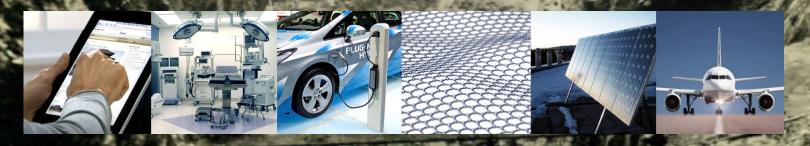


THE NEW BLACK GOLD



Recent Progress in Graphene Research Conference
October 2015

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# **Corporate Overview**



#### **Capital Structure**

Share Price [19 October 2015]	A\$ cents	9.5
Shares On Issue (LGR)	m	70.2
Options	m	15.25
Market Capitalisation	A\$m	6.67



#### **Directors & Major Shareholders**

Jitto Arulampalam	Executive Chairman
Emily Lee	Managing Director
Dr Alex Cowie	Non-Executive Director
Alison Coutts	Non-Executive Director

### **Largest Shareholders**

Rank	Holder	Shares	Percentage
1	City Winner Holdings Ltd	3,000,000	4.29%
2	Medigen Biotechnology Corp	3,000,000	4.29%
3	Tzu Liang Huang	1,650,000	2.36%
4	Rogue Investments Pty Ltd	1,650,000	2.36%
5	Euro Petroleum Ltd³	1,450,000	2.07%

# Board & Management



### Jitto Arulampalam Executive Chairman

**Emily Lee Managing Director** 

Alison Coutts
Non-Executive Director

Alex Cowie
Non-Executive Director

Supun Wimalanath
GM Technical Services

Experienced Chairman, currently Chair of Progen Ltd (ASX: PGL) formerly Chair of Fortis Mining and Great Western Exploration (ASX:GTE), Medicvision Ltd, Euro Petroleum

Managing Director of Mercer Capital, Raised \$5m for Australian biotech listing, Member of Australian Company Directors

Chairman of NuSep Ltd (ASX:NSP) and Director of DataDot Ltd (ASX:DDT). International Engineering Project Manager – Bechtel, Boston Cons, Egon Zehnder, former Chair CSIRO Health Sector Advisory Council, Bachelor Chem Eng, MBA

Director Research Canaccord Genuity Aust, former Editor of Diggers and Drillers. Master of Applied Fin, Mining Valuation, Strategy and Marketing

Former Senior Technical Officer (Geology) Sri Lankan Geological Survey and Mines Bureau (GSMB)

### Lanka Graphite Corporate Vision



ASX listed Graphite Exploration Company focused on exploring high purity Graphite in Sri Lanka. To date Lanka Graphite holds more than 240km² of granted and pending exploration licenses.

#### **OUR VISION AND GOALS**

- EXPLORE AND DEFINE A LONG-LIFE, VERY HIGH GRADE GRAPHITE RESERVE
- BUILD AND OPERATE A HIGH MARGIN GRAPHITE MINE
- SUPPLY PREMIUM SPECIFICATION GRAPHITE PRODUCTS FOR HIGH VALUE END USERS
- WORK ALONGSIDE GLOBAL GRAPHENE RESEARCH CENTRES TO IDENTIFY COST EFFECTIVE METHODS TO PRODUCE GRAPHENE IN COMMERCIAL SCALE FROM SRI LANKAN ORE
- BECOME KEY GLOBAL SUPPLIER TO HIGH TECH INDUSTRY LEADERS

### Criteria For Success



EXPERIENCED TEAM	<b>EXP</b>	<b>ERIE</b>	NCED	TEAN
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Experienced & dedicated management and exploration team with proven track record of success

**WORLD CLASS PROJECT** 

Historically mined high grade graphite deposit with a supportive local community and government

THE NEW BLACK GOLD

USA and EU have identified graphite as a "Supply-Critical Mineral" and "Strategic Mineral" due to its growing demand and usage in various industries & technology

**TECHNOLOGY AND RESEARCH** 

Graphene Research Collaboration with NTUS Commercial Agreement with Taiwan Tech Company

# What exactly is Graphite?



Graphite is natural form of carbon. It is known for its **excellent electrical conductivity, lubrication and resistant to heat.** The material's combination of high thermal stability, along with is conductive properties, allows graphite to be used in many heat intensive applications. Graphite preserves its strength in temperatures exceeding 3,600 degree Celsius and has the highest natural strength of any known material.



