

# Kanyika Niobium Project

Positioned to be the first  
globally significant Niobium  
mine in 50 years

Poised to take advantage  
of the EV revolution

ersonal use only



Lake Malawi

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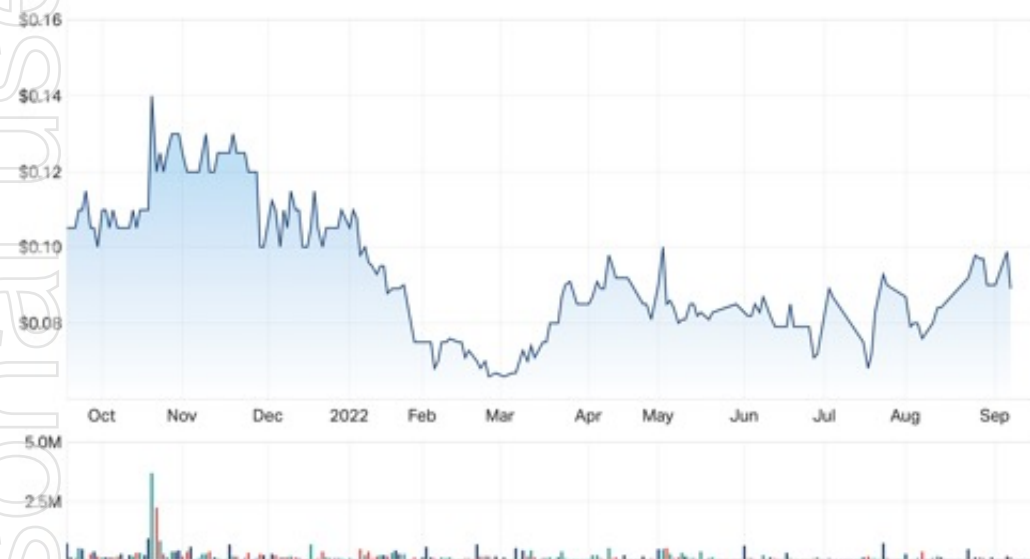
**Niobium is powering  
the future. From safer,  
fast-charge batteries to  
stronger wind-towers,  
niobium is a key part of  
the green revolution.**



# Corporate snapshot

Company ASX Code	GBE
Share Price <sup>1</sup>	AUD\$0.088
Ordinary Shares on Issue	~466M
Options on Issue	~5M
Market Capitalisation (undiluted) <sup>1</sup>	~AUD\$42.4M
Debt <sup>2</sup>	~AUD\$1.0M
Cash Held <sup>3</sup>	~AUD\$0.7M

GBE ASX Chart



<sup>1</sup> As at 14/10/2022  
<sup>2</sup> As at 30/6/2022  
<sup>3</sup> As at 30/6/2022

## Alice Wong | Non-Executive Chairperson

- Entrepreneur with over 10 years' experience in mining, luxury products and healthcare businesses
- Extensive experience in investment banking in Asia

## Grant Hudson | Chief Executive Officer

- Finance and Law Graduate with MBA – extensive experience in minerals sector as a senior executive
- Was CEO of lithium miner Bikita Minerals in Zimbabwe and Managing Director of Tantalite Holdings

## Rex Zietsman | Chief Technology Officer

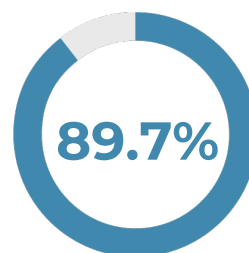
- Chemical engineer with 40 years experience in operations, design, engineering and consulting
- Was shareholder and director of AR Process Projects who co-designed the PBMR nuclear fuel plant
- Experience in the operation and engineering of tantalum/niobium ore concentration and refining

## Paul Hardie | General Counsel & Company Secretary

- Holds a Bachelor of Laws and a Bachelor of Economics
- Experienced commercial lawyer who has both advised public companies and held senior executive and non-executive positions with ASX-listed public companies for over 20 years
- Joined Globe in July 2022

