

Graphene:Graphite

Enabling the commercialisation of
graphene into major volume markets.

Mines and Money
Hong Kong March 2015

Forward Looking Statements and Disclaimer:

This presentation has been prepared by Talga Resources Limited (ACN 138 405 419) ("Issuer") for the sole purpose of providing an overview of its current prospects and proposed exploration and development strategy to recipients ("Recipient"). This presentation and its contents are provided to the Recipient in confidence and may not be reproduced or disclosed in whole or in part to any other person, without the written consent of the Issuer.

The presentation is based on information available to the Issuer as at the date of the presentation. The information contained in this presentation has not been verified by the Issuer nor has the Issuer conducted any due diligence in relation to that information. The presentation contains selected information and does not purport to be all inclusive or to contain all information that may be relevant to the Recipient. The Recipient acknowledges that circumstances may change and this presentation may become outdated as a result. The Issuer accepts no obligation to update or correct this presentation.

This document includes forward-looking statements. When used in this document, the words such as "could," "plan," "estimate," "expect," "intend," "may," "potential," "should," and similar expressions are forward-looking statements. Although the Issuer believes that the expectations reflected in these forward-looking statements are reasonable, such statements involve risks and uncertainties, and no assurance can be given that actual results will be consistent with these forward-looking statements.

No representation or warranty, express or implied, is made as to the fairness, accuracy, completeness or correctness of the information, opinions and conclusions contained in this presentation. To the maximum extent permitted by law, none of the Issuer, its directors, employees or agents, advisers, nor any other person accepts any liability for any loss arising from the use of this presentation or its contents or otherwise arising in connection with it, including, without limitation, any liability arising from fault or negligence on the part of the Issuer or its directors, employees or agents. Nothing in this Presentation is a promise or representation as to the future. Statements or assumptions in this presentation as to future matters may prove to be incorrect and differences may be material. The Issuer does not make any representation or warranty as to the accuracy of such statements or assumptions.

The information in this presentation does not take into account the investment objectives, financial situation and particular needs of any Recipient. The Recipient should not make an investment decision on the basis of this presentation alone and the Recipient should conduct its own independent investigation and assessment of the content of this presentation. Nothing in this presentation constitute financial product, investment, legal, tax or other advice. Nothing in this presentation should be construed as a solicitation to buy or sell any security or to engage or refrain from engaging in any dealing in any security.

Photographs, maps, charts, diagrams and schematic drawings appearing in this presentation are owned by and have been prepared by or commissioned by the Issuer, unless otherwise stated. Maps and diagrams used in the presentation are illustrative only and may not be drawn to scale. Unless otherwise stated, all data contained in charts, graphs and tables is based on information available at the date of this presentation. By accepting this presentation the Recipient agrees to be bound by the foregoing statements.

Who we are

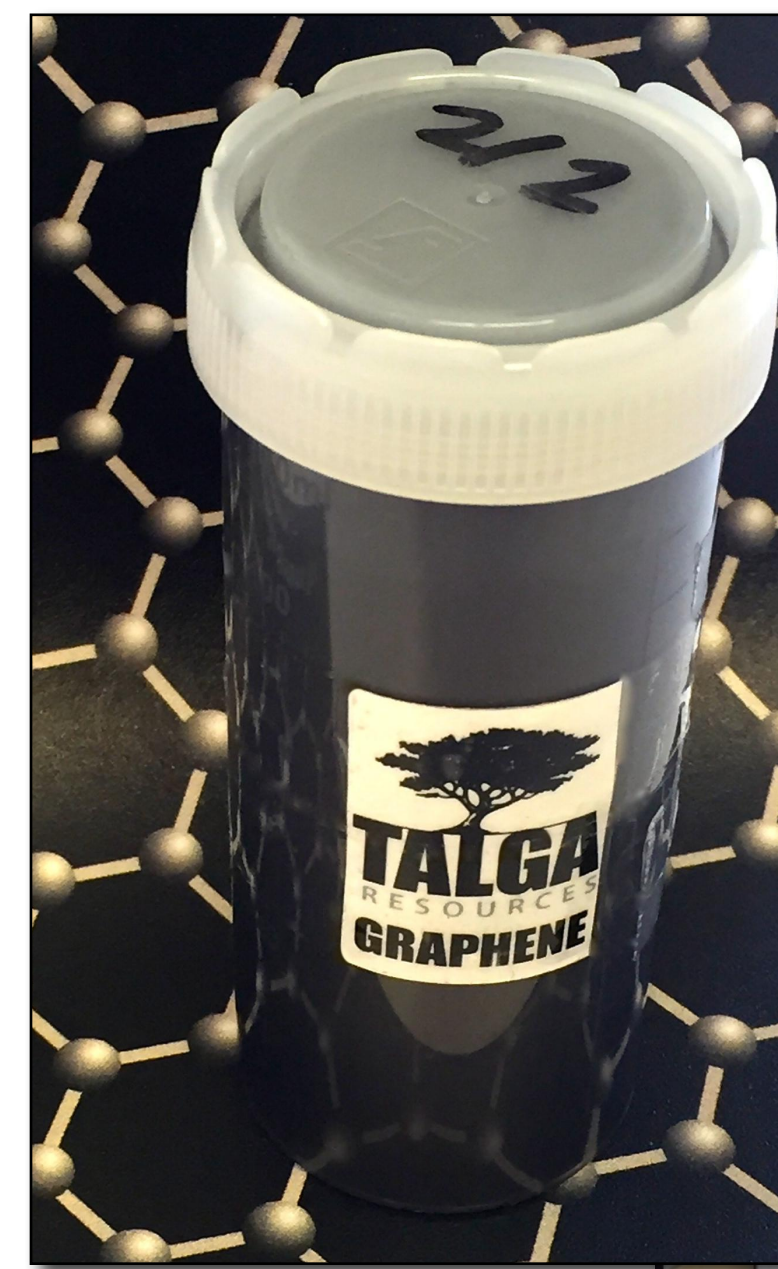


- ▶ Talga Resources Ltd (“Talga”) ASX:TLG is an Australian based technology materials development company with operations in Sweden and Germany.
- ▶ Talga owns five 100% owned high grade graphene/graphite projects (including the **world’s highest grade graphite mineral resource***) as well as non-core **iron ore, cobalt** and **gold** deposits.
- ▶ Listed in 2010 with WA gold assets and focus now on graphite and graphene development with a view to being high margin industrial scale producer of graphene with graphite by-product.
- ▶ Talga’s 2014 breakthrough demonstrated a **world-first ability** to produce **high quality graphene** direct from its **raw graphite ore** (unprocessed) which provides Talga with **unique economic advantages** compared to global graphene peers.
- ▶ Small but growing team in Australia and Europe as development status advances rapidly (scoping study complete, European trial mining and demonstration production in train).

* See www.techmetalsresearch.com for global graphite NI43-101/JORC resources.

What we do

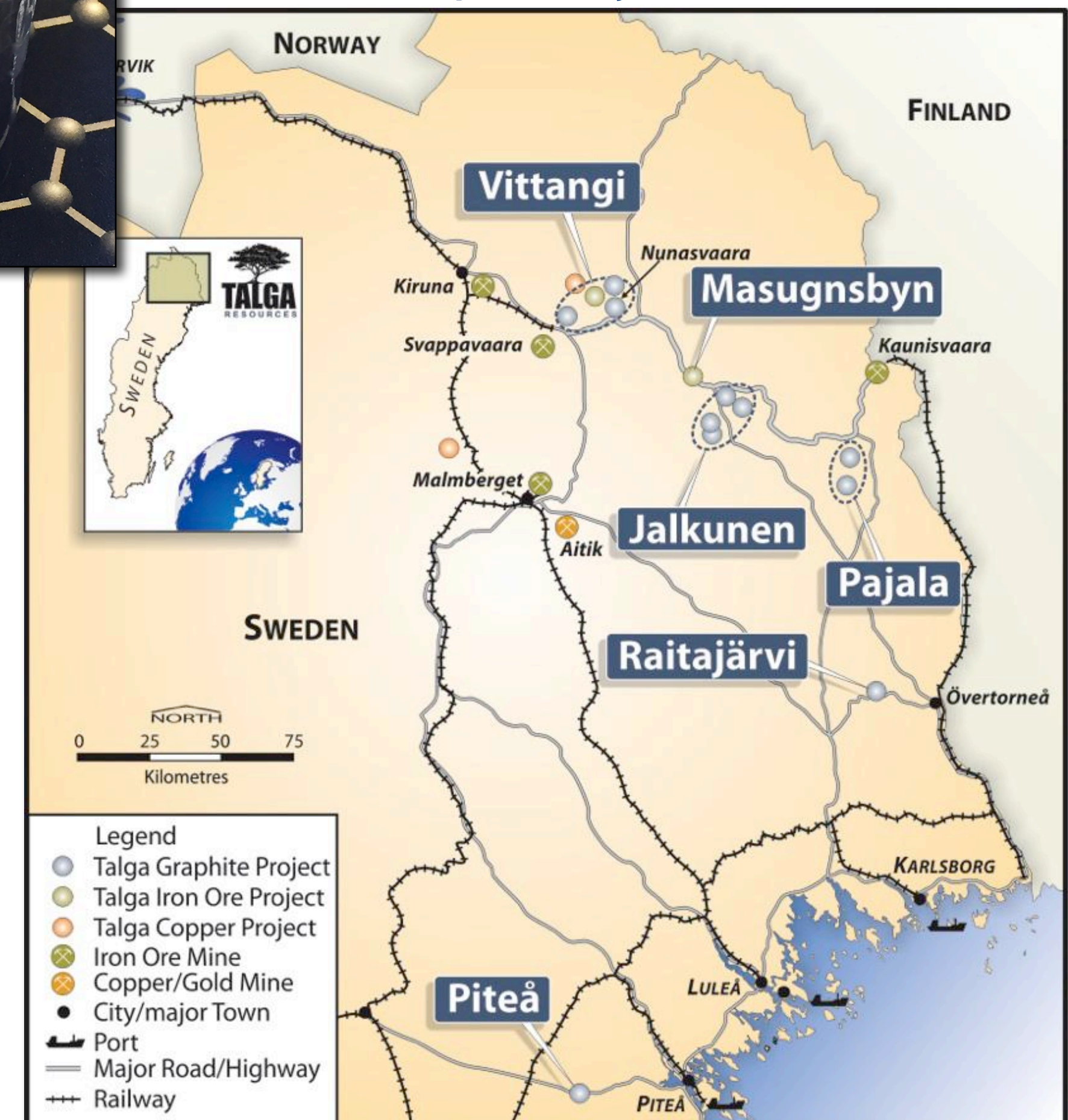
- ▶ Future **bulk** supplier of graphene, graphite and technology materials.
- ▶ Technology company with **100% owned source** for precursor graphene material and future low impact mining operations.
- ▶ Unique process to liberate **large quantities of graphite and graphene direct from ore**. 2 of the 5 core projects will produce both products while remaining 3 are graphite specific.
- ▶ Proposing to produce graphene feed material for functionalisation by industrial end users for use in a range of high technology applications. Graphite by-products at projects where graphene is the focus.
- ▶ Talga aims to **enable large commercial graphene applications** which have to date been impeded by absence of bulk supply and prohibitive pricing.



