24 MARCH, 2014 ASX: TLG



#### MINES AND MONEY HONG KONG 2014 PRESENTATION

#### Talga Resources Ltd ABN 32 138 405 419

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#### Corporate Information

ASX Code **TLG**Shares on issue **105.1m**Options (unlisted) **3.75m** 

#### Company Directors

Keith Coughlan

Non-Executive Chairman

Mark Thompson

Managing Director

**Grant Mooney** 

Non-Executive Director

Talga Resources Limited (ASX:TLG) ("Talga" or "the Company") is pleased to provide a copy of the presentation to be delivered today by Managing Director Mr Mark Thompson at the *Bulks, Base and Industrial Minerals Day* of the Mines and Money Hong Kong 2014 conference.

The presentation summarises Talga's latest corporate information and focusses on it's wholly owned graphite and graphene projects in Sweden. The presentation will be made available on the Company's website <a href="https://www.talgaresources.com">www.talgaresources.com</a>

The presentation details are as follows:

Date: Monday, 24th March 2014

**Time:** 9.55am

**Venue:** S421, Level 4 Hong Kong Convention and Exhibition Centre

Further information on the Company's development and divestment projects will be available at Talga's **booth E51**.

For further information, contact:

#### Mark Thompson

Managing Director Talga Resources Ltd

Tel +61 (08) 9481 6667

Email admin@talgaresources.com

#### **ABOUT TALGA**

Talga Resources Limited (Talga) (ASX: "TLG") is a diversified mineral explorer and developer with a portfolio of 100% owned graphite, iron, copper/gold projects in Sweden and gold projects in Western Australia.

The main focus is the development of graphite resources in northern Sweden utilising the advantages of exceptional grade deposits, low cost power, established quality infrastructure and short transport distance to high demand markets in Europe.









\* Cover picture; graphite from outcrop, Nunasvaara.



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## **Executive Summary**



SWEDEN

- ▶ Talga Resources Ltd ("Talga") is a **mineral exploration** & **development** company listed on the Australian Stock Exchange ("ASX") since July 2010.
- The Company wholly owns multiple graphite, iron ore and copper/gold projects in Sweden gained through the acquisition of a Teck Resources subsidiary in 2012, as well as Australian gold assets owned since listing.
- ▶ Talga's Swedish assets include the world's highest grade graphite resource¹ and iron deposits with combined total JORC mineral resources¹ of 235.6Mt located adjacent to existing infrastructure.
- The **prime focus** is to develop the **graphite** deposits due to their lower cost capital 'footprint', exceptional location and outlook for graphite demand.
- Upcoming material catalysts include results from upscaling breakthrough graphene production option, preliminary economic studies utilising dual graphite/graphene focus and further finance expected from divestments.

<sup>&</sup>lt;sup>1</sup> See appendices for details of JORC (2004) resources and <u>www.techmetalsresearch.com</u> for world graphite resources grade comparison.

## **Corporate Overview - ASX:TLG**



Board of Directors					
Keith Coughlan	Non-executive Chairman				
Mark Thompson	Managing Director				
<b>Grant Mooney</b>	Non-executive Director				

Doard of Directors				
<b>Keith Coughlan</b>	Non-executive Chairman			
Mark Thompson	Managing Director			
<b>Grant Mooney</b>	Non-executive Director			

Share Price 12 months to 18/3/2014							14	ASX:TLG			
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Capitalisation Summary at 21/3/2014		
Ordinary Shares	105.1M	
Unlisted Options <sup>1</sup>	3.75M	
Cash (approx, at 21/3/2014)	\$1.7M	
Debt	\$0.0M	
Market Capitalisation (full diluted @ \$0.13)	\$14.1M	

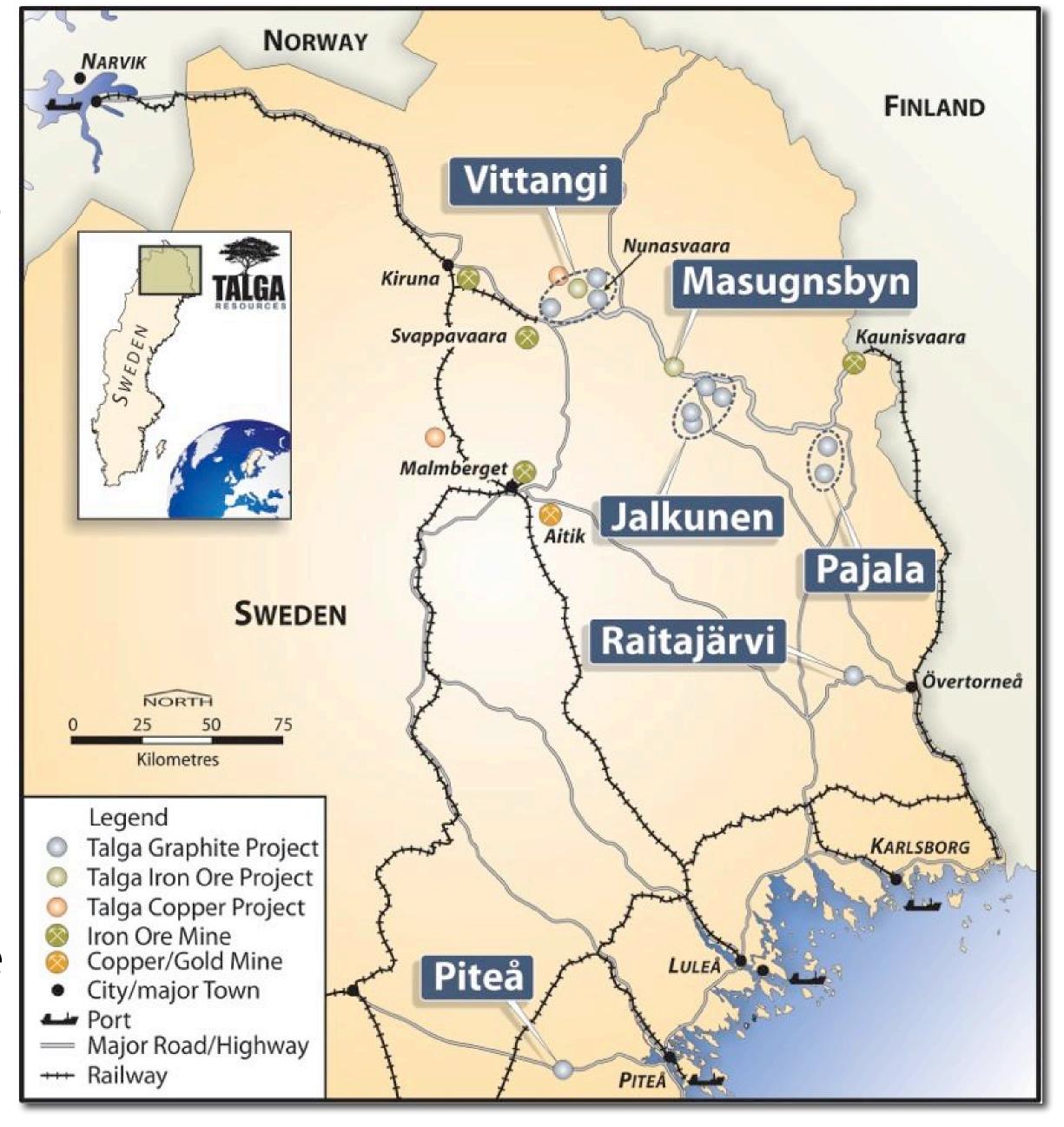
Top Shareholders (+3%) at 21/3/2014	
Lateral Minerals Pty Ltd (M. Thompson)	8.8%
Two Tops Pty Ltd	4.5%
Yandal Investments Pty Ltd	3.4%

**Top 20 own 45%** 

<sup>&</sup>lt;sup>1</sup>2.75m @ 40c director exp 30.11.2014, 0.5m @ 35c employee exp 21.7.2015, 0.5m @ 45c employee exp 3.10.2016

#### Talga's Graphite Projects

- ▶ 100% ownership of five graphite projects with multiple deposits offering the *full range* of market size specifications.
- ➤ Two advanced stage projects in the development pipeline. These are drilled to JORC Indicated status and preliminary economic studies are underway;
  - Nunasvaara is a microcrystalline flake deposit with the highest resource grade in the world. It is located within the *Vittangi* project.
  - *Raitajärvi* is a **coarse flake deposit** with 49% of flake classified large to jumbo size.
- Piteå is our third high priority project; At an earlier stage of drilling but exceptionally well located and contains predominantly XL-size (jumbo) flake graphite.

