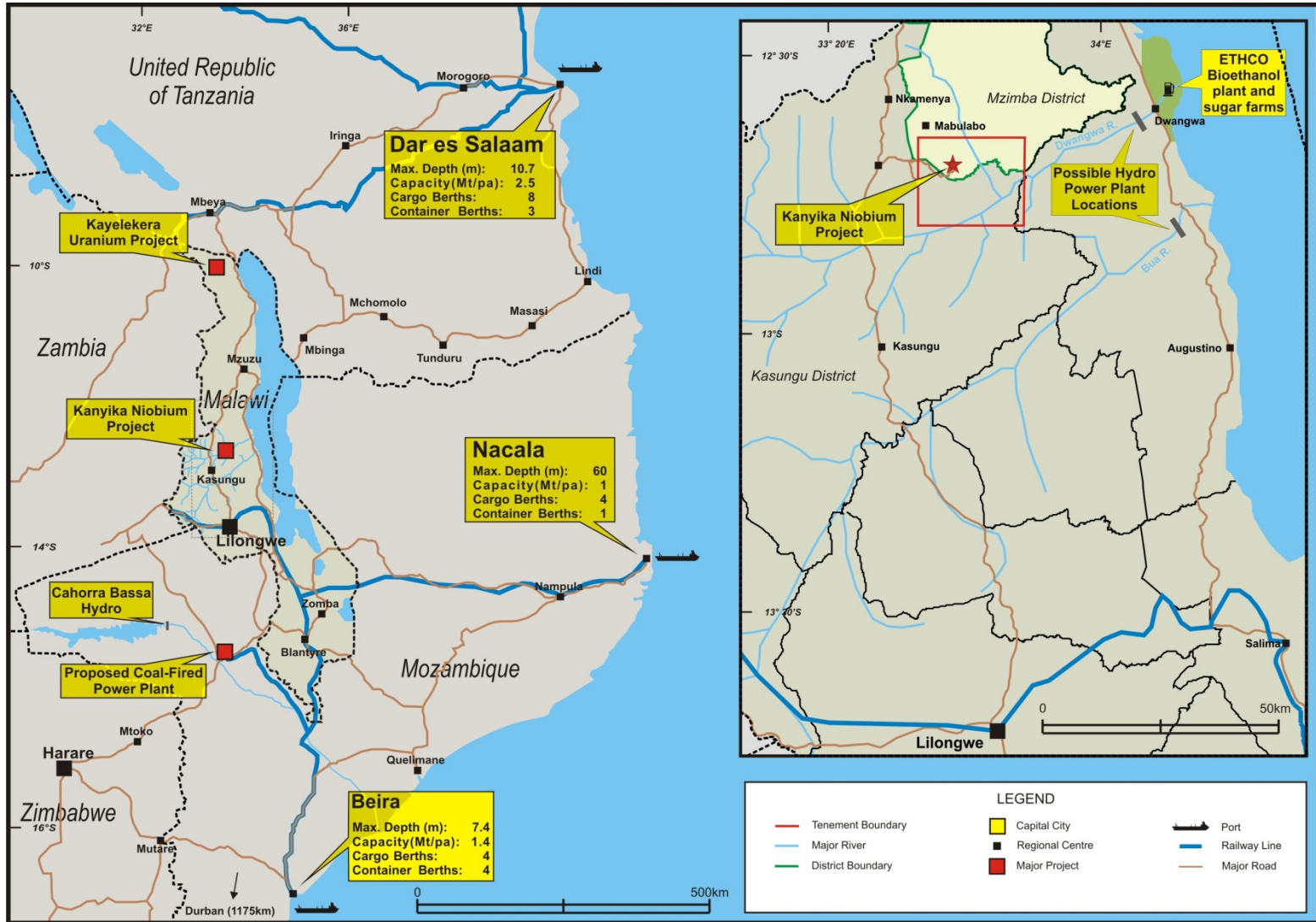


	Ferro-Niobium	Tantalum	Uranium/Yellowcake
Kanyika Production (p.a.)	➤ 3,000t	➤ 194t/0.43Mlbs	➤ 117t/0.26Mlbs
Market Share (%)	➤ 3-4% (2013) <sup>1</sup>	➤ 8%	➤ <0.2%
Market Size 2008 (p.a.)	➤ 67,000t	➤ 5.3 Mlbs	➤ 63,000t
Kanyika Production	➤ Primary	➤ By-product	➤ By-product
Price (Globe Fin. Model)	➤ US\$39/kg (metal)	➤ US\$65/lb	➤ US\$50/lb
Globe Revenue (%)	➤ 77%	➤ 15%	➤ 8%
Customers	➤ Steel mills	➤ Capacitor manuf.	➤ Nuclear power plants
Product Specification	➤ 66.5% Nb, 33.5% Fe	➤ 99% Ta <sub>2</sub> O <sub>5</sub>	➤ Standard grade