High density water-based
graphene dispersion
produced from Vittangi



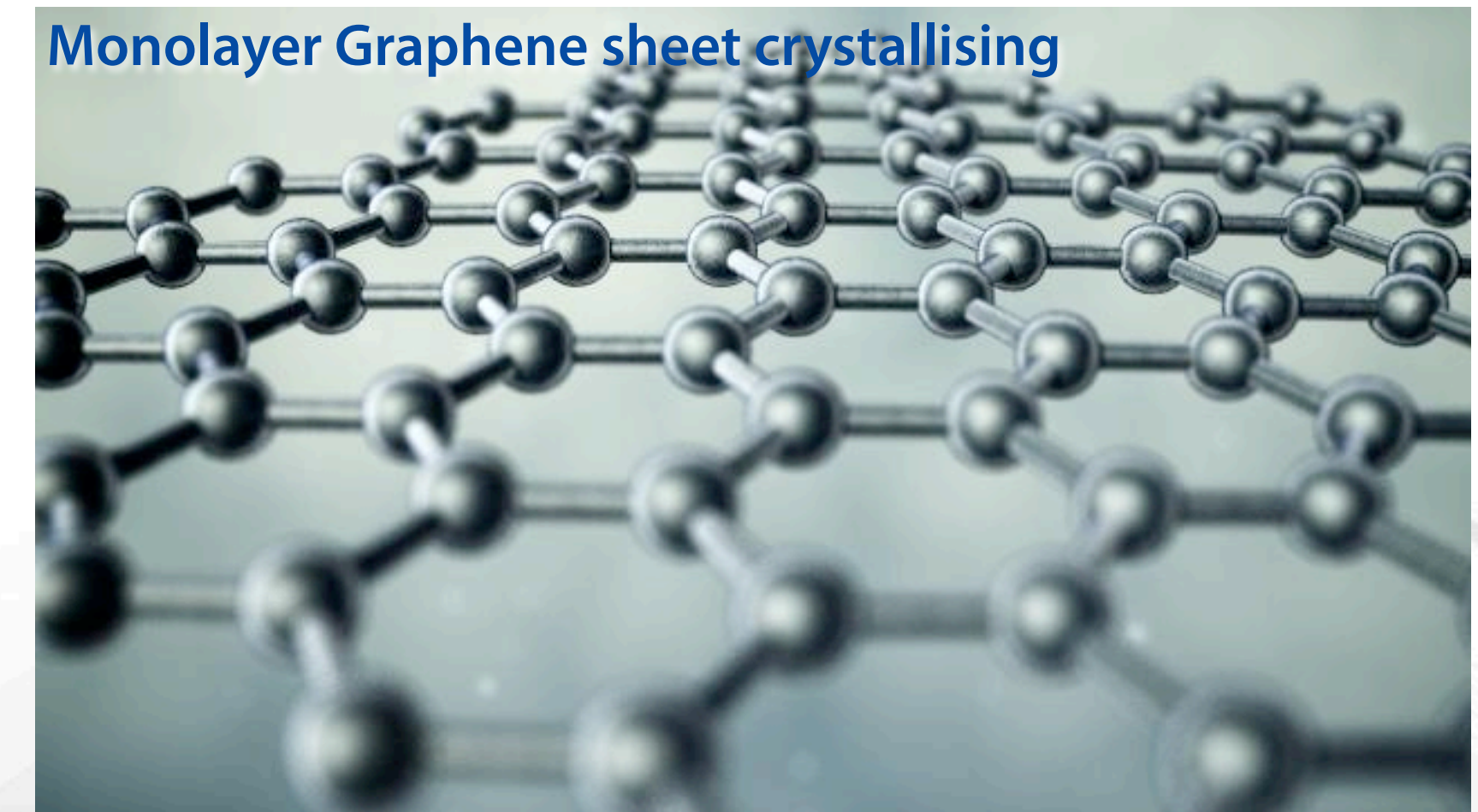
100% owned Graphite Project Locations - Sweden



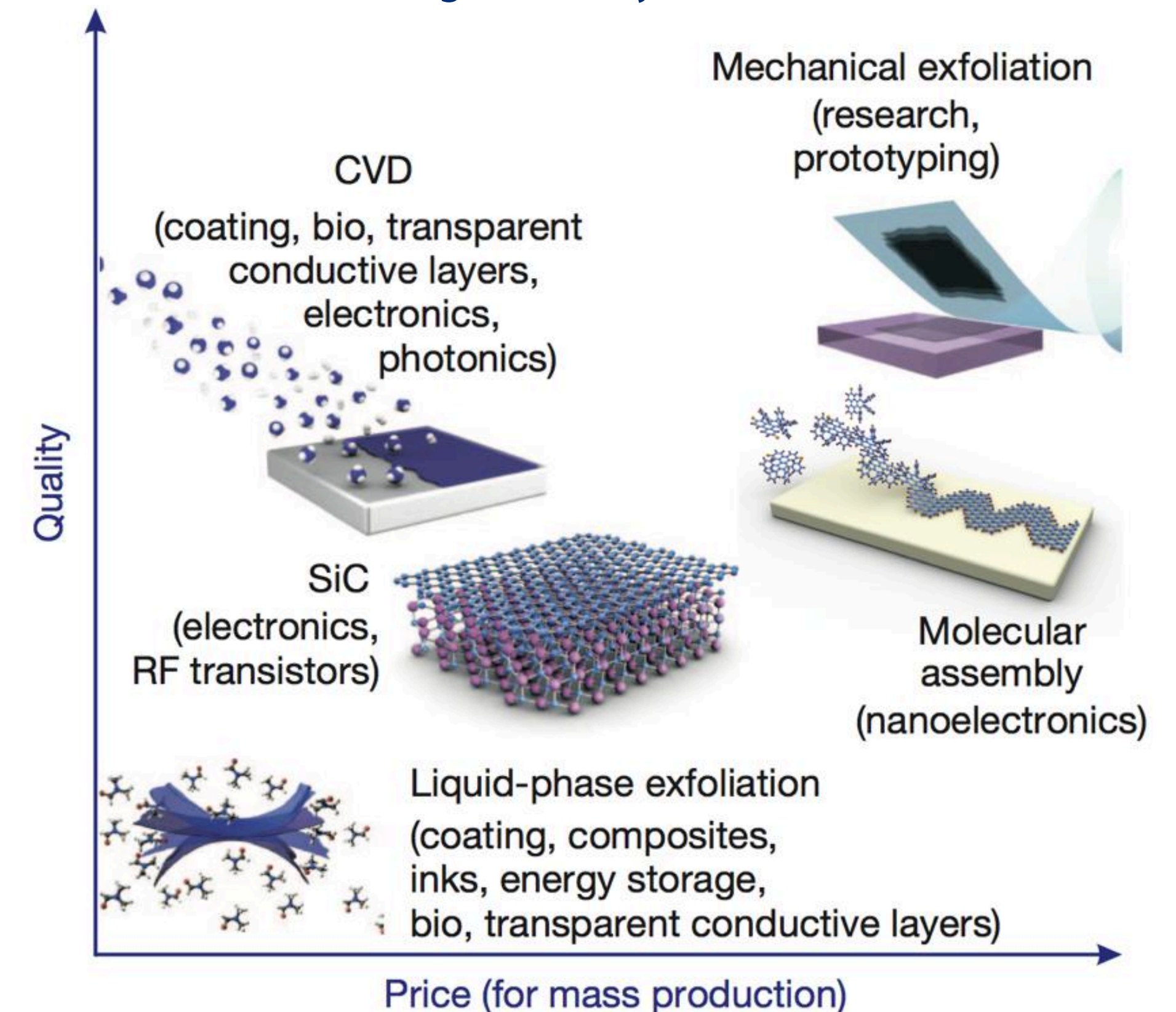
Graphite versus Graphene?

- ▶ Graphite (the mineral) consists of parallel sheets of carbon atoms in a hexagonal lattice, which when one or few atoms in thickness, are called **graphene**.
- ▶ Graphite therefore ***IS*** made from graphene sheets. There are about **3 million** layers of graphene in 1mm of graphite.
- ▶ Graphene is everywhere you find graphite. ***But separating graphite to a few atoms thick is expensive and hard to scale up.***
- ▶ Main factors delaying uptake include:
 - production methods are not scalable enough to supply large quantities for commercial uptake
 - graphene production is prohibitively expensive
 - lower cost scalable production exists however quality (eg. particle size) limits applications/markets.
- ▶ Oil is a good analogy to graphene - is present worldwide however fundamentals required for commercial success.