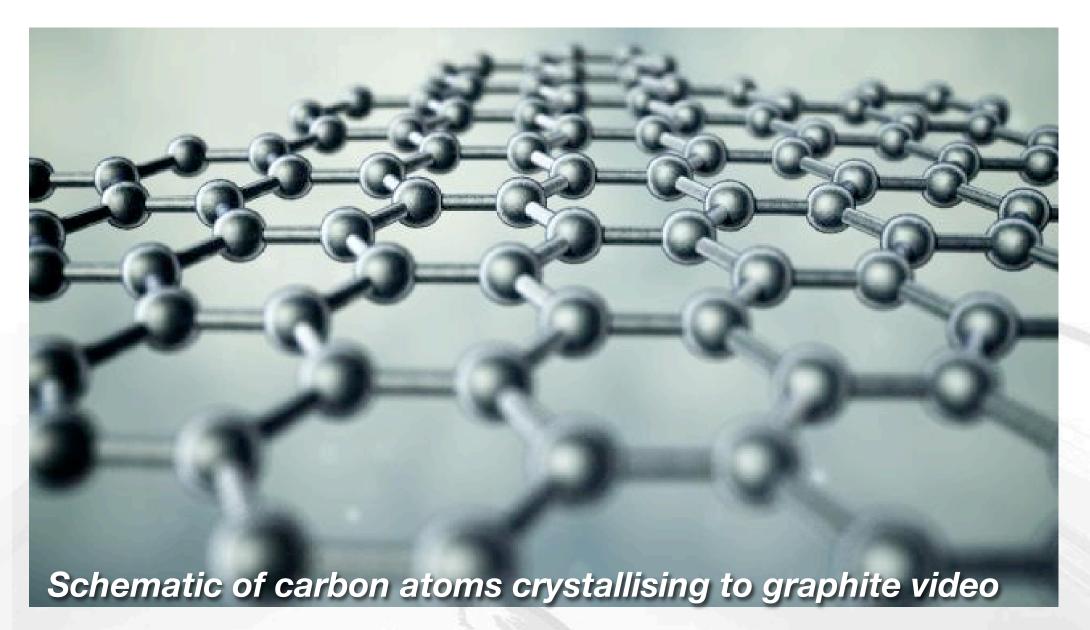


#### Talga projects proximal to established mining, milling and transport infrastructure



### What is Graphite?

- **Graphite** is a crystalline form of carbon that most commonly forms when carbon-rich rocks undergo metamorphism (pressure/temperature induced change).
- Graphite (the mineral) consists of parallel sheets of carbon atoms in a hexagonal lattice. The individual sheets, one or few atoms in thickness, are called **graphene**.
- Graphite has an exceptionally high melting point, and very high thermal and electrical conductivity as well as other remarkable **properties** that make it useful for a large range of applications.
- It can be synthesised from petroleum coke but the process is very energy intensive and costly compared to the production of natural graphite by mining.
- Recovering graphite by mining involves normal open cut or underground methods followed by crush/grind and flotation similar to base metal deposits. Further purification, chemical and shaping may be required to form an end product.



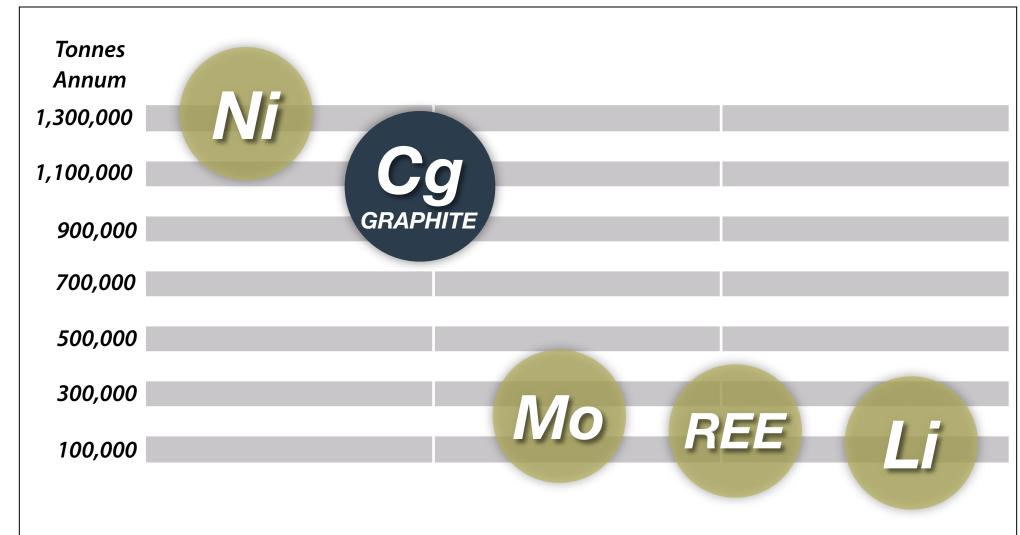


### Natural graphite market

- Natural graphite demand is about 1.1Mt/yr, a volume similar to Nickel, with total value approximately US\$1B/yr.
- Graphite is most commonly sold as a concentrate by private contract and therefore prices are not transparent. Industry prices are surveyed and published by **Industrial Minerals** magazine.
- ➤ Consumption is diverse with significant markets in steel production and refractories (50%), batteries, automotive parts and lubricants.
- Graphite price is determined by particle (flake) size, carbon content (purity) and in some products; shape. Most natural graphite is sold to traders who upsell to refiners/purifiers, polishers and shapers before it is retailed to end user.
- ▶ Graphite is finding **new markets** from new uses in products as diverse as insulation panels and battery/energy technologies.

  There is up to 10x more graphite than lithium in a Li-ion battery.
- ► China and Brazil supply >80% world graphite.

