

## **KIBARAN RESOURCES CONFERENCE PRESENTATION**

**Kibaran Resources Limited** (ASX: KNL), ('Kibaran' or the 'Company') is pleased to advise that Managing Director, Andrew Spinks and Technical Graphite Specialist, Christoph Frey are presenting at the 5<sup>th</sup> Graphite & Graphene Conference in London. This conference is the world's largest forum dedicated to the graphite and graphene industry. The conference is attended by key players throughout both the natural and synthetic graphite supply chain.

The presentation "The Emerging Li-ion Battery Market and Kibaran's Graphite Projects" has been appended to this announcement.

Further information, please contact:

**Managing Director**

Andrew Spinks

**CFO/Company Secretary**

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# DEVELOPING PREMIUM QUALITY GRAPHITE IN TANZANIA



**5th Graphite & Graphene Conference  
8-9 December 2015, Waldorf Hilton, London**

**The emerging Li-ion battery market  
and Kibaran's graphite projects**

**Presented by:**

**Mr Andrew Spinks, Managing Director**

**Mr Christoph Frey, Technical Graphite Specialist**

**ASX: KNL**

*premium quality graphite uniquely tanzanian*



# DISCLAIMER

## Securities Disclaimer

This presentation is for informational purposes only and does not constitute an offer to sell, or solicit to purchase, any securities. Such offer can be made only through proper subscription documentation and only to investors meeting strict suitability requirements. Any failure to comply with these restrictions may constitute a violation of applicable securities laws.

## Forward looking Statements

Various statements in this presentation constitute statements relating to intentions, future acts and events. Such statements are generally classified as “forward looking statements” and involve known and unknown risks, uncertainties and other important factors that could cause those future acts, events and circumstances to differ materially from what is presented or implicitly portrayed herein. The company gives no assurances that the anticipated results, performance or achievements expressed or implied in these forward looking statements will be achieved.

## Competent Person

The information in this report that relates to Exploration Results, Mineral Resources or Ore Reserves is based on information compiled by Mr Andrew Spinks, who is a Member of The Australasian Institute of Mining and Metallurgy included in a list promulgated by the ASX from time to time. Andrew Spinks is a director of Kibaran Resources Limited and 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 a Competent Person as defined in the 2012 Edition of the “Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves”. Andrew Spinks consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

The information in this report that relates to Mineral Resources is based on information compiled by Mr David Williams, a Competent Person, who is a Member of The Australasian Institute of Mining and Metallurgy. David Williams is employed by CSA Global Pty Ltd, an independent consulting company. Mr Williams 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 a Competent Person as defined in the 2012 Edition of the “Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves”. David Williams consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

The information in this report that relates to the Ore Reserve has been compiled by Mr Steve O'Grady. Mr O'Grady, who is a Member of the Australasian Institute of Mining and Metallurgy, is a full time employee of Intermine Engineering and produced the Mining Reserve estimate based on data and geological information supplied by Mr Williams. Mr O'Grady has sufficient experience that is relevant to the estimation, assessment, evaluation and economic extraction of Ore Reserve that he is undertaking to qualify as a Competent Person as defined in the 2012 edition of the Australasian Code for Reporting of Exploration Results, Minerals Resources and Ore Reserves. Mr O'Grady consents to the inclusion in this report of the matters based on his information in the form and context that the information appears.