* Figure source and references "A Roadmap to Graphene" Nature .Vol 490 Oct 11, 2012



Different production methods for graphene; price vs quality (not to scale, or including scalability)



2 Overlapping but Different Markets

Graphite

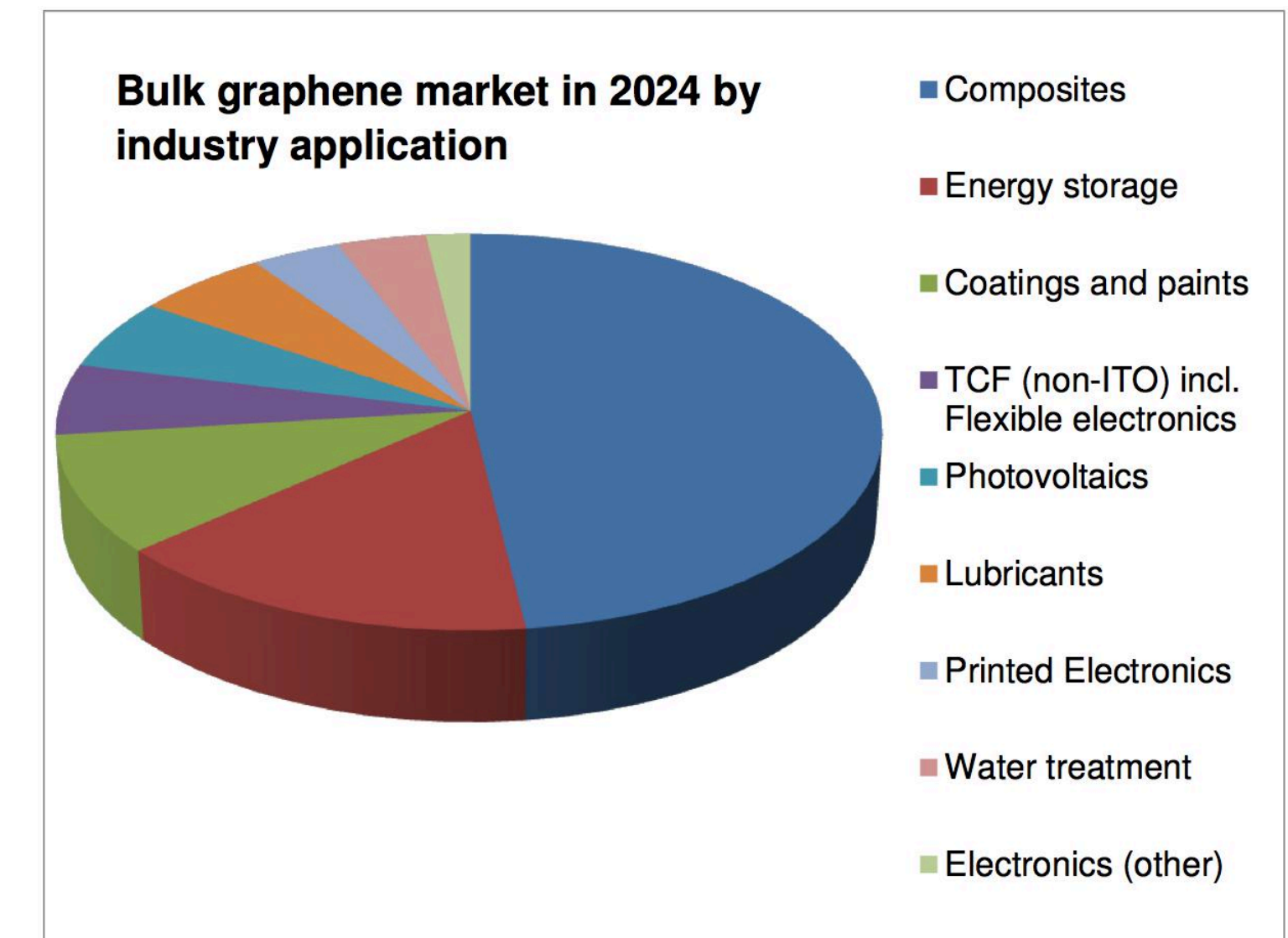
- ▶ Global production ~2Mt/pa. Of this ~1Mt derived from natural graphite for \$1b value versus ~1Mt derived from synthetic sources for \$15B value.
- ▶ Synthetic material very pure yet expensive so dedicated to niche products while natural product ranges in specification and price with approximately 50% being <75µm size and widespread. EU imports 95% of its graphite.

Graphene

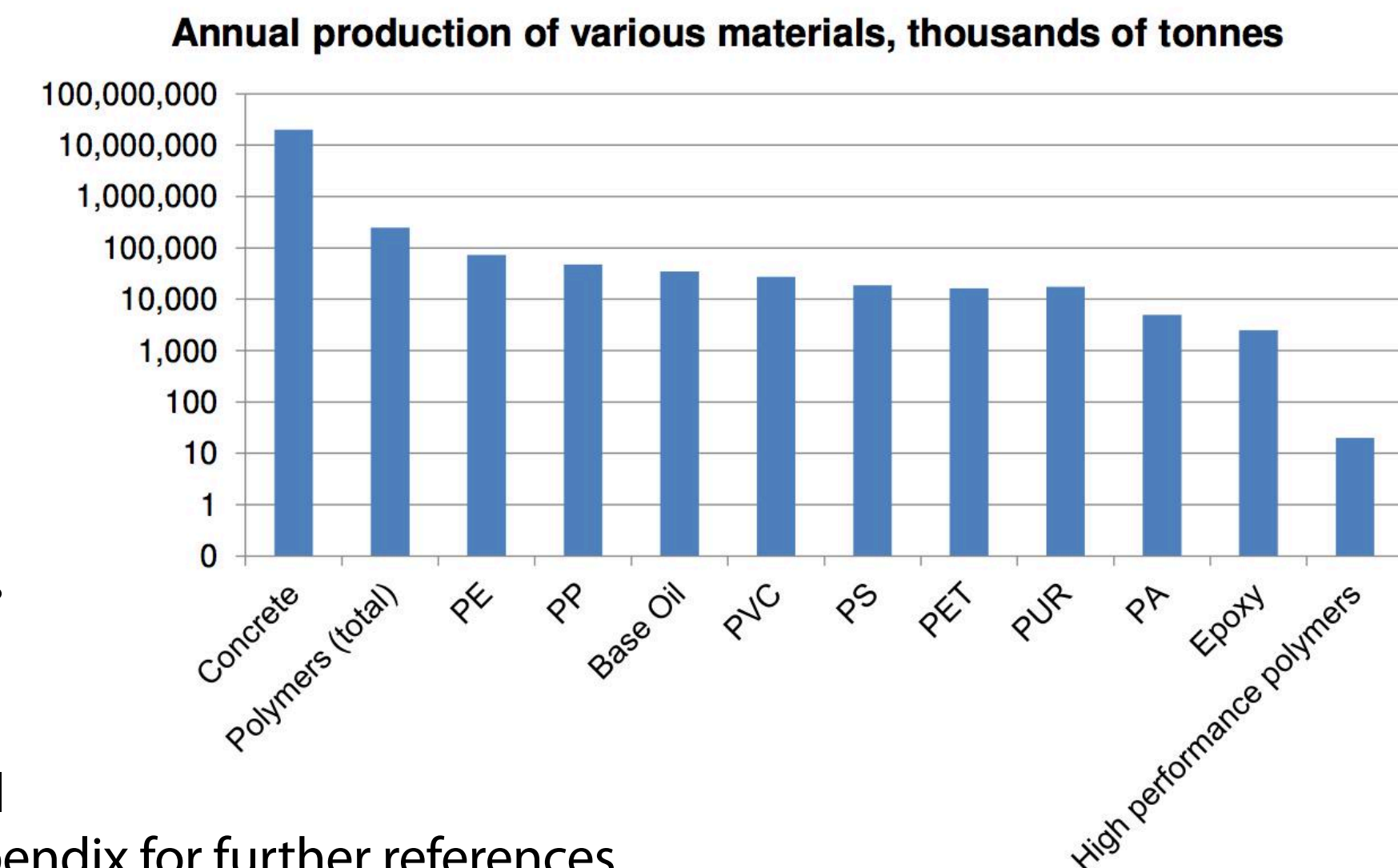
- ▶ While the media is excited by future 'hi-tech' applications, the main driver of near term graphene commoditisation is **additives**.
- ▶ Small amounts of graphene (**0.05-2.0% vol**) added to many materials can impart ***exponential increases in strength and/or conductivity*** allowing making stronger, lighter (more energy efficient) current products and enabling new types of materials.
- ▶ Major volume markets for graphene include **conductive inks**, anti-corrosion **coatings/galvanics**, **paints**, **plastics**, **carbon fibre** composites, **battery materials**, **3-D printing inks**, **alloys** and **concrete/civil** materials. Total market at 2% loading = 220Mt graphene/annum.

* Source: Fullerex Report for Talga 2014 (unpubl). Note: any data not specifically referenced is based on personal communications with industry participants where appropriate and/or unpublished technical research. See Appendix for further references.

Segmentation of industrial applications for bulk graphene by 2024*



Major industrial materials with graphene potential*



Talga Graphene Applications

Conductive Inks / RFID Tags \$3B

Replace currently used carbon black and silver/copper composites in conductive inks for rapid growth
"Internet of Things" devices/RFID tags

Flexible Electronics / Screens \$16B

Graphene's conductivity, transparency and strength enable flexible / bendy display screens and is looking to replace Indium Tin Oxide (ITO) across major display screen types.