#### Volume Comparison of Natural Graphite Market

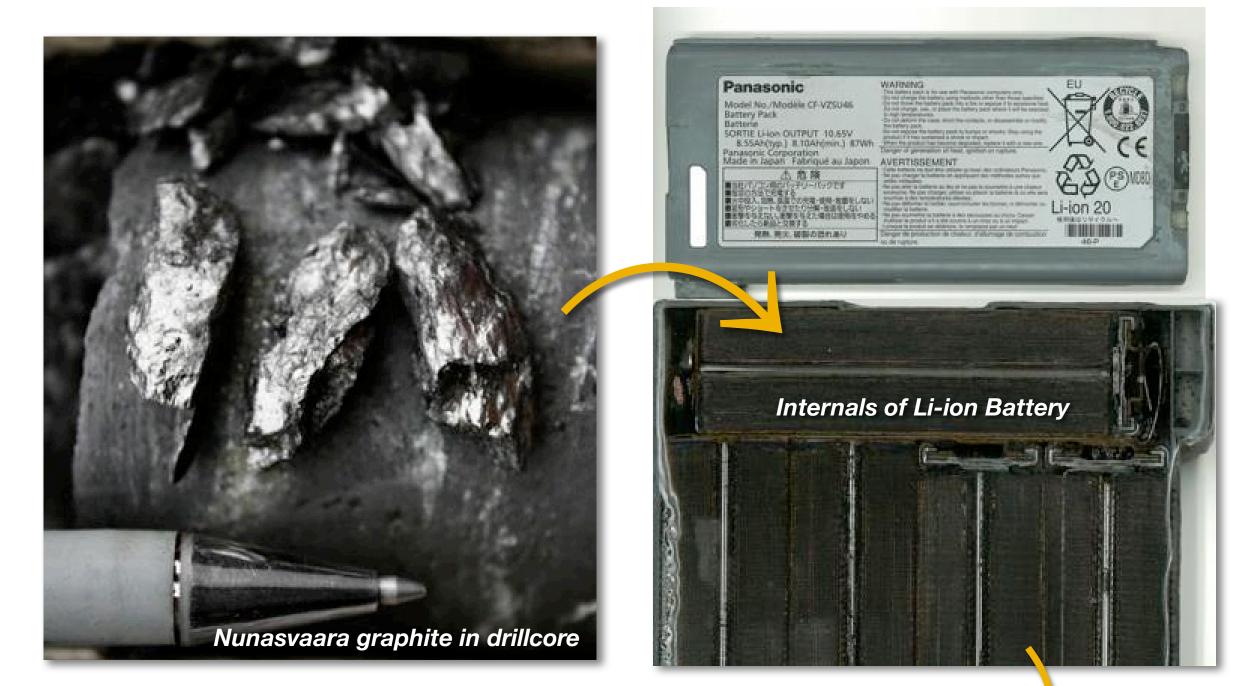


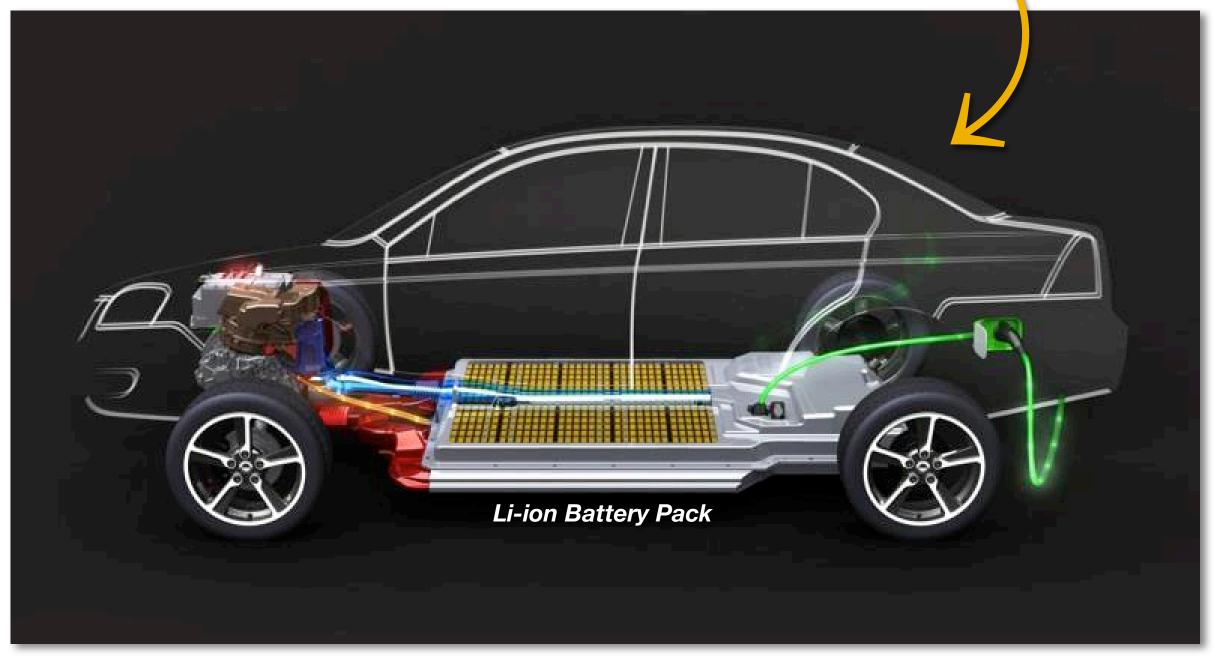


#### **New Demand Driver**

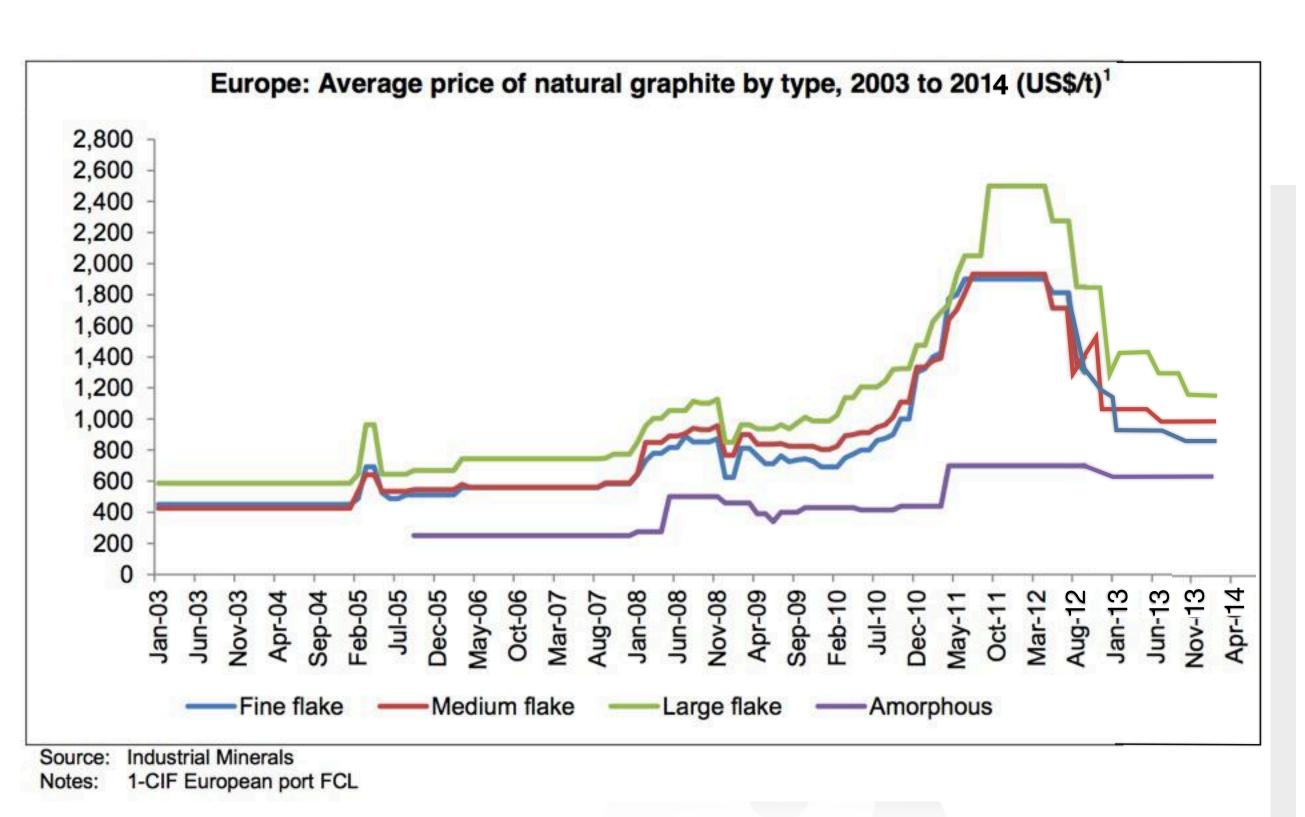
# More graphite than lithium in a Li-ion Battery.

- Graphite is a significant component of many types of battery, particularly Li-ion.
- ► Commonly there is 10x more graphite than lithium in a Li-ion battery anode.
- ▶ Rapid growth; global graphite-rich anode materials market US\$500M (2012), up from US\$375M (2011)\*.
- Electric vehicles can use up to 100kg graphite per vehicle in batteries alone.
- Increases in mobility of energy, green power storage and graphene mean graphite is a commodity in tune with big themes; energy and technology materials.