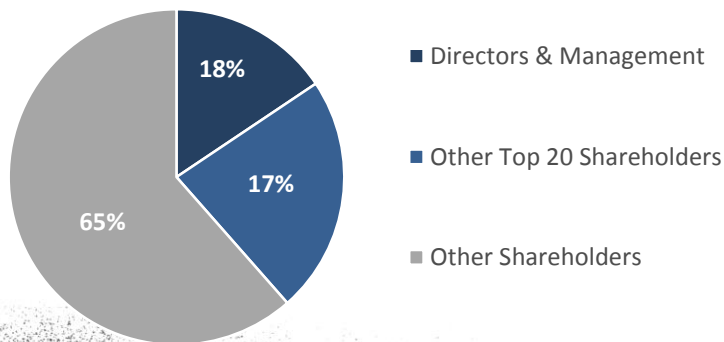


# COMPANY OVERVIEW

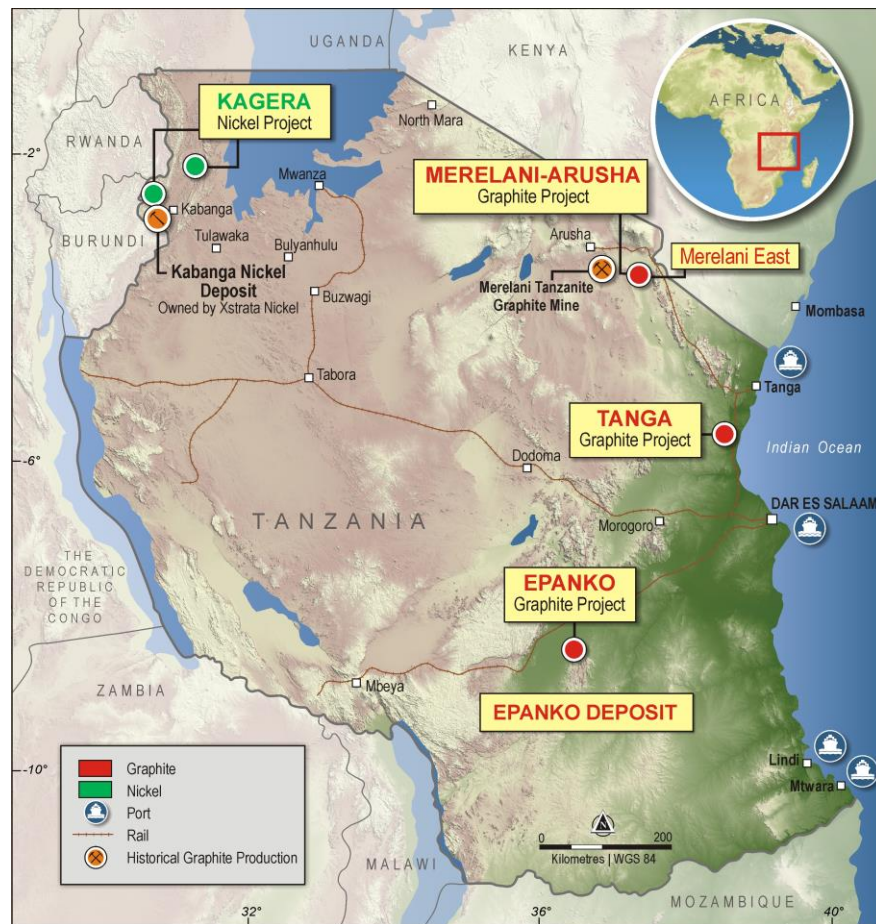
## Capital Structure

KNL:ASX		
Shares on Issue		167.6m
Share Price (7 December 2015)		\$0.17
Market Capitalisation		\$28.4m
Net Cash (30 September 2015)		\$3.0m
Enterprise Value		\$25.4m
Options		
Unlisted Options	Various Exp, Various Ex Prices	12m
TOTAL		12m

## Shareholders



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Focused strategy to become a major graphite producer



## PROJECT HIGHLIGHTS

### World-class Graphite Assets:

#### Epanko Graphite Project

- **Debt financing** supported by in-principle **German Government Loan Guarantee (UFG)** with coverage up to **\$US40m**
- **German KfW Bank mandate letter signed**
- Bankable Feasibility Study completed with **Pre-tax NPV of US\$197.5m**
- Annual EBITDA of US\$33.6m for 15 years
- Annual production of 40,000tpa
- Mining licence granted with environmental approvals in place
- **Staged increase to 84,000tpa, then 150,000tpa increase with global demand**
- **75% planned production supported by offtake**
- Mine life of 25 years is based on Ore Reserve
- Significant mineralisation remains undrilled

### Graphite Offtake & Sales Agreement

- ThyssenKrupp for 20,000tpa
- European trader for 10,000tpa

### Value Add Growth Strategies Underway

#### Merelani-Arusha Graphite Project

- Merelani East Deposit: Mineral Resource with outstanding metallurgy
- Advance to Pre-feasibility and position as second production province

#### Battery Grade Graphite Manufacturing Study

- Scoping Study completed with **Pre-tax NPV of US\$115m**

#### 3D Printing using Graphite & Graphene

- 3D Graphtech partnership with CSIRO

### Market Opportunity

- Growing global graphite demand plus market shortage of large flake product
- Strategic partnerships in Battery Market

*“Positioning Kibaran to be one of the first listed graphite focussed companies to progress to Production”*



## BOARD & MANAGEMENT TEAM

### Robert Pett – *Non-Executive Chairman*

- Minerals Economist with over 30 years experience working in mining and exploration
- Involved with listed companies at all levels in the resources sector at senior levels from grass-roots exploration through to mine development, production and financing
- Founding Chairman of Resolute Mining (gold mines/exploration Africa and (Australia)

### Andrew Spinks - *Managing Director*

- Geologist with over 25 years experience
- Expertise in exploration, mining and management across a number of commodities
- Association with operations in Africa for the past 13 years and worked for Resolute Ltd, Plutonic Resources, Dominion Mining & Whim Creek Resources

### Grant Pierce OAM - *Executive Director Projects*

- Mining engineer with over 25 years experience
- Extensive management experience & knowledge of Tanzanian mining sector
- Senior operational management roles in mining and exploration projects in Africa
- Awarded the Order of Australia Medal in 2003 for his personal contribution to social development in rural Tanzania

### John Conidi - *Non-Executive Director*

- Bachelor of Commerce degree from Royal Melbourne Institute of Technology
- 14 years of experience in developing, acquiring and managing businesses. MD of ASX:CAJ increasing market capitalisation from \$20 million to more than \$500 million in 8 years. Significant involvement in 3D Printing technologies



*His Excellency Jakaya Kikwete (R), President of Tanzania with Grant Pierce (L) and Andrew Spinks (C) at Mahenge on the 20 August 2014 discussing the significance of Kibaran's Epanko and Merelani Graphite Projects to Tanzania.*

30-plus years in-country experience with proven track record in Tanzania



## MANAGEMENT & TECHNICAL TEAM

### Robert Hodby - CFO/Company Secretary

- Bachelor of Commerce, Member of CPA Australia and Governance Institute of Australia
- Over 20 years industry experience in financing and administration of public and listed companies gathered at both operational and corporate levels
- Held roles in numerous executive and project level management as well as CFO, Board & Company Secretarial roles with a number of companies involved in the resource and energy industries

### Christoph Frey - Technical Graphite Specialist

- German based graphite industry professional
- Over 20 years graphite experience in Russia, Europe, Africa and China
- Involved with all facets of development and production of natural flake graphite
- Direct experience in production of battery grade graphite
- Use of graphite in high tech applications
- Production of nanoparticles and nanopowders
- From 2010 to 2013 he served as Technical Director at Graphit Kropfmuehl AG where he worked on the Ancuabe graphite mine in Mozambique



### Consultants Under Exclusivity Arrangements

- GR Engineering Services ~ Study Manager & Engineering Design
- CSA Global ~ Mineral Resource & Geology
- Knight Piésold ~ Hydrology & Infrastructure
- ECG Engineering ~ Power & Electrical Engineering
- Independent Metallurgical Operations ~ Metallurgy
- Intermine Engineers ~ Mining & Ore Reserves
- George Orr & Associates ~ Geotechnical Mine Design
- MTL Consulting ~ Environment
- Trinity Promotions ~ Social & Community

***“GR Engineering and all study consultants are considered leading experts with a proven history of developing project in Tanzania”***



## Key BFS Results

Conventional open cut mine and conventional flotation processing plant.