3D Printing Materials \$3B

Additive to plastics/3D printable materials to make conductive structures for battery use or increase strength for quality print at home products eg, Lego

Lightweight Composites \$20B

Added to current carbon fibre composites for increased strength/decreased weight and emissions

Polymers and Building Materials \$567B

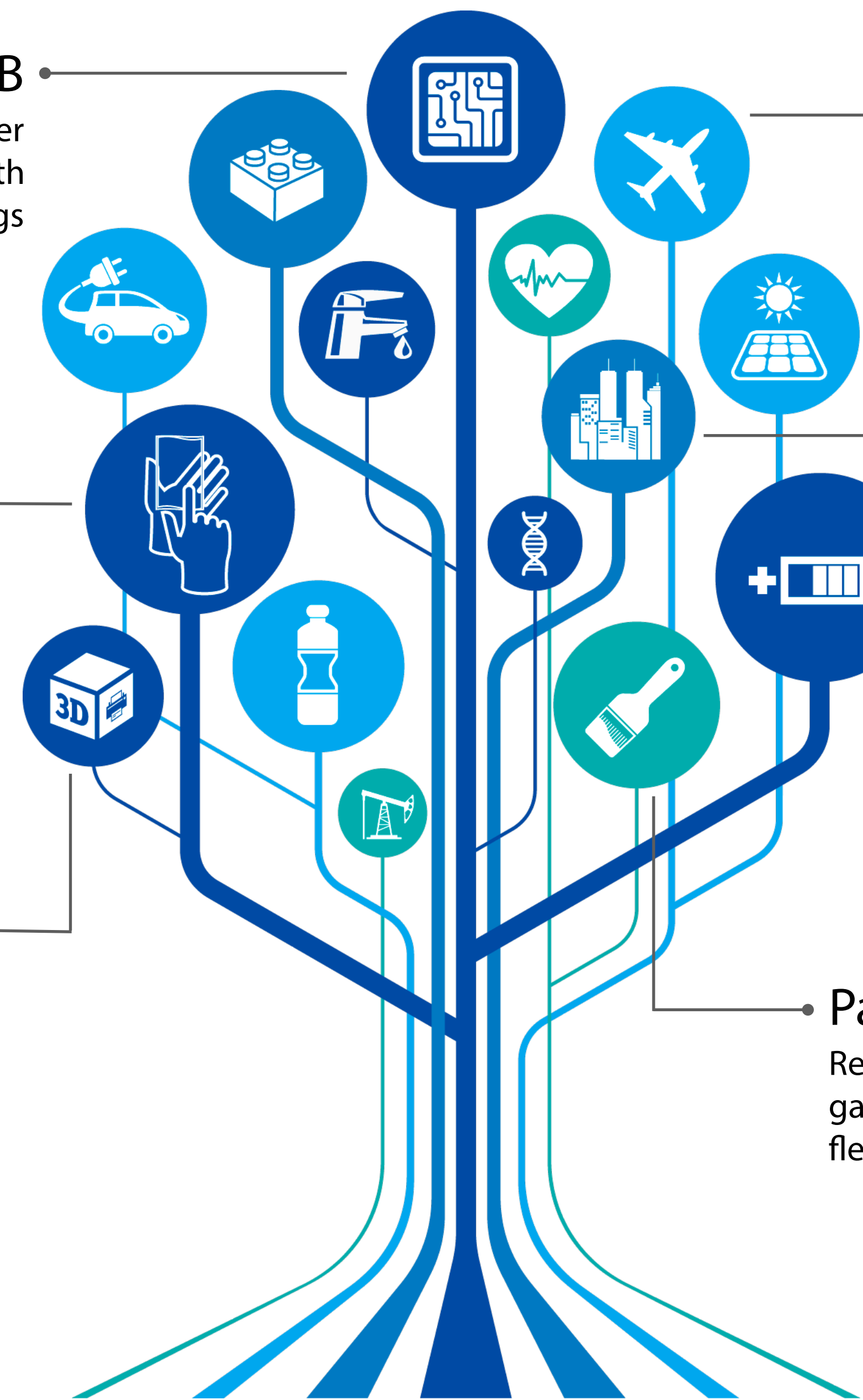
Additive to increase strength and decrease permeability of plastics to increase shelf life of foods eg, PET bottles, packaged goods.

Energy Storage \$62B

Added to or replace spherical graphite in current Li-ion and other batteries to increase performance & range in vehicles, capacity in green energy/off-grid storage

Paints / Coatings / Galvanics \$53B

Replace zinc and chrome in corrosion resistant paints and galvanized steel for increased corrosion resistance, flexibility and longevity



*Total Global Market Value US\$/annum.

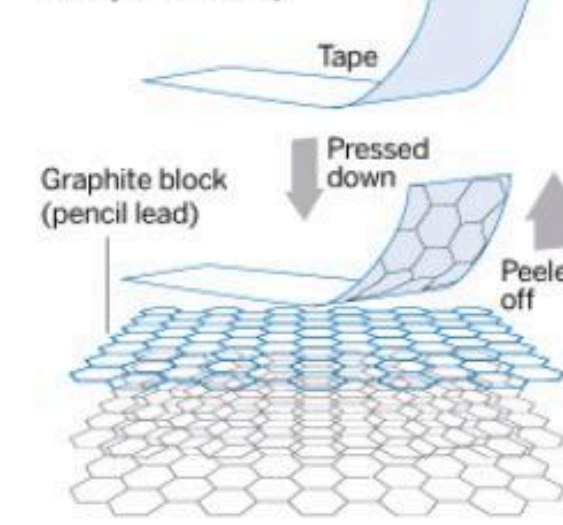
Note: For sources see References in Appendix

Worldwide Graphene Production Methods

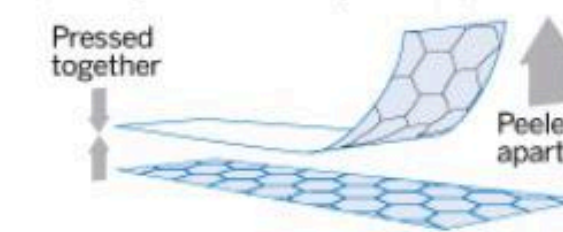
- ▶ There are many processes to make graphene, using different carbon precursors both natural and synthetic, and various combinations of **yield, quality, volume** and **cost**.
- ▶ Graphene comes in many shapes, lengths, layers, functionalised state and defect levels.
- ▶ The carbon source dictates most suitable process which imparts qualities required for certain applications and industries.
- ▶ Talga's unique ore enables a **more direct** and **higher margin** route to produce nanoplatelets with a **large size** range that access the **majority** of **bulk** applications.

Five recipes for graphene Mechanical exfoliation

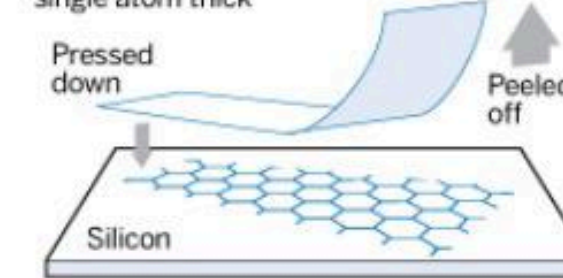
1 A sticky 'tape' is placed on to a block of graphite and then peeled back, stripping a thin layer off the top



2 This layer of carbon is thinned further by pressing it on to other layers of tape



3 The tape is finally pressed on to a very smooth substrate such as silicon then peeled off, leaving a graphene layer a single atom thick

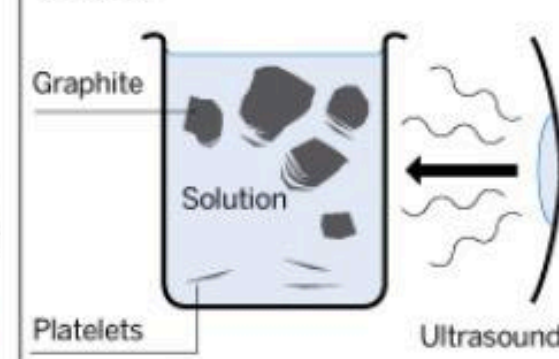


Sample size
Greater than 1mm

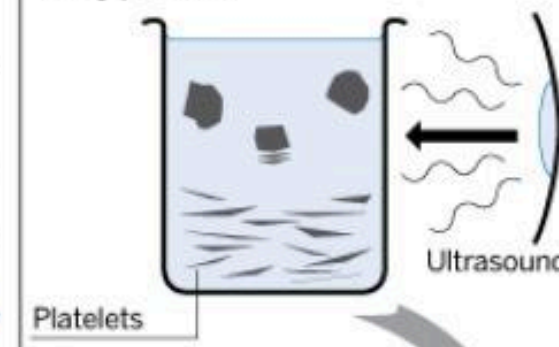
Applications
Research

Chemical exfoliation

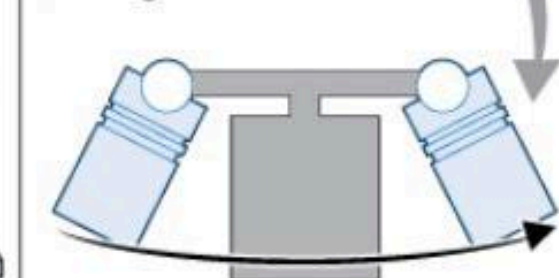
1 Graphite is exposed to a solvent which with the aid of ultrasound causes it to split into individual mono-layer flakes or platelets



2 Prolonged treatment leads to many platelets



3 These mono-layers of graphene can be further enriched by centrifuge



Sample size
Infinite as a layer of overlapping flakes

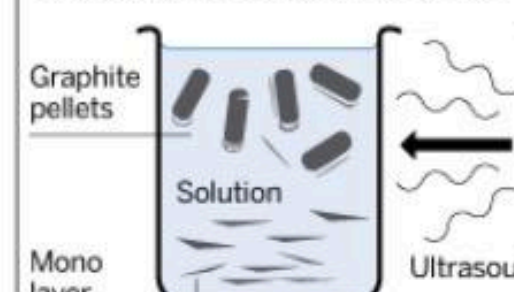
Applications
Coating, paint, ink, composites, transparent conductive layer energy storage and bioapplications

Chemical exfoliation via graphene oxide

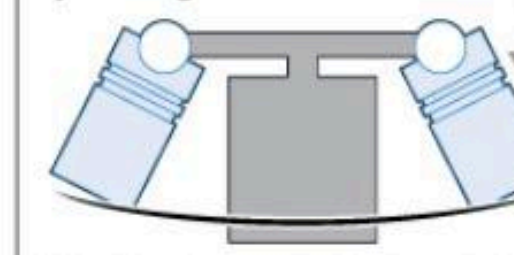
1 Related to chemical exfoliation but graphite pellets are first oxidised



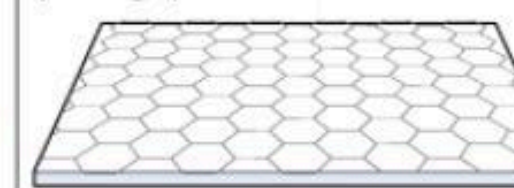
2 Pellets exfoliated in chemical solution to produce mono-layers of graphene



