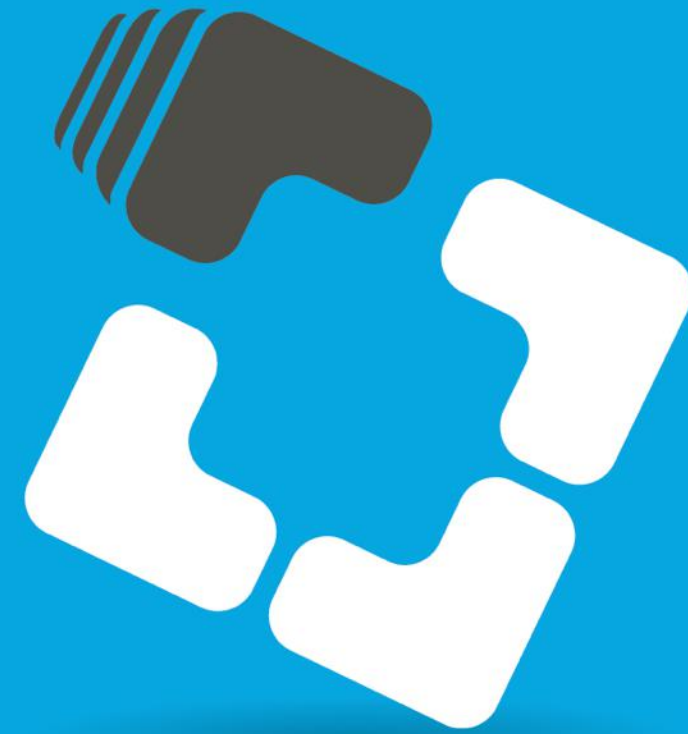


Introducing a revolution in **Graphene** production



talga

unearthing tomorrow

Removing the Volume and Cost Barriers to Economic Graphene Commercialisation



Technology, Opportunities, **Applications**
November 18-19, 2015 | Santa Clara, CA, USA

Mark Thompson, Managing Director



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Executive Summary

- ▶ Talga Resources Ltd (“Talga”) ASX:TLG is an advanced materials company with a scalable, fast and cost effective process to liberate graphene and ultra thin graphite directly from its large high quality graphite ore deposits.
- ▶ Owns five 100% owned high grade graphite mineral projects (including the world’s highest grade graphite resource[#]) as well as non-core cobalt, copper and gold deposits.
- ▶ Processing IP to produce graphene and graphite direct from raw graphite ore which provides unique economic advantages compared to global peers.
- ▶ By removing cost and volume barriers that have slowed uptake, Talga intends to enable widespread industrial graphene use in material markets worth over \$700Bn.
- ▶ Growing team in Australia and Europe as development status advances rapidly (scoping study complete, 2015 trial mining completed, pilot testwork underway, commercial collaborations commencing, 2016-18 trial mining campaigns permitted).



[#] see <http://www.techmetalsresearch.com/metrics-indices/tmr-advanced-graphite-projects-index/>

Talga Europe Operations



Research, Development and Analytics

- ▶ JV Uni of Dresden/Max Planck
- ▶ Friedrich-Schiller-University Jena

Local Industry/End users

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



German Operations

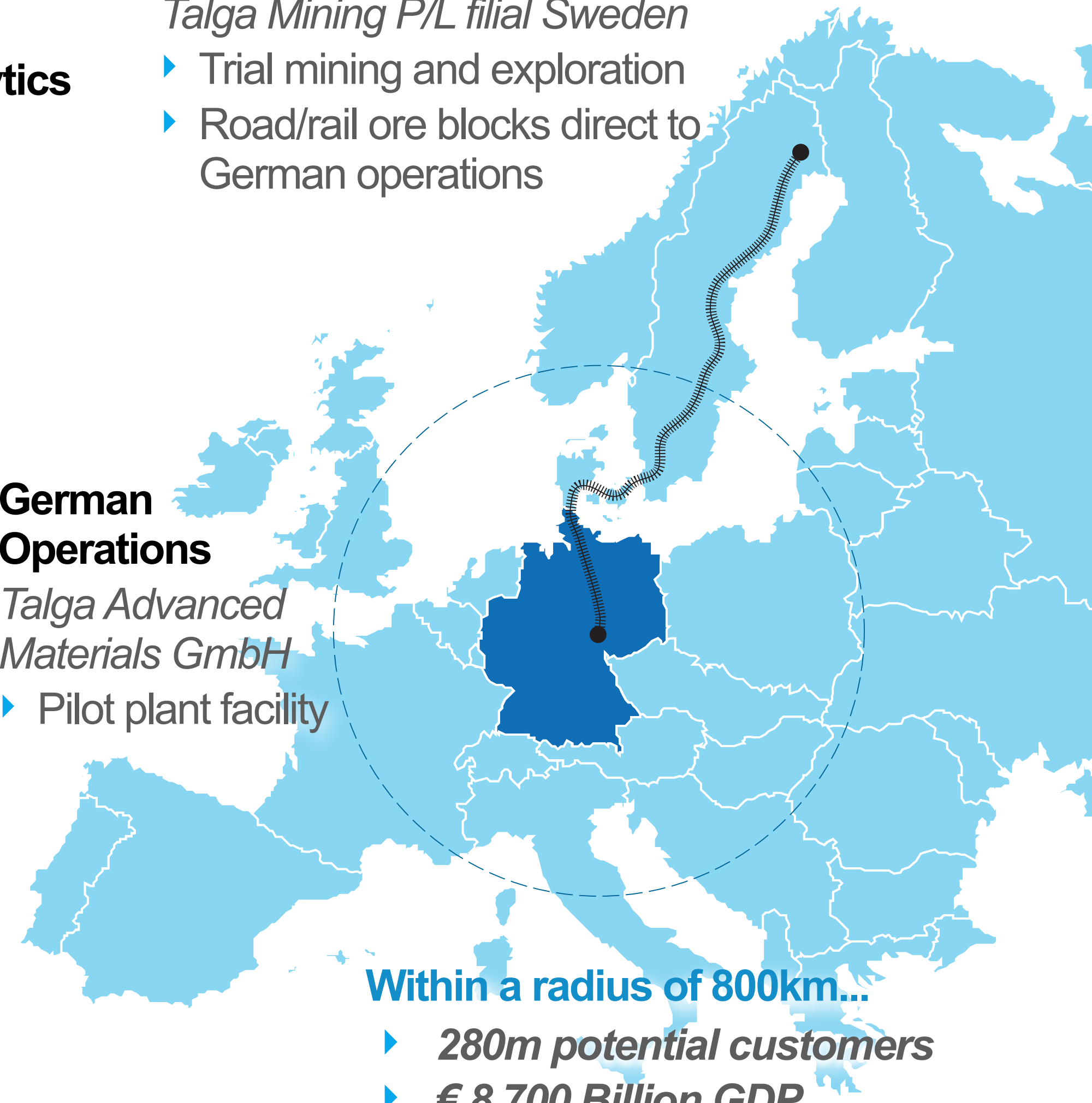
Talga Advanced Materials GmbH

- ▶ Pilot plant facility

Sweden Operations

Talga Mining P/L filial Sweden

- ▶ Trial mining and exploration
- ▶ Road/rail ore blocks direct to German operations



