

*ASX: TLG*

# TALGA RESOURCES

Investor Presentation  
**Goldman Sachs 8th Annual  
Small & Mid-Cap Conference**

27 April 2017 | Sydney





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# INTRODUCTION - WHAT WE DO



Technology minerals company developing and commercialising the worlds highest grade conductive graphite project to mass produce graphene and its carbon derivatives.



- ▶ Talga uniquely placed to own and optimise the graphene supply chain
- ▶ Board and management team in place with substantial commercialisation experience
- ▶ 100%-owned upstream source material is the world's highest grade graphite resource<sup>1</sup>
- ▶ In-house development capability to commercialise graphene products in collaboration with industry majors
- ▶ Formal agreements executed with well capitalised commercialisation partners to manufacture graphene products for 4 key markets
- ▶ Talga is rapidly transitioning towards monetisation with maiden graphene revenues expected in 2Q 2017



# CORPORATE SNAPSHOT



## FINANCIAL INFORMATION

Share price ( <b>ASX code TLG</b> ) (24-Apr-17)	A\$0.79
52 week low / high	A\$0.21/ A\$0.79
Shares outstanding <sup>1,2</sup>	181.9m
<b>Market Capitalisation</b>	<b>A\$144m</b>
Cash (31-Dec-16)	A\$7.8m
Debt (31-Dec-16)	Nil
<b>Enterprise value</b>	<b>A\$136.2m</b>

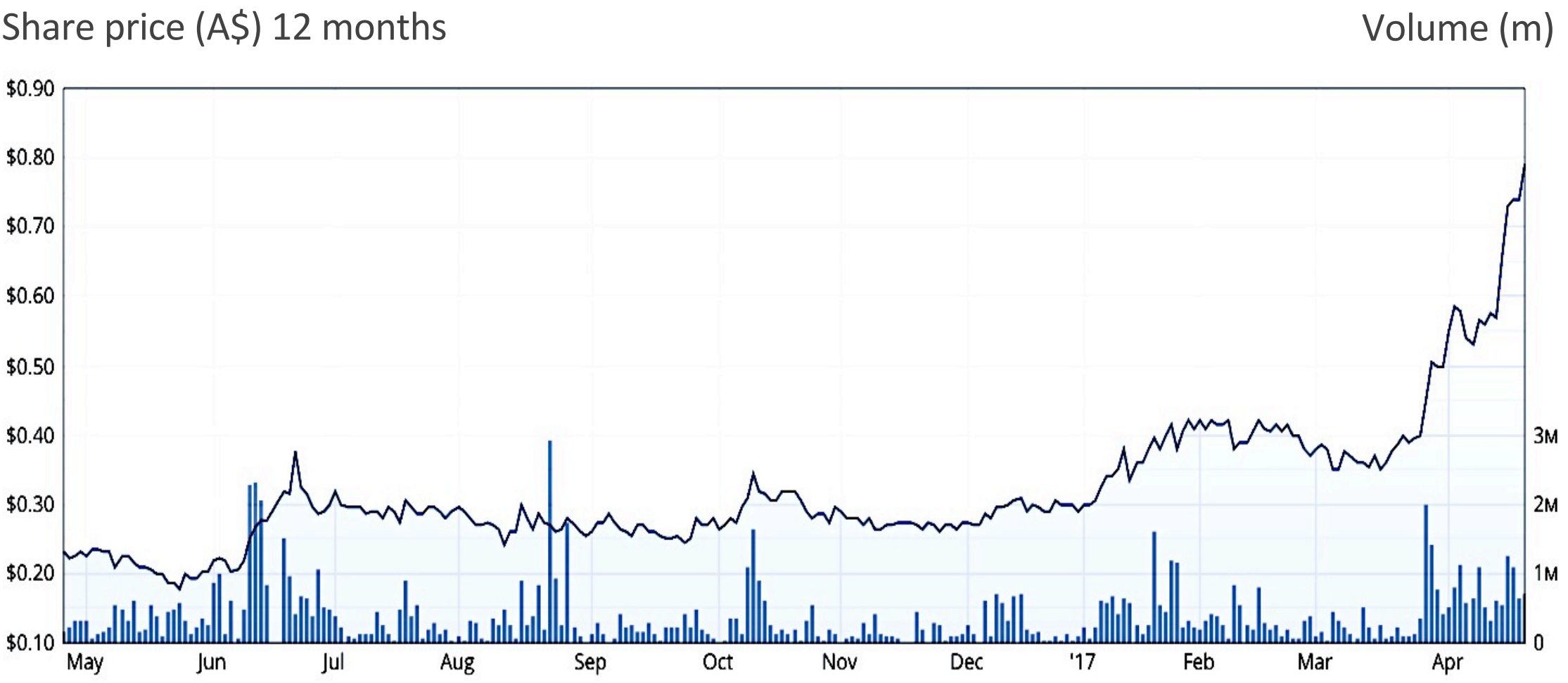
Source: IRESS, company filings. As at 24 April 2017.

1. Excludes 44.9m listed options (TLGOA) with exercise price A\$0.45 and expiring 31 Dec 2018

2. Excludes 28.7m unlisted options (employees and directors) with exercise price range A\$0.35-A\$0.60 and expiry date range of 4 Oct 2018 to 17 Dec 2020



## SHARE PRICE PERFORMANCE



## MAJOR SHAREHOLDERS

Smedvig - <i>Scandinavian based family office</i>	11.3%
Mark Thompson - <i>Managing Director</i>	7.8%
Citicorp Nominees	3.4%
Kamberg Investments	3.3%
HSBC Custody Nominees (Australia)	3.0%
Yandal Investments - <i>investment entity associated with Mark Creasy</i>	3.0%



# BOARD AND MANAGEMENT

Substantial commercialisation experience with some of Australia’s best known innovation and development projects



**Terry Stinson**  
**Non-Executive Chairman**

Former President & CEO of Synerject LLC, and Vice President Manufacturing of Fortune 500 company, Outboard Marine  
  
Current Managing Director and CEO of Orbital Corp (ASX: OEC)



**Mark Thompson**  
**Managing Director**

Founder and former Director of Catalyst Metals (ASX: CYL), Current Non-Executive Director of POZ Minerals (ASX: POZ)  
  
Member of Australian Institute of Geoscientists and the Society of Economic Geologists



**Grant Mooney**  
**Non-Executive Director**

Current Director of Carnegie Energy (ASX: CCE), Barra Resources (ASX: BAR) and POZ Minerals (ASX: POZ)  
  
Wealth of senior management experience in resources and technology markets



**Steve Lowe**  
**Non-Executive Director**

Current business manager for Creasy Group and Non-Executive Director of Coziron Resources (ASX: CZR)  
  
Former Chairman and Non-Executive Director of Sirius Resources (formerly ASX: SIR)



Managed the manufacturing division of the outboard marine propulsion products for a privately held US\$1bn multinational.



Oversaw the evolution of Carnegie Wave Energy from 2008 as it developed innovative renewable energy solutions in Australia.



Oversaw the company during the discovery and development of one of the largest Cu/Ni discoveries in Australia in the last 30 years.



Managed the company from 2000 to 2002 including the introduction of several new sales products.



Has led Orbital since 2008 and successfully secured a breakthrough deal with Insitu Inc. (Boeing) for the supply of global unmanned aerial vehicle propulsion systems worth up to A\$120m over a 3 year period.



# TALGA DIFFERENCE



Technology minerals company developing and commercialising the worlds highest grade conductive graphite project to mass produce graphene and its carbon derivatives.

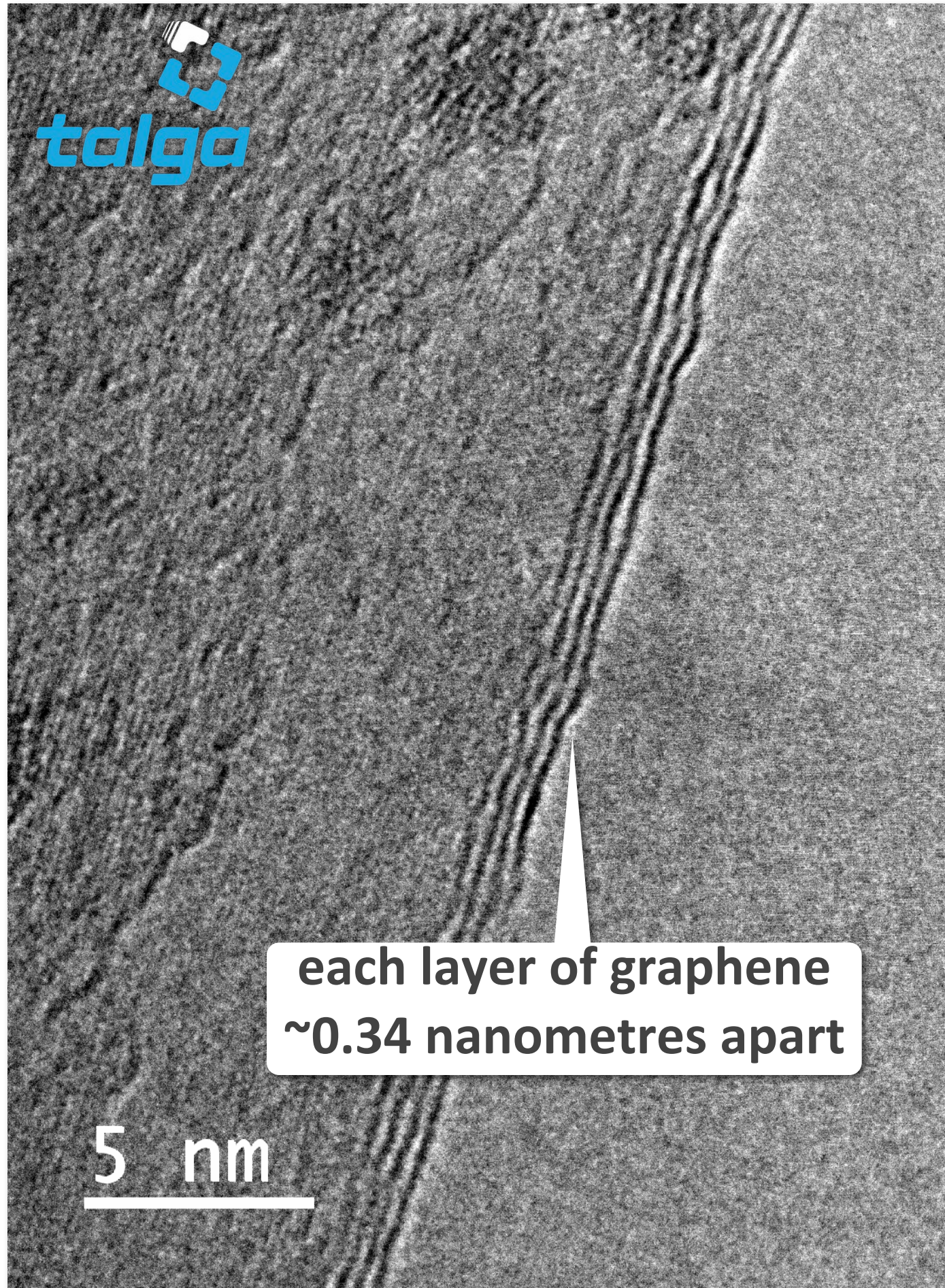


- ▶ Potential to be the worlds largest volume, best margin supplier of graphene and micrographite materials
- ▶ Own 100% of a 'freak' ore body in tier 1 mining and technology materials destination
- ▶ Mining doesn't require drilling or blasting of ore – 100% owned processing technology
- ▶ Low capex/opex/funding requirements
- ▶ Not constrained to one market - big value proposition to remove a supply and pricing bottleneck across multiple large markets
- ▶ Business model revolves around making real world products perform better and with new functionality today
- ▶ End users currently validating the strategy to deliver business case
- ▶ Talga's markets totally different to flake graphite players with exception of batteries
- ▶ Talga is doing it now, not talking about it



# WHAT IS GRAPHENE?

Graphene is an extraordinary material with almost limitless potential uses.  
It is altogether the lightest, strongest most conductive material in the world.