## Michael Fry | Chief Financial Officer

- 10 years' experience working in chartered accounting with KPMG and Deloitte and
- Senior roles with Troika Securities and Swick Mining Services Ltd; Joined GBE in 2015 and leads financial management and reporting functions
- Joined Globe in July 2022



Top 20 Shareholders

Name	Shares	Capital
Apollo Metals Investment Co. Ltd	245,983,611	52.80%
Ao-Zhong International Minerals Pty Ltd	118,143,062	25.36%
BNP Paribas Nominees Pty Ltd	14,055,718	3.02%

# Company overview



Kanyika Niobium Project (KNP) is positioned to be the first niobium mine into production in more than fifty years and the first ever in Africa



Fully permitted, advanced staged; Large-scale mining licence, all environmental and land approvals in place to immediately commence construction



An ESG friendly and highly efficient processing facility – staged development planned; Globe will be the only vertically integrated NB-oxide producer outside the Americas



Long life project up to 38 years: JORC (2012) compliant Mineral Resource Estimate of 68 Mt with grade of 0.283% Nb<sub>2</sub>O<sub>5</sub> (M+I+I) (Cut-Off Grade = 1,500 ppm Nb<sub>2</sub>O<sub>5</sub>); based on ~33km of drilling



Strong relationships with community, local leaders and senior government officials, as well as industry operators



Niobium is a critical mineral in high demand across multiple sectors; favourable market dynamics and macro tailwinds;

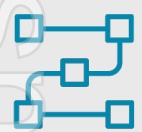
# Niobium has extremely favourable market dynamics



Commercial Niobium projects are rare, strategic and valuable



China is the largest global consumer with no commercially viable niobium mines



Niobium is a 'strategic' and 'critical' metal for USA, Russia and the EU



Niobium titanium/tungsten/oxide anodes expected to become standard for fast charging, next generation Lithium-Ion batteries for battery electric vehicles – refer Toshiba announcement, October 2017



No cost-effective substitutes for the use of Niobium in steel which can match its strength/weight characteristics



Increase in demand for higher quality steels is leading to higher intensity of use. Emerging countries, especially China & India, underpin a long term upswing in demand