1. Market share based upon estimated market size in 2013 (75,000-100,000tpa)



# Infrastructure



# Financials



US\$ million	Unit Cost	Year 1	Unit Cost	Year 10
<b>Production<sup>1</sup></b>				
- Strip ratio (waste:ore)		0.6:1		1.9:1
- Mill feed (Mtpa)		1.72		2.26
- Nb <sub>2</sub> O <sub>5</sub> (ppm)		3,831		2,919
- Ta <sub>2</sub> O <sub>5</sub> (ppm)		173		138
- U <sub>3</sub> O <sub>8</sub> (ppm)		104		78
<b>Revenue</b>		<b>152.5</b>		<b>153.3</b>
Royalties (3%) <sup>2</sup>		4.6		4.6
<b>Net Income</b>		<b>147.9</b>		<b>148.7</b>
<b>Operating Costs</b>				
- Mining	\$2.80/t mined	7.7	\$2.80/t mined	18.3
- Upstream processing (to conc.)	\$11.5/t milled	19.8	\$10.5/t milled	19.8
- Weak acid processing	\$250/t conc	4.9	\$250/t conc	4.9
- Strong acid processing	\$2,250/t conc	32.2	\$2,250/t conc	32.2
- Smelter	\$500/t conc	2.1	\$500/t conc	2.1
- Other		6.9		13.9
<b>Total Operating Costs</b>		<b>73.6</b>		<b>91.2</b>
Sustaining capital <sup>3</sup>		0		4
<b>Pre-Tax Free Cash Flow</b>	48.7% margin	<b>74.3</b>	34.9% margin	<b>53.5</b>

1. Constant production of 3,000tpa over life-of-mine, volume of Ta and U products varies slightly based upon grade. Constant recovery of 65%, mass pull to concentrate of 19,508t and mass post weak acid leach of 14,306t; 2. Royalty rate is an assumption; 3. US\$4m in every year after year 1.

# Niobec Mine Comparison



	Niobec Mine	Kanyika Project <sup>1</sup>
Owner	IAMGOLD (TSX: IMG)	Globe (ASX: GBE)
Location	Quebec, Canada	Mzimba, Malawi
Commencement of FeNb Production	1994	2012
Resources/Reserves (Mt)	52.3 (incl. 23.4 reserves)	55 (Indicated + Inferred resources)
Grade (ppm)		
- Nb <sub>2</sub> O <sub>5</sub>	6,200 <sup>3</sup>	3,831
- Ta <sub>2</sub> O <sub>5</sub>	n/a	173
- U <sub>3</sub> O <sub>8</sub>	n/a	104
- eNb <sub>2</sub> O <sub>5</sub> <sup>6</sup>	6,200	4,759
Mining Method	Underground (>400m)	Open pit (from surface)
FeNb Production Capacity (tpa) (Nb metal content)	4,500	3,000 (+194t Ta <sub>2</sub> O <sub>5</sub> , 117t U <sub>3</sub> O <sub>8</sub> )
FeNb Production (tpa)	4,200	As above
Mined Material (Mtpa)	1.80	2.76
Mill Feed (Mtpa)	1.79	1.72 (0.6:1 strip ratio)
Recovery (%)	58 <sup>2</sup>	65
Revenue (US\$m)	143.1	152.5
FeNb Price (US\$/kg)	37.5 <sup>4</sup>	39
Operating Profit (US\$m)	79.6 (Q4 23.7)	74.3
Operating Margin (%)	56% (Q4 65%)	49%
Implied Market Capitalisation (US\$m)	281 <sup>5</sup> (~3.5x 08 EBITDA) <sup>7</sup>	5.6

1. All Globe production-related figures are year 1-5 figures, and thereafter vary over the 20 year life-of-mine. All Niobec figures are for 2008; 2. Claude Dufresne and Ghislain Goyette, "The Production of Ferroniobium at the Niobec Mine"; 2001 3. Reserve/resource grade is 5,900ppm, currently mining 6,200ppm material; 4. Recovered price in Q4 2008 – see 2008 IAMGOLD Annual Report, p.98; 5. IAMGOLD Corporation Research Report, Paradigm Capital, 15 January 2009 – Niobec representing 7.9% of 'sum-of-the-parts' IAMGOLD valuation; IAMGOLD market capitalisation at 12 May 2009 US\$3.55bn; 6. equivalent Nb<sub>2</sub>O<sub>5</sub> calculated using Ta<sub>2</sub>O<sub>5</sub> and U<sub>3</sub>O<sub>8</sub> grades shown and respective prices from p.15; 7. 2008 Capex \$22.9m.