3 Solution is processed by centrifuge



4 Solution is deposited on to a substrate and reduced (chemically or thermally) to parent graphene state

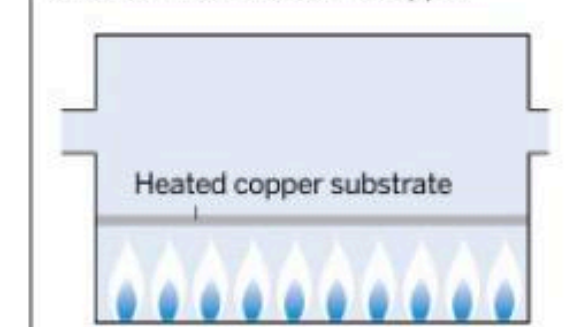


Sample size
Infinite but with larger flake size than simple chemical exfoliation

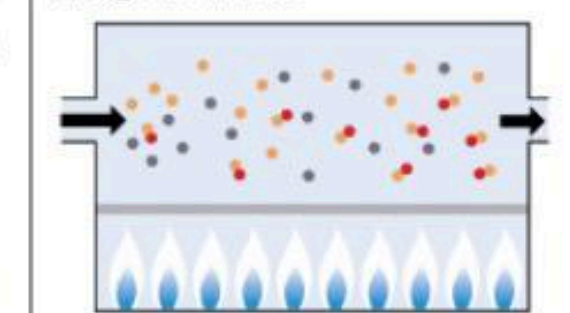
Applications
The same as chemical exfoliation

Chemical vapour deposition

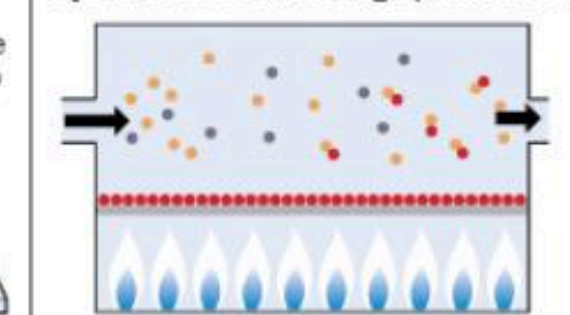
1 A substrate (usually copper) is heated in a furnace at low pressure to about 1,000°C. This anneals the copper



2 Methane and hydrogen gases flow through the furnace



3 Carbon atoms from the methane are deposited on to the copper. They crystallise as a continuous graphene sheet

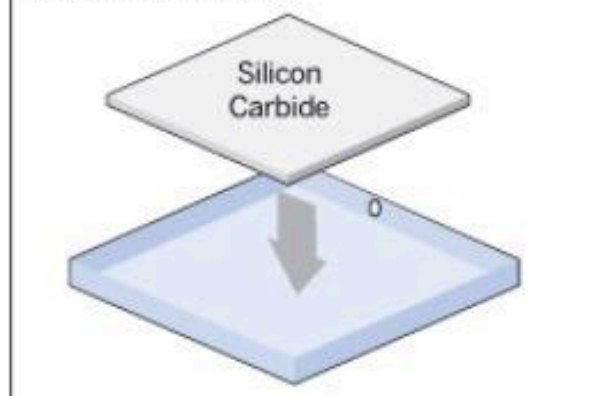


Sample size
About 1m

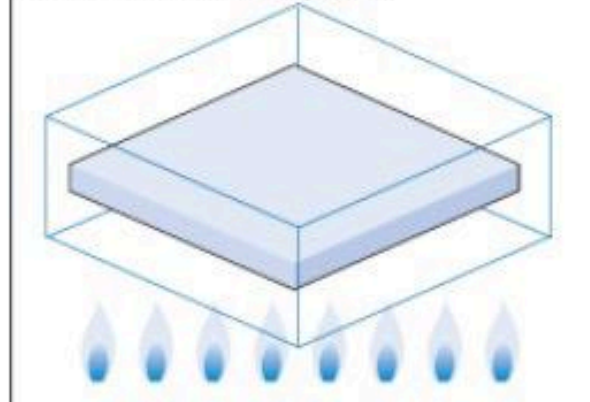
Applications
Photonics, nanoelectronics, transparent conductive layer sensors and bioapplications

Silicon carbide

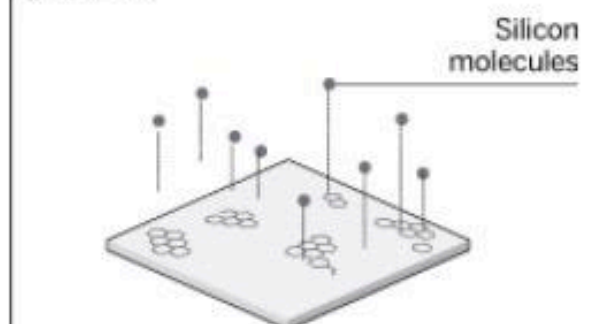
1 A small amount of silicon carbide (about 10mm x 10mm) is placed in a box with a small hole in it



2 The box is sealed in a vacuum or argon and heated to about 1,500°C



3 Silicon molecules 'evaporate' from the surface, leaving a high quality layer of graphene



Sample size
About 100mm

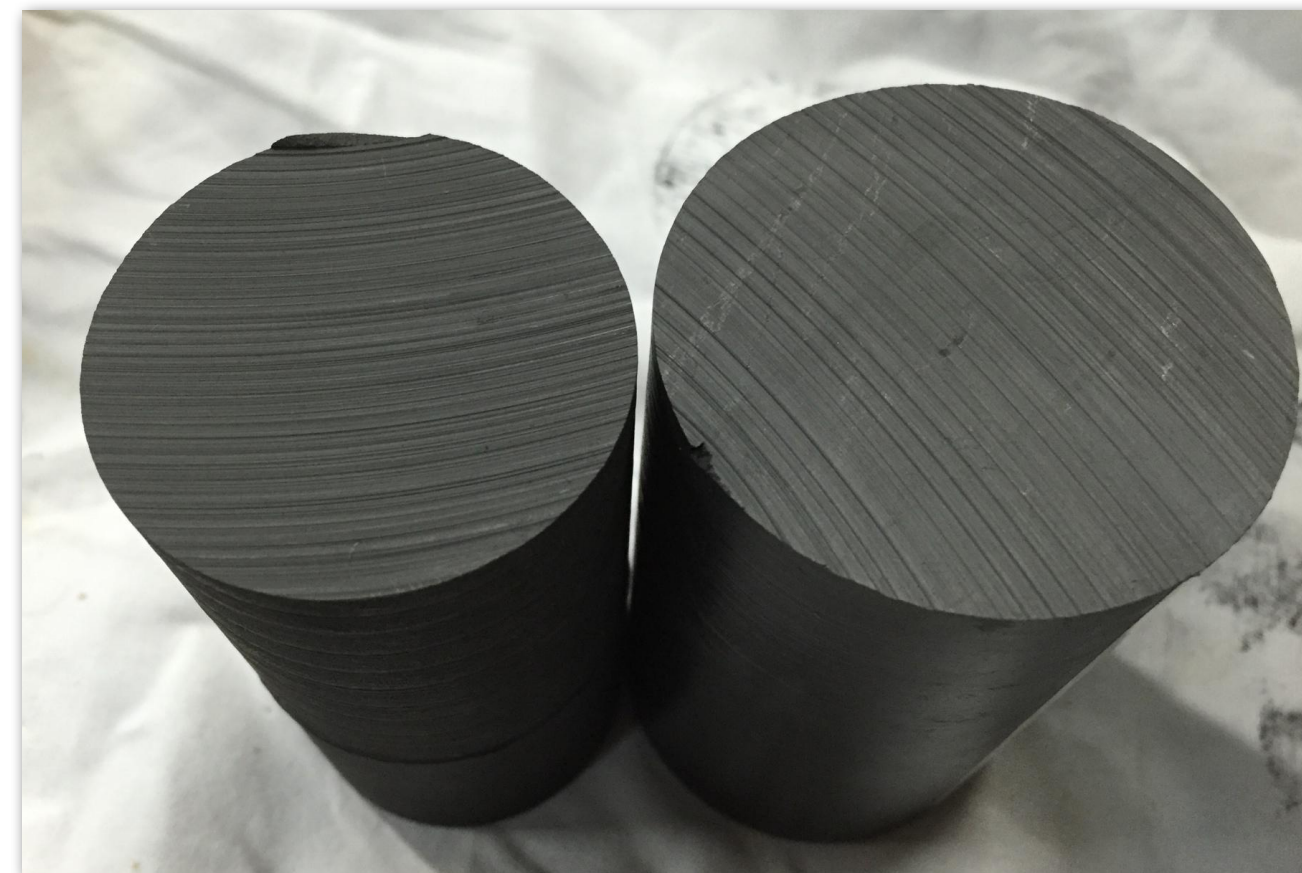
Applications
Transistors and other electrical devices

Sources: Benjamin Pollard, Department of Physics, Pomona College; Nature; Review Research; Electronics Weekly

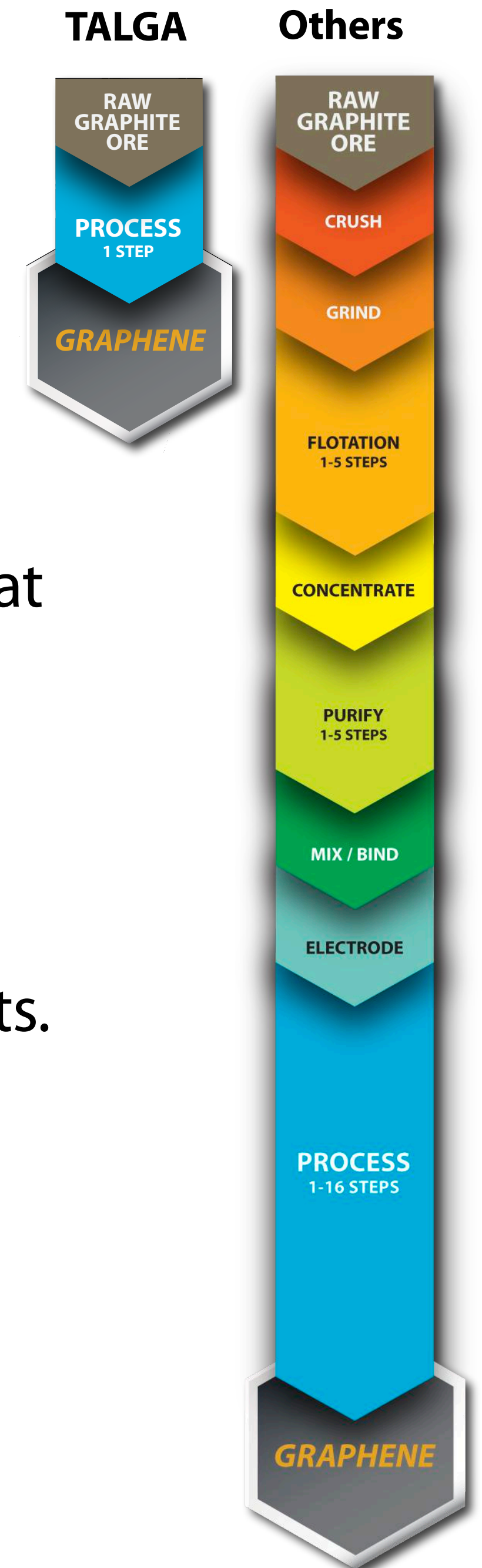
Processing Advantage

- ▶ Graphene is everywhere you find graphite.
But separating graphite to a few atoms thick is expensive and hard to scale up.
- ▶ Talga ore is unique as doesn't require purification processes usually required to upgrade graphite minerals to graphene. Talga extracts graphene **directly** from **natural** microcrystalline graphite ore using recently discovered physio-chemical techniques. **No requirement** for crushing, grinding and other multiple-processes that add cost. Entirely scalable to large volumes and graphite is also recovered as a saleable by-product.
- ▶ Note the photo below; Talga raw natural ore (uncrushed, right) has similar characteristics of high purity synthetic graphite (left), allowing it to have unique processing pathway to graphene with advantages of larger size and much lower costs.