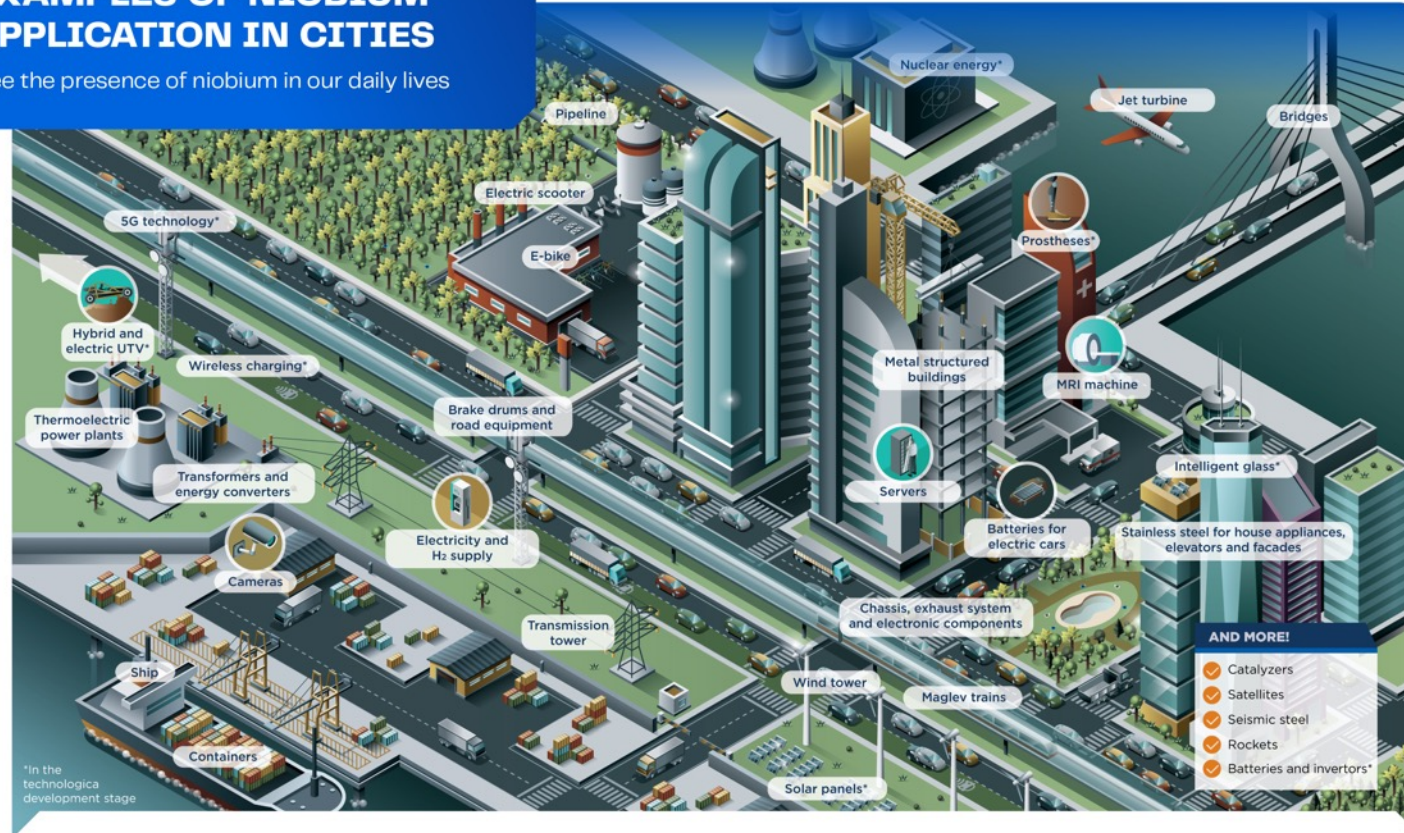
Existing producers responsible for >95% of global supply with >85% concentrated in Brazil



# Day-to-day application of Niobium is extensive

## EXAMPLES OF NIOBIUM APPLICATION IN CITIES

See the presence of niobium in our daily lives



### Increasing value

Increased financial return on manufacturing costs, increased component durability and reduced fuel costs

### Environment

Reduced consumption of inputs, fuels and raw materials, as well as of GHG emissions during the life cycle

### State-of-the-art technology

reduced consumption of inputs, fuels and raw materials, as well as of GHG emissions during the life cycle