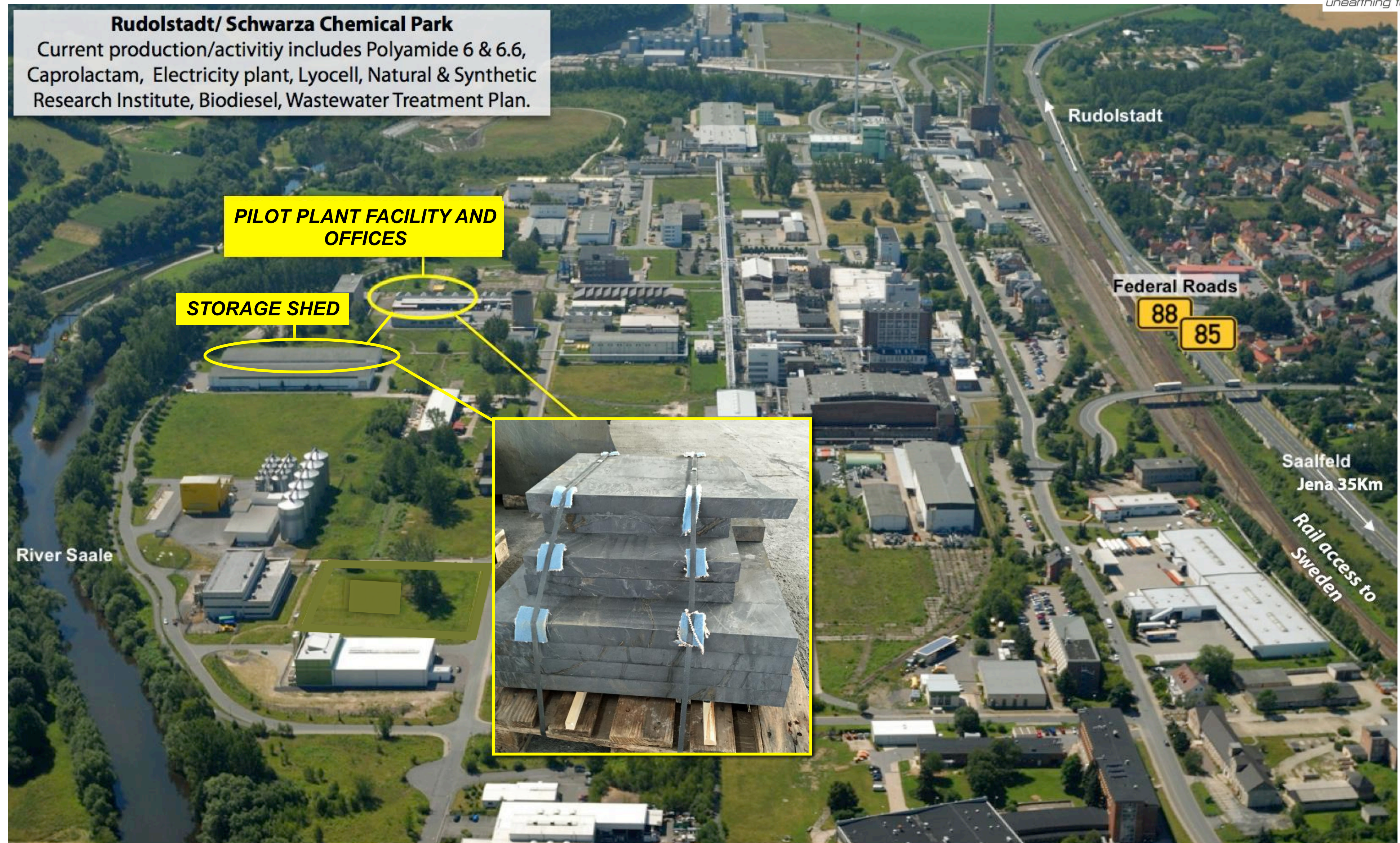
Within a radius of 800km...

- ▶ 280m potential customers
- ▶ € 8,700 Billion GDP

Consultants

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

Pilot Plant Site - Rudolstadt, Germany.



Talga's Graphite Pipeline

100% ownership of **five** graphite projects in **Sweden** containing multiple deposits offering the **full range** of market size specifications. Three JORC resource¹ projects in the development pipeline.



Vittangi

JORC Resource Total **7.6Mt @ 24.4% Cg**, Graphene

Raitajärvi

JORC Resource Total **4.3Mt @ 7.1% Cg**,
87% coarse flake size and 49% >200µm

Jalkunen

JORC Resource Total **31.5Mt @ 14.9% Cg**,
Graphene and <100µm flake

Pajala

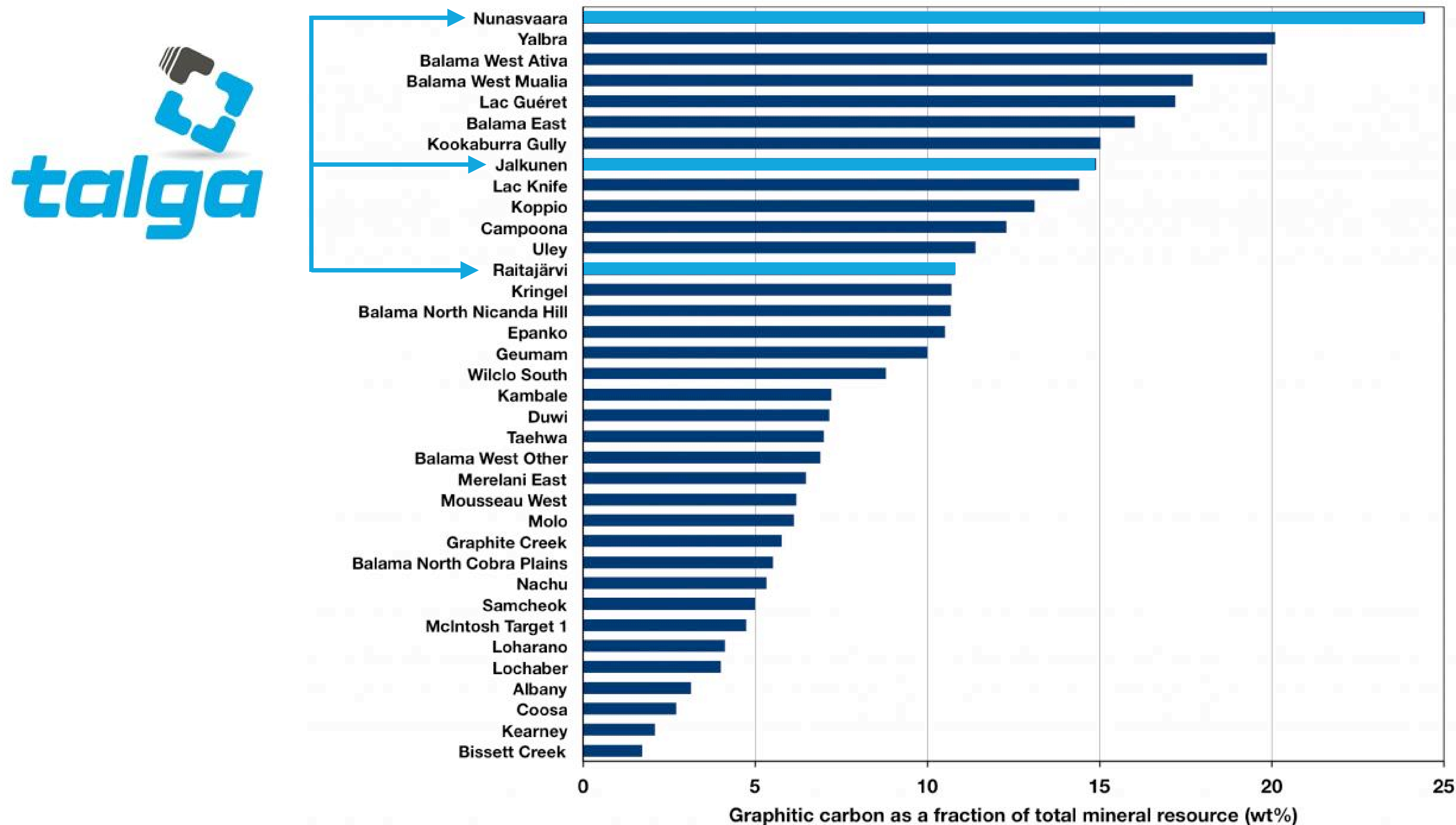
Drilled flake sizes <75µm to >400µm.
Graphene and large flake market.

Piteå

Drilled 80% >300µm large flake, 10-40%
>600µm. Large untested conductors.

Peer Comparison: World Graphite Resources

Average Grade of In-situ Graphite





Advantages of Sweden

- ▶ Established quality **infrastructure**
- ▶ **Low cost** power supply with **high renewable** energy content:
 - Hydro **67 TWh**
 - Wind **12 TWh**
 - Solar **79 MWh**
- ▶ **Low CO₂** emission person/year:
 - Sweden **5.1t**
 - EU **7.9t**
 - USA **19.1t**
- ▶ **Low risk investment jurisdiction** consistently in top 10 Fraser Institute
- ▶ Rail and road **connection** to EU markets
- ▶ Mineral Production tax **0.2%**
Corporate tax rate **22%**