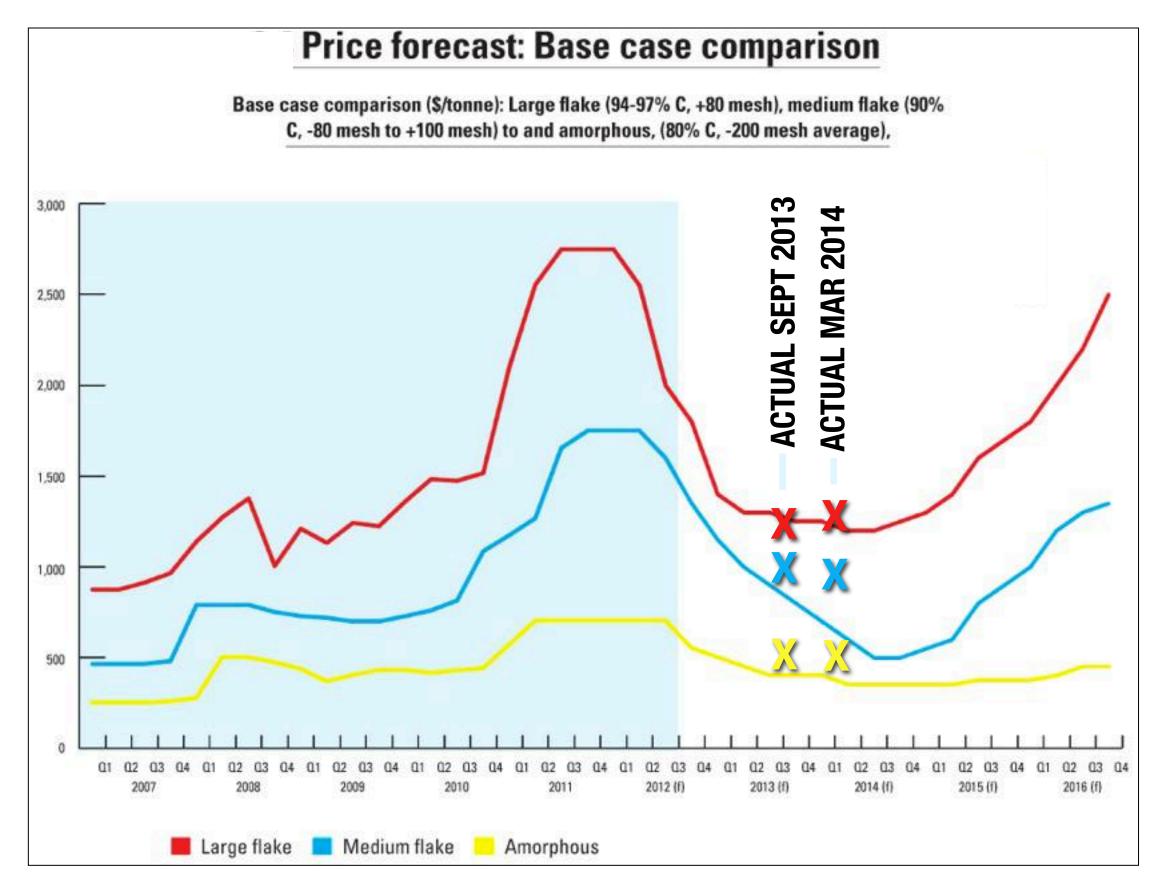




## Price settling well above historic levels; exceeding trend.



After record prices in 2011-12 graphite prices declined but have stabilised far above long term historical levels. Note that price for large flake has settled over 50% higher than historic in real terms and amorphous over 100% higher than long term averages.



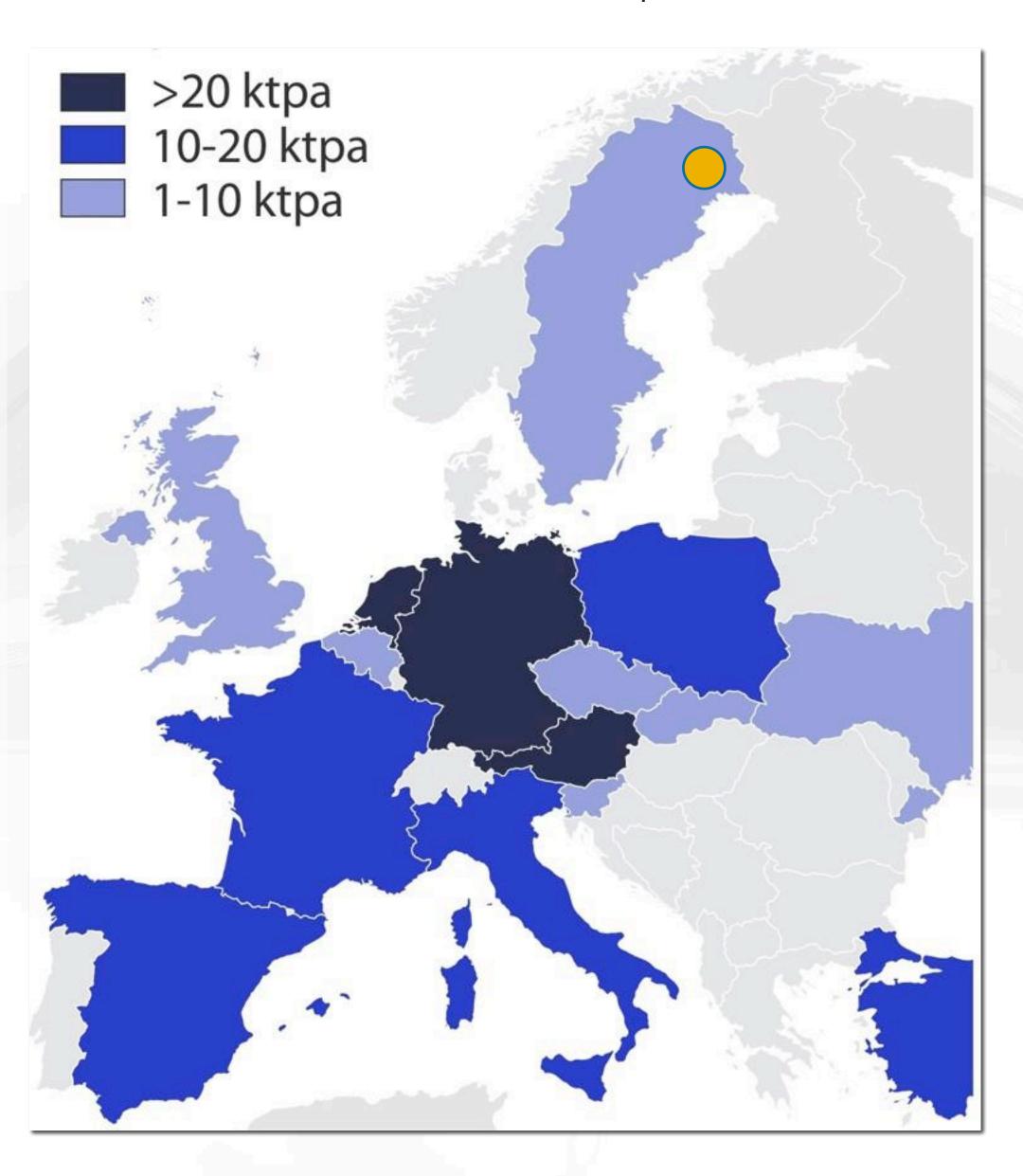
Realised graphite prices across all sizes have exceeded those forecast at end of 2012, suggesting future base case **price trends may also surprise on upside**. See appendix for further price/market data.

#### EU zone graphite consumption

- ▶ EU consumes 20% of world's natural graphite production, and imports 95% of its needs (vast majority from China).
- ▶ EU has classified graphite as a "critical raw material".
- Graphite consumers looking for reliable and quality supply outside of China.
- Sweden is currently a major supplier of iron ore, copper, gold and other minerals to the EU markets and is a historic graphite producer.
- Graphite deposits in Sweden can enjoy a distinct order/ delivery time advantage compared to China and other jurisdictions.

#### **Europe Natural Graphite Imports**

(,000t/annum) Industrial Minerals 2012 Report Data Subset 1+2





- ▶ Ranked No.1 mining jurisdiction in world by Fraser Institute 2013-14
- ▶ Corporate tax rate 22%, Mineral Production tax 0.2%
- Established bulk commodity infrastructure with open access rail, road and ports
- Low cost power from hydroelectricity and nuclear grid
- Well established mining province with highly skilled workforce and support industries
- ▶ Hosts world-class mineral deposits but remains under-explored relative to peers as foreign mineral ownership only allowed since 1992

## Logistics Advantages

▶ Talga's projects located **proximal** to high quality **sealed roads** and open-access heavy haulage **railway**.