- Annual EBITDA of US\$33.6m for 15 years with 40,000tpa
- Pre-tax (NPV) of US\$197.4m
- Payback 2.7 years with 25 year mine life
- Strip Ratio (W:O) 1:1 LOM
- Revenue Price US\$1,466/t of concentrate
- Opex FOB Dar es Salaam \$570/t
- Nameplate throughput of 480,000 tpa
- Ability to increase production as market demand increases via a 2 stage growth strategy to 100ktpa

Items		Parameters (LOM)
Plant Throughput	(tpa)	434,000
Plant Recovery	(%)	93.3
Feed Grade	(%)	8.6
Carbon Grade	(%)	96.3
Production Concentrate	(tpa)	36,400
Base Price Assumption	(US\$/t)	1,446
Cost per Tonne of Concentrate	(US\$/t)	570
Mine Life	(Yrs)	25
Pre-Production Capital	(US\$m)	77.5
Strip Ratio	(W:O)	1:1
Discount Rate	(%)	10
Payback	(Yrs)	2.7
EBITDA/Annum (Avg)	(US\$m)	30.3
Pre-tax IRR	(%)	41.2
Pre-tax NPV	(US\$m)	197.4

### Notes:

- ~ FOB Dar es Salaam
- ~ Excluding Royalties (3%) and Taxes (30%)





# WHY TANZANIA

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## Mining-friendly Country

Stable democratic Government committed to mining sector growth and development

- English speaking
- Common law system
- Friendly tax regime (30%) and low royalties (3%)
- Existing and developed mining activity in place
- Access to skilled and educated local workforce
- Established mining support services

## Commercial Advantages

- Access to grid power
- Emerging power source with major gas discoveries
- Extensive infrastructure network (road, rail and ports)
- Major infrastructure initiatives – Power doubling and Tanga Rail



*New Road and Bridge Constructions on route to Epanko*

***“Tanzania understands the benefits of mineral wealth through the development of minerals”***

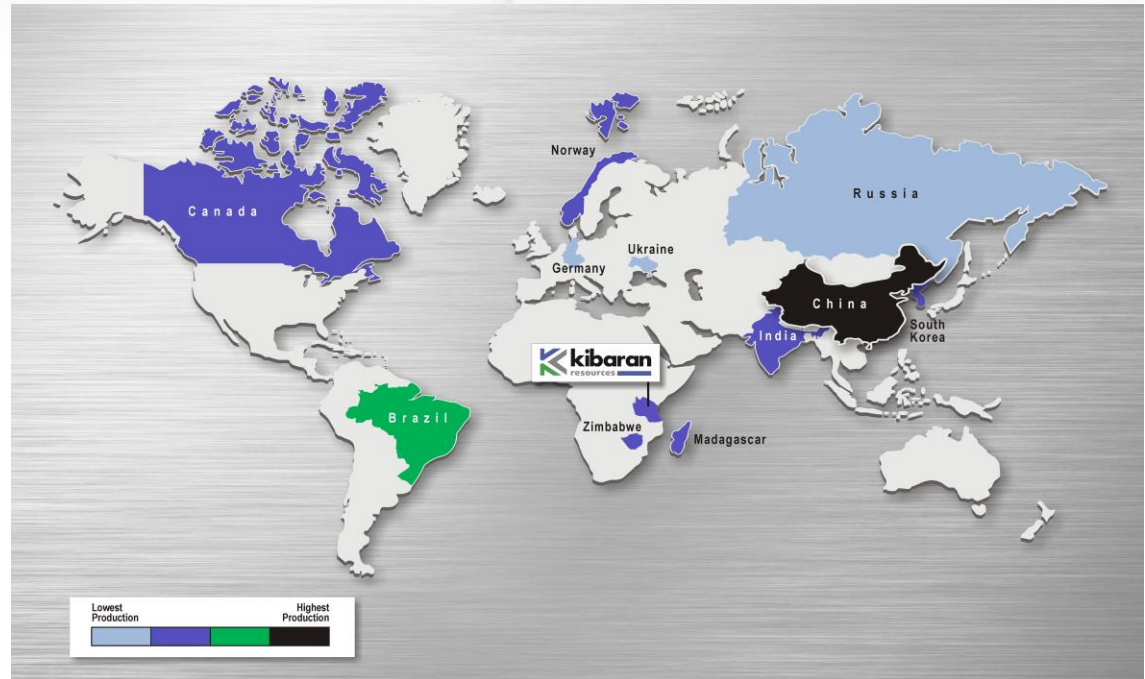
Significant in-country knowledge, expertise and relationships established



# WORLD – DEMAND / SUPPLY

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- Total market is **1.2Mtpa with China the largest producer and consumer**
- Natural flake demand outside of China is 320ktpa and largely sourced from China
- Traders and end users seeking diversity away from Chinese supply
- China seeking to import Large Flake Graphite
- China has 20% Export duty and 17% Vat on natural flake graphite
- China costs are rising
- World seeking eco-friendly supply



US, Japan, Korea, Taiwan and Europe are seeking alternative sources to China

China currently produces 73% of the world natural flake graphite supply

Opportunity to develop new mines that are cost competitive and have technical advantages to existing supply