# Malawi



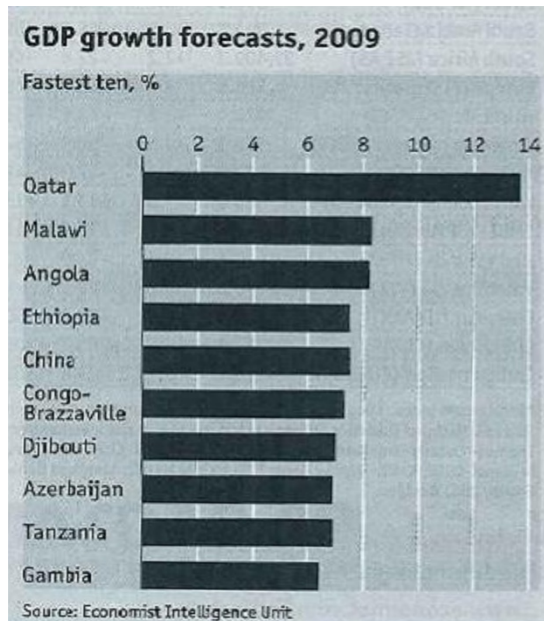
Republic of Malawi	
Size	118,484km <sup>2</sup>
Capital	Lilongwe
Official Language	English
Government	Multi-party democracy
Elections	19 May 2009
Legal system	English Common Law
Population (2008 est.)	14 million
GDP/capita (US\$ at PPP)	590
Local Currency	Kwacha

## Malawi Economy Grew by 9.7% in 2008 – IMF

*“Malawi’s economy expanded by an estimated 9.7 percent in 2008, boosted by an expansion of the telecommunication industry, high tobacco sales and a strong maize harvest, the International Monetary Fund said.*

*The Southern African nation has been enjoying a relative economic boom, and growth averaged 7 percent in the past three years. It managed to bring down inflation from 30 percent to single digits last year.*

*Finance Minister Goodall Gondwe said that the 2008 growth is three times the continent’s forecast of 3 percent.”* (Reuters, 1 April 2009)



## Opening of Kayelekera Uranium Mine

*“The Directors of Paladin Energy Ltd are very pleased to announce that its SECOND mine, the Kayelekera Uranium Mine in Malawi, has been officially opened by His Excellency, Dr Bingu wa Mutharika, the President of the Republic of Malawi.*

*Paladin’s Kayelekera Uranium Mine has been successfully commissioned with the plant showing full capability to operate throughout its flowsheet with yellowcake produced during this phase. The project remains on schedule for its ramp-up.”* (John Borshoff, Managing Director, Paladin Energy Limited, 20 April 2009)



# Community & Government Relations



## Community Engagement

Globe conducts periodic (six monthly) formal meetings at Kanyika with Mabulabo Traditional Authority, representatives of the Ministry of Mines & Energy and the Mzimba District Commissioner's Office. Photo (right) from Kanyika, November 2008.

The Community is consulted on all matters relating to Globe's exploration activities, future activities and current and future employment of locals.

Globe has employed and trained up to 44 individuals per year from the surrounding area; recently contributed 100 desks to the Kanyika Secondary School.



## Government Negotiations

Formal discussions with the Government of Malawi on all aspects of the Project (fiscal regime etc) commenced in March 2009 (picture right).

Expected to result in a Development Agreement with the Government of Malawi, encompassing all rights and obligations applying to Kanyika.

Discussions to recommence in June 2009 after the Presidential and National Assembly elections on 19 May 2009.



**NIOBIUM**

# Key Facts

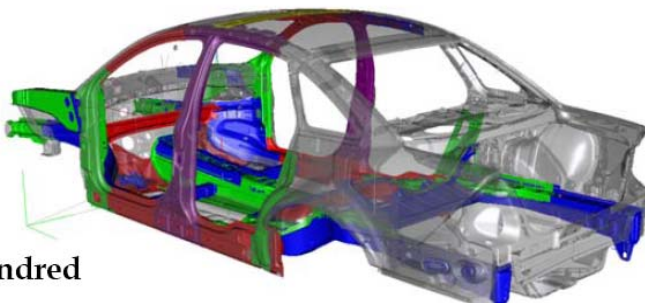


Chemical Symbol	Nb; atomic # 41 on periodic table
Market Size (2008 est.)	67,000t (Nb metal content)
Market Value (2008 est.)	US\$2.8bn (@ average US\$42/kg Nb metal)
Segments	90%+ consumed in steel industry as FeNb
FeNb Growth	21% CAGR (2002-07); 7.9% CAGR (1990-08) <sup>1</sup>
World Steel Growth	4.1% CAGR (1994-08) <sup>2</sup>
Properties	Small addition to molten steel acts as grain refiner, encouraging formation of a micro-structure that adds toughness, corrosion resistance, tensile strength, formability, and strength
Segments (within steel industry)	Nb primarily used in steel industry in High-Strength Low-Alloy Steels (HSLA), or micro-alloyed steels; ~10-12% steels are HSLA <sup>3</sup>
ppm	HSLA steels usually contain 350-500 g/tonne (0.035-0.05%) Nb; up to 1000 g/tonne (e.g.BSC 4360:55E); addition of 0.01% Nb strengthens steel by 35-40 MPa <sup>4</sup>
Benefits	In addition to performance, also lighter, requires less raw materials, lower energy and transport costs, more profitable for producers
Products/Industries	Auto, construction, ship building, oil and gas, heavy machinery, transport
Substitutes/Related Commodities	V and Mo used in HSLA; Ni and Cr used to impart corrosion resistance in stainless steels; Ti and Ta used in high temperature applications
Market Structure	95%+ FeNb traded on annual, privately negotiated, off-take contracts between mills and producer