*Processed
Synthetic graphite
99.99% grade*

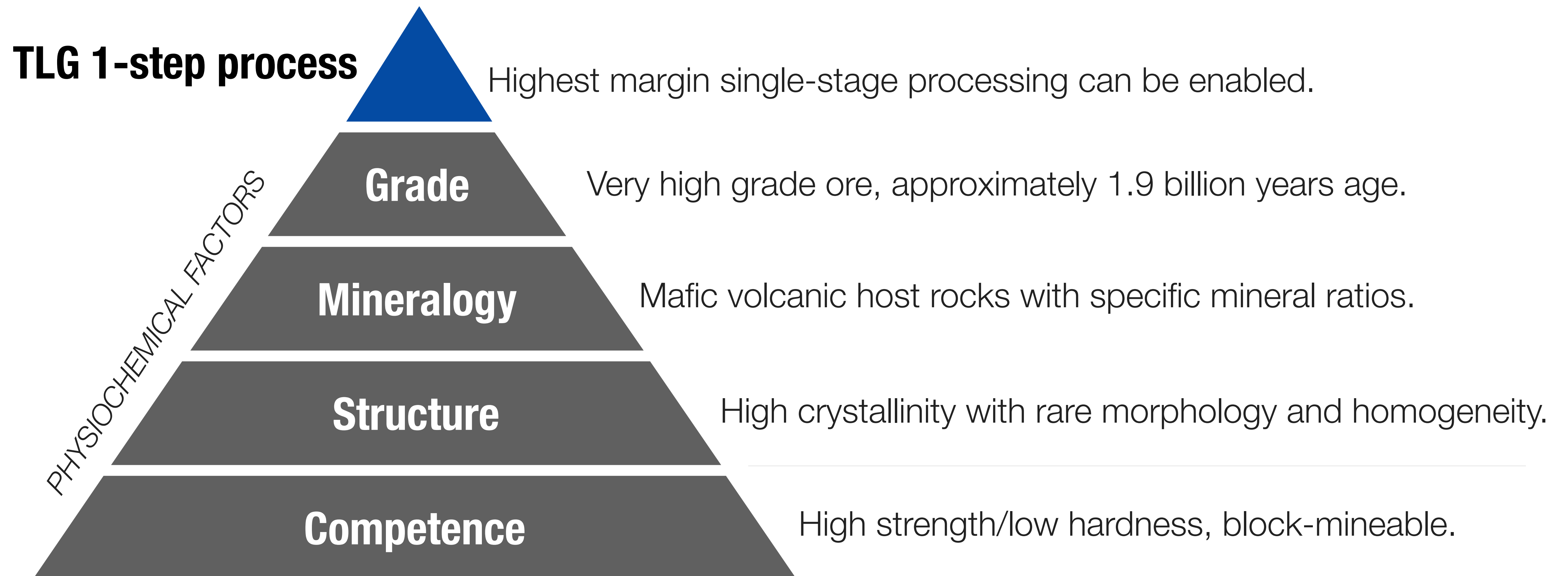


*Unprocessed
Talga graphite drillcore
24.4% grade*



Why Is The Talga Approach Unique

- ▶ Graphite is made from layers of graphene so in theory anyone can produce graphene in a laboratory - but at what volume and cost? Talga ore is differentiator.
- ▶ Talga's production process unlikely to work on other deposits due to multiple physio-chemical factors required for raw ore to liberate graphene without physical comminution.

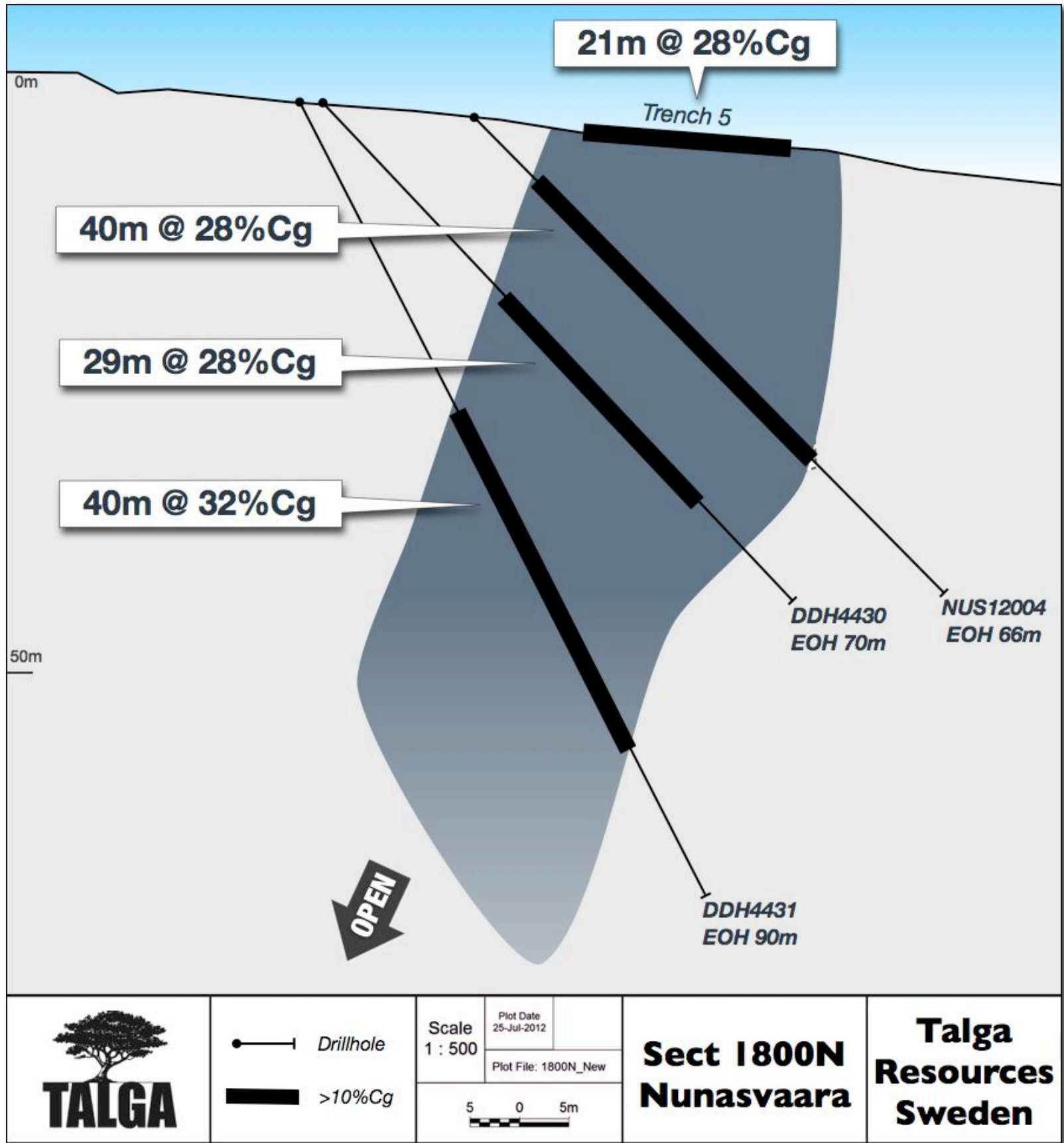
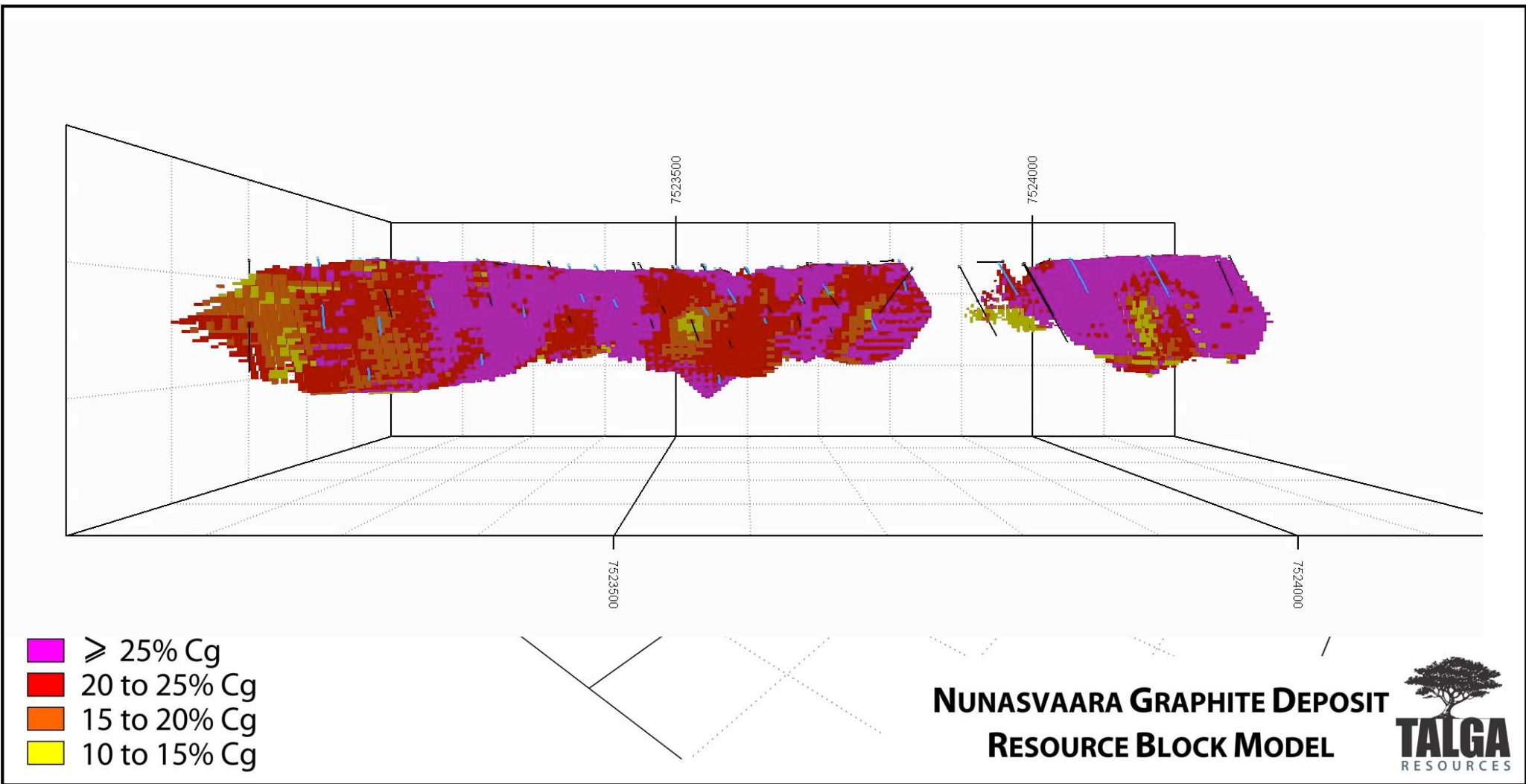