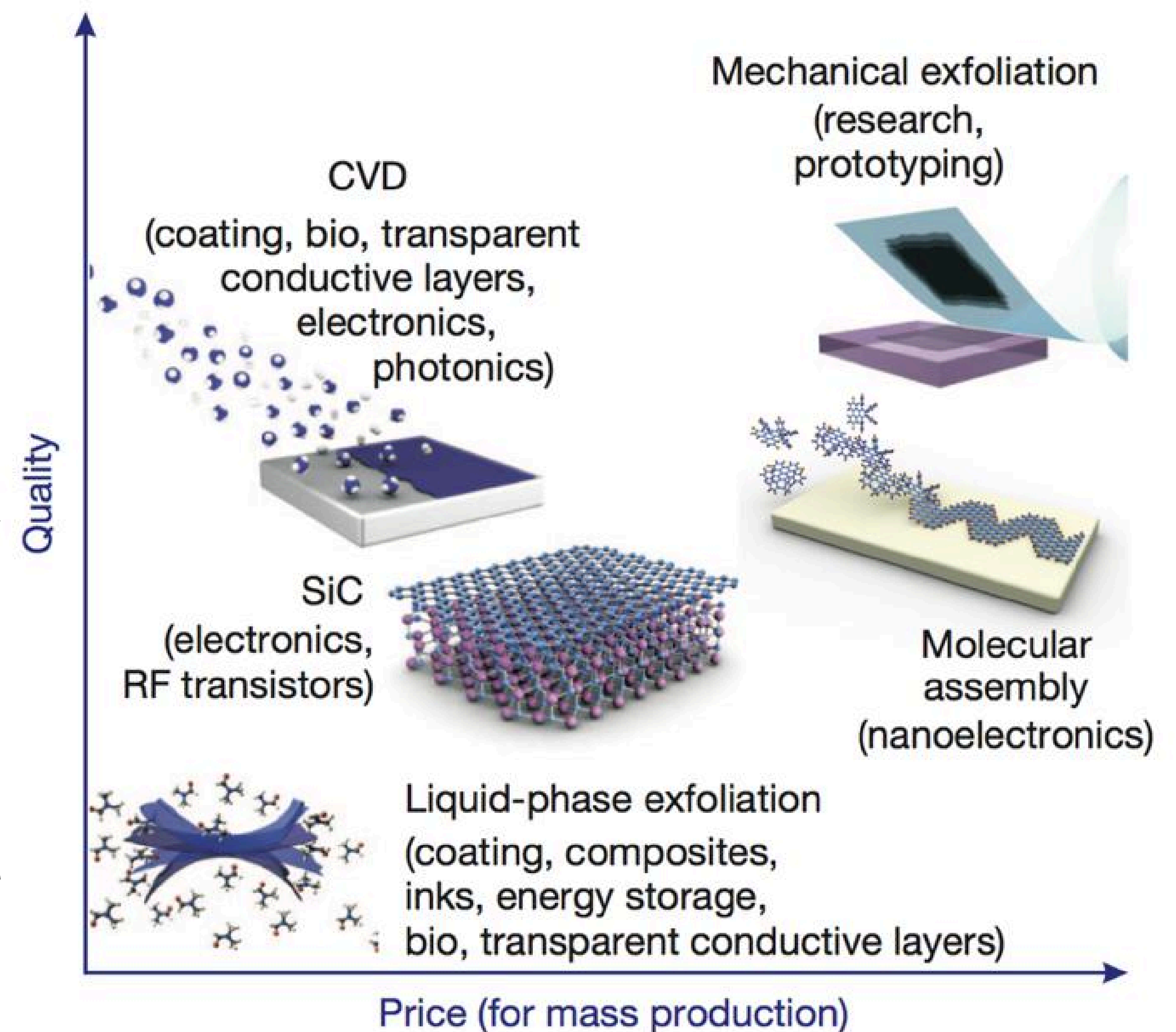
Hydroelectric power source in north Sweden



Graphene Production

- ▶ **Many** graphene production methods exist
- ▶ Almost all suffer **low scalability** and **high costs** due to high temperature/pressure/energy/precursor beneficiation costs ie, gas.
- ▶ The **advantage** in using **natural graphite** is it is **dense** with graphene (high yield) and the temperature/pressure inputs were **freely completed** by the earth's crust.
- ▶ But most techniques using natural graphite are also limited in **scale**, or produce **small** and chemically **damaged** particles that **limit** applications (and margins).

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



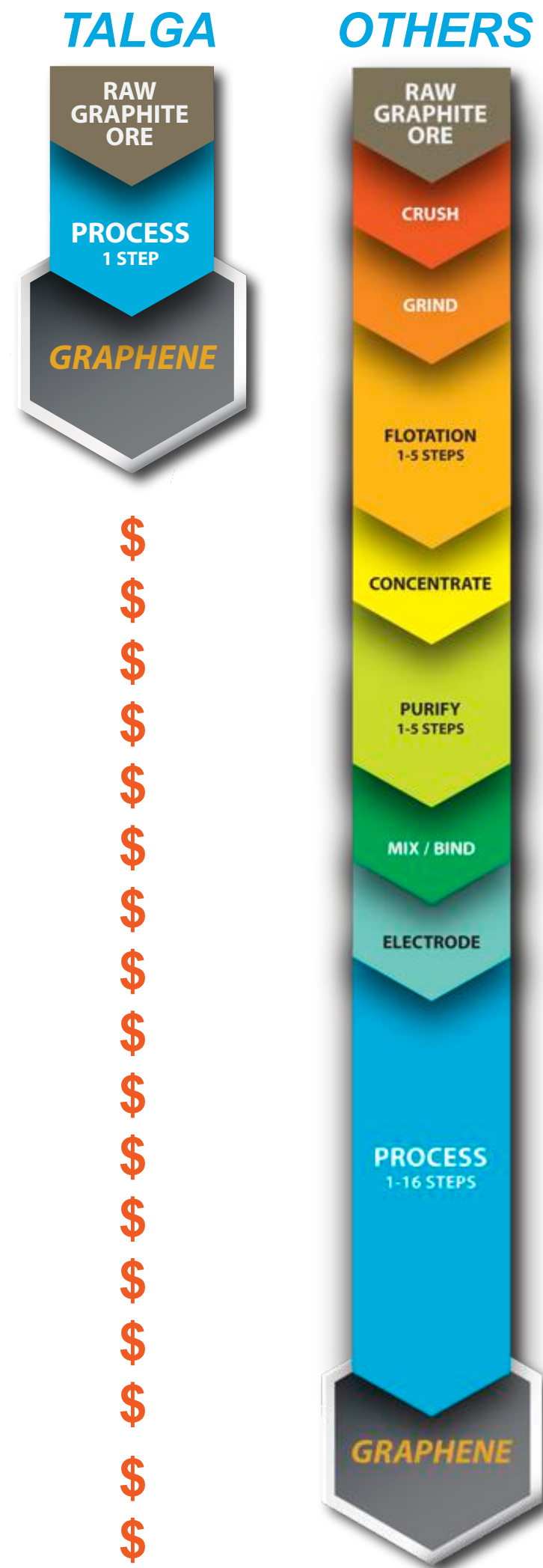
Graphite to Graphene: do you know the cost?

Typical Graphite flake production facilities in northern China



- ▶ Usually graphite ores require drill/blast mining, crushing, milling, flotation and purification stages to produce a graphite concentrate.
- ▶ This is **prior** to the start of making graphene.
- ▶ Each stage induces an environmental footprint from the energy, dust, chemicals and waste.
- ▶ The graphite is then blended from different sources and may contain impurities that differ.
- ▶ Cleaner and lower risk supply chains from consistent/homogenous sources are required.
- ▶ The **ideal** is a method that does not require so many steps and has a smaller energy, social, environmental and economic cost.

Solution-Talga natural ore advantage



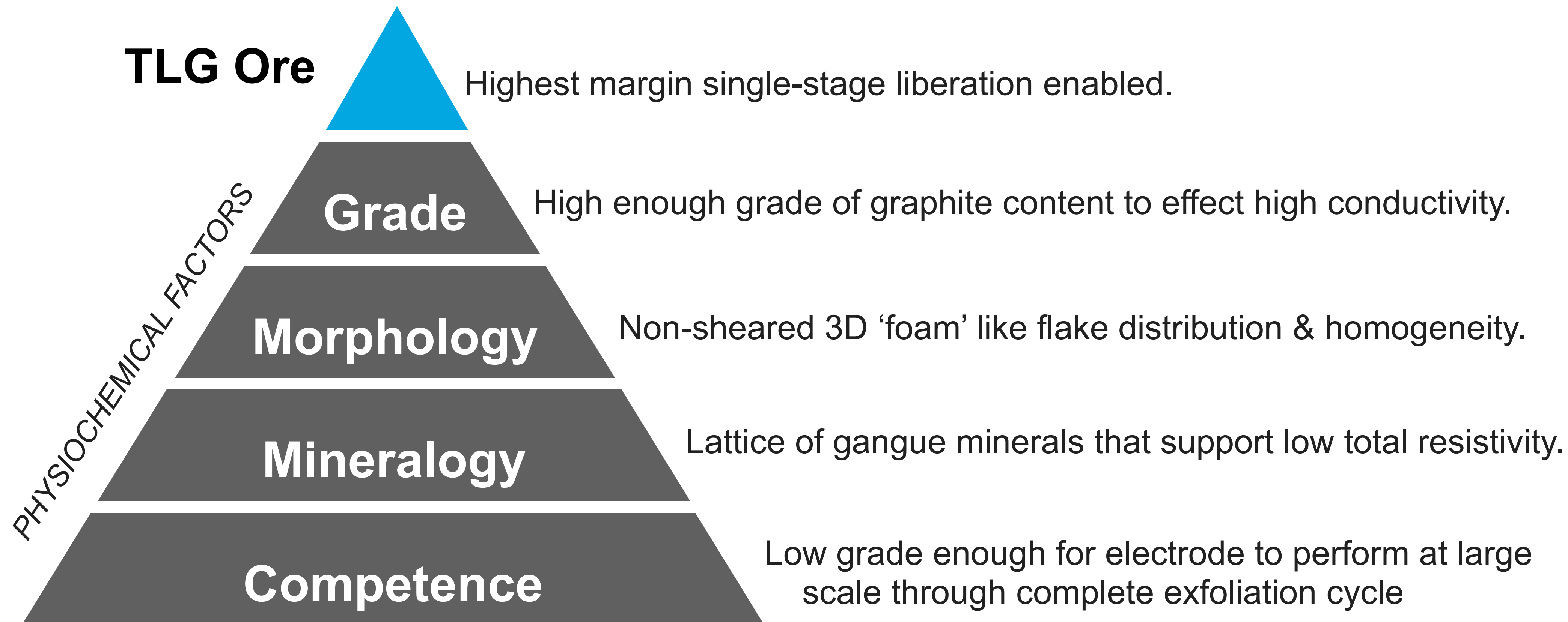
- ▶ Talga's patent pending technology produces graphene **directly** from **unprocessed raw graphite ore**, skipping intermediate purification steps required by peers.
- ▶ Talga can use its raw (uncrushed/unmilled) ore directly as an **electrode in an electrochemical cell**.
- ▶ **The process drives molecules between the layers of graphite** to liberate them directly into pristine **graphene**.
- ▶ Benefits are that it is **Scalable** to industrial requirements, **Fast**, **Efficient**, **Flexible** to produce choice of products for broadest market and ultimately more **Economic with a potentially lower environmental footprint**.
- ▶ Can incorporate **in-situ** functionalisation and product dispersion.