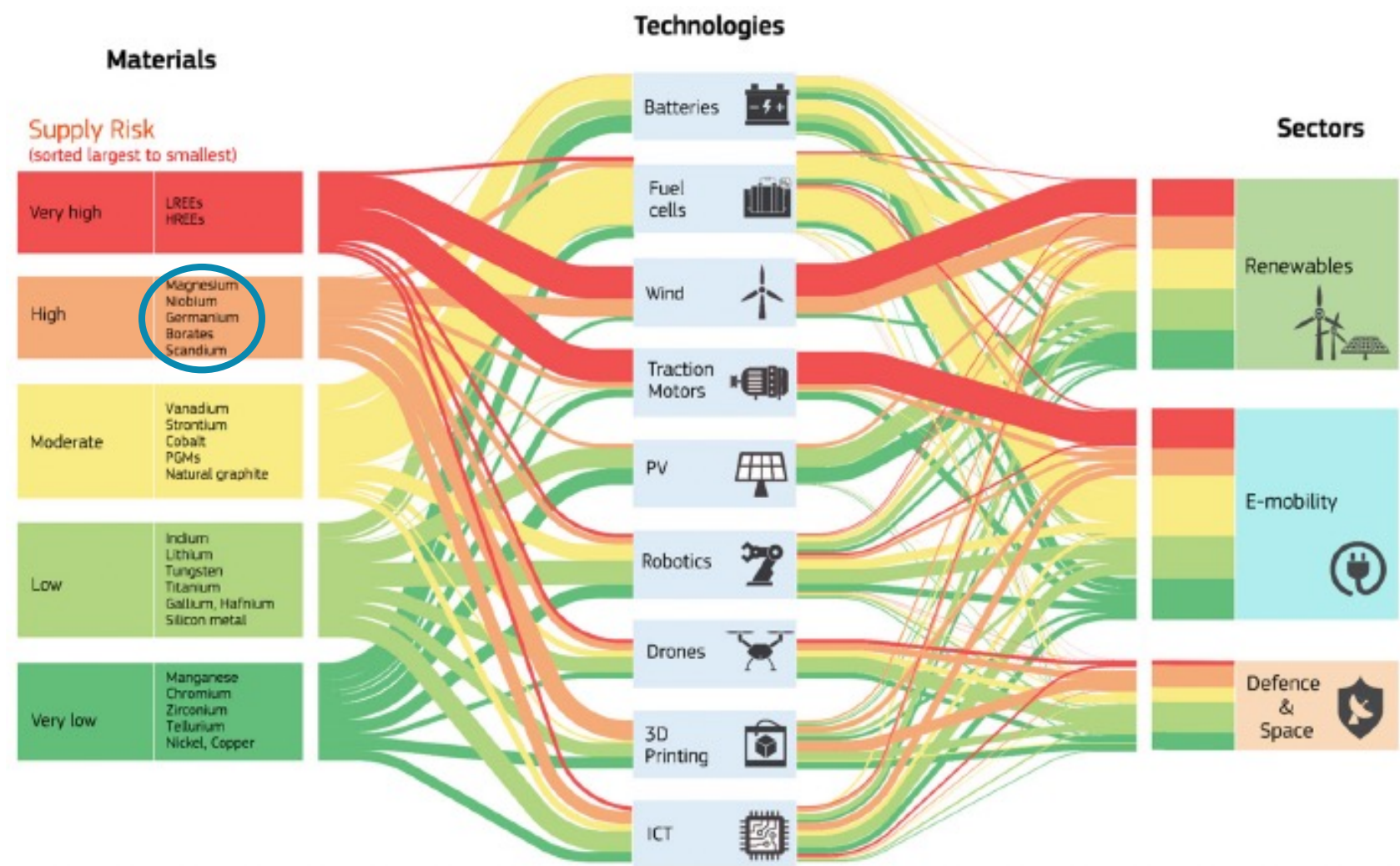
### Best performance

Malleability, weldability, uniformity and weight reduction

### Increased safety

Lighter and more resistant structures

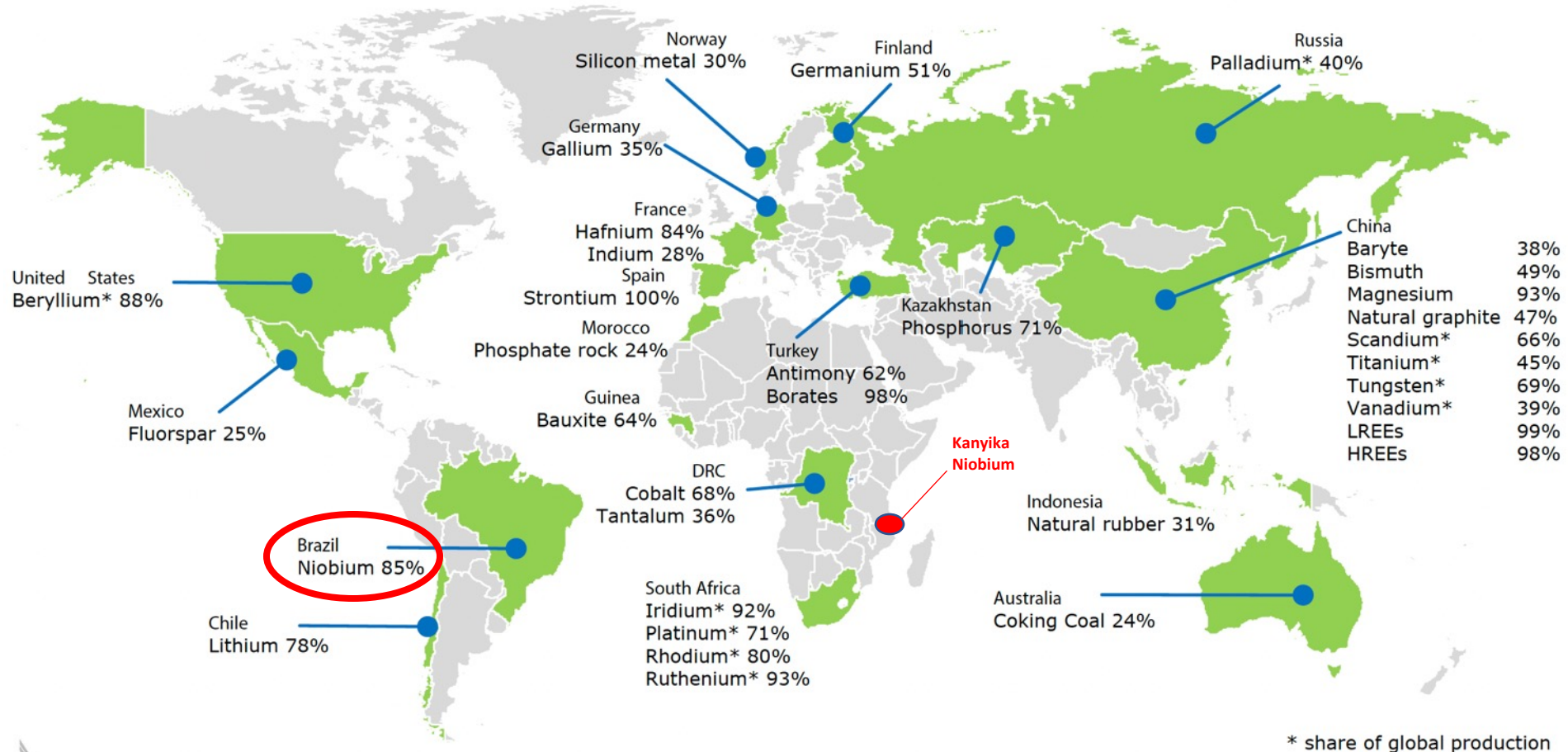
# A critical raw material with high supply risk





# Kanyika – a solution for supply-side risk

Excessive dependence on single supplier countries makes Europe vulnerable



# Huge emerging demand for Nb in Li-on batteries

## Why is Niobium important for LIB development?

Niobium addresses almost all of the major barriers to EV adoption

### Barriers to EV adoption

### Niobium's Role

#### RANGE ANXIETY

Consumers worry that an EV will not travel as far as an ICE vehicle and that performance will vary



**Niobium** helps increase the energy density of batteries, giving more power and increased range, and improves performance at low temperatures

#### CHARGING TIME

Charging times can vary significantly depending upon the car and charging station but can take several hours



**Niobium** materials can increase the rate with which batteries charge and discharge

#### PERFORMANCE/LONGEVITY

Batteries have a relatively short operating life as materials degrade during charge/recharge cycle



**Niobium** increases the stability of the battery so it can withstand more charging cycles

#### COSTS

Even with subsidies, BEVs are more expensive than equivalent ICE vehicles



**Niobium** is readily available and cost effective compared to other battery materials

#### CHOICE

There are few BEVs on the market



This is changing rapidly

Niobium production has risen ~25% over the past 7 years, with major producer (CBMM) recently announcing a **4.5X** increase in niobium oxide production capacity to cater for increasing demand from the electric vehicle battery sector.