1: CBMM, TIC Conference, Shanghai, 2008 ([www.cbmm.br](http://www.cbmm.br)); USGS Minerals Yearbook ([www.usgs.gov](http://www.usgs.gov)); 2: USGS and World Steel Association ([www.worldsteel.org](http://www.worldsteel.org)); 3: W. B. Morrison, "Overview of Microalloying in Steel", Vanadium International Technical Committee ([www.VANITEC.org](http://www.VANITEC.org)) estimates that HSLA steel accounts for approx. 12% of all steel produced 4: Globe Mining & Metals commissioned research, Mining Research ([www.miningresearch.co.uk](http://www.miningresearch.co.uk)).



# Products



**Ford Five Hundred**

- Green: HSLA 250
- Blue: HSLA 350
- Yellow: HSLA 550
- Red: DP 600
- Purple: Inner: Top DP600 / Bottom HSLA 250  
Outer: Top DP600 / Bottom Mild Steel

4kg of niobium used in the manufacture of a mid-sized vehicle would save 100kg of steel, which would translate into fuel savings of half a litre per 100km<sup>1</sup>



1. "Niobium Demand, Price Stays High, Despite Steel Weakness", *Mining Weekly.com*, 7 November 2008



# Market Structure



Company	Mine	Nb Production 2008	Market %
CBMM	Araxa, Brazil	51,000	76.1%
Anglo American	Catalao, Brazil	5,000	7.5%
IAMGOLD	Niobec, Canada	4,200	6.3%
Chinese/Others	Purchased ores	1,500	2.2%
<b>Total FeNb (Nb content)</b>		<b>61,700</b>	<b>92.1%</b>
Non-Steel Nb production	Various	5,300	7.9%
<b>Total Nb Production</b>		<b>67,000</b>	<b>100%</b>

New Producers	Mine	Nb Production	Year
Globe	Kanyika, Malawi	3,000	2012
Rosspetsplav	Luesche, DRC/Russia	1,500	2009

***“The level of consumption of [niobium and tantalum] is to a large extent an indicator of a nation’s technical prowess.”***

(E. G. Polyakov & L. P. Polyakova, “Current Trends in the Production of Tantalum and Niobium”, *Metallurgist*, Vol. 47, Nos. 1-2, 2003)

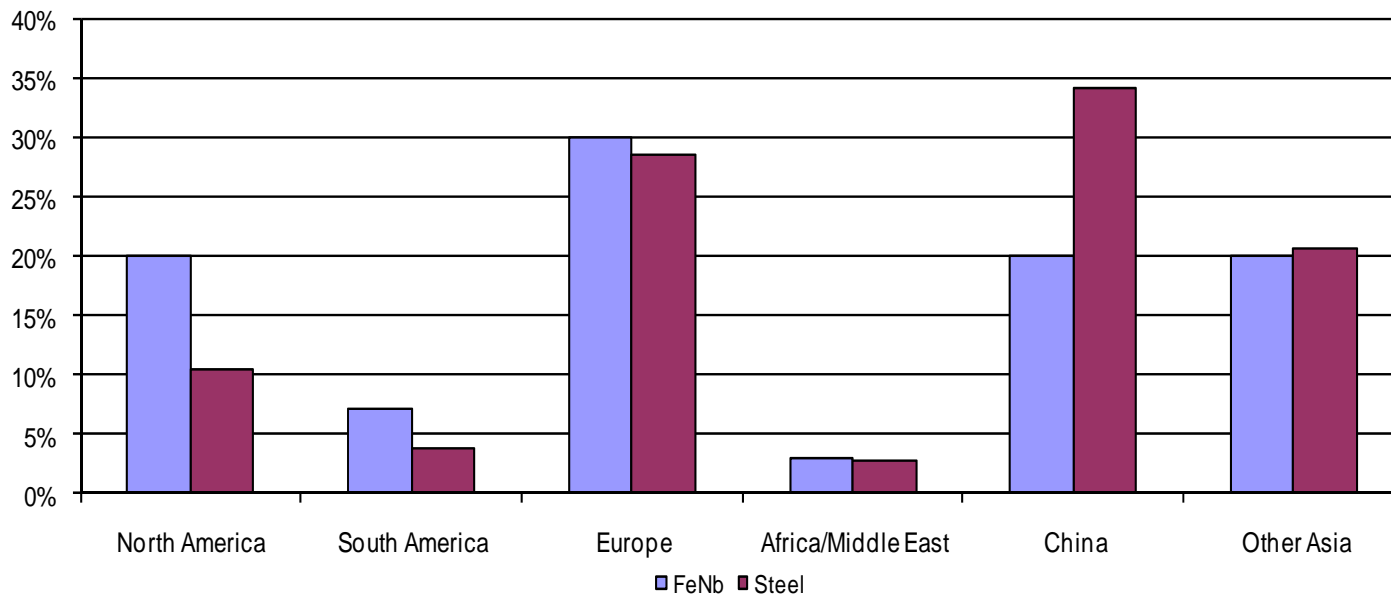
***“In 2008, ferro-niobium was used in about 10% of total steel production. There is good potential for that figure to grow, perhaps to as much as 20%, as higher-quality steels continue to replace mild steel in a number of applications.”***