**Graphene** is the thinnest substance ever made: a single sheet of carbon atoms arranged in a hexagonal honeycomb pattern. Stiff as diamond and 100's times stronger than steel — yet flexible, it conducts electricity faster at room temperature than any other known material.

Graphene can be added to many materials to impart superior **strength** and **conductivity** or enhanced **functionality** such as memory, self-healing or thermal capabilities. This can make advanced materials that are more:

- ▶ **efficient** (lighter, stronger, faster)
- ▶ **functional** (conduct electricity or temperature)
- ▶ **sustainable** (higher efficiency, lower enviro-footprint, longer life)

Talga's graphene has been measured and tested by various and prestigious universities and scientists, including peer review studies and the ultimate test  
- does it work in a product

Talga has trademarked it's graphene as Talphene™ in preparation for commercialisation of value-added products



# TECHNOLOGY ADVANTAGE

Concept demonstration of Talga exfoliating graphene direct from its Swedish graphite ore





# TALGA OPERATIONS



Vertically integrated carbon production operations based in Europe will provide a significant cost advantage.

1.

## Upstream Source

### Talga Mining Pty Ltd Filial, Sweden

- ▶ 100%-owned flagship graphite project near Kiruna in Northern Sweden
- ▶ World's highest grade graphite resource (JORC/NI43-101)
- ▶ Ore is a semi-conductor straight from ground
- ▶ Allows solid graphite electrodes to be cut straight from surface

2.

## Midstream Processing

### Talga Advanced Materials GmbH, Germany

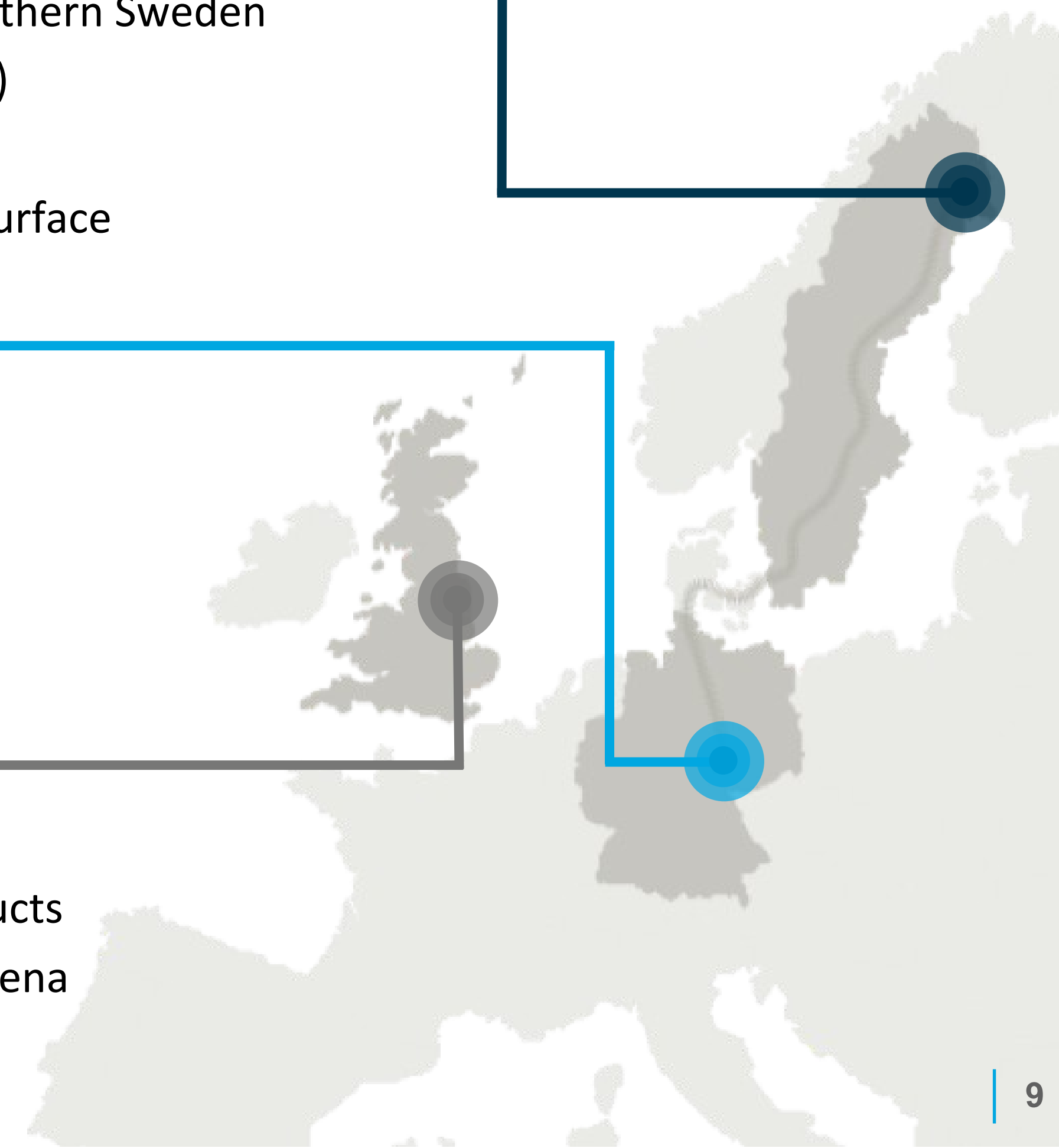
- ▶ 100%-owned test facility located in Rudolstadt, Germany
- ▶ Phase II expansion commissioned in September 2016
- ▶ Current ore treatment capacity of ~30tpa (max)
- ▶ Phase III design and engineering at final stages

3.

## Downstream Product Development

### Talga Technologies UK Ltd, United Kingdom

- ▶ Small product development team based in Cambridge
- ▶ In-house technology and skills to create 'value-add' products
- ▶ Currently collaborating with partners such as Tata Steel, Jena Batteries, Haydale, Zinergy UK and Chemetall (BASF)



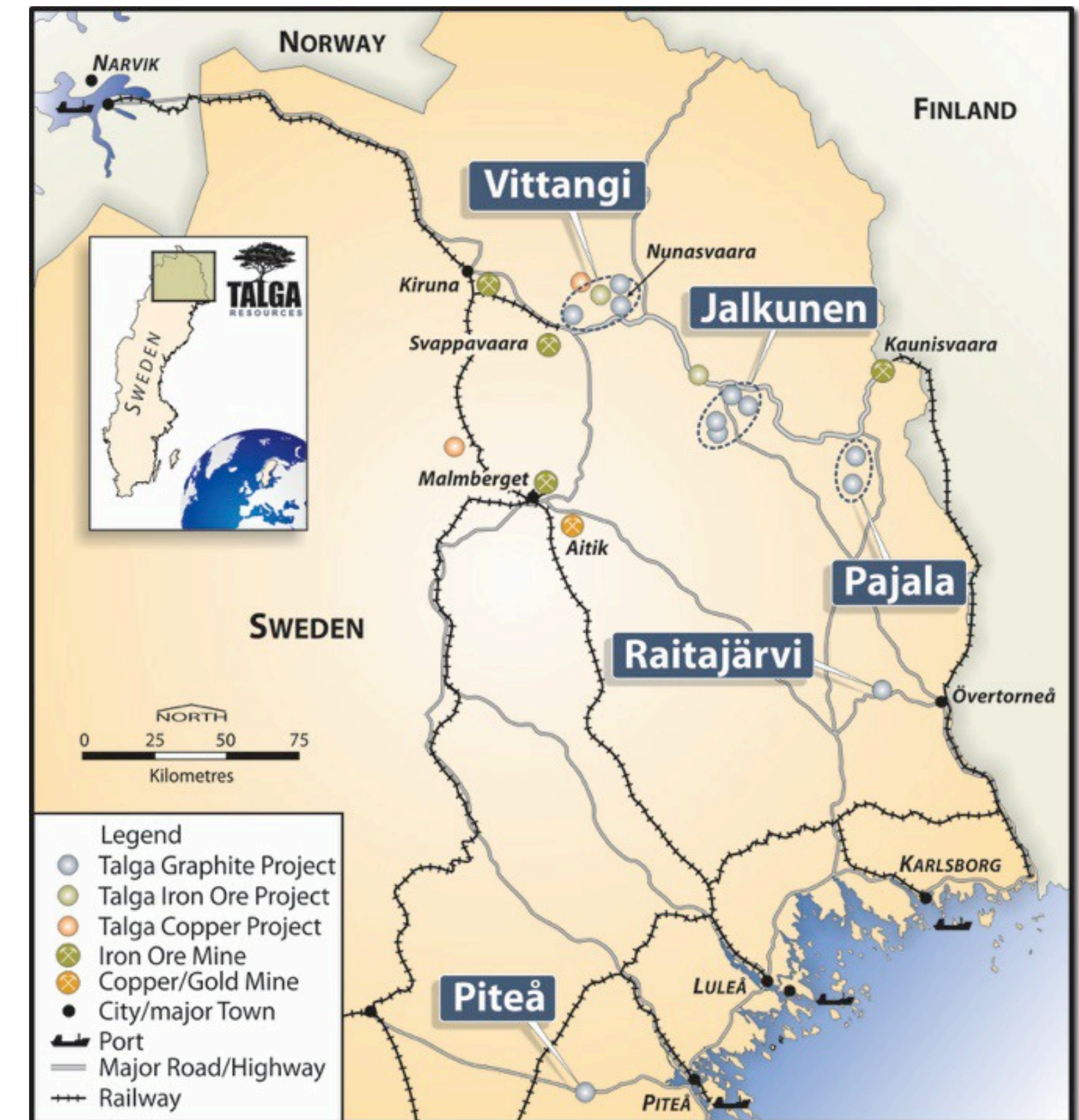


# 1 UPSTREAM SOURCE: VITTANGI GRAPHITE PROJECT



100%-owned upstream asset which is the world's highest grade JORC/NI43-101 graphite mineral resource

- ▶ Talga flagship Vittangi graphite resource located 20km east of LKAB's iron ore mine and railhead at Svappavaara, Sweden
- ▶ Wide, uniform mineralisation starts at surface – can support long mine life and industrial scale production
- ▶ Unique combination of conductivity, morphology, competence and grade all support processing method
- ▶ Vittangi is the world's highest grade JORC/NI43-101 compliant graphite resource
- ▶ JORC Resource of 12.3Mt @ 25.5% Cg
- ▶ Trial mining has demonstrated a quarry mining technique using tailor-made ore block cutting equipment
- ▶ Electrodes are cut from in situ graphite - No crushing or milling required (small footprint, capex, opex)
- ▶ Multi tonne electrode blocks are being stored in Germany and Sweden to feed processing, scale up, R&D and industry samples