# JORC minerals estimated resource and proven reserves

## Mineral resources:

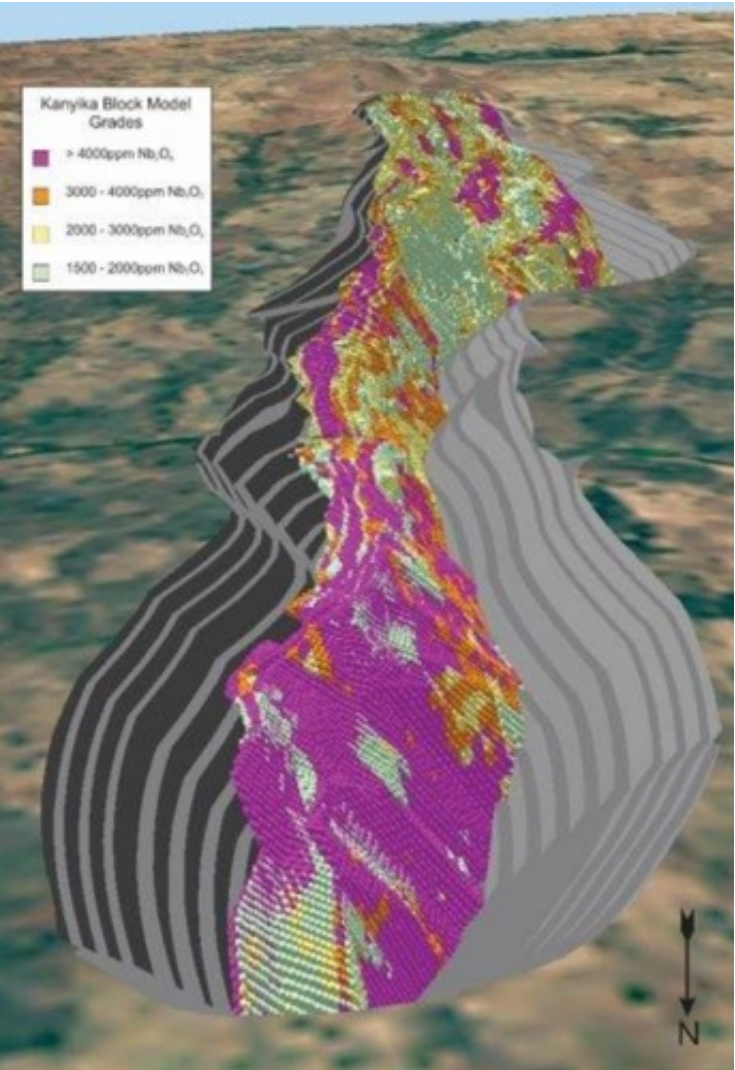
Classification	Tonnes (Mt)	Nb <sub>2</sub> O <sub>5</sub> (ppm)	Contained Nb <sub>2</sub> O <sub>5</sub> (t)	Ta <sub>2</sub> O <sub>5</sub> (ppm)	Contained Ta <sub>2</sub> O <sub>5</sub> (t)
Measured	5.3	3,770	19,981	180	954
Indicated	47	2,860	134,420	135	6,345
Inferred	16	2,430	38,880	120	1,920
<b>Total</b>	<b>68.3</b>	<b>2,830</b>	<b>193,281</b>	<b>135</b>	<b>9,219</b>