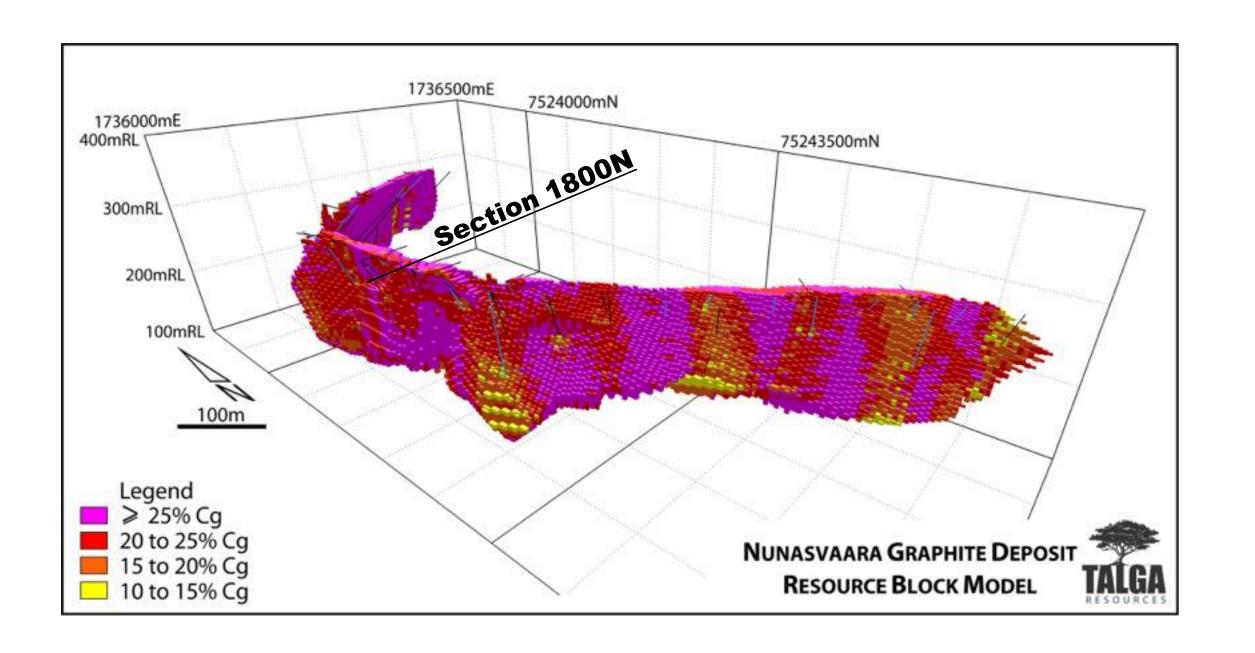
Direct road and rail link to Europe markets via Öresund bridge and tunnel. No shipping required.

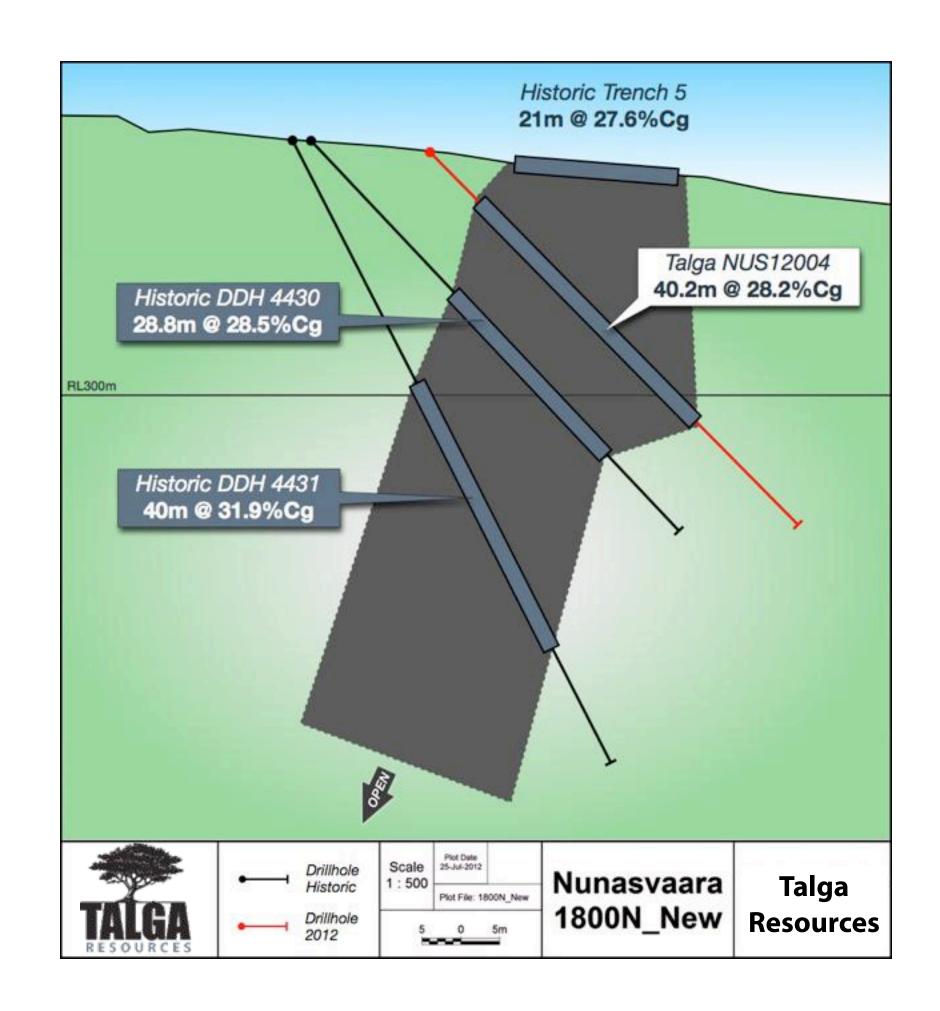
 Major cost advantage on delivery compared to shipments from other jurisdictions.



## Vittangi Project - Nunasvaara Graphite

- World's highest grade JORC/NI43-101 resource¹of (ASX:TLG 8 Nov 2012) 7.6Mt @ 24.4% graphite ("Cg") (see appendix).
- ▶ Resource mineralisation **from surface to** 165m depth and remains **open**. Average true width 20m over 1.2km strike and remains open.
- Graphite unit hosted within **atypically** low metamorphic grade volcanic greenstones with potentially unique mineralogy. **Robust** outcropping **high grade** resource makes **low-cost** potential in both amorphous to fine graphite and bulk graphene market.





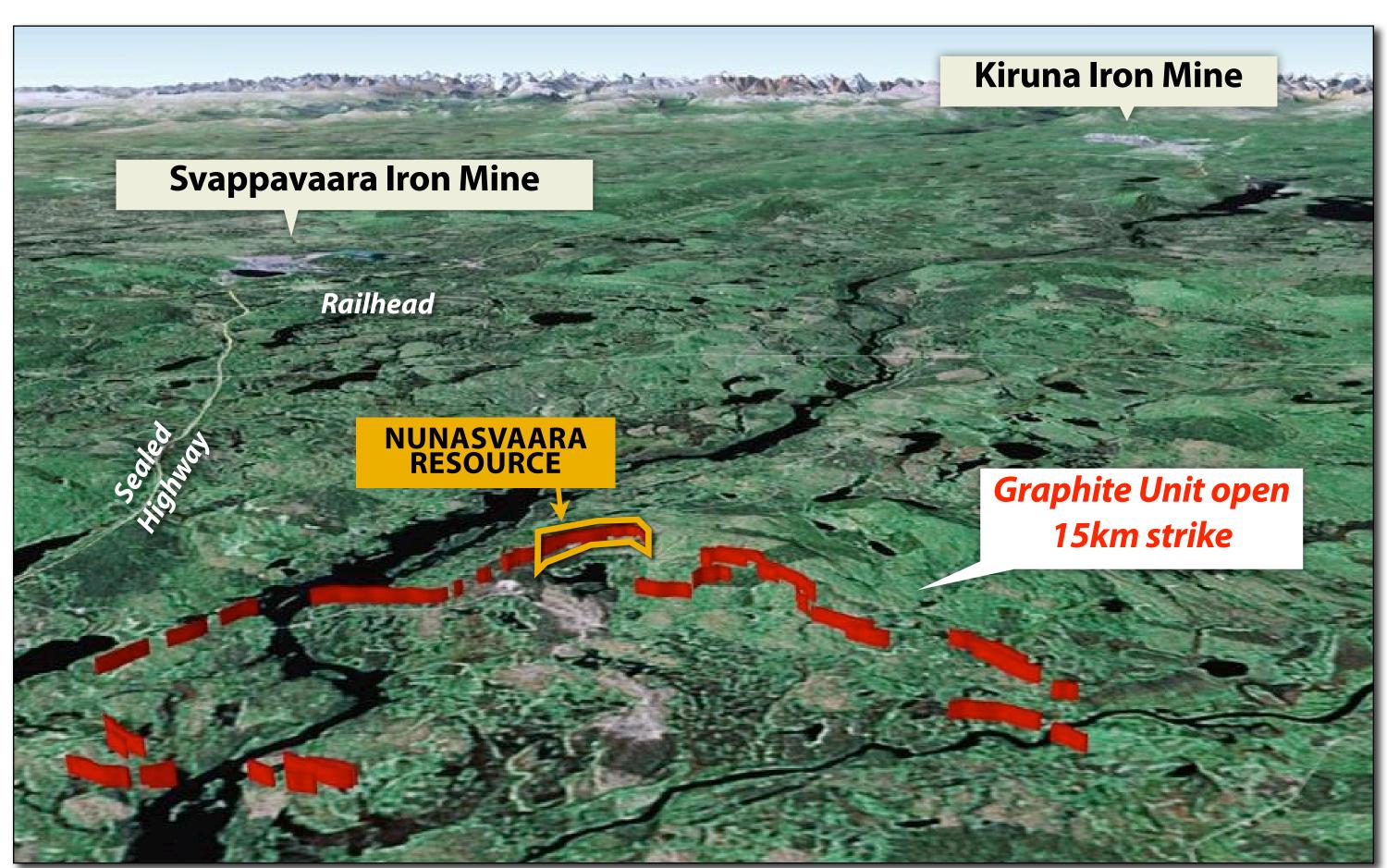
#### Nunasvaara Mineral Resource<sup>1</sup> (10% Cg lower cut-off grade)