## Commercial Advantage over Existing Supply

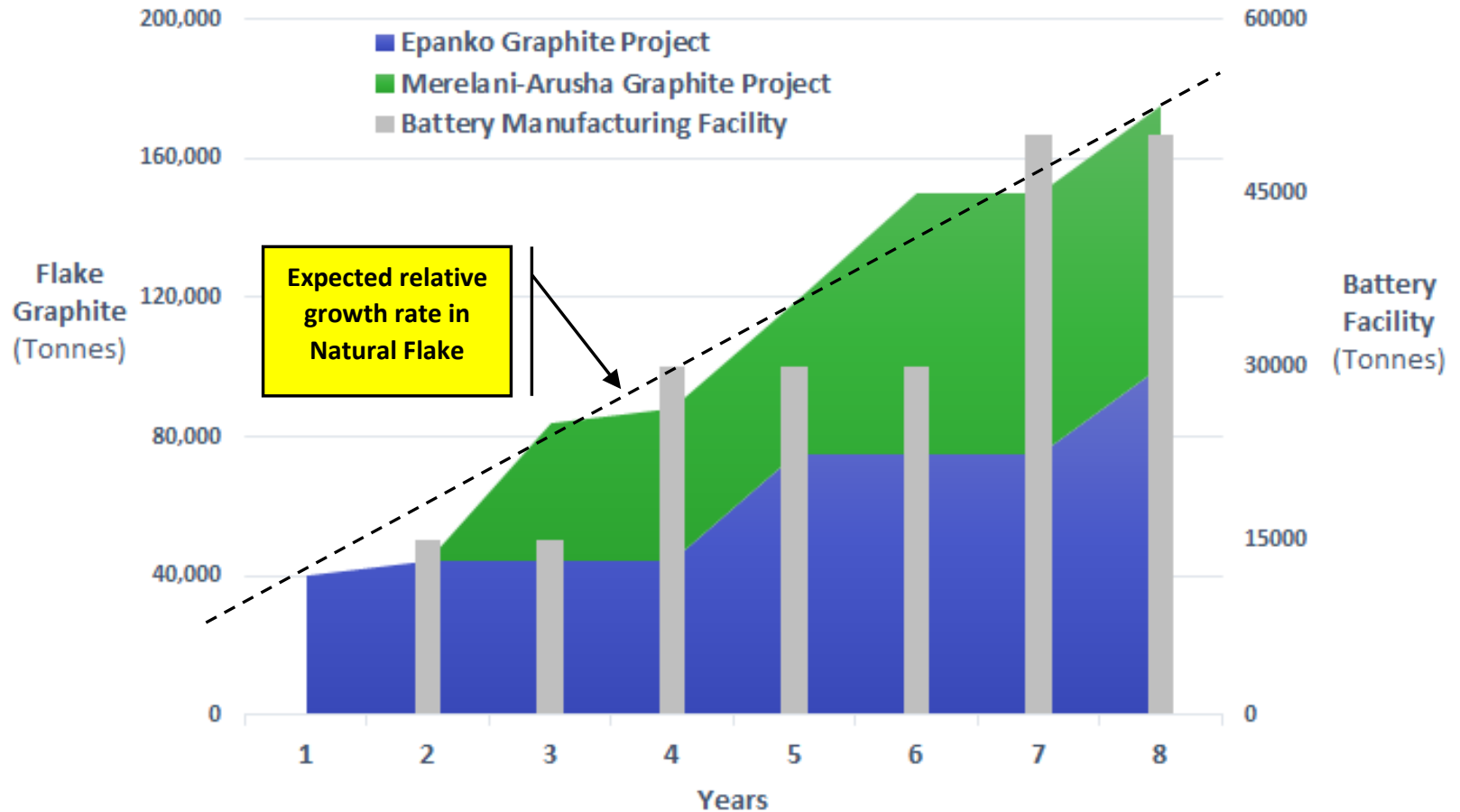
- Expansion Rates for Jumbo (+50 mesh) flake is 490 ml/g which is up to 30% higher than Chinese supply
- Ultra High purity of 99.98 % Carbon
- Very low percentage of fine flake (< 75micron)
- Testwork confirmed no limitation on industrial uses
- Extremely High percentage of large flake provides higher basket prices and increased saleability
- High Crystallinity expected to generate higher conductivity and densities which is important for LiB market





# PRODUCTION GROWTH STRATEGY

## Two Fold Growth via Diversity



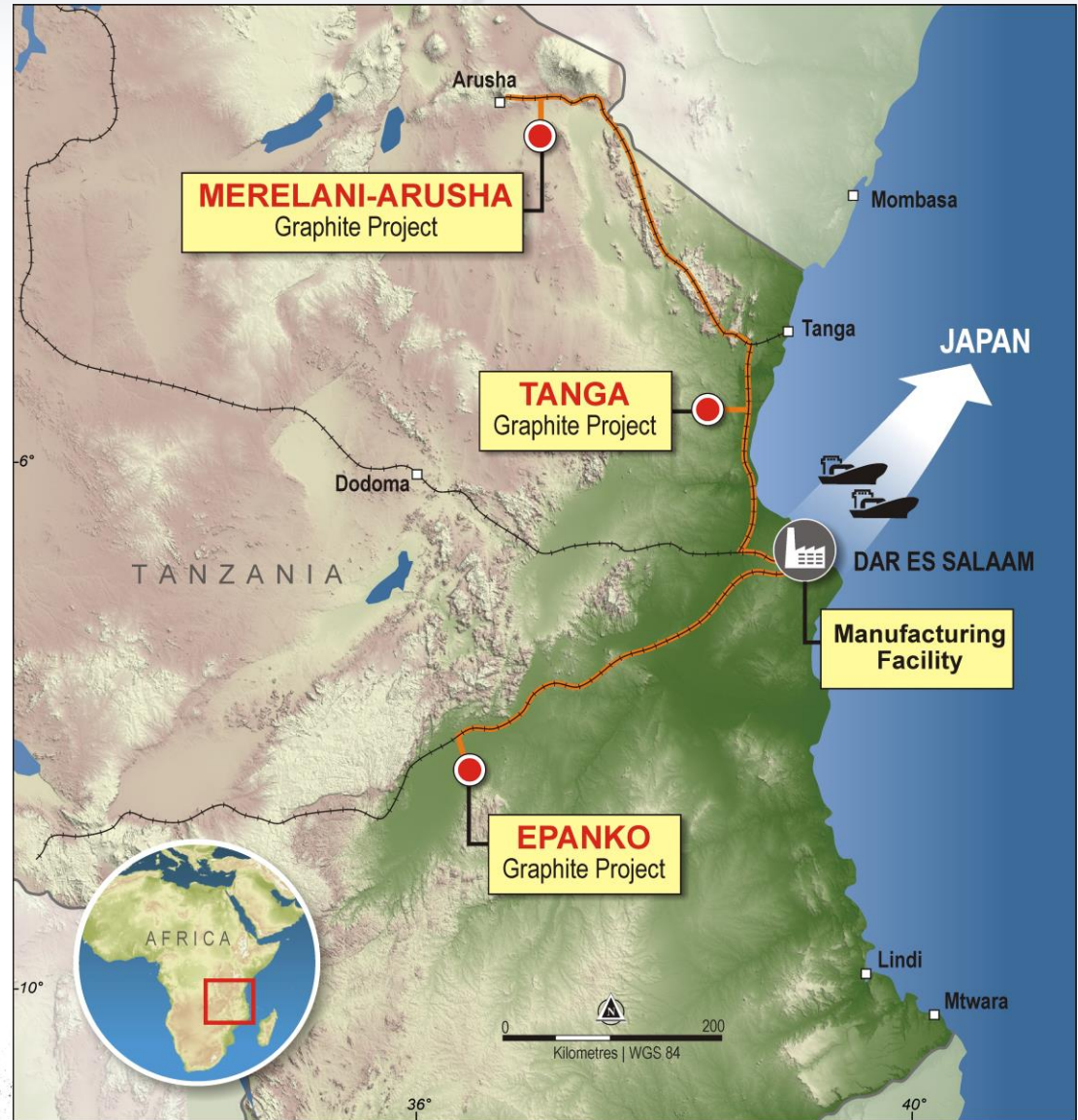
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Kibaran is leading Tanzania to become the world's second largest graphite producer