Early lab scale test demonstrating simplicity, scalability and speed of electrochemical exfoliation process on Talga unprocessed graphite ore



How is the Talga Ore Different

- ▶ 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 mining and processing method is designed to use natural multiple physio-chemical factors in the 100% owned orebody to liberate graphene without physical comminution.



Simplifying Production Talga vs Others

GRAPHITE PRODUCTION

Liberation

Concentration

GRAPHENE PRODUCTION

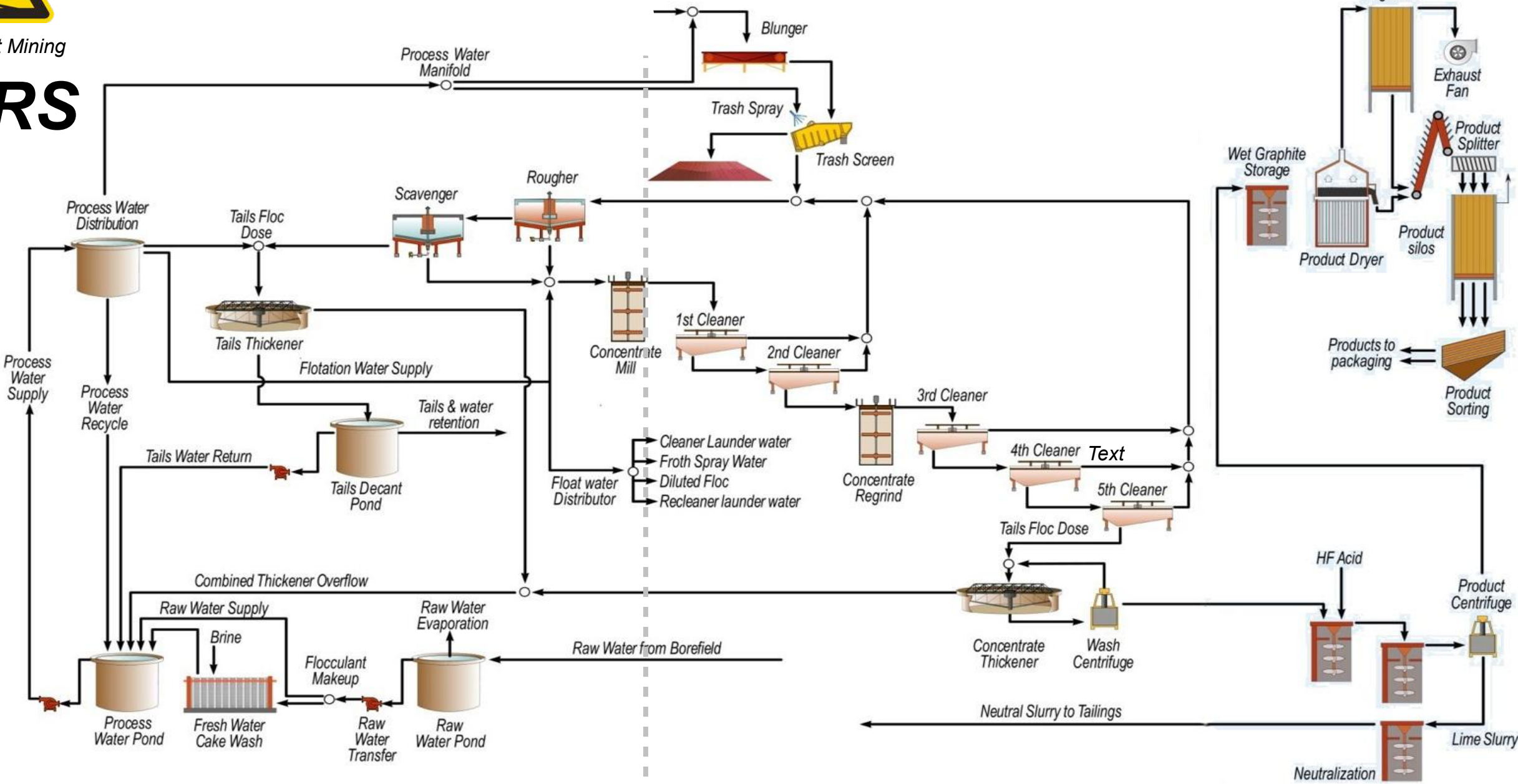
Liberation

Concentration



Drill and Blast Mining

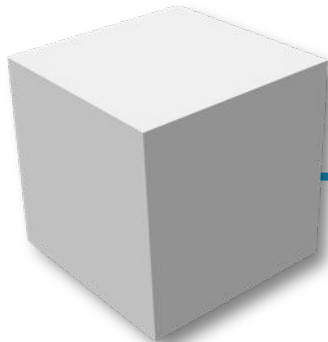
OTHERS



Stylised Graphene and Mico-Graphite
Liberation and Concentration Plant

Product Packaging

TALGA



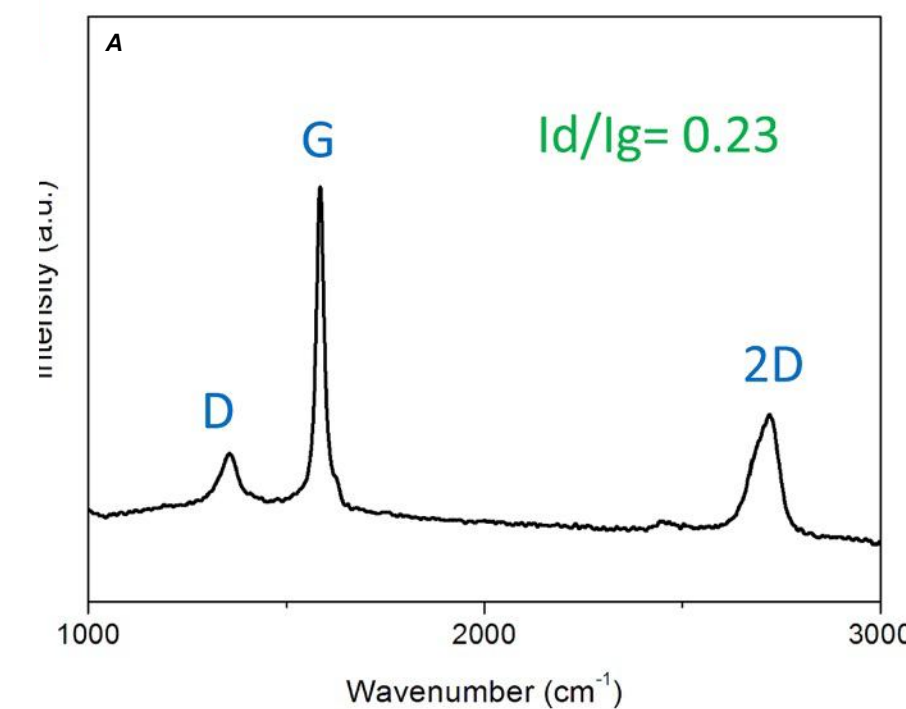