JORC 2004			
Classification	(Mt)	(%Cg)	Graphite (tonnes)
Indicated		24.6	1,377,600
Inferred	2.0	24.0	480,000
Total	7.6	24.4	1,857,600

## Growth potential and logistics advantages



- Graphite unit is mapped by Swedish Geological Survey over 15km strike.
- ▶ Surface sampling by Talga along the outcropping unit averaged 26.2% Cg with grades up to 46.7% Cg.
- Less than 8% of graphite unit drill tested to date.
- Development advantages of exceptional grade, open-pit bulk mining option, low-cost grid power and nearby road/rail/port options (3km to road, 25km to rail).
- Preliminary economic studies underway. Stage 1 pit optimisation and mine design work completed.
   Product specification studies, metallurgy and final economic inputs are pending. Results expected Q2-Q3 2014 after graphene upscaling tests included.



## **Graphene Development Option**

On 19 Feb 2014 Talga announced exceptional results from graphene testwork on Nunasvaara graphite. Key conclusions of the testwork include:

- Unoxidised graphene can be directly and rapidly liberated from unprocessed, unpurified Nunasvaara graphite ore in a one-step environmentally friendly process i.e. no crushing/grinding, sonication, microwaving, purification required.
- Nunasvaara ore has extraordinary physical properties that enable the extraction process and that may be unique to the deposit.
- ▶ Quality of graphene produced is outstanding and comparable to graphene made from synthetic routes (>99.9% C precursors).
- Processing method suits upscaling to bulk production and produces graphite/graphene at a ratio of approximately 9 to 1 respectively.
- Next stage tests will confirm graphite/graphene yields, particle size/ distribution, graphite recovery/purity, process upscalability and scoping study level opex/capex costs.
- ▶ Potential to be lowest cost producer of bulk graphene for additive market polymers, metals, cement, conductive inks, 3D print materials.