Vittangi Project - Nunasvaara Graphite Deposit

- ▶ World's **highest grade** graphite resource - JORC compliant graphite resources¹ totalling 7.6Mt @ 24.4% Cg (ASX:TLG 8 Nov 2012).
- ▶ Deposit is **1.9 billion** years age and hosted in greenstone volcanics unlike peers in sheared or contact metamorphic deposits hosted within granite/gneiss. Combined with **extreme homogeneity** makes north Sweden a **unique source** for large scale high margin natural graphene production.
- ▶ Less than **2%** of the graphite formation has been drilled to date. The deposits and process are entirely scalable to meet what additive markets may require. Indicates initial **~20 year production life** at current stage (see Scoping Study released ASX 9 October 2014).

Vittangi project's Nunasvaara Mineral Resource (2004) (@10% Cg lower cut-off). Scoping Study limited to JORC Indicated portion only.

Deposit	JORC Status	Tonnes	Grade Cg %
Nunasvaara	Indicated	5,600,000	24.6
Nunasvaara	Inferred	2,000,000	24.0
Total		7,600,000	24.4



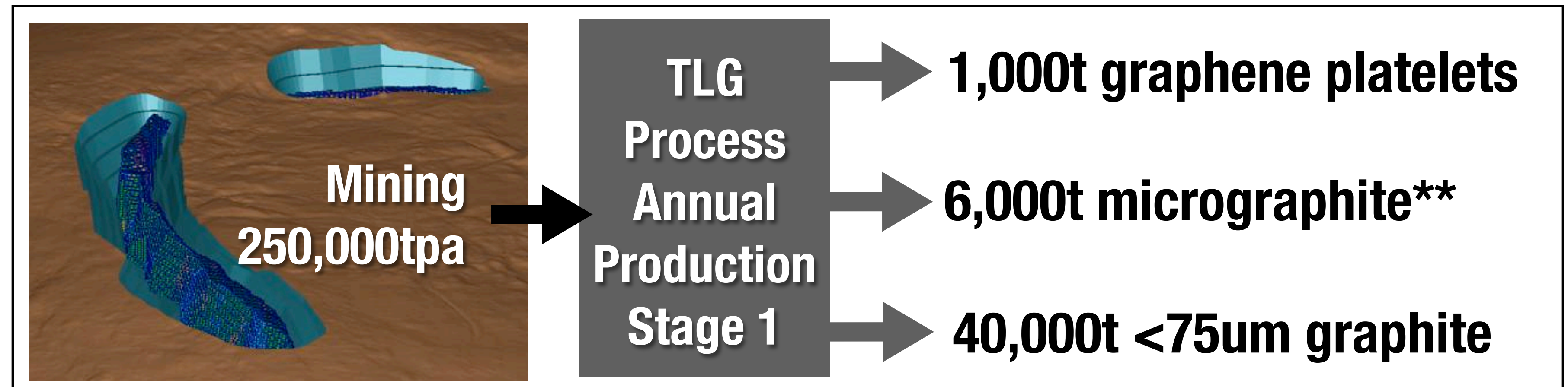
Production Model

- ▶ Graphite and graphene platelets can be liberated from ore in a **single step** with minimal downstream recovery processing compared to many purification stages (complex/costly).
- ▶ Paradigm shift in the production outlook for **bulk graphene cost and scale**.
- ▶ Current aim to sell non-functionalised bulk graphene to large end users developing specific applications for nanoplatelets (polymers, coatings, additives, inks etc).
- ▶ Other future possibilities include licencing parts of the processing technique and equipment, and supplying semi-beneficated ore for certain segments of the market.

Stage 1 Vittangi Project Financial Metrics*:

Pre-tax NPV A\$490m (12% discount rate)

Capital cost A\$29m (1.4yr payback. Minelife ~20yr)



*See Scoping Study released to ASX 9 October 2014. **Micrographite volume can be beneficiated to graphene upon demand.

Full Scale Plant Design (Video)



Development Status

- ▶ Process has been replicated by 4 independent parties in two countries and opens the door to commoditising supply into everyday applications.
- ▶ Talga has moved from metallurgical breakthrough in lab to benchtop scale and is now scaling up to pilot/demonstration plant phase on way towards full scale production in Sweden.
- ▶ Currently Talga awaits permitting approval for trial mining to operate Jul-Oct 2015. Sawn blocks of ore (equipment similar to pictured right) will be railed to a demonstration plant to be commissioned in Germany.
- ▶ The trial mining and demonstration plant provides an opportunity for testing upscaling of technology and will be designed to produce 100-200t/annum graphene, for large scale product development and potentially material sale revenue. Process improvements (yields, quality) will continue in parallel.
- ▶ Company focus is now on striking commercial relationships to place graphene and graphite production, and finance the path to full scale production if required.

Example of sawn-block mining to be trialled at Vittangi 2015



Potential demo plant site, Germany.



Talga Europe Operations

Local Industry/Graphene End users

- ▶ Use research as interface
- ▶ Product testing/development



Research, Development and Analytics

- ▶ Jena
- ▶ Dresden/Mainz

TALGA

German Operations

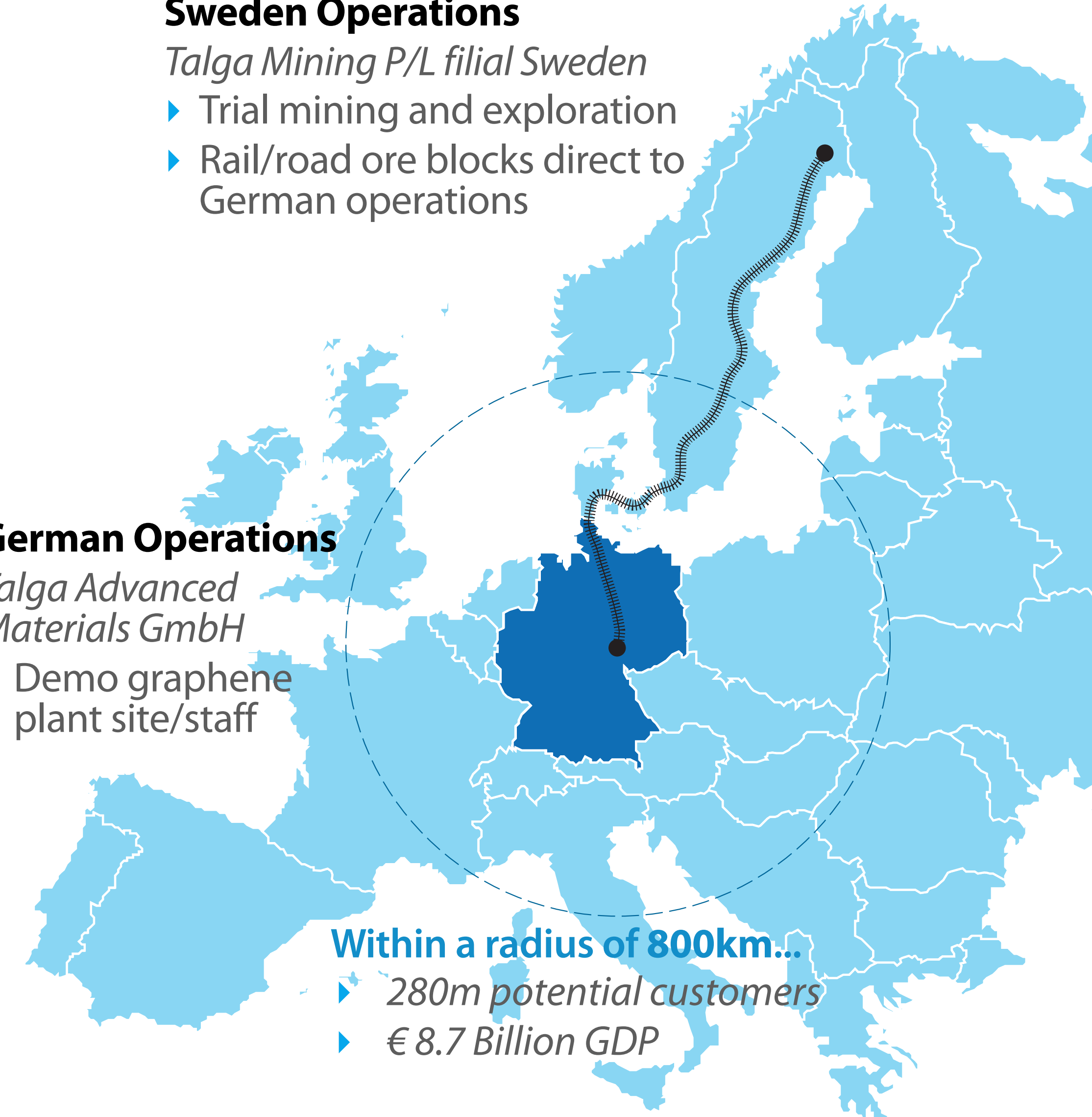
Talga Advanced Materials GmbH

- ▶ Demo graphene plant site/staff

Sweden Operations

Talga Mining P/L filial Sweden

- ▶ Trial mining and exploration
- ▶ Rail/road ore blocks direct to German operations



Within a radius of 800km...