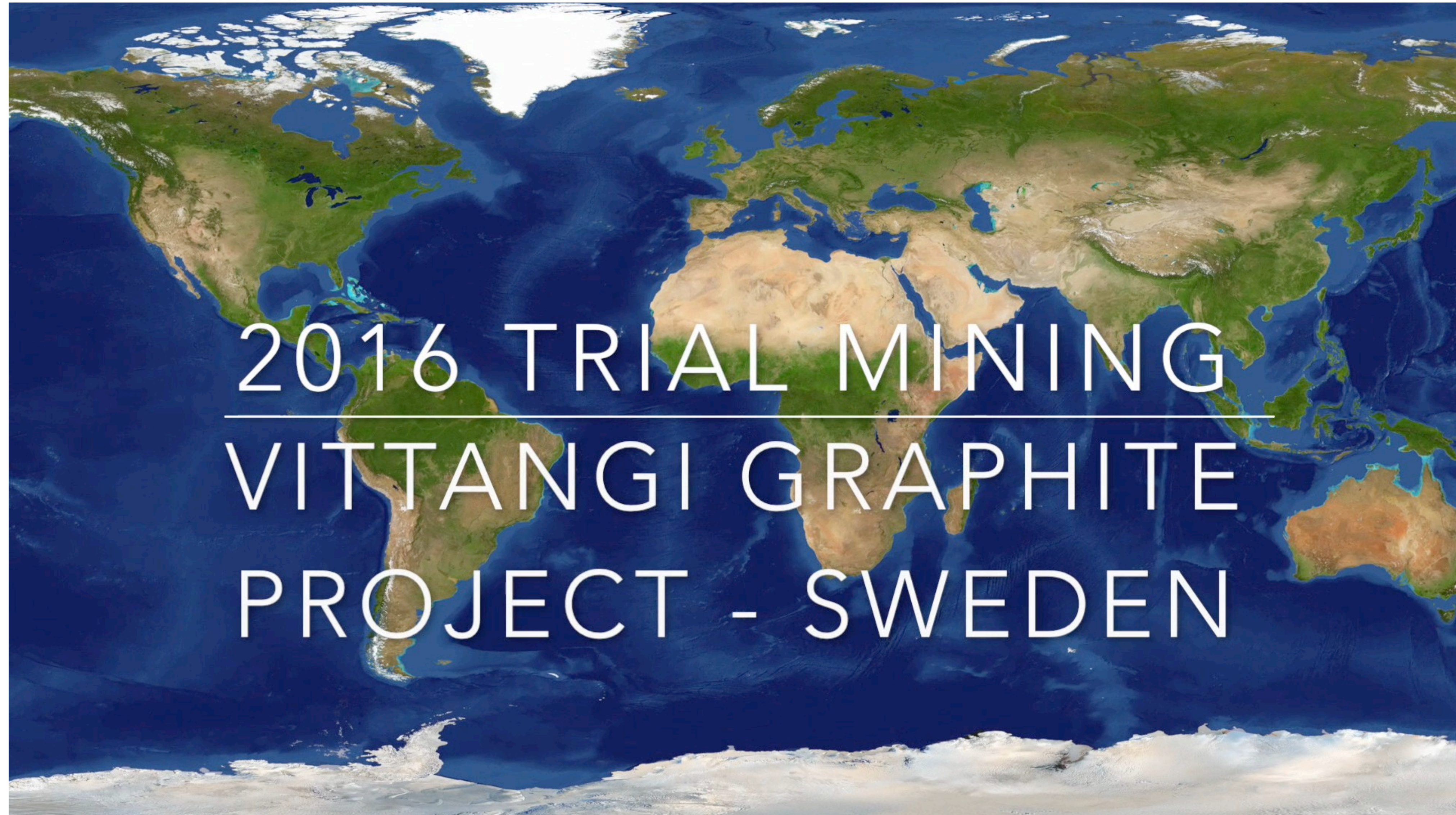


## Operational progress





# 1 UPSTREAM SOURCE: VITTANGI GRAPHITE PROJECT





## 2 MIDSTREAM PROCESSING: TEST PROCESSING FACILITY

Talga successfully commissioned Phase II of its graphene processing facility in September 2016 and is producing graphene samples for several industrial customers

Test facility in Rudolstadt, Germany (process scale-up, R&D, industry samples) processes the shaped raw graphite electrode blocks from Sweden. Current plant can convert up to c. 76% of ore graphitic carbon to graphene and remainder can be sold as micrographite products.

### Phase 1

#### August 2015 - Current

- ▶ ~20L exfoliation cells processing graphite drill core
- ▶ Duplication of this basic design still used in the Talga laboratory

### Phase 2

#### Commissioned September 2016

- ▶ Scale up from Phase 1 – combination of larger exfoliation cells which process up to 50kg shaped graphite slabs each
- ▶ 30tpa ore treatment capacity (max)
- ▶ Consistent graphene and micrographite output for end user trials

### Phase 3

#### Expected 2H 2017

- ▶ Proposed installation of optimised cell and flowsheet design – 5X scale
- ▶ Pre-feasibility study model based on Phase III engineering and costs
- ▶ Economic balance not driven by graphene yield alone – feasibility studies to determine most effective balance of products/raw materials





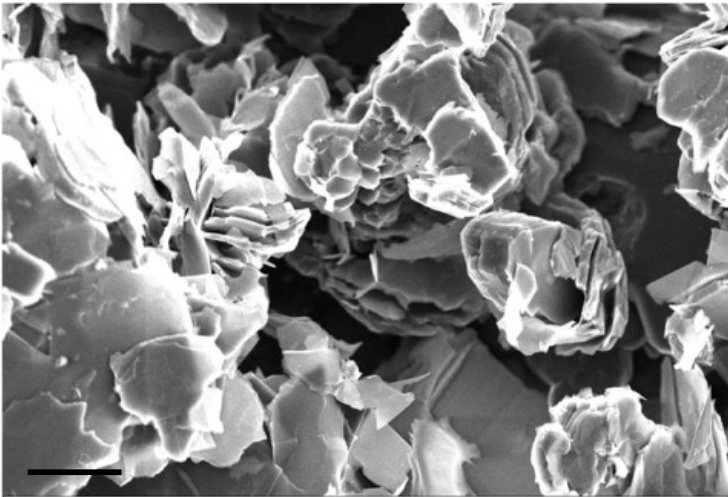

# PROCESS ADVANTAGE



Talga’s patent pending technology produces graphene directly from unprocessed raw graphite ore, skipping intermediate pre-cursor purification steps required by peers

- ▶ Talga uses its unique raw ore directly as an electrode in an electrochemical cell
- ▶ The process liberates graphene and micrographite using a process that is fast, efficient and flexible
- ▶ Process made possible by the unique Vittangi ore
- ▶ Lowers cost of energy and environmental footprint to make graphene and also graphite products such as Li-ion battery anode materials



Talga Graphite	Spheronised Graphite
Talga Processing Steps	Peer Processing Steps
Exfoliate	Crush
↓	Grind Stages
Concentrator single stage	Flotation stages
↓	Micronisation
↓	Purification (chemical/thermal)
↓	Shaping (spheronisation)
↓	Coating
Mix binder and dispersant	Mix binder and dispersant
	
Battery average capacity ~360 mAh/g	Battery average capacity ~360 mAh/g



# 3 DOWNSTREAM: PRODUCT DEVELOPMENT

Talga has in-house 'value added' product development capabilities – starts with internal prototype testing followed by external validation with end users

## Product Development

- ▶ Talga's UK team, based in Cambridge, focuses on developing value-added graphene and micrographite products for key end-user markets
- ▶ Products developed by Talga are important to unlock value-add margins (as distinct from 'raw' graphite and graphene revenue)
- ▶ Talphone™, is the brand backbone behind Talga graphene enhanced products



*Talphone™ enabled liquid dispersion products*

## Research Partners

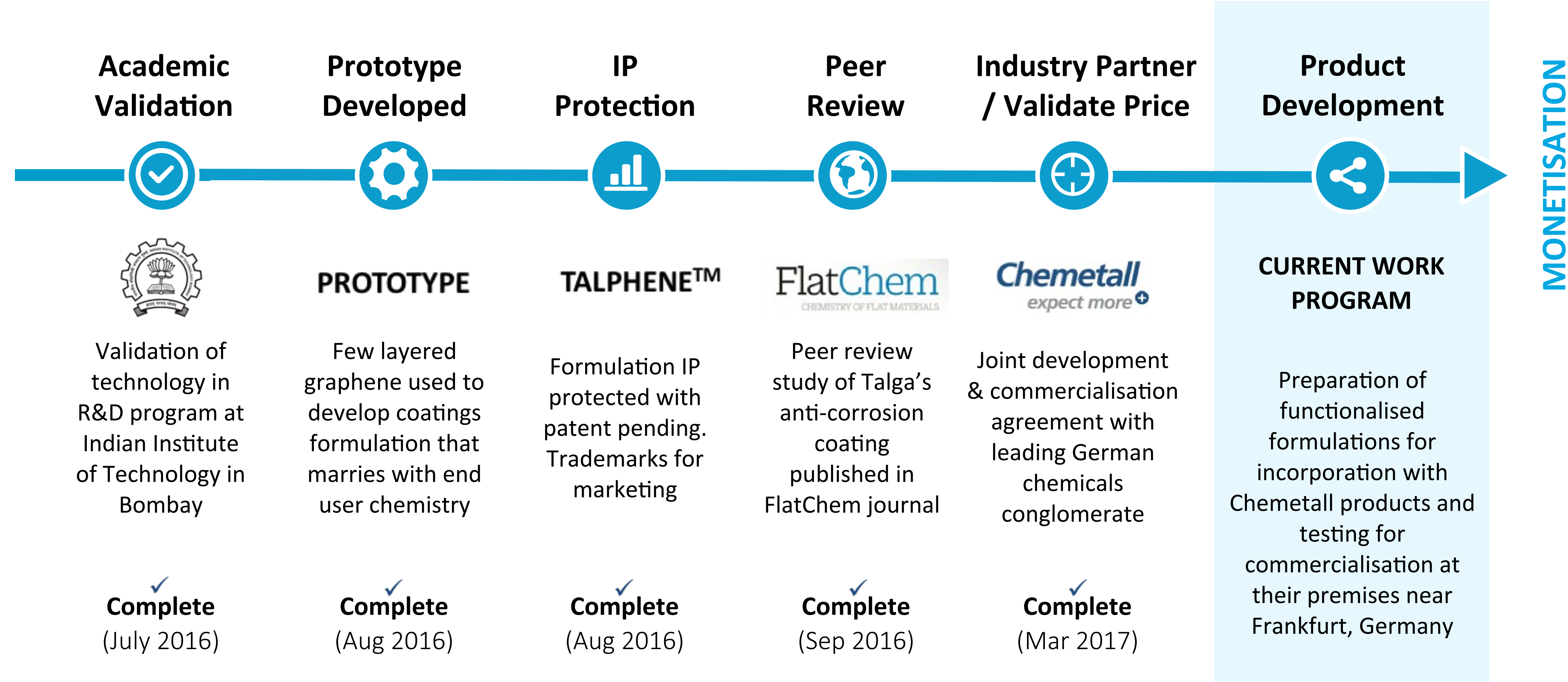
- ▶ Talga's product development team collaborates with industry leading partners to accelerate the commercialisation of its graphene and micrographite products
- ▶ Resources are shared and various intellectual property agreements are in place to ensure commercial protection of Talga's developments