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A pipeline of projects to become a major supply chain for the battery markets





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## Metallurgical Results

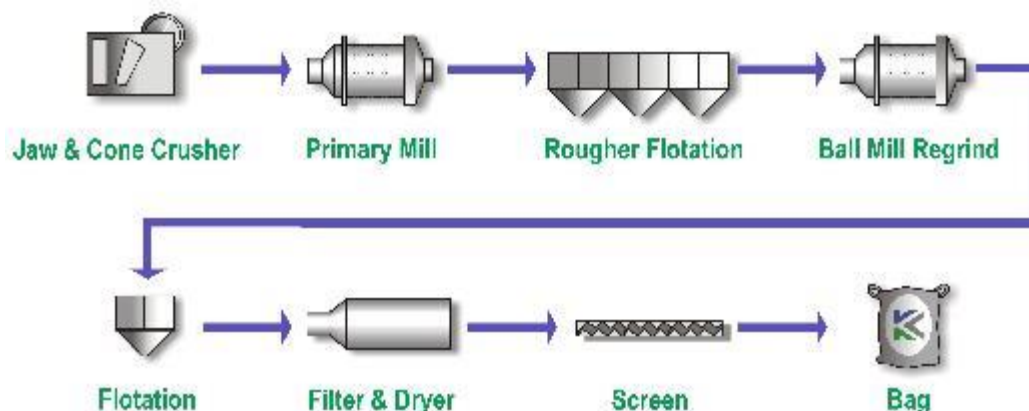
- 85.7% of distribution > than 106 micron
- Final carbon conc. of 96.3% TGC

## Flowsheet

- Simple flowsheet design
- Flotation circuit - rougher, scavenger, primary cleaner and secondary cleaner flotation stages
- Graphite concentrate will be filtered and dried
- Dry graphite concentrate will be screened into various product sizes and bagged for shipping

\* Micron ( $\mu\text{m}$ ) and Millimetre (mm).  $1\text{mm} = 1000\mu\text{m}$  and fixed carbon content determined by loss on ignition method (LOI)

Name	Microns ( $\mu\text{m}$ )	Mesh Size	Portion Retained (%)	Carbon Grade (%)
Jumbo	>300	>48	20.0	97.1
Large	>180	>80	35.4	96.7
Medium	>106	>150	30.3	96.2
Small	>75	>200	7.4	95.3
Fine	<75	<200	6.9	92.6
			<b>100%</b>	<b>96.3%</b>

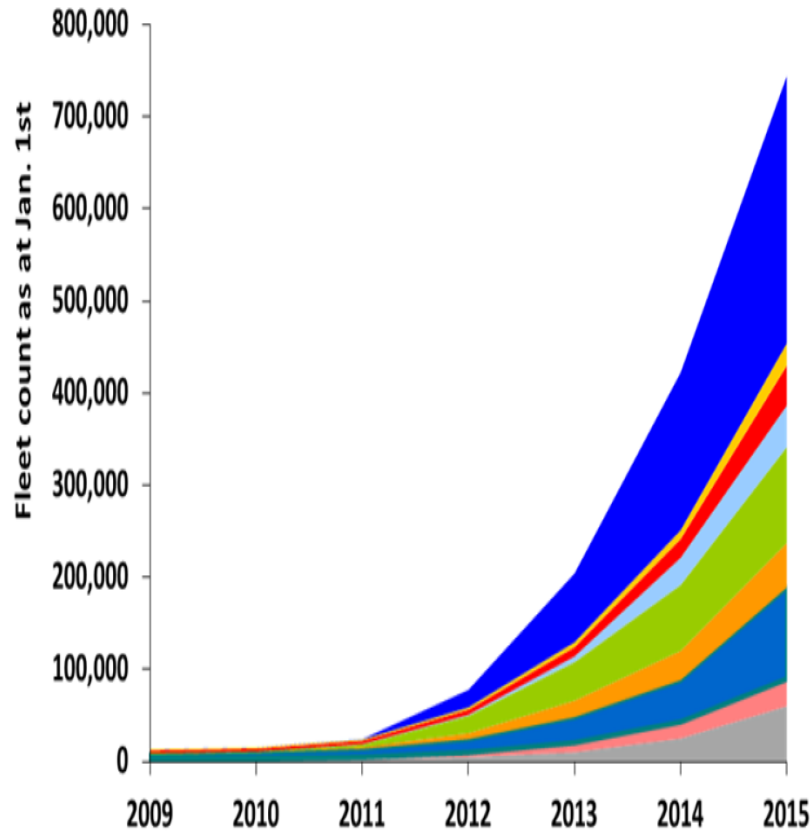


Competitive advantage  
in highest large flake distribution  
and lowest fines fraction