## Ore reserve:

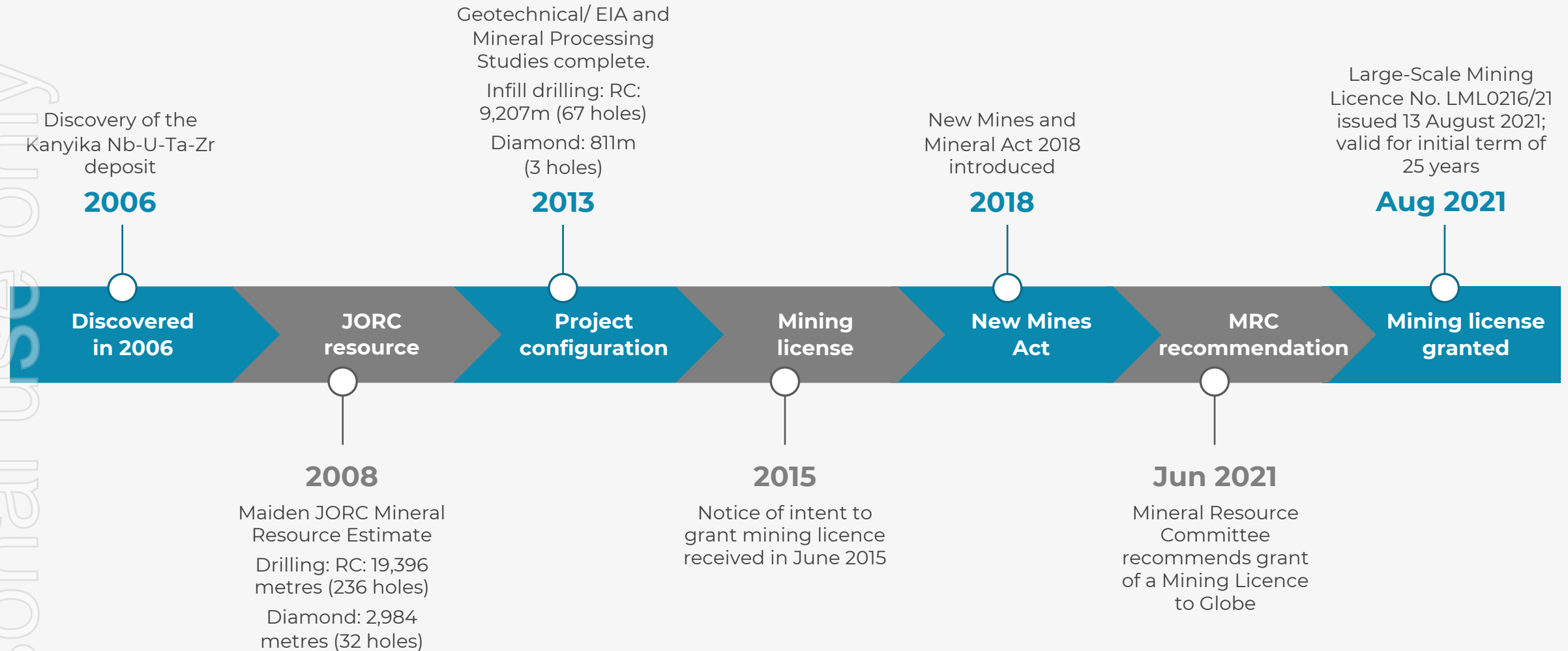
Reserve Classification	Tonnes (Mt)	Nb <sub>2</sub> O <sub>5</sub> (ppm)	Contained Nb <sub>2</sub> O <sub>5</sub> (t)	Ta <sub>2</sub> O <sub>5</sub> (ppm)	Contained Ta <sub>2</sub> O <sub>5</sub> (t)
Proved	5.3	3,680	19,504	171	906
Probable	28.5	2,930	83,505	136	3,876
<b>Total</b>	<b>33.8</b>	<b>3,048</b>	<b>103,009</b>	<b>141</b>	<b>4,782</b>

## Geology of ore body:

- Contains pyrochlore and zircon mineralization in disseminated zones
- Niobium and tantalum mineralization occurs within the mineral pyrochlore
- High-grade mineralization features pyrochlore bands associated with zircon



# Considerable progress made to date





# Phase One: Low-cost start-up operations

## Kanyika mine site: Phase One Pilot



### Open pit mining:

Drill and blast  
Load and haul



### Crushing:

Primary jaw and  
secondary cone



### Milling:

EDS mill  
Ball mill



### Flotation:

Single stage:  
Rougher, scavenger  
and cleaners



### Drying:

Locally produced  
biomass as fuel



### Concentrate:

Contains  
radioactive nuclides



### Sale and trucking:

Bulk bags loaded  
onto flat bed trucks

## Namibia refinery: Phase One Pilot



### Salt (NaCl):

Electrolysis of salt to produce  
chlorine



### Concentrate and chlorine gas:

Chlorine is recycled from  
oxidation and reduction



### Chlorination reactor:

Metals converted to gaseous  
chlorides at high  
temperature

Selective cooling gives  
primary separation of metal  
chlorides



### Distillation and purification:

Very high purity >99%  
achievable in batch  
distillation



### High grade niobium (and other) metal oxides and powders:

Regenerated chlorine  
is recycled back to the  
chlorinator

# Strong ESG Drivers

## Social

### Social and Labour Plan

- A percentage of turnover is spent on projects with qualified communities within a 20km radius from the mine