# STRATEGY IN ACTION: ROADMAP FOR COATING PRODUCTS

Talga’s most advanced product development highlights the Company’s ability to execute on its strategy of targeting large end users and securing commercialisation agreements





# MARKET OPPORTUNITY FOR GRAPHENE



In addition to raw materials, Talga is focused on the manufacturing and commercialisation of targeted products across 4 key industry sectors

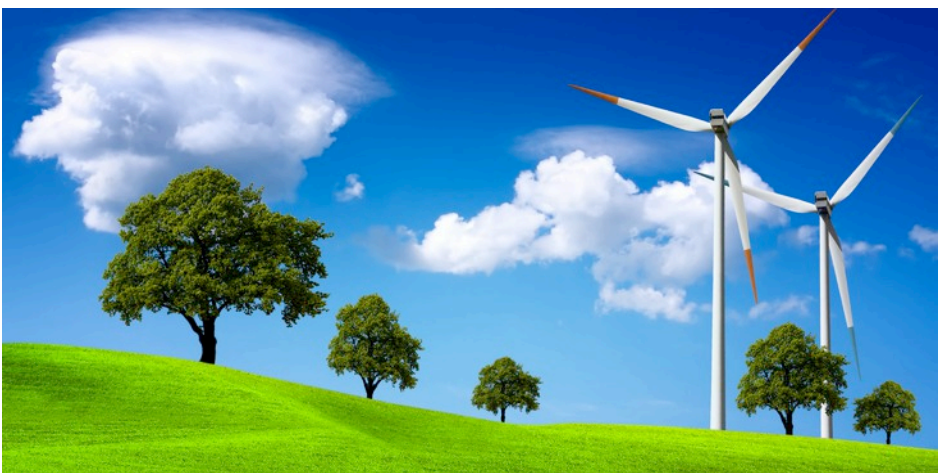


## Construction additives

### Advantages

- Improves concrete durability and impermeability
- Imparts electric and thermally conductive properties
- Reduces concrete used and decreases industry CO2 emissions
- Enables thermal concrete for underground power transmission cables, floor heating, road and bridge snow melting and de-icing

**Immediate market opportunity**  
US\$17bn specialty concrete



## Energy storage (batteries)

### Advantages

- Higher anode performance and lower cost Li-ion, flow and alkaline batteries.
- Flexible, printable batteries for ‘Internet of Things’ and ‘Wearable’ devices
- Lower toxic footprint by enabling water-based battery chemistry
- Lower cost fuel cells

**Immediate market opportunity**  
US\$24bn battery market



## Talphone™ enhanced coatings

### Advantages

- Eco-friendly alternative to toxic chromium based coatings
- Lower cost and superior performance due to reduction in zinc, copper and zircon volumes
- Corrosion protection increased by up to 74% for mild steel
- Eco-friendly anti-fouling for marine

**Immediate market opportunity**  
US\$22bn corrosion protection sector within global US\$120bn



## Carbon fibre composites/resins

### Advantages

- Stronger and lighter epoxy resin systems for carbon fibre and polymer composites
- Enables lightning strike protection and EM shielding in carbon fibre planes
- Replaces copper and aluminium heating elements/wires and reduces weight of EV’s

**Immediate market opportunity**  
US\$18bn composites sector



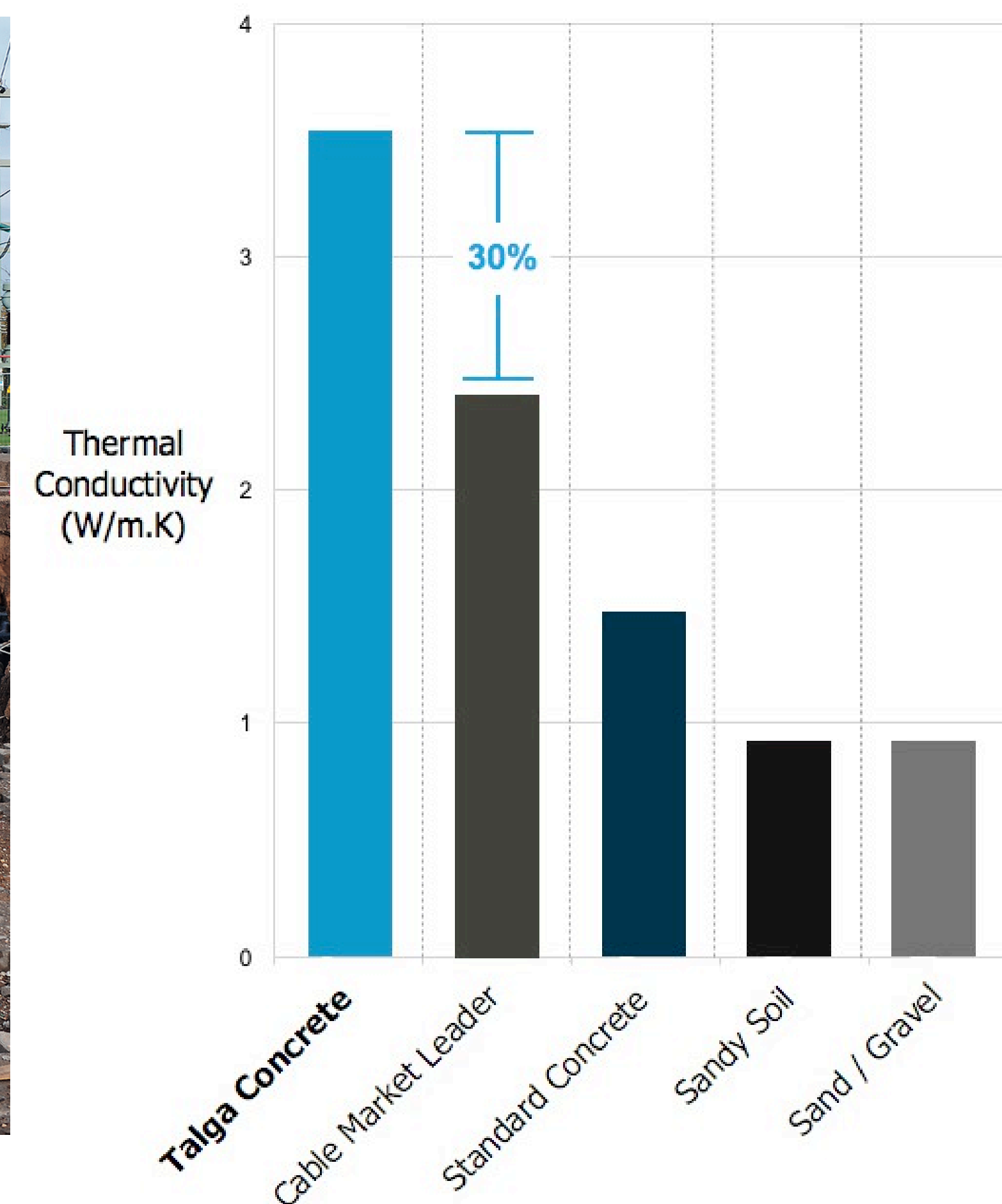
# CONSTRUCTION PRODUCTS

Thermally conductive concrete is a growing market which has potential to be an early adopter of graphene enhanced products.

- ▶ Graphene added to cement can enable concrete to become electrically or thermally conductive
- ▶ Applications include heat dissipation for underground power transmission cables, domestic underfloor heating, road-bridge-tarmac snow melting & de-icing
- ▶ Recent test results of Talga product shows up to 30% more conductivity than market leader
- ▶ German government plans upgrades to >7,500 kilometres of high voltage electric power lines, with significant amount of these installed underground, driving demand in near term
- ▶ Graphene is also proven to strengthen concrete similar to carbon nanotubes but potentially at lower cost. Talga electrically conductive and strengthened concrete products being tested.



*Thermal concrete in underground power line application.*



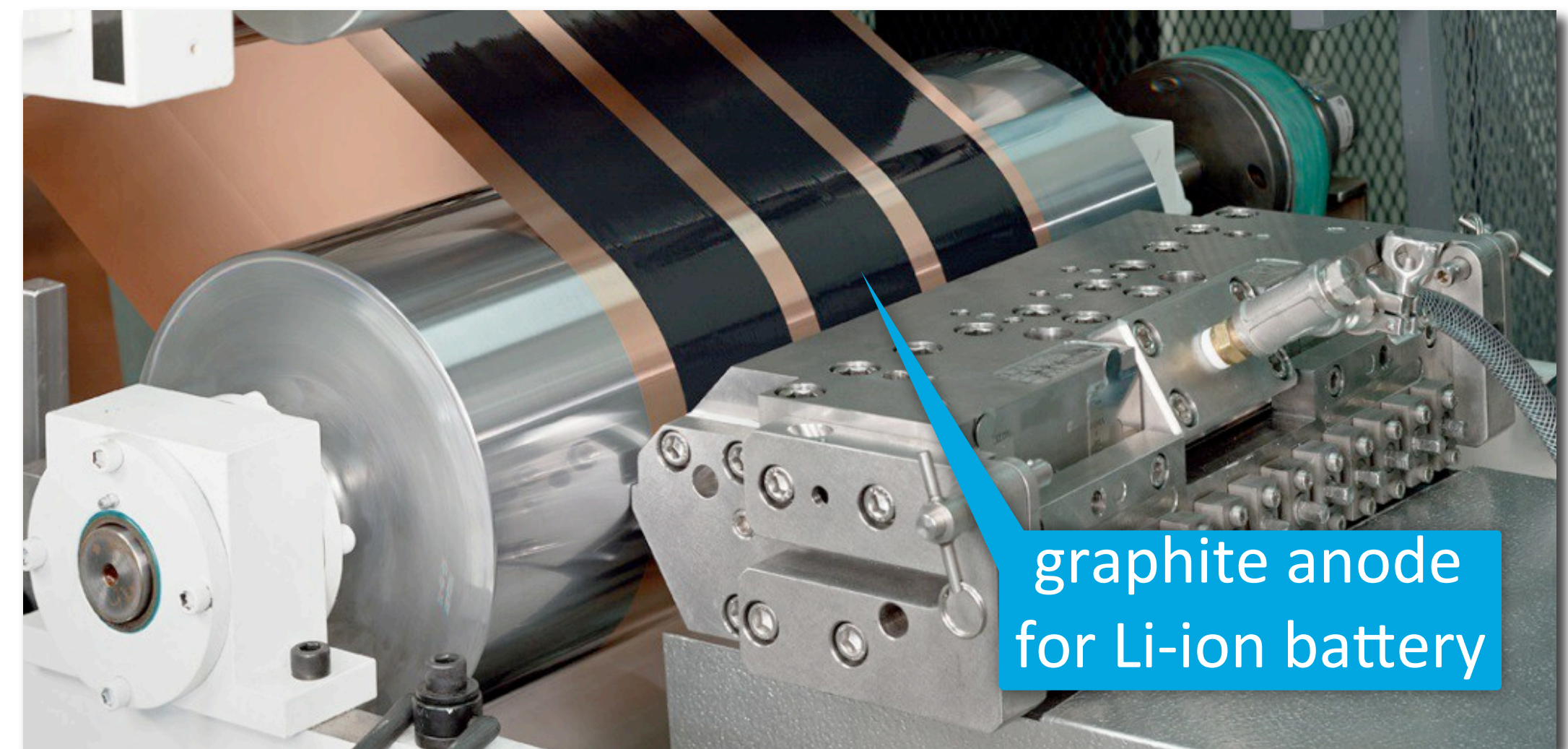
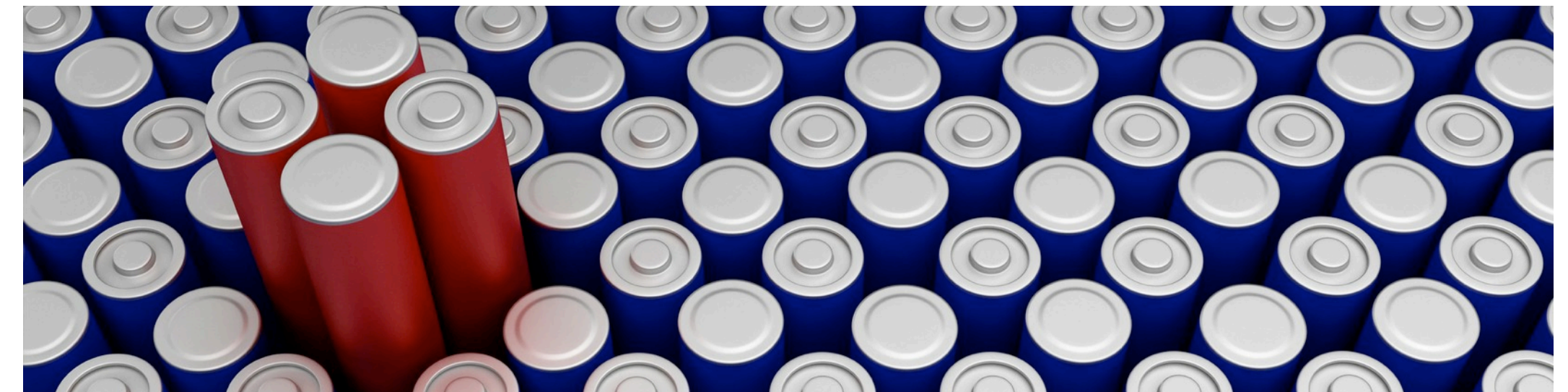