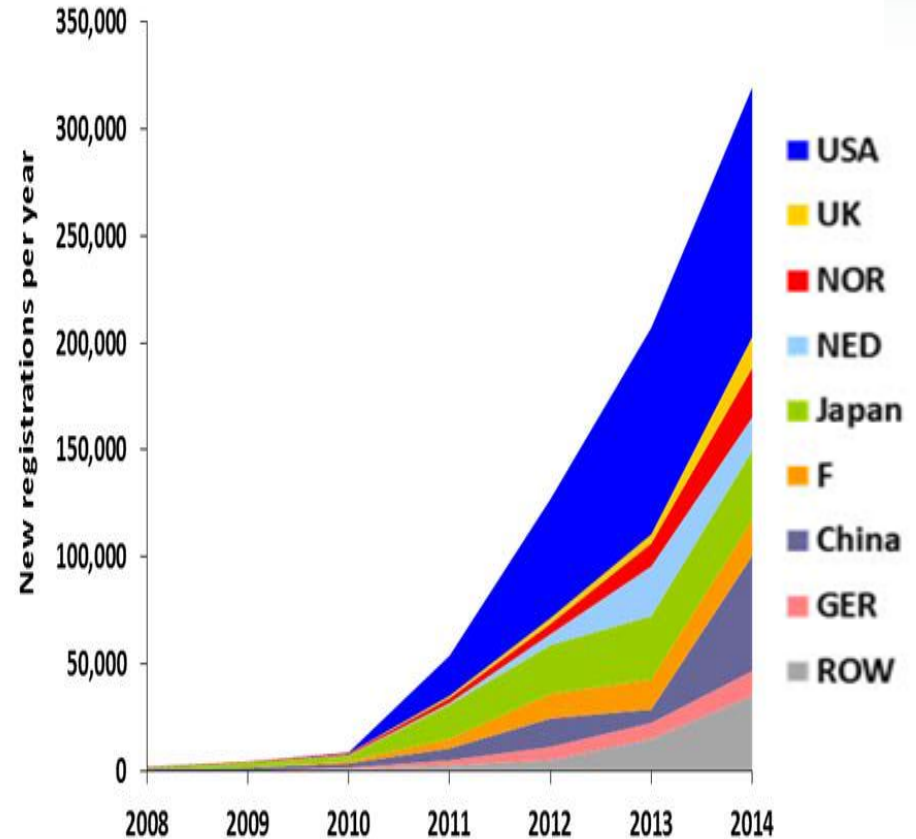


# EV'S: CURRENT MARKET SITUATION

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Number of electric cars worldwide on January 1, 2015



New registrations per year

PHEV, REEV and EV only



# EV'S: CURRENT MARKET SITUATION

## Arrangement of propulsion concepts into classes

	Combustion Engine				Hybrids			Electric Vehicle			
	Diesel, Otto, optimized engine, alternative fuels. Concepts A, B, C, D				Full Hybrids, Mild Hybrids Concepts E, F			PHEV, REEV, BEV Concepts G, H, I			
	A	B	C	D	E	F	G	H	I	J	K
Identifier	SI engine, conventional	CI engine, conventional	(HEV) Subhybrid	HEV Microhybrid	HEV Mild Hybrid	HEV Full Hybrid	PHEV Full Hybrid	PHEV Range Extender ICE	EV	PHEV Range Extender Fuel Cell	Fuel Cell Hybrid
Drivetrain Structure											
Primary Energy Source	Hydrocarbons	Hydrocarbons	Hydrocarbons	Hydrocarbons	Hydrocarbons	Hydrocarbons	Hydrocarbons	Electricity (from grid)	Electricity (from grid)	Electricity (from grid)	Hydrogen
	Advanced, high efficiency si- and diesel technology; alternative fuels: CNG, LPG and even more		Additionally to A or B: start-stop-function by conventional equipment	Additionally to A or B: start-stop-function, with belt driven starter-alternator	Additionally to A or B: regenerative braking, acceleration assistance by integrat. SA	Instead of E: electric launch, acceleration assistance electric driving	Additionally to F: larger battery, plug-in-capability	Propulsion energy stored in the battery, only small ICE to recharge onboard	No onboard recharge unit.	Energy stored in the battery, only small fuel cell and hydrogen to recharge	PEM fuel cell produces electricity from hydrogen