- ▶ 280m potential customers
- ▶ € 8.7 Billion GDP

Consultants

- ▶ General Research GmbH
- ▶ Conduit to research, industry, local finance

Milestones on path to full-scale Production



Jan-Jun 2015

- ▶ Permitting receipt for trial mining
- ▶ Ongoing offtake, collaboration discussions with end-users
- ▶ Euro-based research collaboration results
- ▶ Ongoing metallurgical development
- ▶ Gold asset divestment
- ▶ Further exploration - test Exploration Targets for new resources

Jul-Dec 2015

- ▶ Demonstration plant construction in Germany
- ▶ Distribution of larger samples from demonstration plant
- ▶ Ongoing product development with end users
- ▶ IOCG/iron ore assets divestment
- ▶ Further exploration on flagship projects to grow resource base
- ▶ Demo plant lock-cycle production
- ▶ Samples to end users
- ▶ Sales

Jan-Jun 2016

- ▶ Continue scale up of demonstration plant
- ▶ Pre-feasibility study
- ▶ Permitting for second trial mine
- ▶ Begin permitting for aspects of full scale production targeting 2017
- ▶ Ongoing commercial developments with end users etc.

Financial and Corporate Summary



Capitalisation Summary

ASX:TLG Ordinary Shares	124.6M
ASX:TLGO Options (<i>exp 30 Nov 2015 at 35c</i>)	7.72M
Unlisted Options ¹	10.9M
Market Capitalisation (<i>undiluted @ \$0.42</i>)	A\$52.3M

Cash: Dec 2014 \$2.72m

Debt: Nil

Revenue: Immaterial

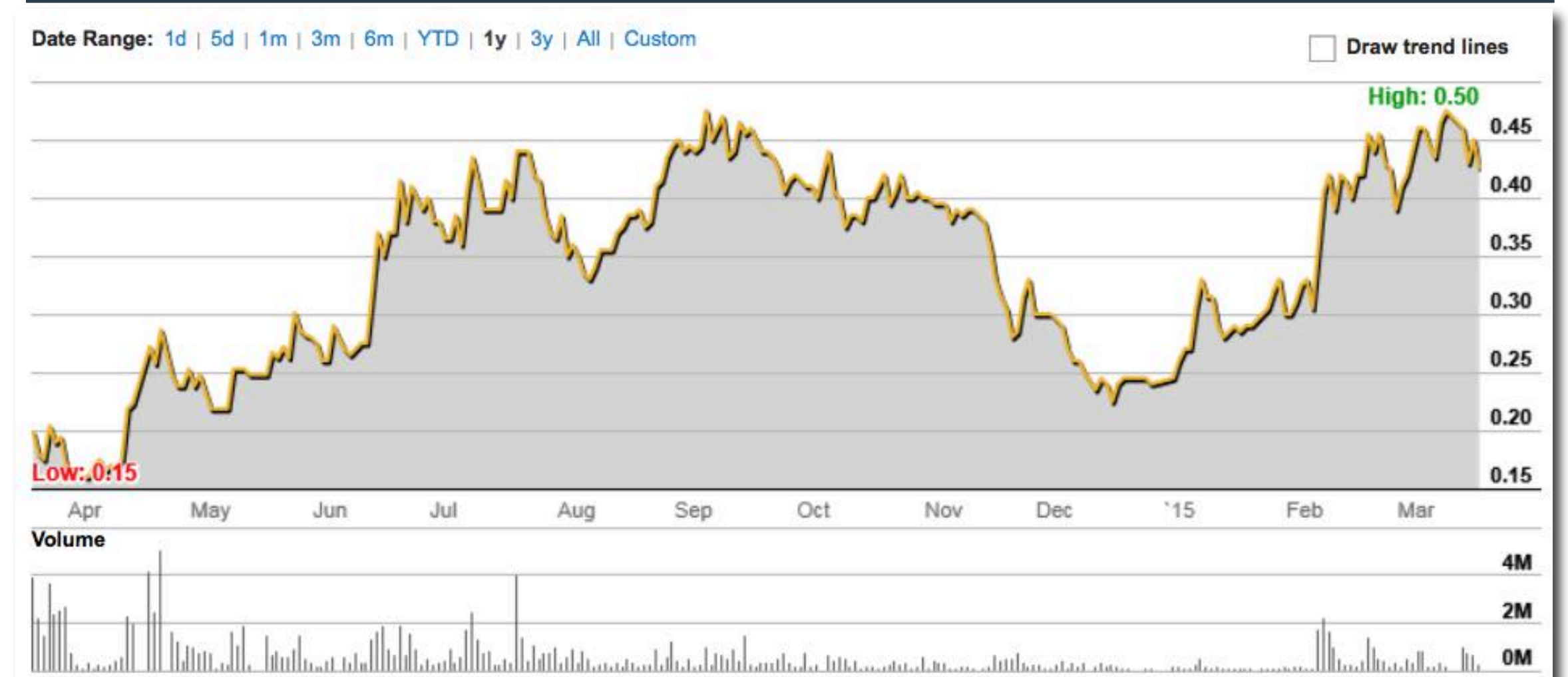
Note: Placement for \$5.5 million announced ASX on 18 March 2015 @ 40c per share.

Top Shareholders (+3%)

Lateral Minerals Pty Ltd (<i>Mark Thompson</i>)	11.4%
Gregorach Pty Ltd and related co.	8.3%
HSBC Custody Nominees Australia Pty Ltd	5.4%
UBS Nominees Pty Ltd	3.2%
Yandal Investments Pty Ltd	3.1%
Two Tops Pty Ltd	3.0%

Share Price and Volume Last 12 Months

ASX:TLG



¹ As at 8 February 2015, various strike prices with majority exp 2016 at 50-60c

Summary of Highlights



- ▶ **Highest grade JORC/NI43-101 global graphite resource.**
- ▶ Truly **unique ore** that facilitates **high margin bulk** production of **graphene**.
- ▶ Best in class **research partners** optimising processes in **world class** facilities.
- ▶ **Growth profile** of Swedish graphene producing resources is immense.
- ▶ Significant financial metric **upside** as **yield** and **production** profile **increase**.
- ▶ Strong **differentiation** and **leverage** to peers.
- ▶ Strong **margin** protection as graphene price normalises.
- ▶ Development status - **positioned** to **commercialise** aspects of project development.
- ▶ Assets located in **premier mining jurisdiction** with low geopolitical risk, **100% ownership** of assets, supportive government and first class **infrastructure** next to European **market**.
- ▶ Funding requirement small - **small capex**, potential material revenues this year and beyond with full scale permitting in the background.

Appendices

References

a) Lucintel - global polymer industry 2012_2017 trends forecast June 2012 b) Fullerex Graphene Report 2014 c) McKinsey Global Report 2013 “Disruptive technologies: Advances that will transform life, business, and the global economy” d) www.Directa-plus.com/applications/ e) www.paintsquare.com/news/images/Paint-Market-chart-500px-new.gif f) any data not specifically referenced is based on personal communications with industry participants where appropriate and/or unpublished technical research.

¹ The Vittangi graphite project Mineral Resource (Nunasvaara deposit) estimate was first reported in February 2012 and has not been updated to comply with the 2012 JORC Code. The Company is not aware of any new information or data that materially affects the information included in the relevant market releases for this estimate. The Company confirms that all material assumptions and technical parameters underpinning the estimate in the relevant market releases continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Person’s findings are presented here have not been materially modified. In light of the positive results from the Study, Talga and its consultants have closely reviewed the parameters of the JORC 2004 estimate and are satisfied with its use in the context of this Study. A further revision of the estimate will be undertaken in order to move the resource to 2012 JORC compliant status in the near future as part of next stage feasibility studies.

Cautionary Statement

The scoping study referred to in this report is based on low level technical and economic assessments, and is insufficient to support estimation and economic assessments, and is insufficient to support estimation of Ore Reserves or to provide assurance of an economic development case at this stage, or to provide certainty that the conclusion of the scoping study will be realised. The Company confirms that all material assumptions and technical parameters underpinning the scoping study results and projections in this release continue to apply and have not materially changed. The use of the word "ore" in the context of this report does not support the definition of 'Ore Reserves' as defined by the 2012 Edition of the ‘Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves’. The word 'ore' is used in this report to give an indication of quality and quantity of mineralised material that would be fed to the processing plant and is not to be assumed that 'ore' will provide assurance of an economic development case at this stage, or to provide certainty that the conclusion of the scoping study will be realised.

Competent Person’s Statement

The information in this report that relates to Exploration Results is based on information compiled and reviewed by Mr Mark Thompson, who is a member of the Australian Institute of Geoscientists. Mr Thompson, an employee of the Company, has sufficient experience which is relevant to the activity which is being undertaken 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” (“JORC Code”). Mr Thompson consents to the inclusion in the report of the matters based on this information in the form and context in which it appears.

The information in this report that relates to Resource Estimation is based on information compiled and reviewed by Mr Simon Coxhell of CoxsRocks Pty Ltd. Mr Coxhell is a consultant to the Company and a member of the Australian Institute of Mining and Metallurgy. Mr Coxhell has sufficient experience relevant to the styles of mineralisation and types of deposits which are covered in this document 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” (“JORC Code”). Mr Coxhell consents to the inclusion in this report of the matters based on this information in the form and context in which it appears.