# ENERGY PRODUCTS - BATTERIES



Talga is positioned to supply higher performance and lower cost Li-ion, flow and alkaline batteries with lower manufacturing impact on environment.

- ▶ Talga graphite is proven to make Li-ion battery anodes with less processing steps and lower environmental footprint than other processes (see initial results ASX:TLG 17 Feb 2016)
- ▶ Tests at Energy Innovation Centre of University of Warwick UK show excellent stability and greater than 99.7% efficiency without capacity fade (see ASX:TLG 10 Oct 2016)
- ▶ Data supports commencing industrial Li-ion 'pouch' cell testwork and commercial-style roll to roll anode formulations
- ▶ Talga is targeting to improve current Li-ion batteries by lowering their toxic footprint, enabling water-based battery chemistry and lower manufacturing inputs
- ▶ Test programs are also underway on flexible, printable batteries for 'Internet of Things' and 'Wearable' devices with Zinergy UK Ltd, and high performance high-silicon anodes for Li-ion batteries



*Roll-to-roll preparation of graphite-based anode for Li-ion battery cell*



# COATINGS PRODUCTS

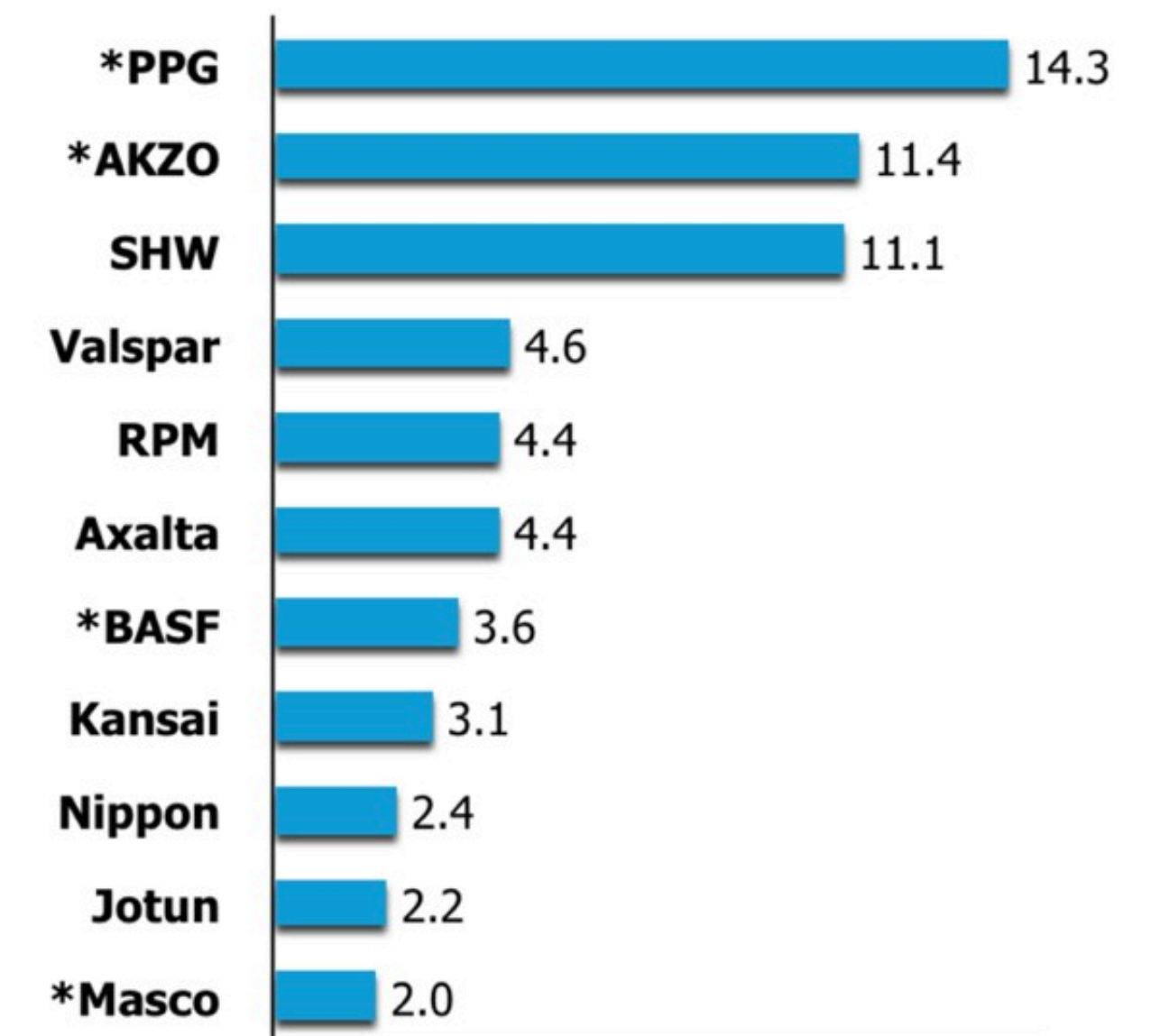


Talga is advancing higher performance coatings with graphene as eco-friendly alternative to chromium, zinc and copper for giant global coatings market

- ▶ In March 2017 Talga signed a Joint Development Agreement (“JDA”) with **Chemetall**, a global business unit of **BASF** Coatings Division, to co-develop and commercialise graphene-enhanced coatings.
- ▶ The JDA aims to set new industry standards for eco-friendly, high performance, corrosion resistant surface treatments (estimated metal protective treatments market size c. USD\$10.4B).
- ▶ Disclosable terms to the Agreement include:
  - Two (2) year product development phase where Talga graphene test samples and products will be sold to Chemetall; and
  - Five (5) year exclusive graphene supply arrangement where Chemetall shall purchase graphene solely and exclusively from Talga in the event that jointly developed products are commercialised (in addition to product development samples).

*Paints and Coatings Market Leaders US\$/annum.*

## Global Leaders by Sales (\$Billion)



*Source: Jan 2016 Valspar Investor Presentation & Company reports.  
\* Excludes non-coating sales*



# COATING PRODUCT - ANTI CORROSION



In ASTM-standard salt exposure tests Talga graphene formulation improves performance over chrome-containing reference. Patent lodged and customer trials in progress.

**COMMERCIAL CHROME-  
CONTAINING REFERENCE**



*After salt spray*

**ASTM B117**

**TALGA GRAPHENE  
PRE-TREATMENT COATED**



*After salt spray*



# COMPOSITES PRODUCTS

## Carbon fibre and paint coating epoxy resins



- ▶ Graphene has been demonstrated (through Talga partner Haydale) to make epoxy resin systems stronger, lighter or conductive
- ▶ Epoxy resins are used to make **carbon fibre**, a lightweight material with growing volume use in aerospace and automotive sectors
- ▶ Current markets include automotive, aerospace and consumer goods products looking for less weight and less fuel use, plus lightning protection (planes and wind turbines)
- ▶ **Anti-fouling marine coatings** market is looking for new epoxy based paint coatings amid growing environmental legislation against currently used toxic metals and chemicals
- ▶ Emerging markets in textiles, plastic and fibres for 'wearable' technologies & 3-D printing
- ▶ Talga is using its coatings graphene technology to test applications in a range of composites and polymer (plastics) materials



# PRODUCTS - ENERGY, COATINGS, COMPOSITES



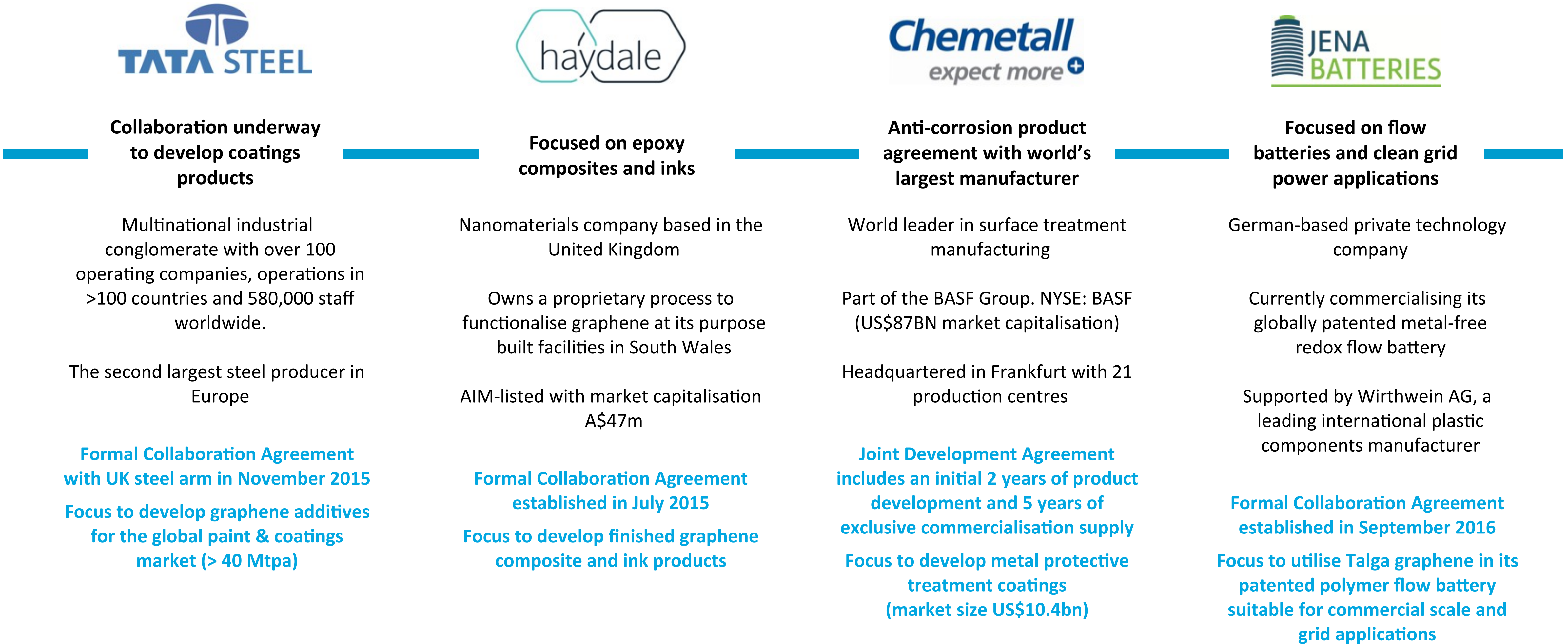
Graphene produces opportunity to deploy our products more widely than just batteries.  
Lighter components increase range and decrease emissions/km travelled