#### Three discrete commercial types

- Vein/Lump Graphite (<1% of world's output)</li>
- Flake Graphite (49% of world's output)
- Amorphous graphite (50% of world's output)

USA has identified graphite as a "Supply-Critical Mineral" and EU as "Strategic Mineral" due to its growing demand and usage in technology

### Material Use of Graphite



### **Brake linings**

□ Amorphous and flake graphite are used for brake pads

#### **Electrodes**

□Primarily used in recycling steel

#### **Batteries**

- □Lithium-ion batteries (uses flake and vein graphite)
- ☐Batteries require 10 to 30x more graphite than lithium
- ☐ Estimated demand will increase by 30-40% annually (Hybrid and electric cars, electronics, etc)

#### Lubricants

☐ High purity and fine graphite used in lubricants to withstand extreme pressures and high temperatures.

(used in high temperature gearing machinery)

#### Refractories

☐ Graphite crucible used to hold molten metal









## **Emerging Uses of Graphite**



#### Fuel cells

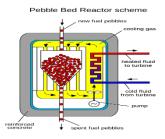
- •While batteries store energy for subsequent use, fuel cells are able to generate electricity through chemical reactions
- Produce little or no waste products
- ■No moving parts, long lasting, low maintenance and reliable
- Require around 40-50kg of Graphite per vehicle

#### **Nuclear** power

- •Traditionally nuclear reactors used graphite as their main component as a moderator in nuclear control rods.
- ■Pebble Bed Reactor is a graphite-moderated, helium gas cooled Generation IV nuclear reactor
- Passively safer and reactor design to handle higher temperatures and survive accident scenario







### Global Graphite Production



- Since the year 2000 to 2012, consumption of Graphite has doubled from 600,000 tons to 1.2 M tons
- USA imports 100% of its graphite with no domestic production
- China is the largest supplier accounting for 70% of the world's graphite production (mostly lower grade amorphous graphite)
- Speculation that China might limit exporting Graphite in future like rare Earth (Chinese government imposing 20% export duty tax + 17% VAT)
- Due to environmental issues the Chinese authorities are closing dozens of graphite mines

(USGS DATA)		
Country	Mine Production Tons 2012	Mine Production Tons 2013
United States		
Brazil	110,000	105,000
Canada	25,000	25,000
China	800,000	810,000
India	160,000	160,000
North Korea	30,000	30,000
Madagascar	4,000	10,000
Mexico	8,000	8,000
Norway	2,000	2,000
Russia	14,000	14,000
Sri Lanka	4,000	5,000
Turkey	5,000	5,000
Ukraine	6,000	6,000
Zimbabwe	6,000	6,000
Other	2,000	2,000
World Total (rounded)	1,170,000	1,190,000