**⊣** 500 nm

#### **Graphene Market**

Growing fast, massive research and development funding

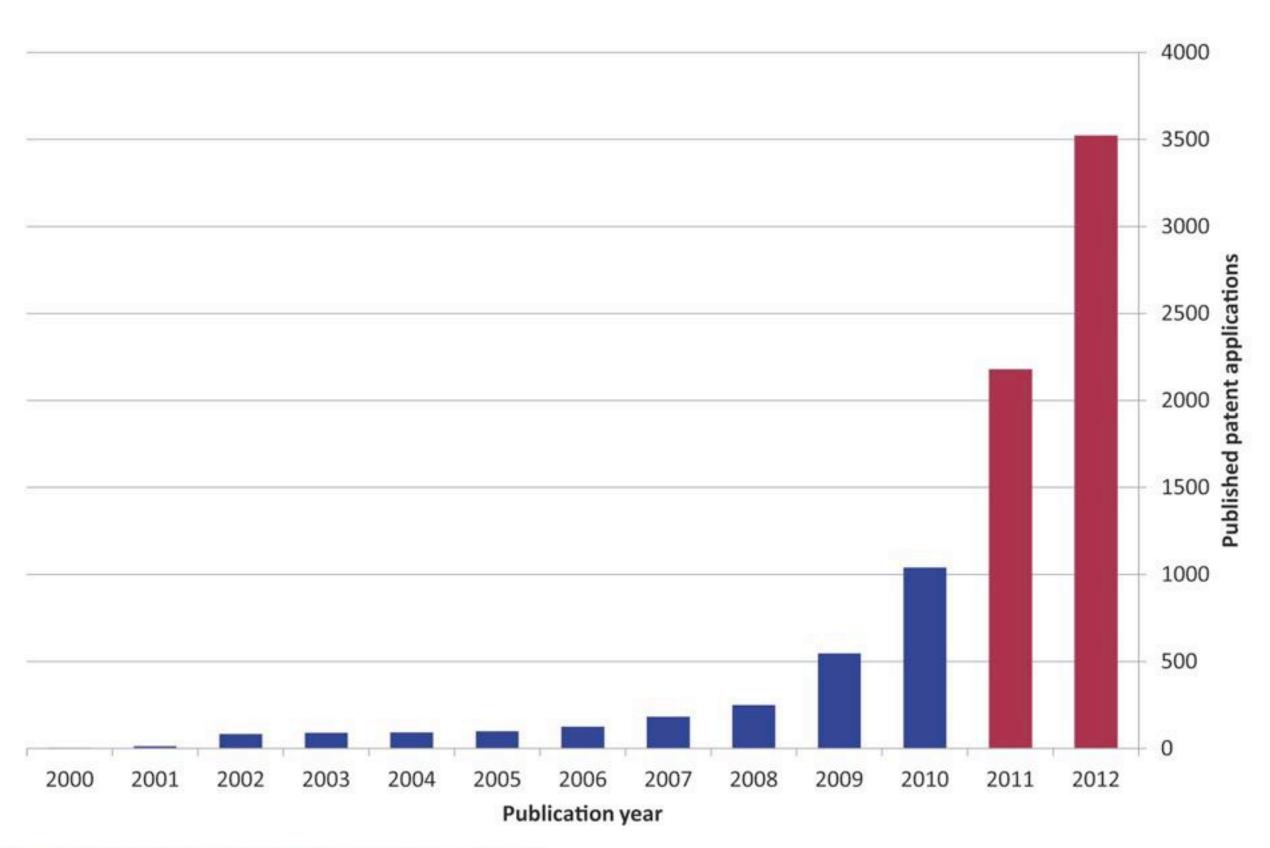


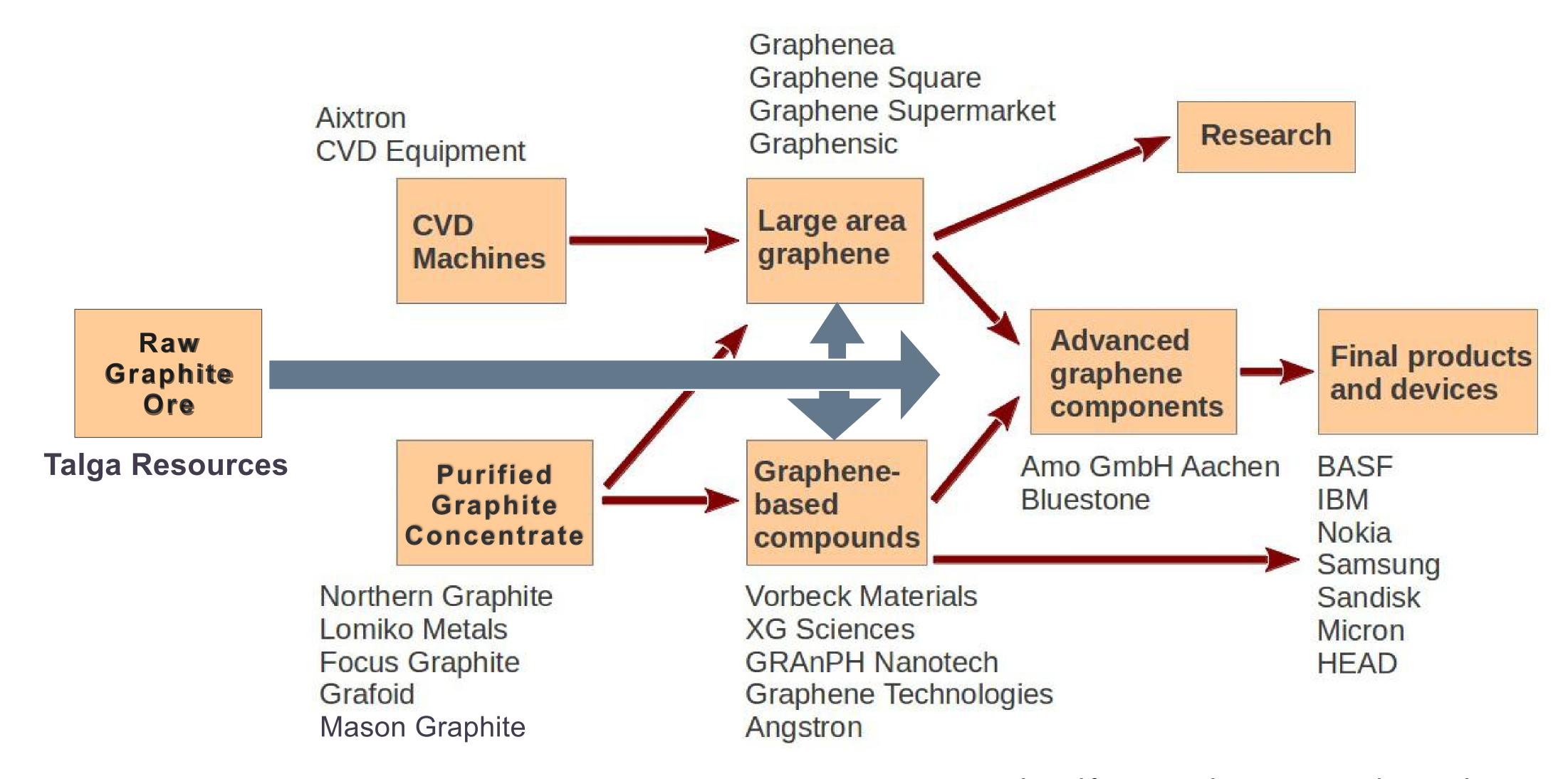
Figure 1: Worldwide patent publications by publication year

From Intellectual Property Office UK, Graphene Patent Landscape 2013

- ▶ Exponential growth apparent in graphene patents a proxy for growing use.
- Market in infancy with most being used in government and private research institutions towards finalising applications.
- As for graphite, different applications require different qualities of graphene i.e. particle size and purity. High technology applications may require single, high purity sheets, while additives to polymers (plastics), inks, metals, concrete and other bulk markets may use multi-layer nanoplatelets.
- Predictions of the value of graphene markets in 2020 range widely from approximately \$140M to more than \$1B depending on source.
- Over \$2.5B in graphene research funding has been launched in the EU (Sweden) alone in last 12 months.

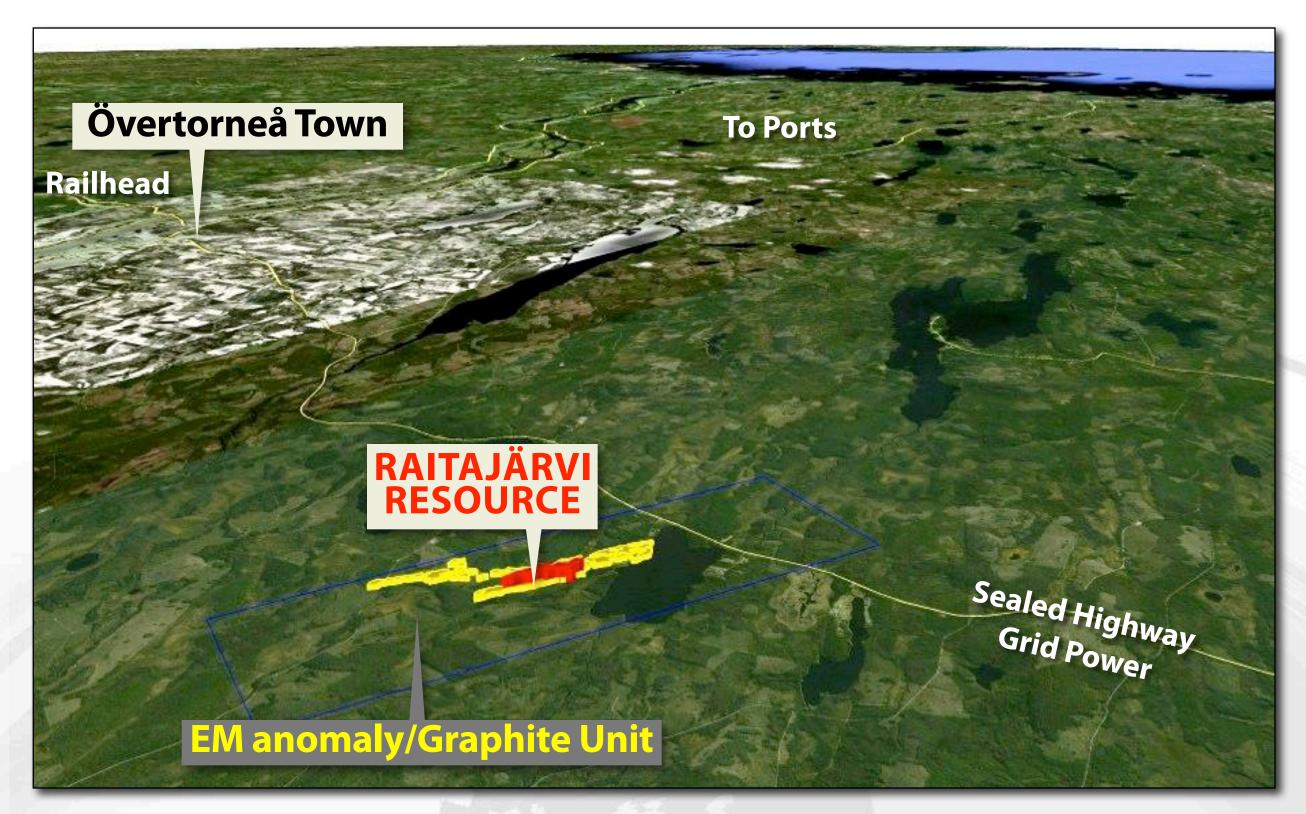
#### **Graphene Supply Chain**

Talga has major and unique potential in low cost bulk supply.



### Raitajärvi Graphite Project

- Advantageously located 2km from the Överkalix -Övertorneå Highway and grid power, 25km to town and railway, 130km to port.
- Current total JORC 2004 resource<sup>1</sup> of 4.3Mt @ 7.1% Cg, open and less than 25% of EM anomaly drill tested.
- A high proportion of resource is coarse flake.
   87% >100 micron ("μm") and 49% >200μm.
- Historic metallurgical tests produced graphite concentrate grading 90-94% C from simple (unoptimised) flotation and 99% C in basic enrichment test.
- ➤ Targeting 10-20,000t/annum capable deposit to be second producer for Talga. Scoping study planned to commence after Nunasvaara complete.