# COMMERCIALISATION PARTNERS TO ACCELERATE DEVELOPMENT

Talga has formal agreements with well capitalised, industry leading partners to accelerate the commercialisation of its graphene products





# WHY IS TALGA UNIQUELY PLACED TO UNLOCK GRAPHENE

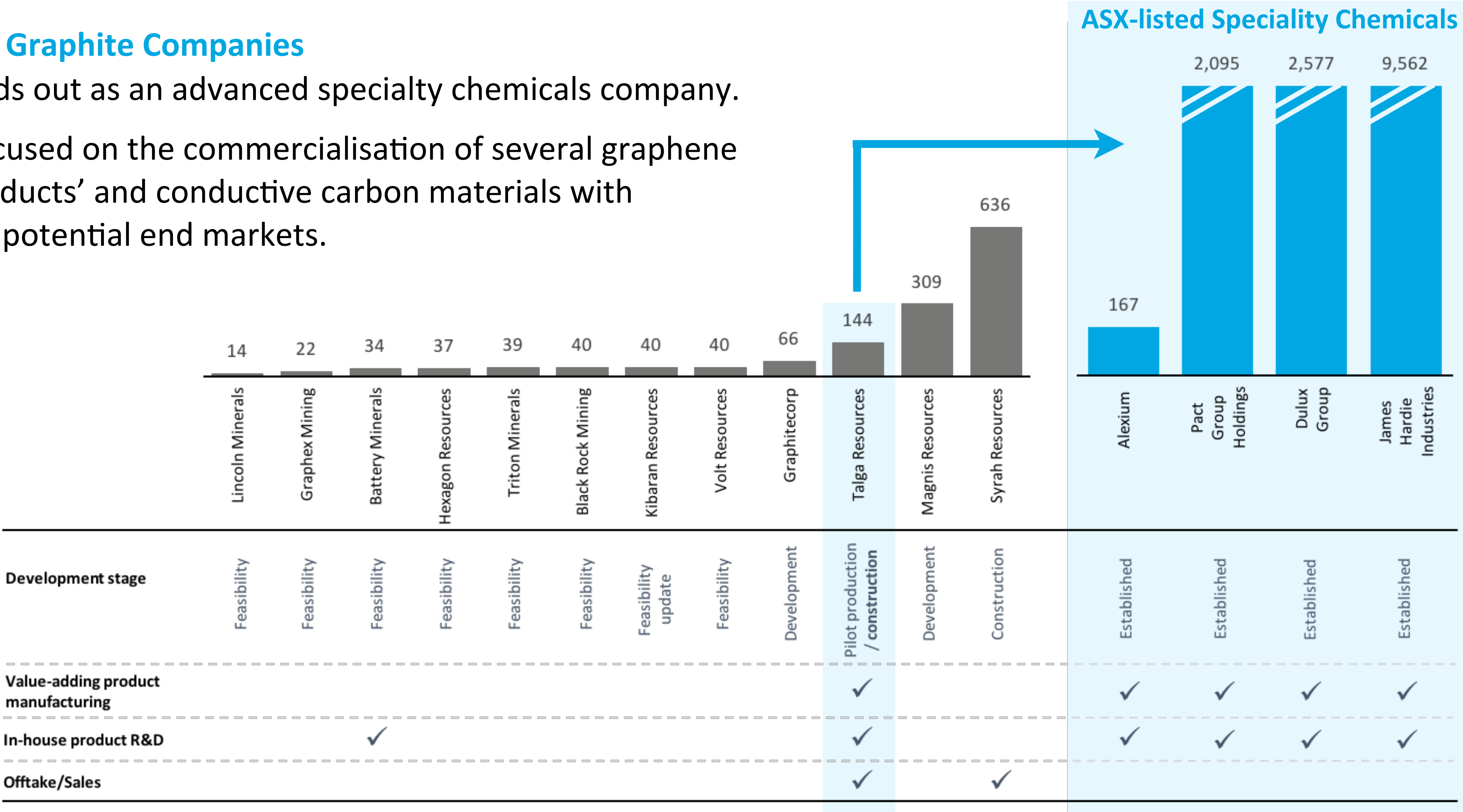


Talga is a unique graphite/graphene company with integration along multiple stages of the value chain

## ASX-listed Graphite Companies

Talga stands out as an advanced specialty chemicals company.

Talga is focused on the commercialisation of several graphene based ‘products’ and conductive carbon materials with enormous potential end markets.





# MONETISATION OF SECONDARY ASSETS

Ongoing work on secondary assets to advance them to a commercialisation decision and maximise shareholder returns

A variety of corporate and operational alternatives to be considered to maximise value to shareholders, including project development, project level joint-venture partnerships, and/or a corporate transaction

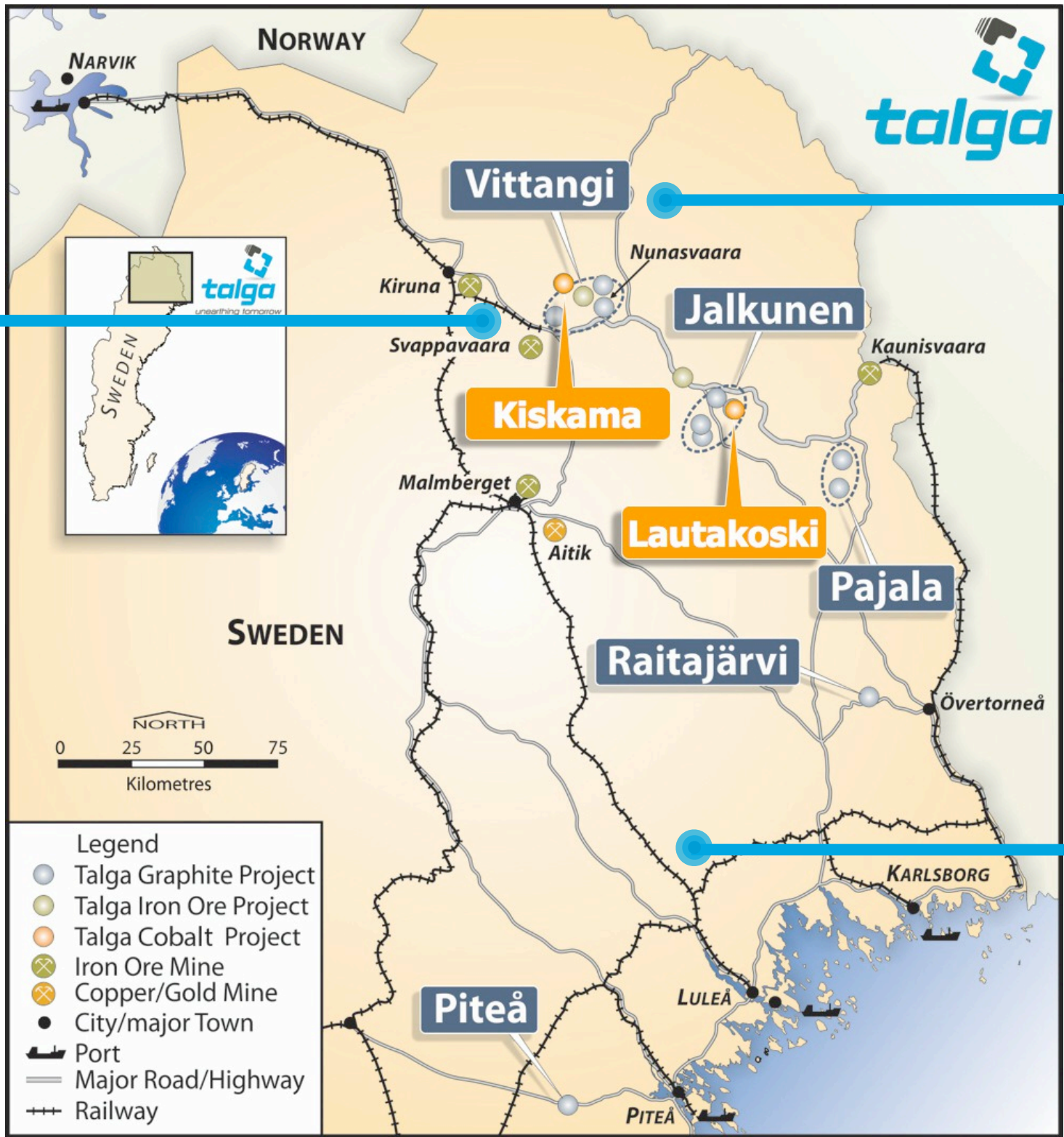
## Kiskama & Lautakoski, Northern Sweden

**Commodity:** Cobalt, gold and copper (IOCG deposits)

**Ownership:** 100%

**Development works:** Multi-tiered cobalt evaluation program underway across Swedish assets

- ▶ Historic core sampling and assaying at Kiskama project to assist in potential maiden JORC resource estimation and economic studies
- ▶ Metallurgy to determine cobalt, copper and gold recovery at Kiskama
- ▶ Cobalt assessment across other Talga projects, such as Lautakoski following exploration discoveries in late 2016