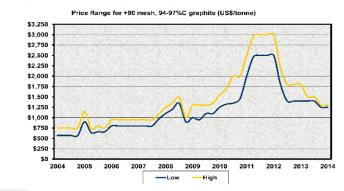
Source: USGS – U.S Geological Survey

# Graphite Price



2012 Indust	rial Minerals	Graphite Prid	ces per Tonne	
	FCL CIF main	European port		
Purity % and mesh size	Price range US\$/tonne		Mesh Size equivalent microns	
99% to 99.9% C, +50 mesh	\$4,500	\$6,000	+300	C
94% to 97% C, +80 mesh CIF	\$2,500	\$3,000	+180	Coarse
90% C, +80 mesh	\$2,000	\$2,500	+180	šė
94% to 97% C, +100-80 mesh	\$2,200	\$2,500	+150-180	₹
90% C, +100-80 mesh	\$1,500	\$2,000	+150-180	Medium
85% to 87% C, +100-80 mesh	\$1,500	\$1,900	+150-180	3
94% to 97% C, -100 mesh	\$2,000	\$2,400	-150	Fine
90% C, -100 mesh	\$1,400	\$1,800	-150	าе
Amorphous powder 80% to 85C	\$600	\$800	-75	
Synthetic 99.95% C2	\$7,000	\$20,000	source	e www.Indmin.com

Price range for +80 mesh, 94-97%C graphite (US\$/t)



### **Graphite Sector Overview**

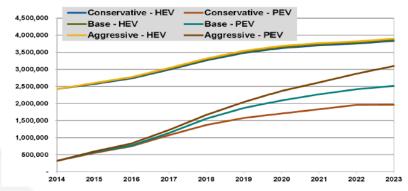


#### **Growing demand for Graphite**

- Li-ion batteries (electric vehicle market)
- Fuel Cells
- Pebble bed nuclear reactors
- Lubricants
- Refractories
- Replacement of Petroleum Coke in Steel Industry
- Graphene

#### **Current Production**

- Current world production 1.2Mtpa
  - 45% flake
  - 54% amorphous
  - 1% lump/vein
- China produces 70-80% world graphite



#### **Estimated Electric Vehicle Sales**

Source: Navigant Resource

Year	2015	2016	2017	2018	2019	2020
Electric vehicles (millions)	0.5	1	1.5	2.5	4	6
Tonnes of graphite (thousands)	133	265	397	662	1060	1589
Tonnage annual increase (thousands)		132	132	265	397	530

#### **Estimate Graphite Demand from Electric Vehicle Market**

Source: Investor Intel

## Graphite Market Outlook



Current market for Graphite Industry is US\$13 Billion segmented into 3 major components:

#### Natural Graphite:

Market Share of US\$1 Billion Major Market Applications

- Refractories
- Lubricants
- Pencil
- Consumer electronics

High grade Natural Graphite from Sri Lanka has the potential to substitute Synthetic Graphite due to growing overlapping uses in future

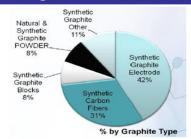
#### Carbon Fibre:

Second largest market share estimated around US\$4 Billion

Major market applications

- Aircraft
- Automotive
- Off shore drilling
- Sporting goods
- Wind Energy

#### World Graphite Market (Ashbury Carbons)



Source: www.ashbury.com

#### Synthetic Graphite:

Market share of US\$8 Billion

Major market applications

- Steel mills
- Iron foundries
- Solar
- Electronics
- battery

### Sri Lanka as a nation



- Population 20.6M
- Sri Lanka politically stable after ending their conflict in 2009.
- GDP estimate \$64B in 2012, \$75B in 2014, while maintaining a strong GDP growth of 6.5%
- Tax incentives to attract foreign investments
- In 2013, The Lonely Planet ranked Sri Lanka as the No. 1 destination to visit!

### Sri Lankan Graphite



The existence of Graphite was first recorded in Sri Lanka in 1675. Mining activities of Graphite in Sri Lanka has a long history dating back into 1800's with peak production in the first two decades of twentieth century. During WW1, 35% of world's graphite consumption in 1916 was exported from Sri Lanka.