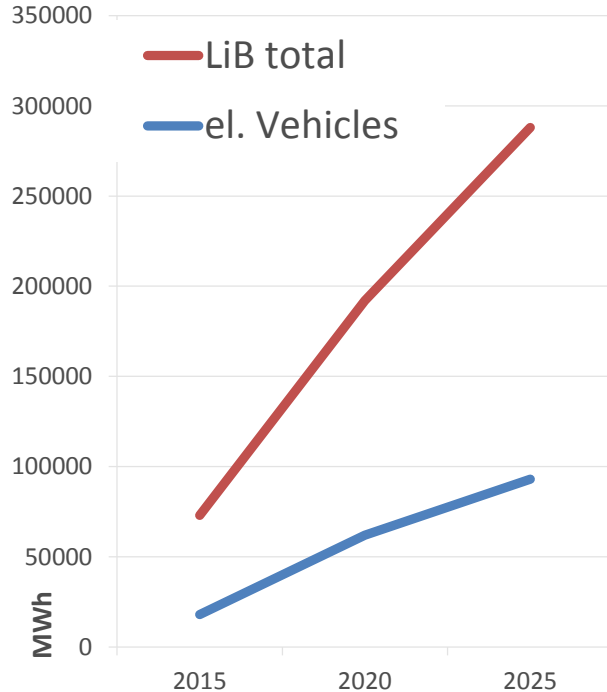
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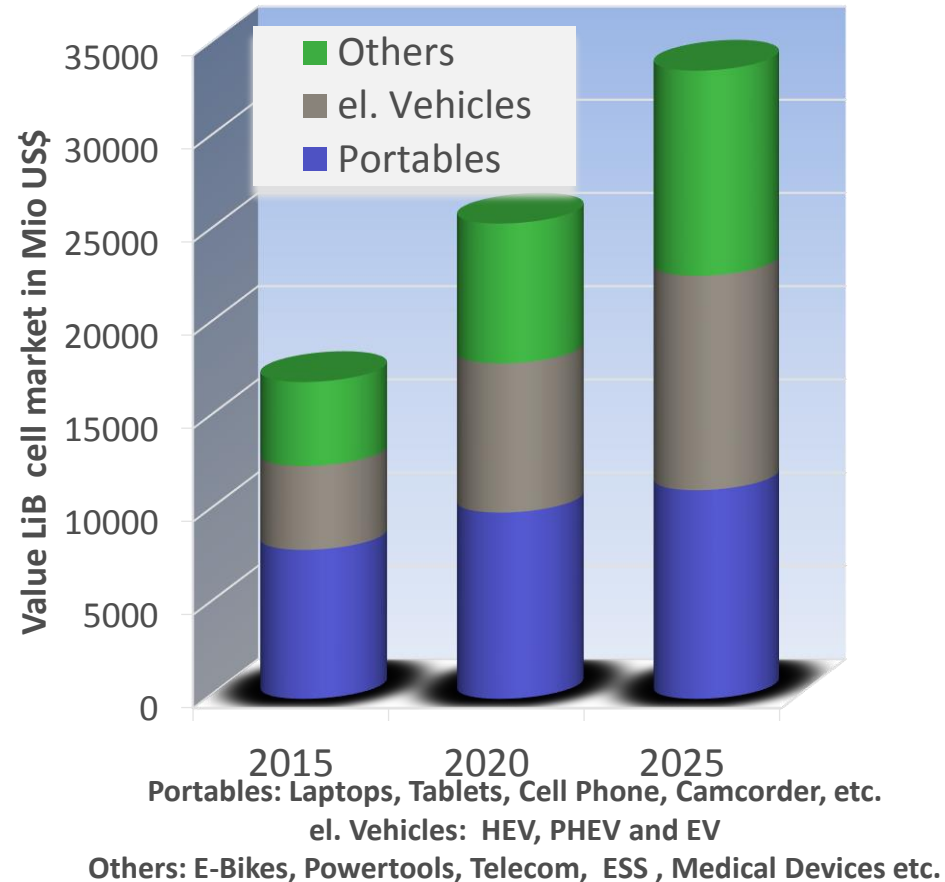


# EV'S: CURRENT MARKET SITUATION

## Prognosis of LiB Energy Demand



## Li-Ion Batteries are not limited to EVs



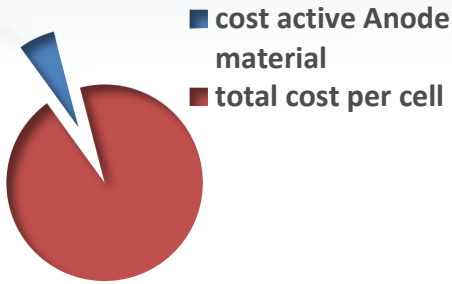
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Energy demand: CAGR > 10%  
Cost US\$/kWh is decreasing from \$300-400 to <\$200 in 2020



# GRAPHITE IN LI-ION BATTERIES (LIB)

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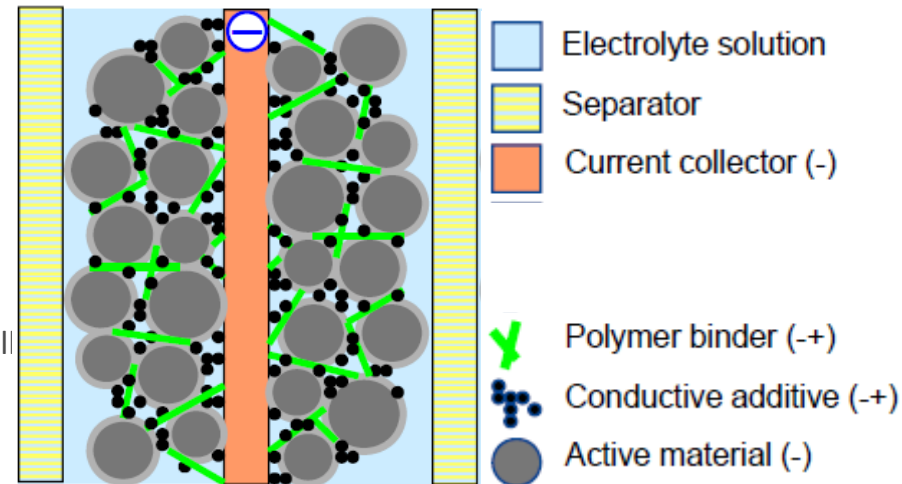
value share of the anode material will remain between 5 and 10% of the total cost of the LiB cell

value for anode material will increase from currently \$1 billion to \$ 2,6 billion in 2025 (CAGR 10%)



## Graphite is the dominant Anode Material for LiB

- Current market share of graphite above 90%
- Thereof: approx. 55% natural, 45% synthetic
- Currently low oil price and less synth. graphite demand from steel industry => increase in usage of synthetic graphite for LIB, especially for consumer electronics
- Other anode materials include LTO, MCMB, hard and soft carbon
- Often mixture of different types of graphite/carbon in one cell
- Advantages Natural Graphite vs. Synth. Graphite: lower price, and higher energy density (EV!)
- But: Synth. Graphite more customizable and stable