(Roskill, “*The Economics of Niobium*”, 11th edition, 2009; [www.roskill.co.uk](http://www.roskill.co.uk))

***“The best substitute for steel is better steel.”***

(CBMM, “*Niobium – The Capacity Expansion Project at CBMM*”, TIC Conference Presentation, Shanghai, 2008)

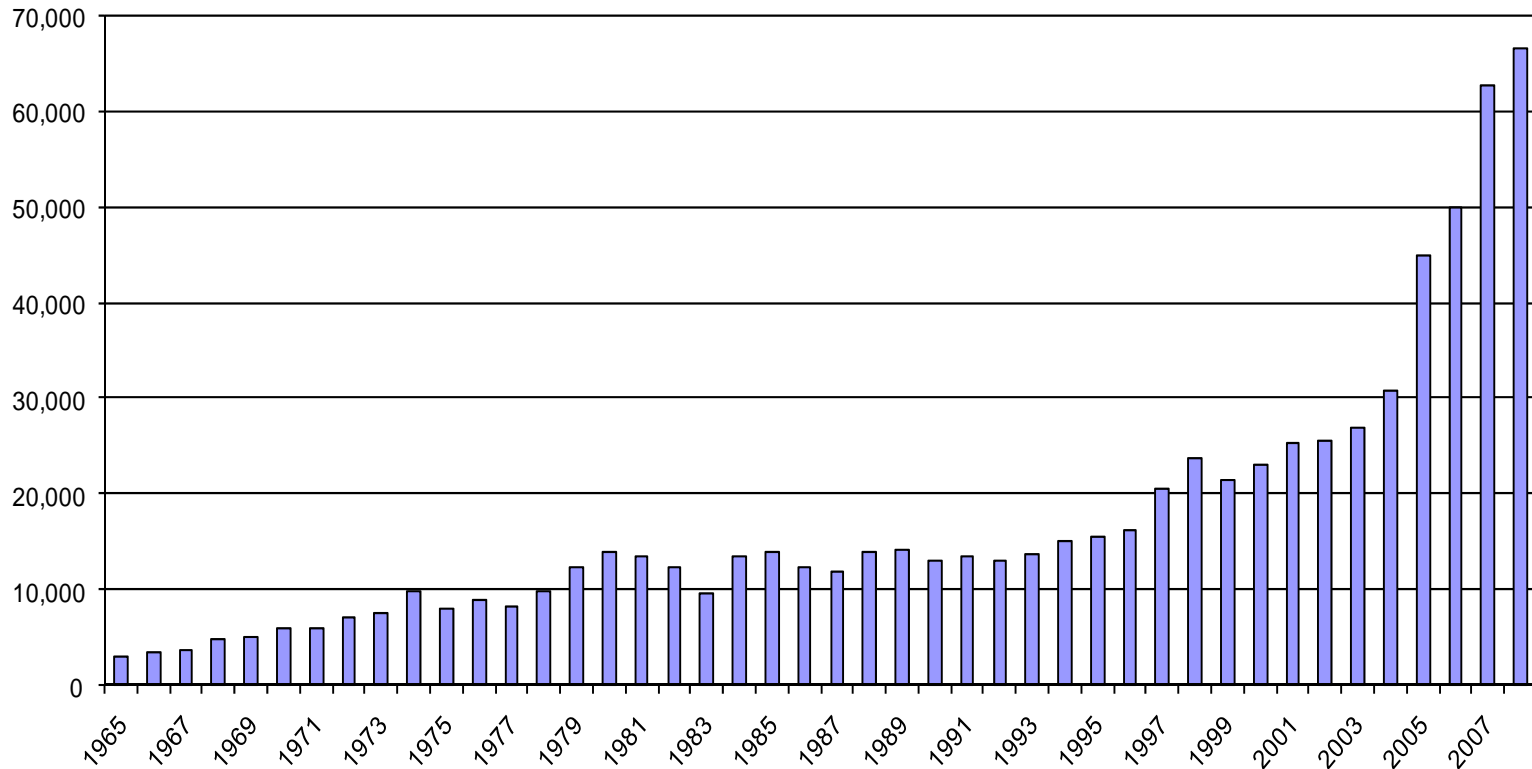
**Comparative Market Share by Region: FeNb v Steel Consumption, 2006**