### Irrigation water

- Globe will build a dam to divert the river and for fresh water storage
- Raising the dam wall will retain additional water that will be made available to local communities
- Being able to grow two crops per year is a significant income improvement

### Growing biomass for purchase by Globe

- Globe will contract to buy suitable biomass as a fossil fuel replacement in the mining and plant operations
- This will provide a cash crop to the local community

## Environment

### Biogas from biomass

- The biomass purchased from the community will be anaerobically digested to produce biogas
- Biogas will be used to dry concentrate
- Biogas will be upgraded to biomethane
- Biomethane will replace 60% of the diesel in the mining fleet

### Solar PV with battery storage

- Solar power will provide power to the plant and charge the battery during daylight
- The battery will be used to provide power during morning and evening peak
- The battery will be recharged at night from grid hydropower

### Hydro power

- 96% of the Malawi grid is powered by hydro
- Globe will install a run-of-river hydro generator that will operate during the rainy season

### Regenerative chlorination process

- The chlorination process regenerates and recycles chlorine
- Very low residue volumes remain



# Near-term value drivers

## 2022

### Complete Phase One concentrator and refinery engineering

- Engineering contracts signed
- MDA

### Commence mine-site sample preparation for advanced engineering test-work

- Commence Phase One engineering programs
- Complete Namibia site selection and commence EIA

November

December

## 2023

### Complete advanced sample test-work

- Milling through EDS mill
- Gravity volume reduction

### Produce concentrate

- Flotation
- Chlorination
- Oxide sample production
- Update engineering design parameters

May

### Design review of engineering programs

- Flow sheets
- Hazop studies
- Layouts
- Equipment selection
- Complete CDAs with 'qualified communities'

June

### Complete Namibia EIA

- Complete all other Namibian regulatory requirements
- Complete provision uranium offtake agreement
- Produce saleable Nb<sub>2</sub>O<sub>5</sub> sample for customer validation

August

### Complete engineering and cost estimation programs

- Commence capital raise for Phase One mine and refinery pilot plants
- Commence relocation of Project Affected Persons

October

### Commence Phase One project

- Purchase mining equipment
- Mine site development
- EPC contracts for concentrator and refinery
- Exercise option on refinery site

December

ASX: GBE

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# Competent Persons Statement



## Mineral resource estimates:

The information in this report that relates to Mineral Resources is extracted from the report titled “Kanyika Niobium Project – Updated JORC Resource Estimate” released to the Australian Securities Exchange (ASX) on 11 July 2018 and available to view at [www.globemm.com](http://www.globemm.com) and for which Competent Persons’ consents were obtained. Each Competent Person’s consent remains in place for subsequent releases by the Company of the same information in the same form and context, until the consent is withdrawn or replaced by a subsequent report and accompanying consent.

The Company confirms that is not aware of any new information or data that materially affects the information included in the original ASX announcement released on 11 July 2018 and, in the case of estimates of Mineral Resources, that all material assumptions and technical parameters underpinning the estimates in the original ASX announcement continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Persons’ findings are presented have not been materially modified from the original ASX announcement.

Full details are contained in the ASX announcement released on 11 July 2018 titled “Kanyika Niobium Project – Updated JORC Resource Estimate” is available to view at [www.globemm.com](http://www.globemm.com)

## Ore reserves:

The information in the report that relates to Ore Reserves is extracted from the report titled “Kanyika Niobium Project – Project Feasibility and Economics” released to the Australian Securities Exchange (ASX) on 19 August 2021 and available to view at [www.globemm.com](http://www.globemm.com) and for which a Competent Person’s consent was obtained. The Competent Person’s consent remains in place for subsequent releases by the Company of the same information in the same form and context, until the consent is withdrawn or replaced by a subsequent report and accompanying consent.

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# Kanyika Niobium Project

## Addendums

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