## Vittangi & Masugnsbyn, Norrbotten County

**Commodity:** Iron ore (magnetite)

**Ownership:** 100%

**Resources (JORC 2004):** 123.6Mt @ 32.6% Fe (Vittangi); 112Mt @ 28.6% Fe (Masugnsbyn)

**Development works:** Ongoing assessment of divestiture of non-core assets

- ▶ Initial metallurgy at Masugnsbyn returns 69.3%Fe concentrate

## Various flake graphite projects, Jalkunen/Pajala/Raitajärvi/Piteå

**Commodity:** Graphite (flake)

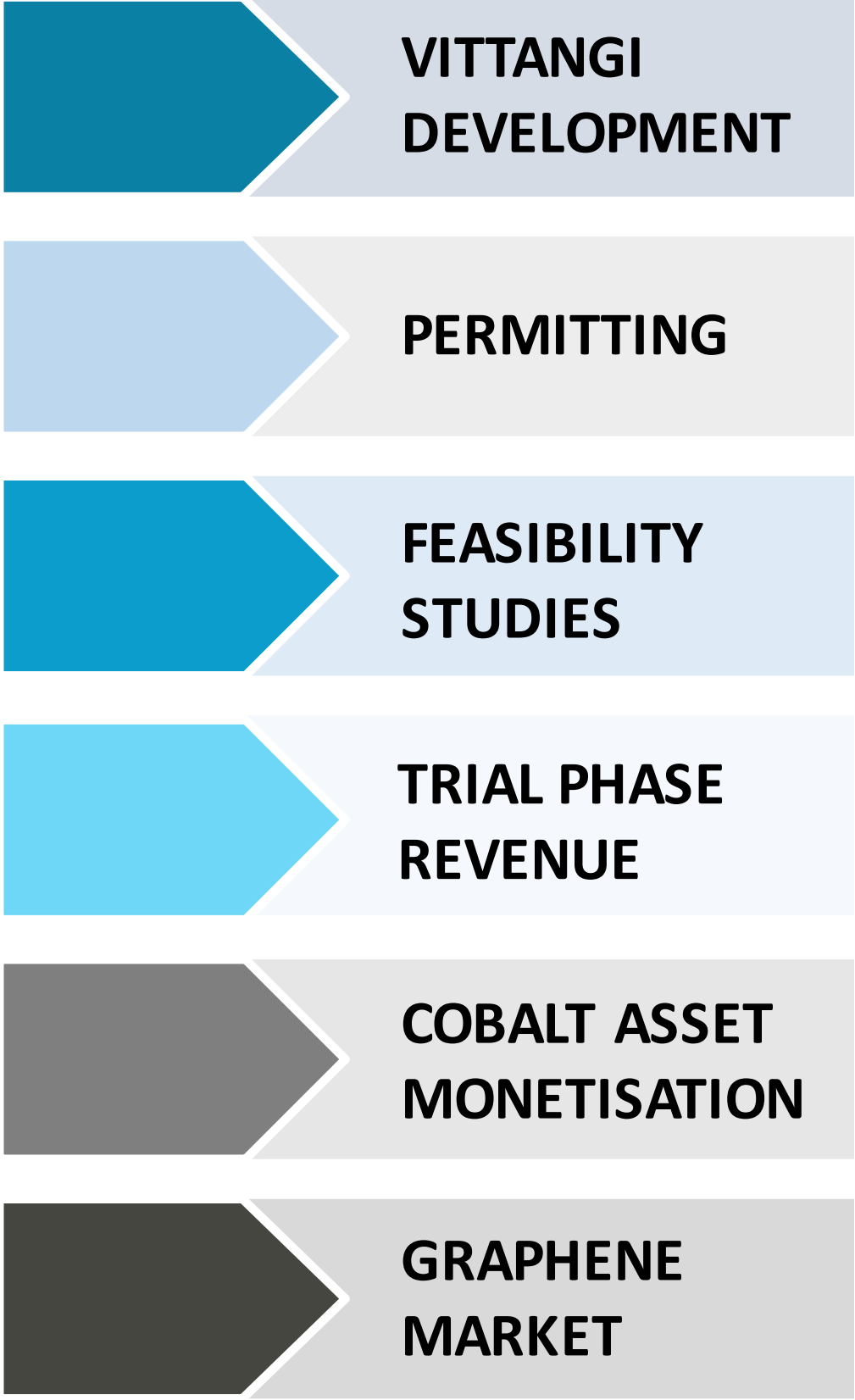
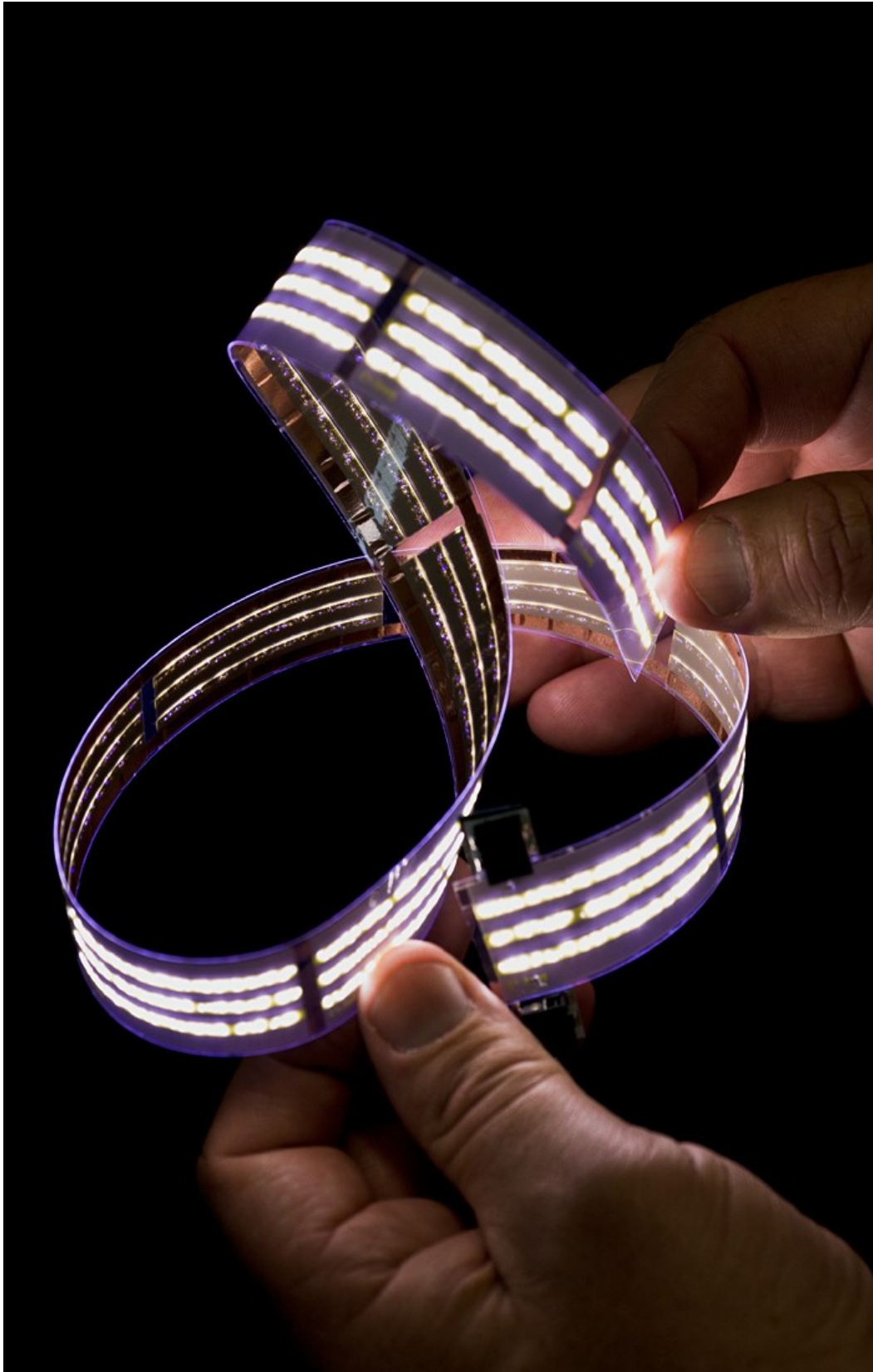
**Ownership:** 100% across projects



# UPCOMING CATALYSTS



## Positioning Talga for commercialisation





# APPENDIX AND STATEMENTS



## Competent Person's Statements

The information in this document that relates to exploration results is based on information compiled by Amanda Scott, a Competent Person who is a Member of the Australian Institute of Mining and Metallurgy (Membership No.990895). Amanda Scott is a full-time employee of Scott Geological AB. Amanda Scott has sufficient experience, which is relevant to the style of mineralisation and types of deposits under consideration and to the activity which has been 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). Amanda Scott consents to the inclusion in the report of the matters based on her information in the form and context in which it appears.

The information in this report that relates to Graphite Resource Estimation for the Vittangi Project is based on information compiled by Oliver Mapeto and reviewed by Albert Thamm. Both Mr Mapeto and Mr Thamm are consultants to the Company. Mr Mapeto is a Member of both the Australian Institute of Mining and Metallurgy (Membership No.306582) and Australian Institute of Geoscientists (Member No 5057) and MR Thamm (Member No 203217) is a Fellow Member of the AusIMM.

Both Mr Mapeto and Mr Thamm have sufficient experience relevant to the styles of mineralisation and types of deposits which are covered in this document and to the activity which both are 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 Mapeto and Mr Thamm consent to the inclusion in this 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 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.

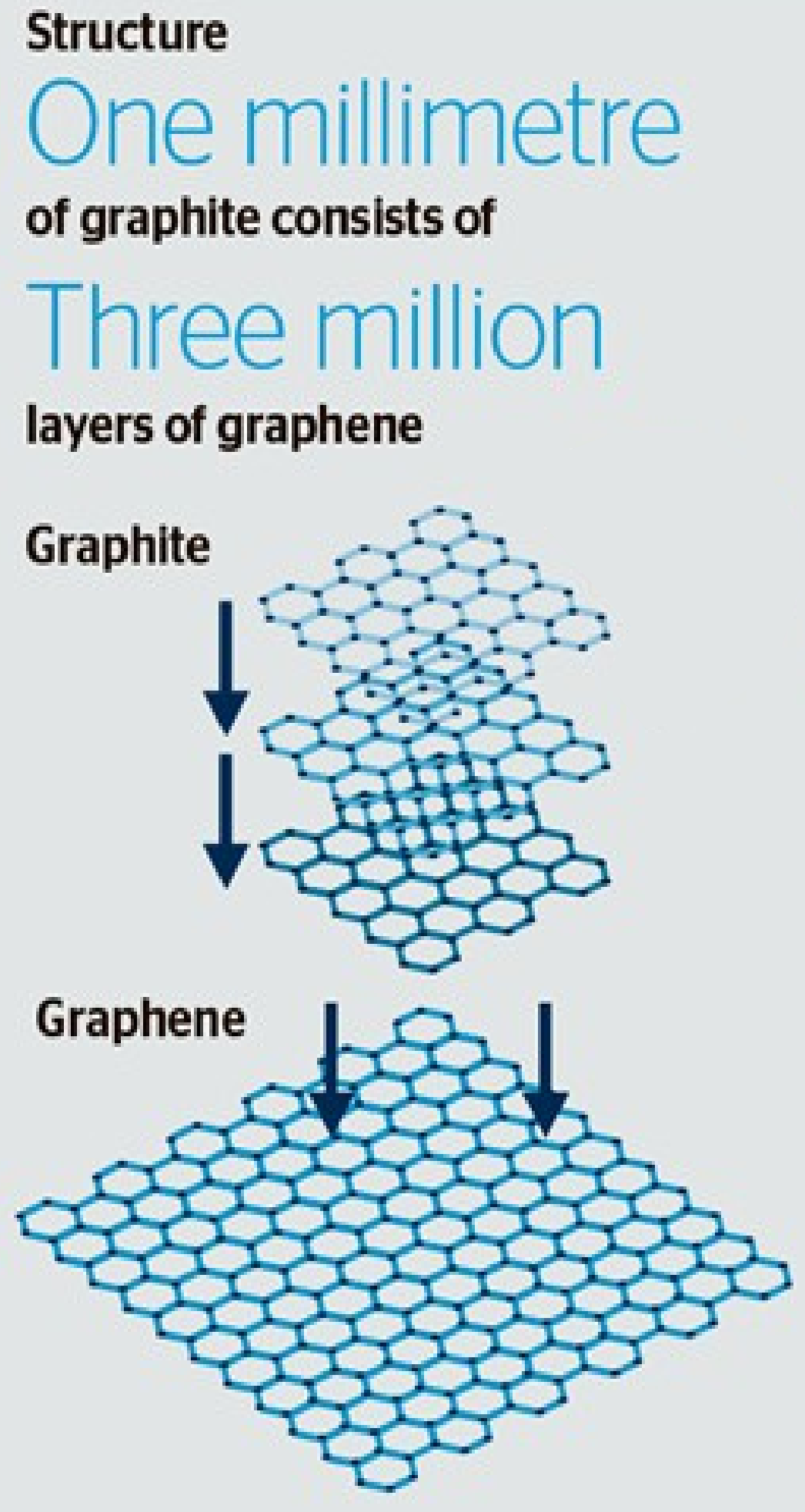
The information in this report that relates to Iron Ore Resource Estimation and Graphite Resource Estimation for the Jalkuen and Raitajärvi Projects is based on information compiled and reviewed by Mr Simon Coxhell. Mr Coxhell is a consultant to the Company and a member of the Australian Institute of 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.