### Potential of Graphite Mining in Sri Lanka

- High Grade Graphite with Purity >97% and size (lump to fines)
- Low mining and Operating costs
- Minimal further processing required
- Diverse applications for end users
- High level of demand
- Low Export Duty 5%
- Relatively under exploited industry
  - · Large areas of deeper reserves in Sri Lanka have not been explored

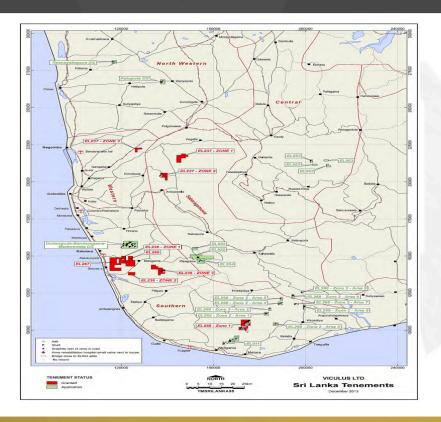
# Lanka Graphite Project



- Has historically mined high grade/lump vein graphite with purity over 97%C
- Exploration Licences EL 236/237/266/267/268/952/954 and applications cover over 240km<sup>2</sup> of highly prospective ground including historic high grade graphite mines
- Commenced Geophysical Survey (EM) of prospective drill targets
- Core drilling program expected to commence in Q1 2016
- Strong local Community and Government support

## Lanka Graphite Project Location





Ideal location for supply to Asian markets

Lanka Graphite tenements are located in Central and South Western Sri Lanka ~ 100km by road to Colombo Port, close proximity to nearby townships, labour, energy and roads.

Historic mining on location produced high grade graphite before being abandoned

Graphite was mined in shallow mines with further mineralisation at depth

Low Cost operation can commence near term

### Lanka Graphite Project Infrastructure



- Roads: Exploration licenses are accessed by a combination of primary, secondary, and tertiary roads
- Port: within 100km of 3 ports including Colombo Port (Only deep sea port in South Asia)
- Water and Power: Readily available at the project site
- Geographic: Accessible terrain, simple clear and free digging





### Lanka Graphite Project - Metallurgical Results



- Lab test results on our graphite samples found in our prospective ELs indicate purity levels over 99% TGC making it ideal for end user markets without further processing
- Further test work to follow after commencement of current sampling program
- EM survey across cluster of old mines and geographical structures has commenced
- Core drilling program to follow EM survey analysis



Geological Survey & Mines Bureau No. 4, Galle Road, Dehiwala, Sri Lanka,

Telephone: 725746, 739307-8 Fax: 735752 E-mail: gsmb@slt.lk

#### RESULTS OF CHEMICAL ANALYSIS

Material Submitted by Graphite

: Euro Petroleum Limited

Sample Collected by

: GSMB Technical Service (Pvt) Ltd.

Sample Location

:Kalutara District (Reserved GSMB Exploration Licence No.EL/236, Grid

No.35. Abanded Graphite Mines & Pits at Rideewita)

Laboratory Reference No.

: AL/13/46-1

No. of samples : 01

Constituent determined	Content (%)
Moisture	0.03
Volatiles	0.17
Carbon	99.06
Ash	0.74

The results are valid only for the sample submitted for analysis.



13-06-2013



## Supporting Graphene Research



#### GRAPHENE RESEARCH

- •Lanka Graphite proactively supporting Graphene related research for different end user applications already supplying graphite samples for research testing
- •Provided samples to international research institutions in German Japanese research labs, Taiwan National Universities, and other industry end users
- •National Taiwan University (NTUST) Professor Wei-Hung Chiang, Dept Chem Eng, successfully **produced high quality Graphene** with Lanka Graphite raw graphite
- Lanka Graphite will continue to develop relationships with research institutions

# Summary



- ✓ High Grade Graphite near surface resource with minimal processing requirement.
- ✓ Commenced 2 Phase EM survey over Exploration Licences to define drill program.
- ✓ Experienced former Sri Lankan government mines technical manager
- ✓ Low mining and operating cost, good local and state infrastructure
- ✓ High quality value added product will be exported to end user markets in near term.
- ✓ Collaboration on Research & Development for producing commercial scale Graphene
- ✓ Strategic location of project with supportive government
- ✓ Sri Lanka geographically close to Asian market
- ✓ Growing industry demand

### **Contact Details**



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