Block Transport to Mill

Block Extraction Mining/Shaping

Graphene from Talga Ore

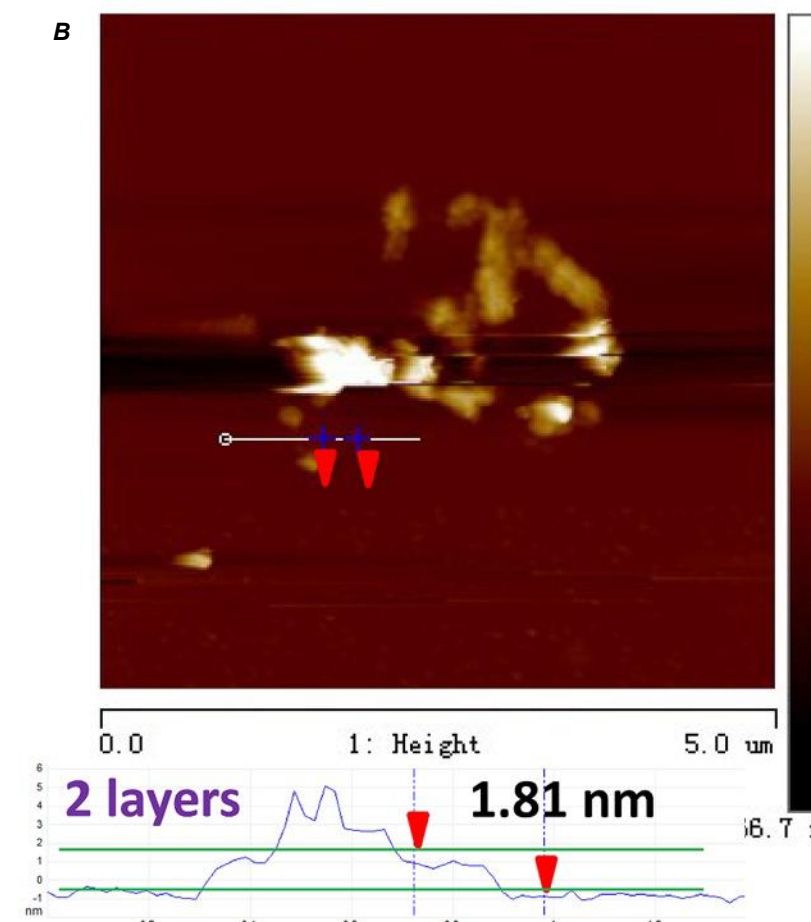
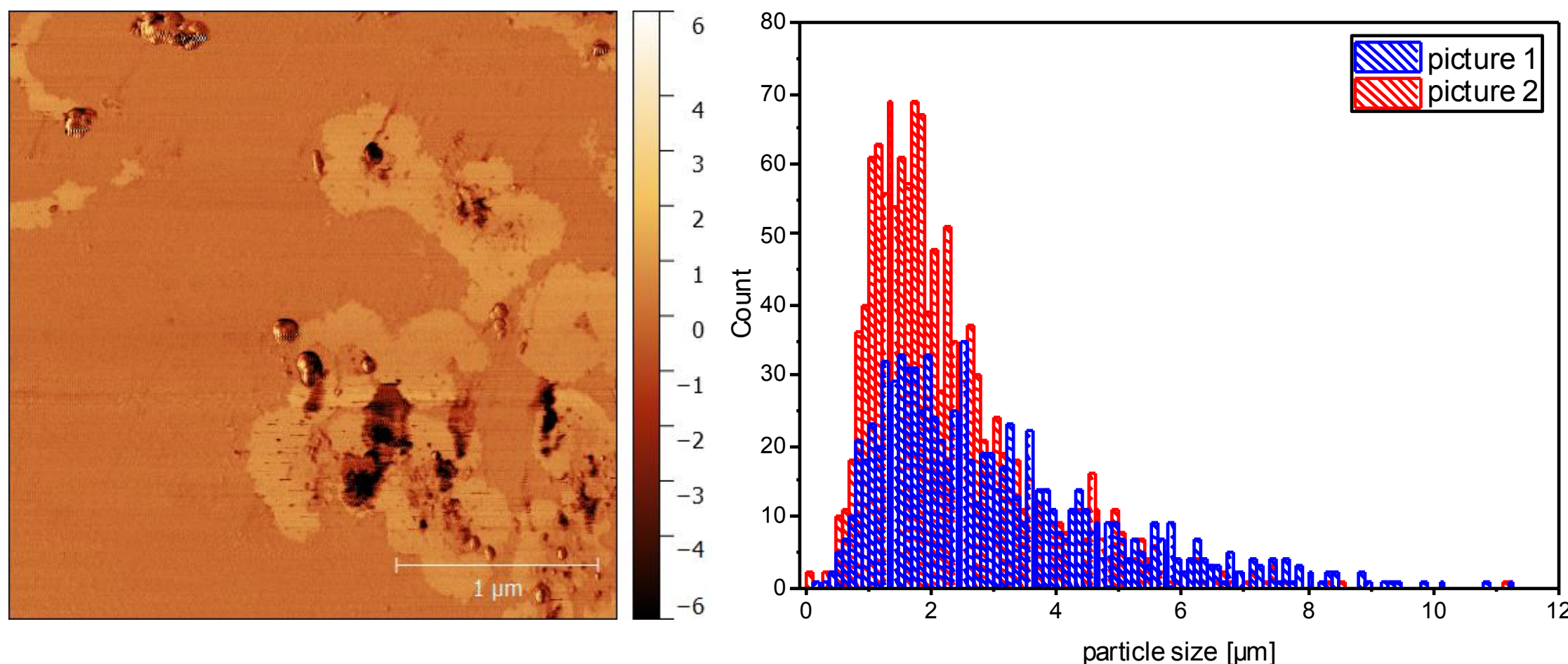
- ▶ Vittangi raw ore exfoliates directly to micro-sized graphite and graphene without crushing, grinding, milling or micronisation.
- ▶ Various studies confirm Talga's low defect graphene.
- ▶ Avoids 'Hummers' style oxidation and retains good size range for additive applications.
- ▶ Flexible process can be **optimised** for different layers/purity spec output to suit range of current and future applications.

A) Raman Spectra B) Atomic Force Microscope image
C) Graphene powder D) Graphene dispersion



TLG Graphene Image

SEM Size Study

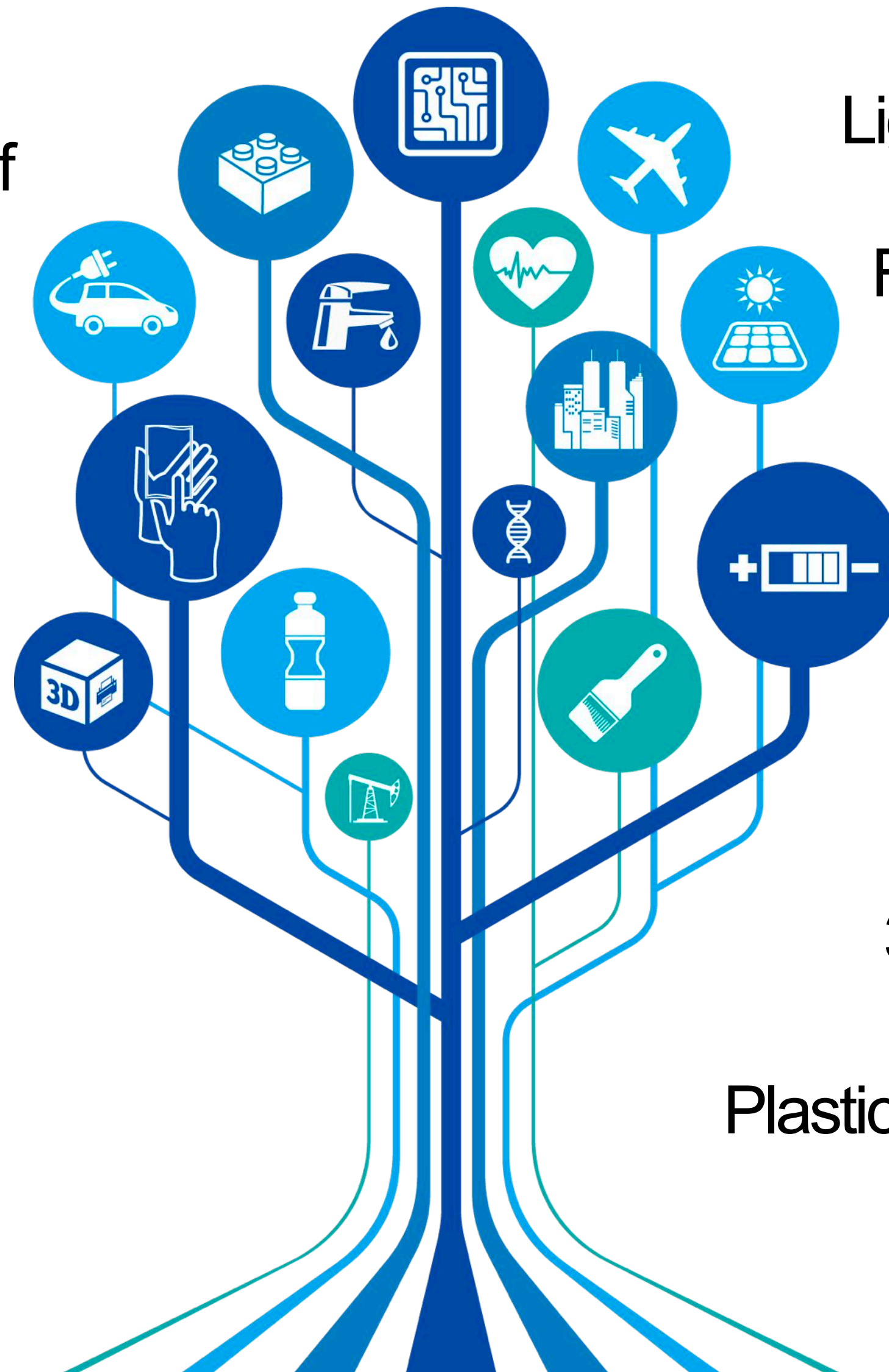


Graphene Applications

Graphene's combination of best-in-class:

- **strength**
- **electrical conductivity**
- **thermal conductivity**
- **impermeability**
- **flexibility**

and more make it the ultimate **additive** to improve a wide range of industrial applications.



Lightweight Composites \$20B

Flexible Electronics / Screens \$16B

Paints / Coatings / Galvanics \$53B

Energy Storage \$62B

Conductive Inks / RFID Tags \$3B

3D Printing Materials \$3B

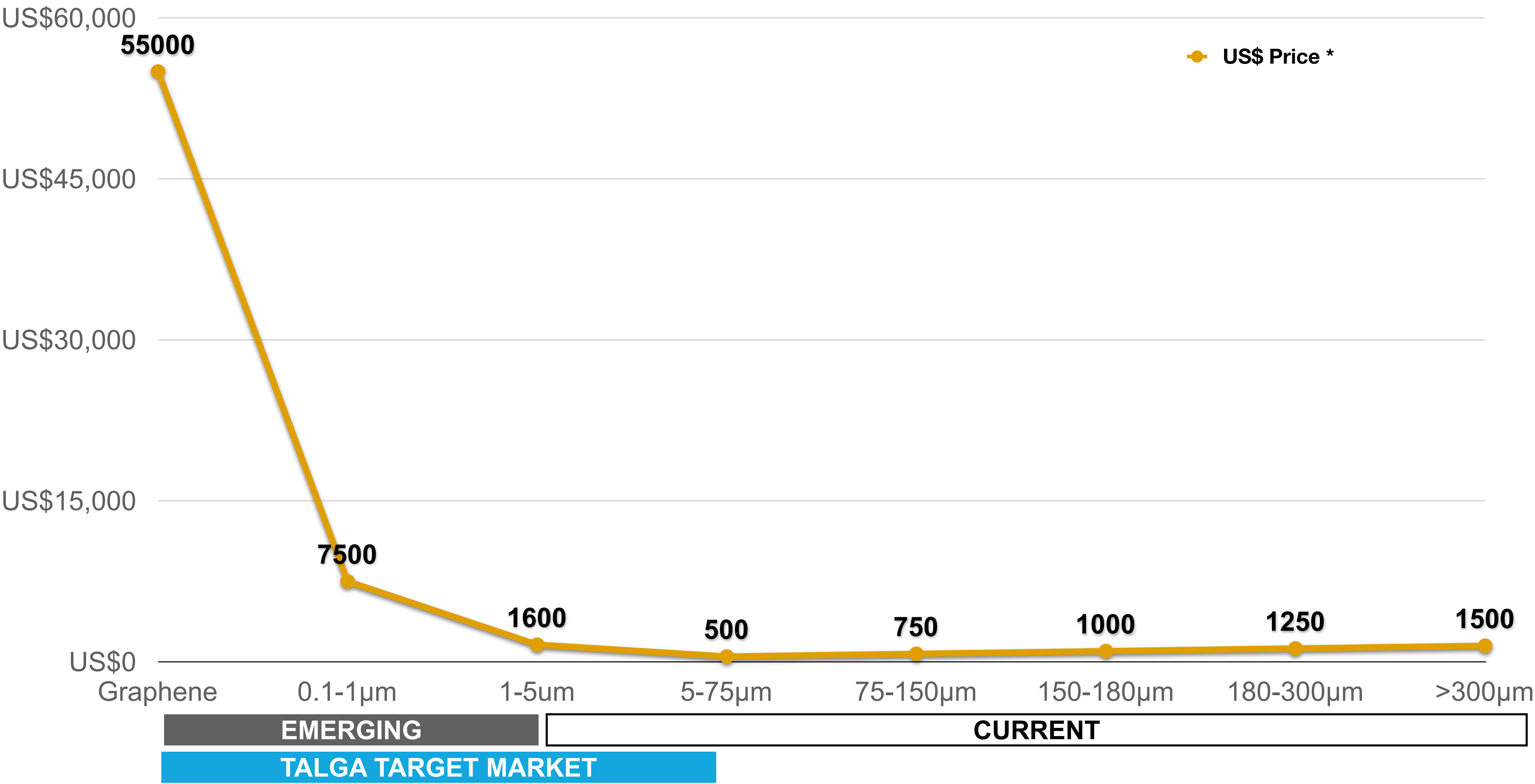
Plastics and Building Materials \$567B

Application Example - Transparent Conductive Ink

- ▶ Talga graphene tested at Frederick-Schiller University, Jena to make transparent conductive ink shows high transparency even after printing 100 layers.
- ▶ Tests to improve conductivity and transparency in different dispersions and using different application methods ongoing.



Bulk Graphitic Carbon - Pricing

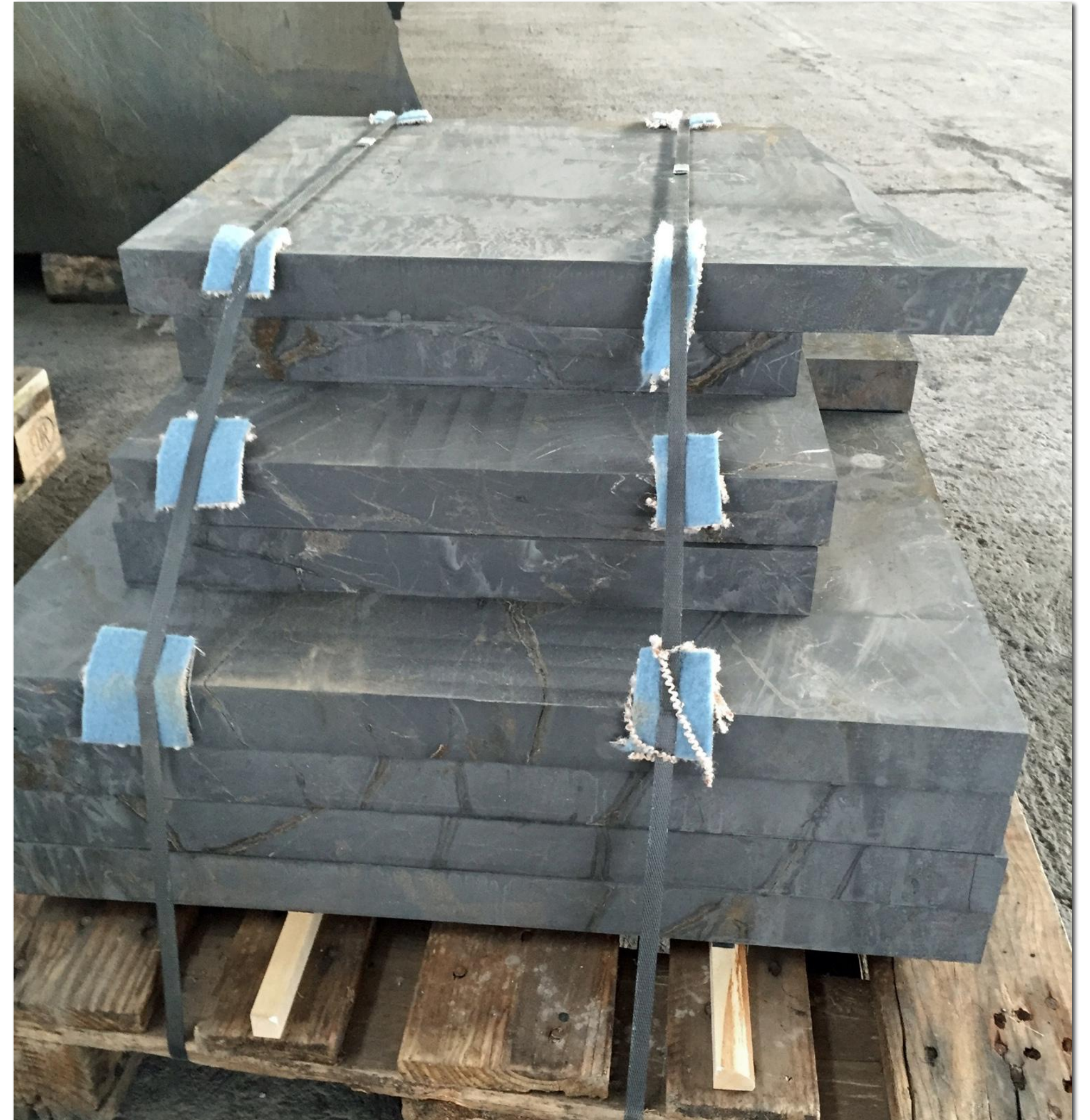


Details see Scoping Study released to ASX 9 October 2014, public data and various industry sources.