# Market Size and Growth



World Niobium Production (tonnes): 1965-2008

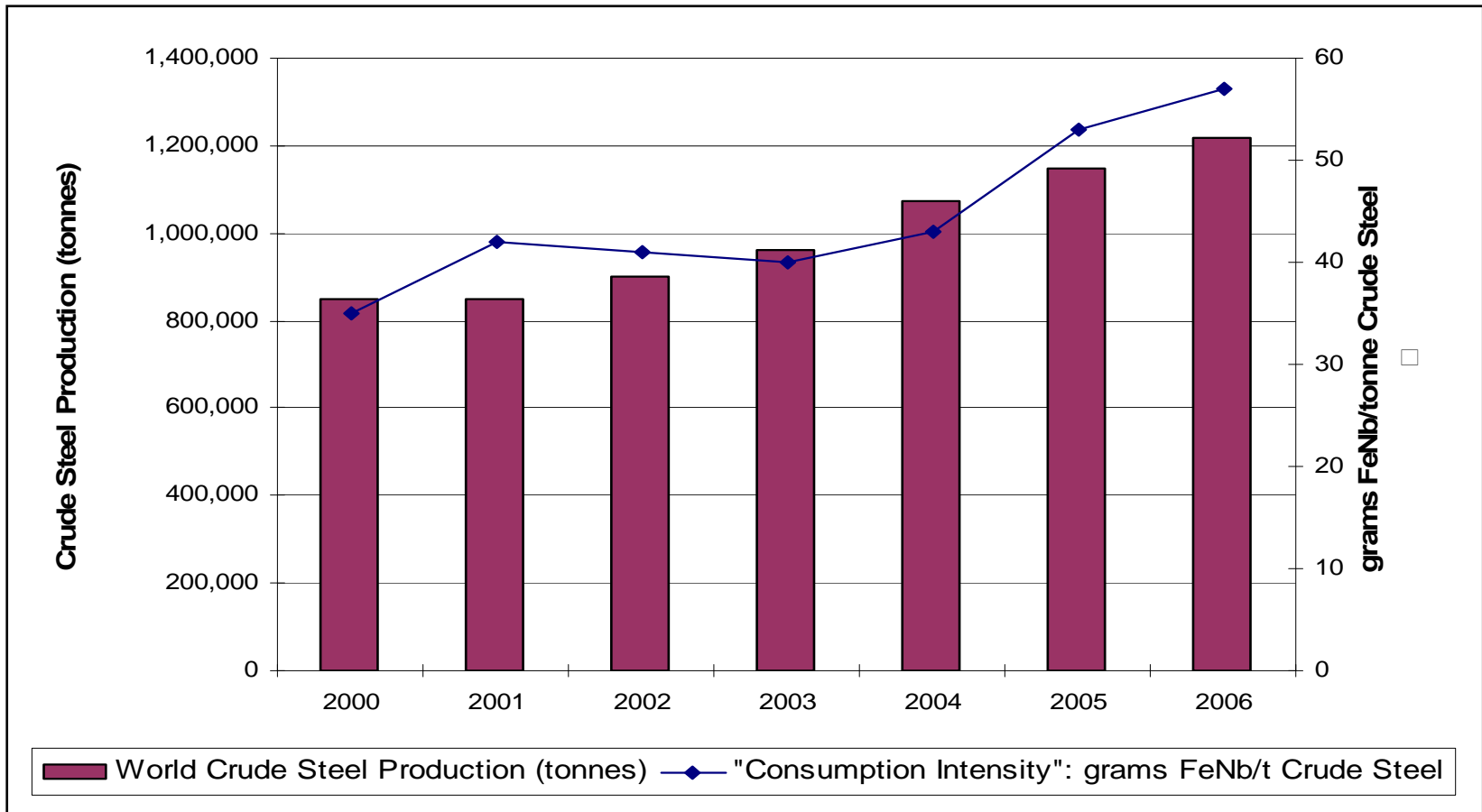


Sources: Compiled utilising data from Mining Research ([www.miningresearch.co.uk](http://www.miningresearch.co.uk)), Roskill ([www.roskill.co.uk](http://www.roskill.co.uk)), CBMM ([www.cbmm.br](http://www.cbmm.br)) and Tantalum & Niobium International Studies Centre ([www.tanb.org](http://www.tanb.org))