# GRAPHITE IN LI-ION BATTERIES (LIB)

## New Developments for the Anode

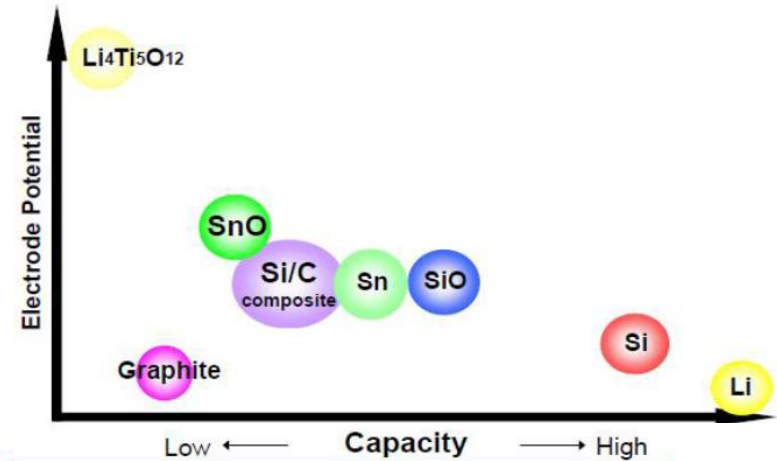
- New Developments on the way but it takes years from research -> mass production
- Last 5% of research most challenging!
- New materials: Si (already used as C-compound with 1-8% Si), Sn, Li-Metal, Graphene, Al, S, Carbon Nanotubes...
- For each new type still massive problems to be solved
- Pressure for new materials:
  - lower cost for batteries
  - higher capacity and range
  - faster charging
  - less weight

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Battery-pack in "VW up!"  
 nowadays: 230 kg for 19 kWh  
 With a battery with Li-Li-  
 technology, the volume could be  
 reduced by 75%, weight would be  
 half; lower cost, extended range

## LIB Anode Materials

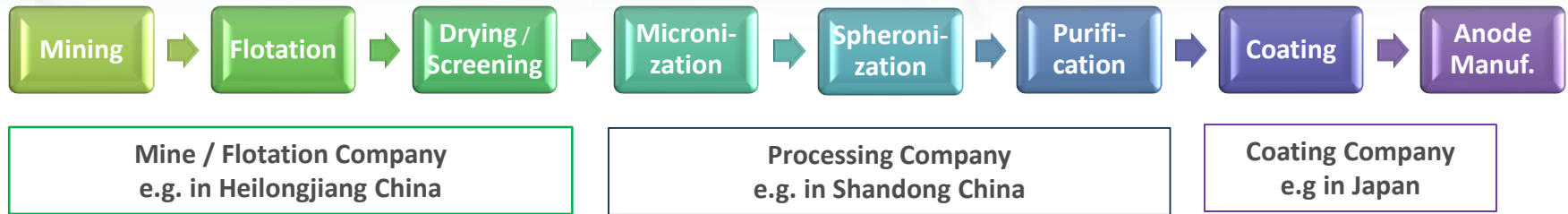


BUT: Batteries are systems!  
 Besides the Anode, also the other  
 components (Cathode,  
 Electrolyte...) need to be  
 improved in parallel

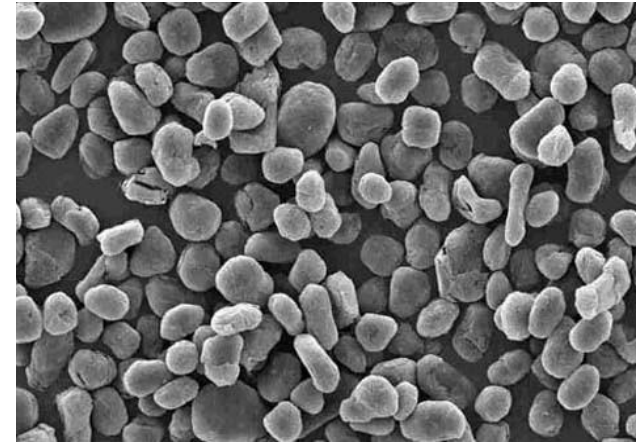
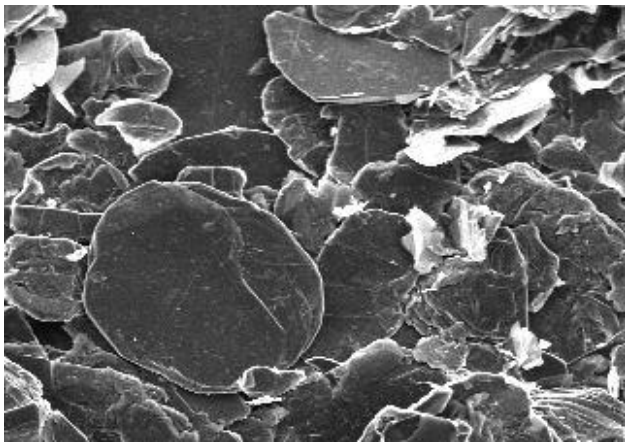


# NATURAL GRAPHITE FOR LIB

## Process Flow for Production of Spherical Natural Graphite from the Mine to the Anode Producer



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**Flake Graphite is converted from a raw material into sophisticated high tech product**

- Very strict quality requirements
- Infrastructure needs to be suitable: cheap consumables, electricity, labour
- Graphite needs to be suitable, like high crystallinity, high bulk density



Items		2015	2020	2025
Anode material needed for LiB	(ktpa)	70	160	270
Market share graphite as anode material	(%)	95%	91%	88%
Spherical graphite needed	(ktpa)	67	146	238
thereof share of natural graphite	(%)	55%	50%	50%
Spherical natural graphite needed	(ktpa)	37	73	119
Yield spherical graphite from feed	(%)	50%	51%	53%
Natural graphite needed as feed	(ktpa)	73	143	224
Additional demand of nat. graphite vs. 2015	(ktpa)		70	151
CAGR based on 2015	(%)		14%	12%

There is good opportunity for few new graphite mine developers like **Kibaran Resources** to develop a good market, provided quality and price are competitive

Source: **ProGraphite**

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