Development Status

- ▶ Lab and Bench-top scale trials **complete**.
- ▶ **2015** trial mining **complete** - 2016 campaign in planning
- ▶ **Pilot test-work underway** in Talga's facility in **Germany** (team assembled)
- ▶ **3 phases** to pilot production - first scale **underway**, second phase equipment started fabrication and delivery
- ▶ Focus now on commercial relationships to place upcoming graphene and graphite production - samples being delivered to end users now
- ▶ Future full scale processing planned to shift from Germany to **Sweden** once statutory permitting completed - process commenced.

Vittangi ore blocks in Germany trimmed for Stage 2 cells.



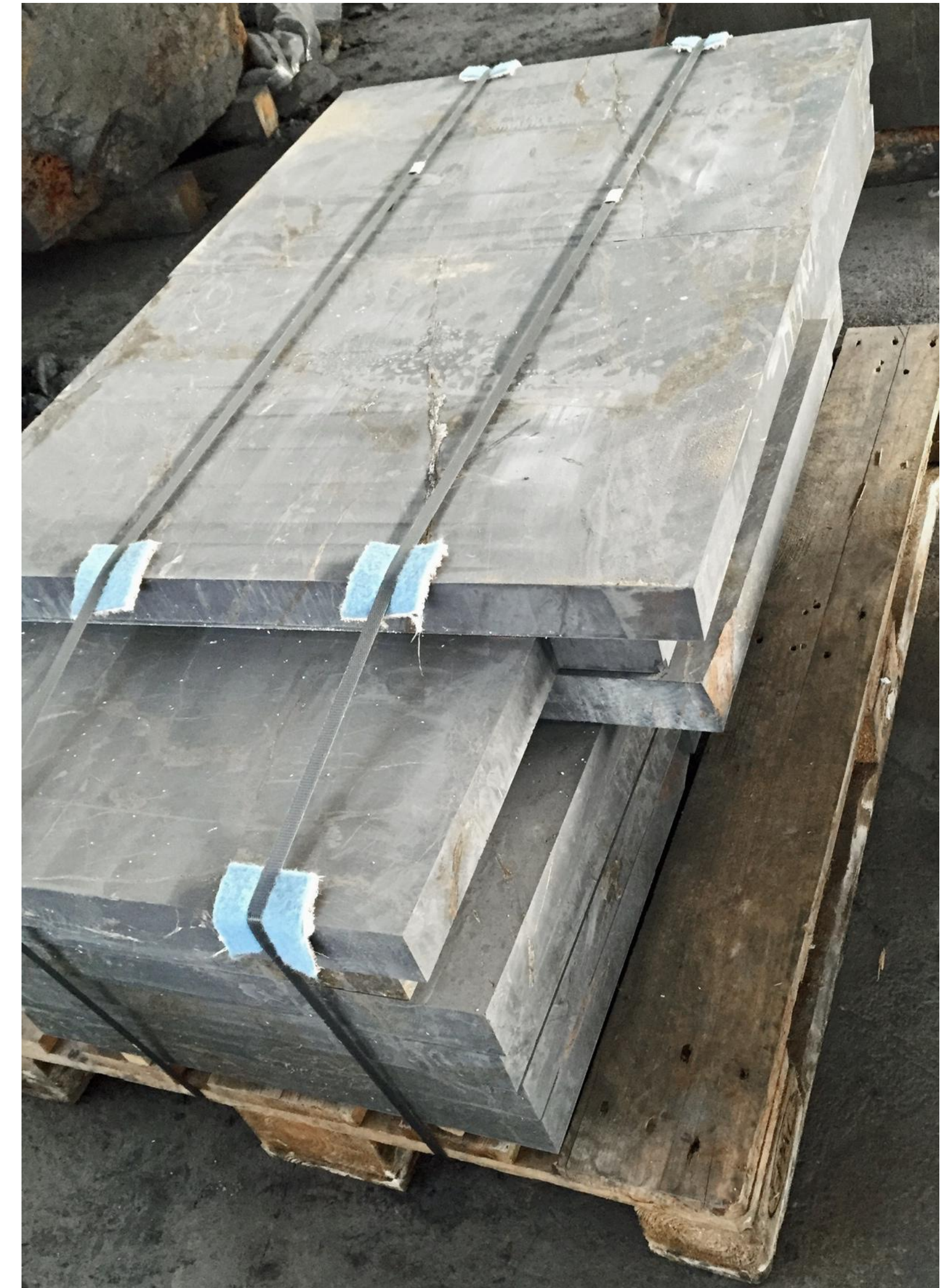
Trial Mine (Video)



Full Scale Production Modelling³

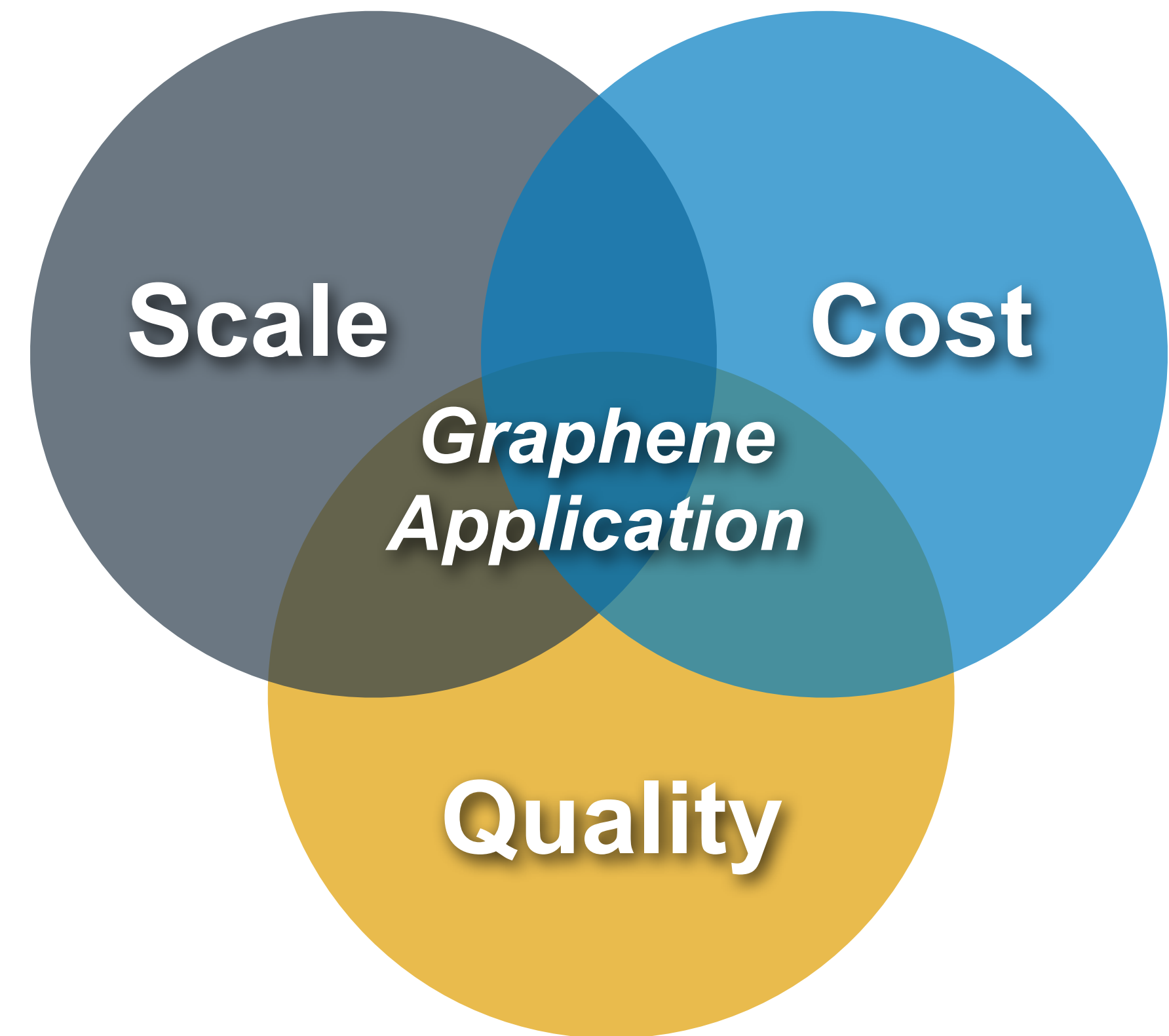
| Items | Base Case | |
|-----------------------------------|-----------|---------|
| Plant throughput | (tpa) | 250,000 |
| Diluted Feed Grade | (%) | 23.6* |
| Graphite production | (tpa) | ~46,000 |
| Graphene production | (tpa) | ~1,000 |
| Life of Mine Strip Ratio | W:O | 4:1 |
| Graphite price assumption | (USD\$/t) | 480 |
| Graphene price assumption | (USD\$/t) | 55,000 |
| Capital cost | (AUD\$m) | 29.3 |
| Mine Life | (years) | 19.7 |
| Discount Rate | (%) | 12 |
| Pre Tax Net Present Value (NPV)** | (AUD\$m) | ~490 |
| Payback from construction start | (years) | 1.4 |