# Consumption Intensity



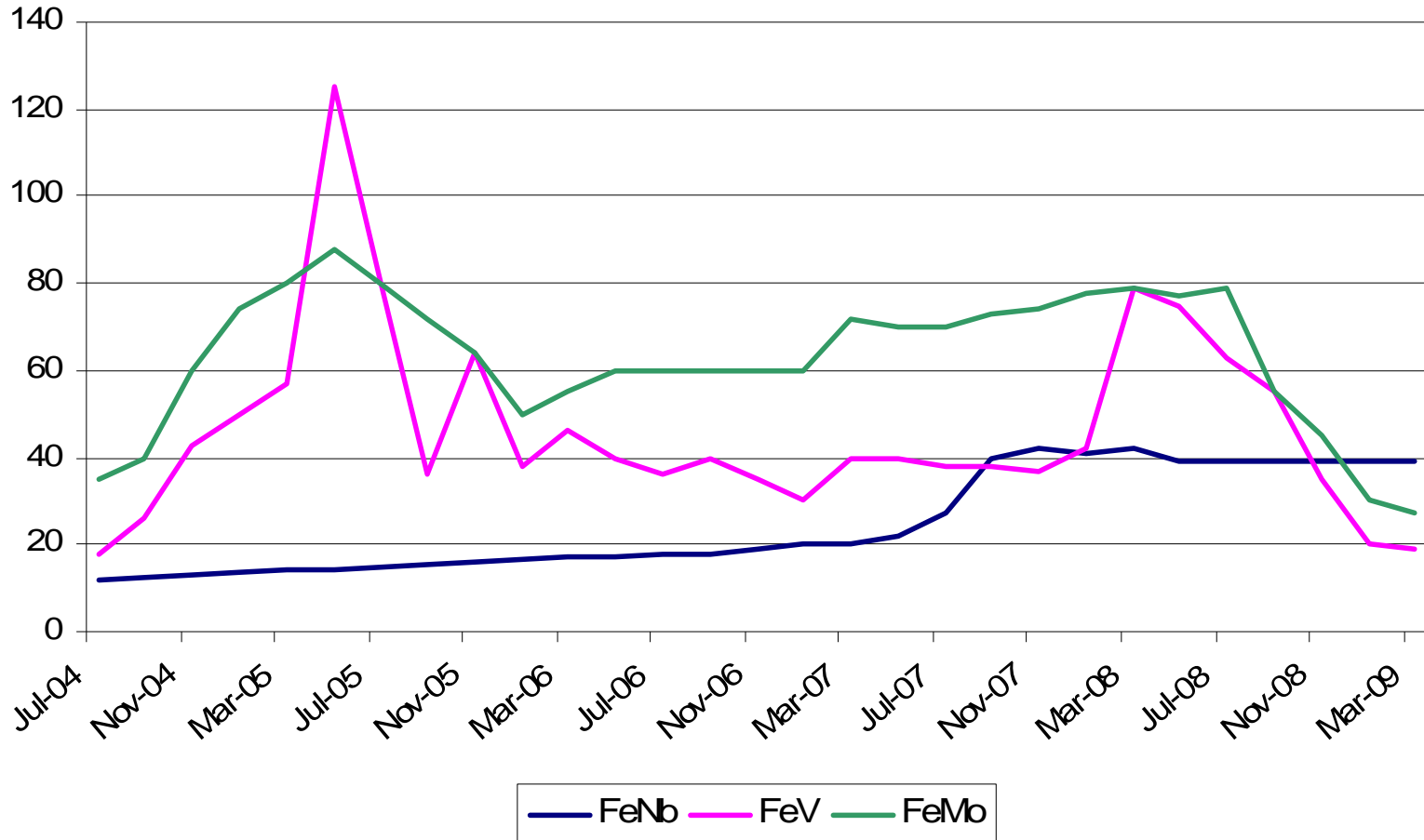
*“The growth in consumption of niobium...has resulted from both the overall growth in total steel consumption and a shift from mild steels to higher quality steels, which often contain niobium. Worldwide, in 2008 the unit consumption of niobium in steel was around 55-60g/t of steel produced. In the most highly developed countries the figure was 100g/t or more, whereas in China only around 40g/t were consumed. There would appear, therefore, to be significant potential for the increased use of niobium in this end-use market. (Roskill)*



# Commodity Prices



### Selected Ferro-Alloy Price Comparison (US\$/Kg)



*“Ferro-niobium prices increased sharply from mid-2007...By May 2008, spot prices had risen to US\$39.70-41.90/kg (US\$18-19/lb), with **producer prices at US\$35.30-36.40/kg (US\$16-16.50/lb)**. In November 2008 a benchmark contract price of US\$43.00-46.00/kg (US\$19.50-21/lb) was reported. Prices remained at that level in early 2009.”*

*“**It would be natural to expect such a large increase in prices to be only temporary, particularly during a time of severe global economic downturn. Roskill does not share that view.** Prior to 2007, niobium prices had been flat for some years and thus falling in real terms. At the same time, demand was increasing and producers were expanding capacity accordingly, probably at considerable expense. An adjustment to the benchmark price at some point was inevitable. Roskill has obtained independent opinion on future pricing from within the steel industry and considers that **ferro-niobium prices are likely to stay at about the level seen in late 2008 and early 2009.**”*

*“It is to be noted that ferro-niobium is consumed in very small quantities and that, even at the new higher price, it forms a **very minor component of steel production costs.**” (Roskill)*

*“The price of Brazilian ferroniobium remains **stable at around RMB230,000-235,000/t (USD51.1-52.2/kg Nb) in the spot market** this week and the sole agent sells the material at lower prices around RMB220,000/t (USD48.9/kg Nb) to the steel mill...Some steel mills reported that demand for automobile plate is seeing some recovery this month, but others believe that it will still take some time for the high-end steels markets to revive, so the price of Brazilian ferroniobium will not go up, but keep stable in the coming weeks”*