## Cautionary Statement

Any data on 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 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.



# GRAPHENE VS GRAPHITE



- ▶ Graphite - is crystalline carbon, arranged in stacked layers of hexagonal sheets (graphene)
- ▶ Graphene can be made from most any graphite, but the high energy cost and lack of scalable methods is bottleneck
- ▶ Graphite can be processed into 'galaxy' of materials - extraordinary properties increase as you reduce layers
- ▶ Graphene dubbed the 'wonder-material' with potential uses as an additive across almost all physical materials
- ▶ Commercial measure of quality relates to performance of material you add it to



# GENERAL GUIDE TO GRAPHITE-GRAPHENE MARKET

## PRODUCTS AND APPLICATIONS

### GRAPHENE

**vFLG = Very Few Layer Graphene (1-3 sheets)**  
Flexible electronics, Water membranes, Bio-tech

**FLG = Few Layer Graphene (2-5 sheets)**  
Sensors, Conductive ink, Li-Air batteries

**MLG = Multilayer Graphene (3-10 sheets)**  
Functional coatings, Composites, Plastics

**GNP = Graphene Nano Platelets (10-150 sheets)**  
Functional coatings, Fuel cells, Cement and road additives

### GRAPHITE

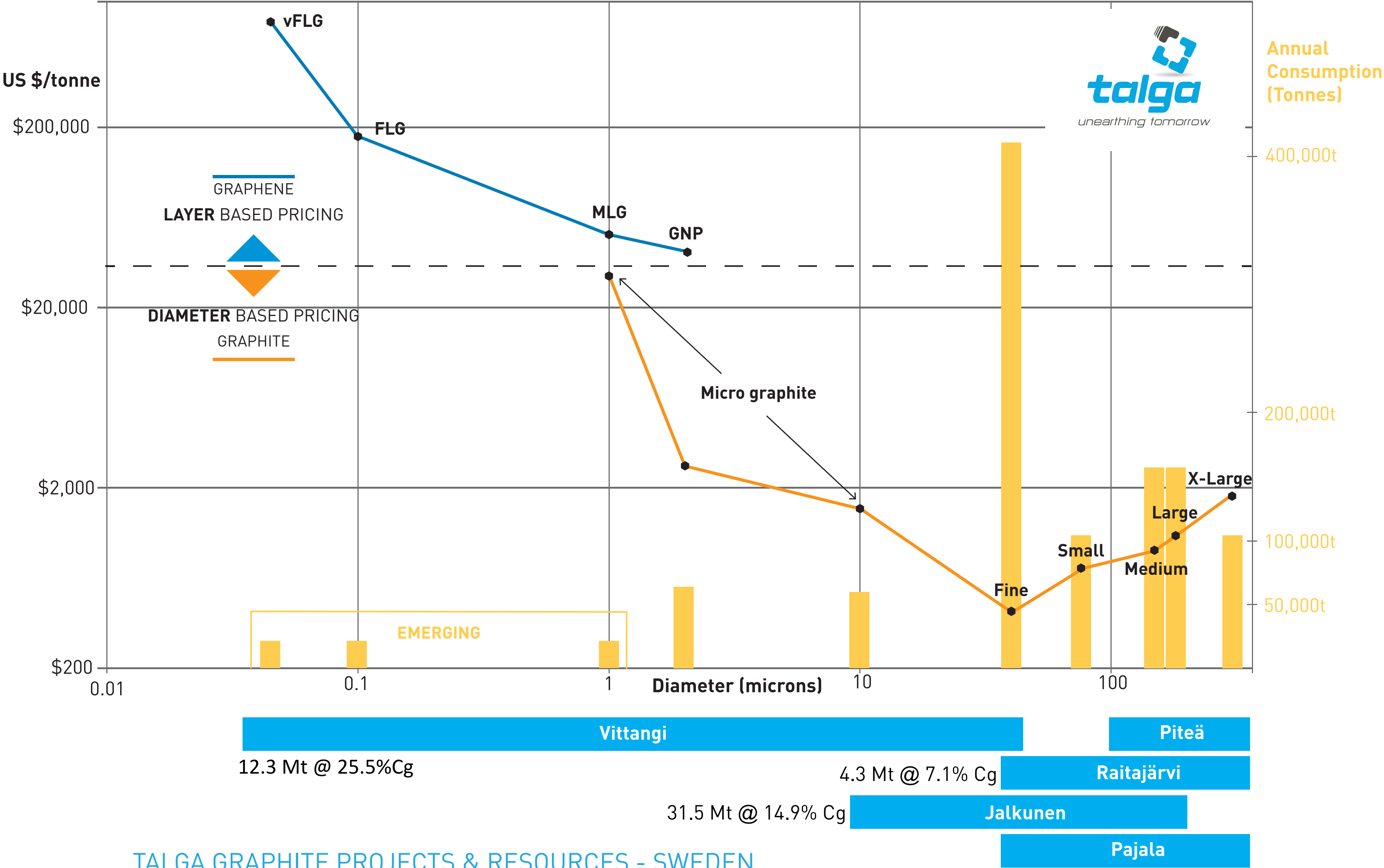
**Micro to X-Large = Flake graphite (>3,000 sheets)**

**Micro** - Insulation and construction products, Lubricants, Pencils, Flame retardants, Additives, Li-Ion batteries

**Fine** - Refractories

**Small-Large** - Recarburisers, Li-Ion batteries

**X-Large** - Various industrial uses



References: Reports of Benchmark Minerals, Industrial Minerals, Fullerex, Roskill, Prographit, internal reports and personal communications



# GRAPHITE JORC RESOURCES AND EXPLORATION TARGETS



*Nunasvaara JORC (2012) Mineral Resource (17% Cg cut-off)*

JORC 2012 Classification	Tonnes	Graphite (%Cg)
Indicated	10,700,000	25.7
Inferred	1,600,000	23.9
Total	12,300,000	25.5

*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 Resource<sup>1</sup> (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 <sup>2</sup> 0-100m Depth*

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.



# 'IRON ORE' JORC RESOURCES AND EXPLORATION TARGETS

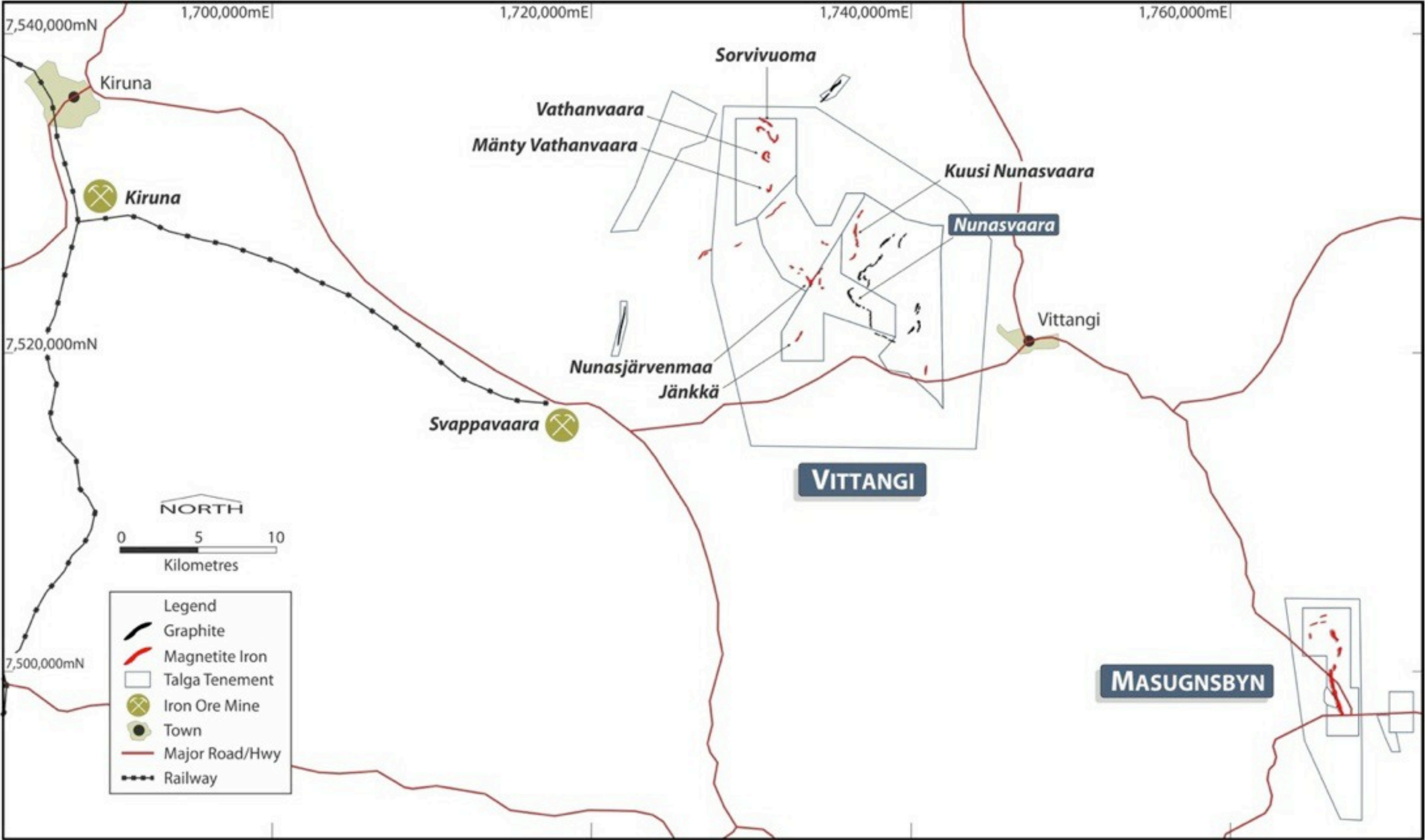


Masugnsbyn JORC (2004) Mineral Resource<sup>1</sup> (20% Fe cut-off)

Deposit	JORC 2004 Classification	Tonnes	Iron (%Fe)
Masugnsbyn	Indicated	87,000,000	28.3
Masugnsbyn	Inferred	25,000,000	29.5
	Total	112,000,000	28.6

Vittangi Iron Project In-Situ JORC (2004) Mineral Resources (20% Fe cut-off)

Deposit	JORC 2004 Classification	Tonnes	Iron (%Fe)
Vathanvaara	Inferred	51,200,000	36.0
Kuusi Nunasvaara	Inferred	46,100,000	28.7
Mänty	Inferred	16,300,000	31.0
Sorvivuoma	Inferred	5,500,000	38.3
Jänkkä	Inferred	4,500,000	33.0
Total		123,600,000	32.6



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: Since the location map was produced updates to the tenement boundaries, status and area may have occurred. Map is for deposit location guide only.