*Feed grade after mining dilution factors. ** Pre-tax and other impositions but including state and private royalties.



³ Details see Scoping Study released to ASX 9 October 2014.

- ▶ Using pilot test facilities for samples to collaborate with industry and develop product range prior to full scale permitting
- ▶ Producer and supplier of raw materials with natural advantages in scale and cost to disrupt graphene and nano/micro graphite sectors
- ▶ Sell bulk graphene and ultra thin graphite to largest end users developing additive applications (making today's products perform better)
- ▶ Potential to licence IP, manufacture precursor materials to feed other technologies/processes or partner on application development (eg, share royalties on products)



Current Collaborations



Tata Steel (UK)

- ▶ Formal collaboration agreement to work together on development of finished graphene products using Talga materials
- ▶ Tata Group comprises over 100 companies with multinational operations, 2014 revenue USD100B and >580,000 staff
- ▶ Talga graphene to be used in anti-corrosion and high performance coatings. Paint and coatings market > 40 Mt annum.



Haydale Graphene Industries PLC

- ▶ UK based nanomaterials company with value add functionalisation process but no source of graphene. Specialise in graphene enriched polymers for composites and plastics.

EU Graphene Flagship - Associate Member

- ▶ Fast track access to huge network of commercial and technology partners
- ▶ Invited alongside **Bosch** and **Lego**.



Talga Highlights

- ▶ World's highest grade graphite resource[#] - 100% owned
- ▶ Truly unique ore with natural advantage for making graphene and graphite in largest volume high growth markets
- ▶ High quality low risk mining and logistics jurisdiction - clean supply chain
- ▶ Leverage to high growth battery and graphene additive market but with small full scale capex requirement
- ▶ Advanced stage - trial mining and processing underway
- ▶ Pilot test-work strategy - large scale sample supply to collaborate with market and develop best spec for volume and margin on path to full scale production



Talga's graphite ore has super high conductivity as demonstrated by powering an LED through the unprocessed rock straight from the ground, Vittangi project.

Financial and Corporate Summary

Capitalisation Summary 18 November 2015

| | |
|--|----------------|
| Shares on issue (TLG Ordinary) | 139.4M |
| Listed Opts (TLGO exp 30/11/15 @35c) | 6.8M |
| Unlisted Options ¹ | 15.8M |
| Market Capitalisation (undiluted @ \$0.37) | A~\$52M |

Board

Managing Director - Mark Thompson

Chairman - Keith Coughlan

Non-Executive - Grant Mooney

Cash (end of Sept 2015) ~\$4.02 million. Nil Debt.

Top 5 Shareholders

| | |
|---|--------------|
| Lateral Minerals P/L (M.D. Mark Thompson) | 10.3% |
| Gregorach P/L and related entities | 6.1% |
| HSBC Custody Nominees Australia Ltd | 5.3% |
| UBS Nominees P/L | 3.1% |
| Yandal Inv P/L | 2.9% |

ASX: TLG Share Price and Volume Year to Date



Average Daily Share Volume (TLG past 12 months): 274,600

¹ Various expiry and strike prices with majority expiring 2016 at 50-60c



Mark Thompson
Managing Director

+25 years international industry experience in mineral exploration and mining management. Member of the Australian Institute of Geoscientists and the Society of Economic Geologists, guest Professor in Mineral Exploration Technology at Chengdu University of Technology and the Southwest University of Science and Technology in China. Past director of ASX listed Catalyst Metals Ltd and a current Non-Executive Director of Phosphate Australia Ltd.



Keith Coughlan
Non-Executive Chairman

+30 years' experience in stockbroking/funds management. Largely involved in the funding and promoting of resource companies listed on the ASX, AIM and TSX. Advised various companies on the identification/acquisition of resource projects and previously employed by one of Australia's then largest funds management organisations. Mr Coughlan is a current executive director of ASX listed European Metals Holdings Limited.



Grant Mooney
Non-Executive Director

Mr Mooney has extensive experience in resources and technology markets. Has served as Director and Company Secretary to several ASX listed companies including Director of renewable energy developer, Carnegie Wave Energy Ltd, Barra Resources Ltd, Phosphate Australia Ltd and Wild Acre Metals Limited. Mr Mooney is a member of the Institute of Chartered Accountants Australia.

Appendices- Graphite Resources and Targets

Nunasvaara JORC (2004) Mineral Resource¹ (10% Cg cut-off)

| JORC 2004 Classification | Tonnes | Graphite (%Cg) |
|--------------------------|------------------|----------------|
| Indicated | 5,600,000 | 24.6 |
| Inferred | 2,000,000 | 24.0 |
| Total | 7,600,000 | 24.4 |

Jalkunen JORC (2012) Mineral Resource (5% Cg cut-off)

| JORC 2012 Classification | Tonnes | Graphite (%Cg) |
|--------------------------|------------|----------------|
| Inferred | 31,500,000 | 14.9 |

Raitajärvi JORC (2004) Mineral Resource¹ (5% Cg cut-off)

| JORC 2004 Classification | Tonnes | Graphite (%Cg) |
|--------------------------|------------------|----------------|
| Indicated | 3,400,000 | 7.3 |
| Inferred | 900,000 | 6.4 |
| Total | 4,300,000 | 7.1 |

Talga Graphite Exploration Targets ²

| Project | Exploration Target | Tonnes (0-100m Vertical Depth) | | Graphite (% Cg) | |
|----------------------|--------------------|--------------------------------|--------------------|-----------------|-----------|
| | | Min. | Max. | Min. | Max. |
| Vittangi | Nunasvaara | 62,400,000 | 93,600,000 | 20 | 30 |
| | Kotajärvi | 16,640,000 | 30,160,000 | 20 | 25 |
| | Maltosrova | 20,800,000 | 52,000,000 | 20 | 25 |
| Jalkunen | Tiankijokki | 2,600,000 | 5,200,000 | 15 | 25 |
| | Nybrännan | 5,200,000 | 10,400,000 | 20 | 30 |
| | Suinavaara | 2,600,000 | 5,720,000 | 15 | 25 |
| | Lautakoski | 26,000,000 | 52,000,000 | 15 | 25 |
| Subtotal | | 136,240,000 | 249,080,000 | 19 | 27 |
| Rounded Total | | 136,000,000 | 250,000,000 | 18 | 25 |

1 Note: This information was prepared and first disclosed under the JORC code 2004. It has not been updated since to comply with the JORC code 2012 on the basis that the information has not materially changed since it was last reported. The Company is not aware of any new information or data that materially affects the information included in the previous announcement and that all of the previous assumptions and technical parameters underpinning the estimates in the previous announcement have not materially changed.

2 Note: The Exploration Target is based on a number of assumptions and limitations with the potential grade and quantity being conceptual in nature. There has been insufficient exploration to estimate a Mineral Resource Estimate in accordance with the JORC Code and it is uncertain if future exploration will result in the estimation of a Mineral Resource.

References

#) see <http://www.techmetalsresearch.com/metrics-indices/tmr-advanced-graphite-projects-index/>

* see Industrial Minerals Natural Graphite report 2012, unpublished reports for Talga, and Scoping Study released to ASX 9 October 2014.

NB) any data not specifically referenced is based on personal communications with industry participants where appropriate and/or unpublished technical research.

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 and Exploration Targets is based on information compiled and reviewed by Mr Simon Coxhell, a consultant to the Company and a member of the Australian Institute of Mining and Metallurgy and Mr Mark Thompson, who is an employee of the Company and a member of the Australian Institute of Geoscientists. Mr Thompson and Mr Coxhell have 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 and Mr Coxhell consent 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. 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.