*“Bao Steel, one of the major ferroniobium consumers in China, stated that **demand for construction steels recovers after the Chinese government released the economic stimulus package plans**, but most of Bao Steel’s products are medium- and high-end products, whose markets are reviving. Nevertheless, it is worth mentioning that automobile plate market sees some improvements, thanks to the reviving car industry. Bao Steel disclosed that orders for the steel have soared to 290,000t in April, up from 140,000t in March, while the purchasing volume was less than 100,000t at worst. The major ferroniobium consumer expressed that they are cautiously positive towards the steel market in June and July. The steel industry improves somewhat in April, which is a result of downstream consumers consume their inventories to low levels since they primarily used their inventories from the last quarter in 2008.” ([www.asianmetal.com](http://www.asianmetal.com); 30 April 2009)*

# Substitutes ?

	Nb	V	Mo
Market Size (2008 est.)	67,000t	60,000t	212,000t
Use in Steel Industry (%)	90%+	85%	75%
Primary Application	Refining HSLA/low carbon steels	Refining high carbon steels	Hardening steel
CAGR 1990-08 (%)	7.9%	2.7%	2.9%
Metal Content in Alloy (%)	66%	45-50%; 80%	60-75%
Use in HSLA (%)	95%+	23%	6%
Primary Production (%)	95%+	29%/85%*	<30%, typically Cu credit

- Often Nb and V **provide best outcome together**, rather than used alone (e.g. yield strength and ductile-brittle transition temperatures in conventional hot-rolled steels).
- Nb a more effective grain refiner than V – the usual Nb addition is 0.02-0.04%, which is a third of the optimal V addition (**AND** FeV only 92% of FeNb price over 1998-2008.)
- FeNb produced by primary Nb producers – historically very stable supply and prices; FeV price historically very volatile, and **supply unreliable**.

Sources: USGS Commodity Reviews ([www.usgs.gov](http://www.usgs.gov)); Globe Mining & Metals commissioned research, Mining Research ([www.miningresearch.co.uk](http://www.miningresearch.co.uk)); \*56% of total production is co-production of vanadiferrous magnetite ore processed for steel making, with V produced as a by-product (Windimurra Vanadium 2008 AGM Presentation).

# Substitutes ?

***“In the higher-quality steels, where niobium is finding increasing use, there is little opportunity for substitution by other alloying elements. At the typical addition rate of 0.05%, niobium delivers steel with a ferrite grain size of 20µm<sup>2</sup>. Similar additions of titanium and vanadium result in much larger grain sizes, approximately 60µm<sup>2</sup> and 100µm<sup>2</sup>, respectively. Even at much higher rates of addition, titanium and vanadium cannot offer the degree of refinement provided by microalloying with niobium.”***

***“As ferro-niobium, like other alloys, is used in very small amounts its impact on the cost per tonne of steel produced is minor. Ferro-niobium prices are historically also very stable. The same cannot be said of ferro-vanadium and ferro-titanium prices, which show very wide fluctuations. There have been periods when the price of ferro-vanadium was below that of ferro-niobium: there have also been periods when it was several times higher...Roskill considers that there is little real risk of niobium being replaced to any significant extent by other alloys in steelmaking.”*** (Roskill)

## Receivers poised as lender moves on vanadium miner



The West Australian, 18 February 2009



## 1. Economic Crisis

*“... the niobium industry remained confident of the industry’s future prospects. Demand for **natural gas pipeline**, the main application for HSLA steel, is healthy and will remain so. The **automobile industry**, another major consumer of HSLA steel, was in a major downturn in 2008, and one that will continue into 2009 and 2010. There too, however, the long-term prospects for niobium remained good, given the general trend towards greater use of HSLA steel. The **construction industry**, the third major user of HSLA steel is set to recover in 2010...Little, if any, growth is likely in 2009 but **a return to the underlying trend will very probably be seen from 2010.**”*

## 2. Developing Nations

- ▶ Nb consumption per unit of steel to increase as economies become more sophisticated (measured as “consumption intensity”)
- ▶ Growth in underlying steel consumption alone is significant – China 13.1% CAGR 1994-08<sup>1</sup>
- ▶ China leading world economic recovery

*“Combined with the country’s wider 4 trillion yuan (US\$585 billion) economic stimulus package, the policies have caused General Motors to roughly double is forecast for China’s nationwide auto market growth this year” (Bloomberg, 25 March 2009)*

## 3. Developed Nations

- ▶ Trend of increasing sophistication of steels will continue: 10-12% HSLA steels forecast to rise to 20%
- ▶ Trend evidenced by historic FeNb consumption of 7.9% CAGR v 4.1% for steel
- ▶ E.g. Fiat used 6% HSLA steels in 1980, 67% in 2006<sup>2</sup>

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