#### Raitajärvi Mineral Resource<sup>1</sup> (5% Cg lower cut-off)

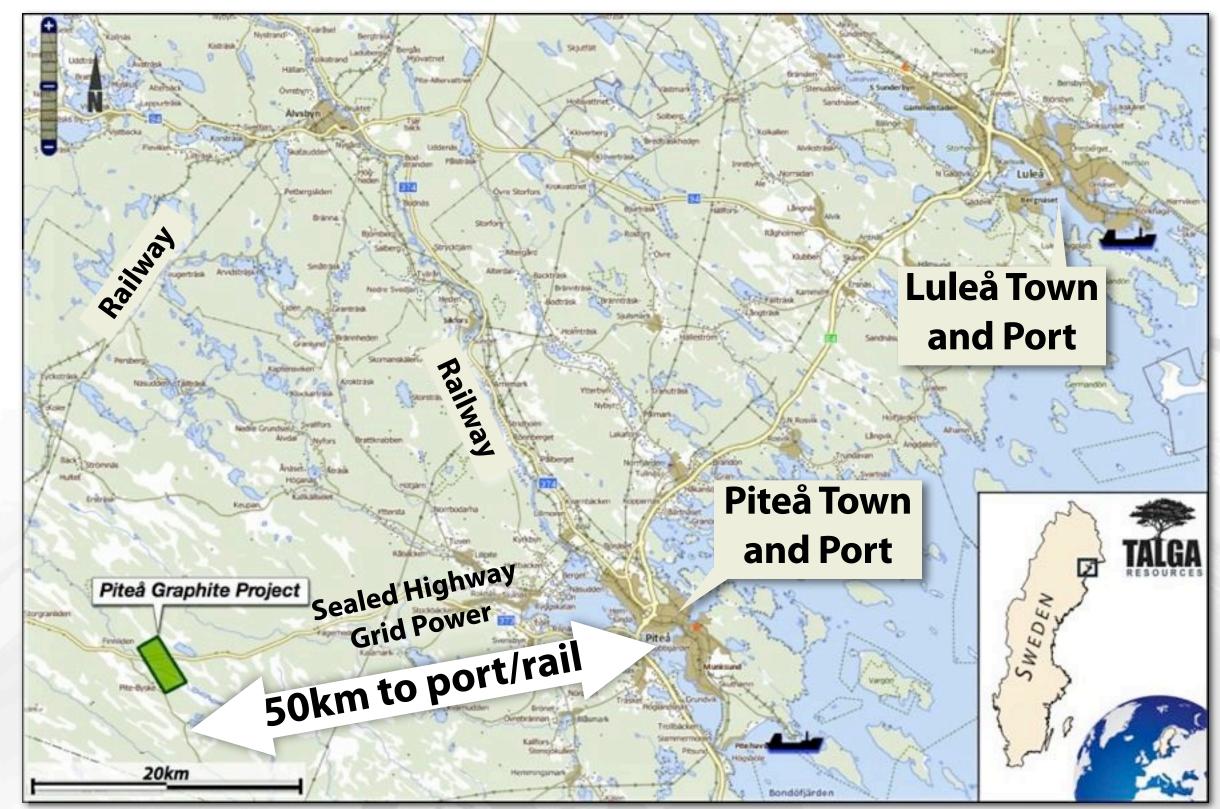
<b>JORC 2004</b>	Tonnes	Grade	Contained
Classification	(Mt)	(%Cg)	Graphite (t)
Indicated	3.4	7.3	246,400
Inferred	0.9	6.4	60,900
Total	4.3	7.1	307,300

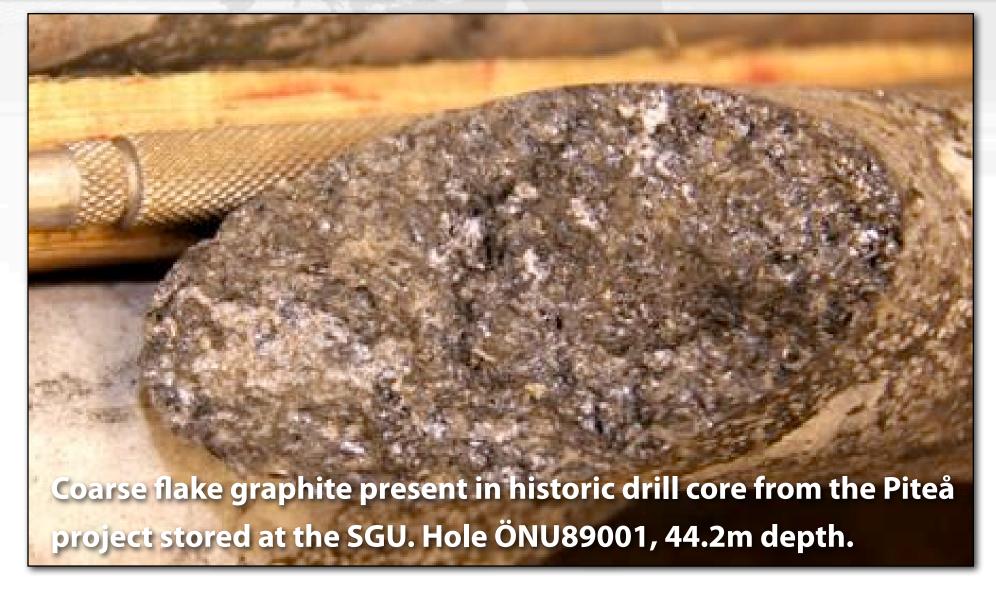
#### Raitajärvi graphite flake size

< 100µm	100-200μm	200-400μm	>400µm
13%	38%	38%	11%

## Piteå Jumbo Flake Project

- ▶ 3 historic drillholes targeting base metals intercepted coarse flake graphite within a 4 x 1km EM anomaly.
- ▶ 80% of flake graphite at Piteå exceeds 300 μm size i.e. 80% +50 mesh, aka "jumbo".
- Such large flake graphite is premium product for spherical graphite production and commands higher prices (>\$1700/t, see Appendix).
- Blue sky growth project located on sealed road 50km from port of Piteå and adjacent to grid power.
- ▶ Location and size advantages worth exploring.
- ▶ Plan to expand target zone and drill test in 2014





# Talga's Graphite Development Advantages

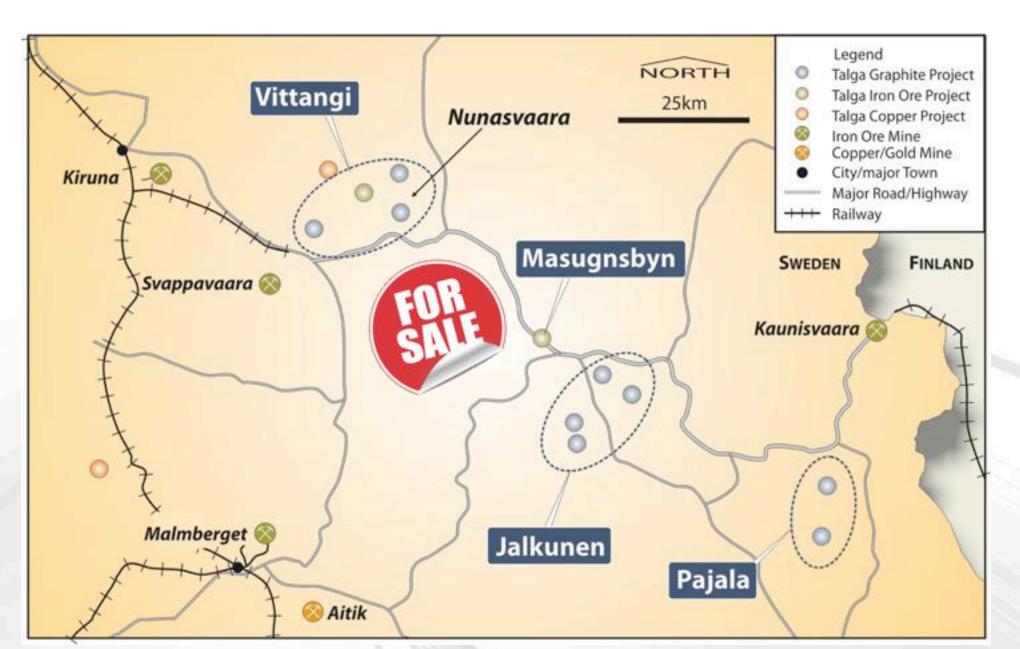
- ▶ Highest grade JORC/NI43-101 graphite resource in world.
- Located on road and rail routes to major markets.
- Advanced stage PEAS underway; further major drilling not required.
- Low cost capex and bottom of production cost curve expected.
- Massive growth profile; dominant land position on drilled EU graphite deposits.
- Highly ranked low-risk mining and corporate jurisdiction, Sweden.
- Unique low-cost graphene production option can add massive value.

## Catalysts/Events

- Confirmation of dual graphite/graphene process upscaling.
- Scoping study results with dual graphite/graphene focus.
- Strategic partnerships and non-core asset divestments funding options.

## Divestment Projects - Iron Ore (Sweden)

- Talga is divesting all non-core projects to focus on graphite.
- The most advanced divestment project is Masugnsbyn and additional JORC resources<sup>1</sup> exist at Vittangi. Total JORC resource<sup>1</sup> inventory of 236Mt @ 30.7% Fe, with further growth targets defined (see Appendix)...
- Relatively simple and proven processing of the magnetite ore is expected to deliver a high quality concentrate at coarse grain sizes. Preliminary test confirms >69% Fe concentrate.
- Proximal to road and open access rail infrastructure, which connect to several open access ports currently loading Panamax to Cape-sized vessels.
- Located close to European and Middle East iron ore markets.
- Deposits situated between two magnetite concentrators belonging to LKAB and Northlands; toll treatment potential.



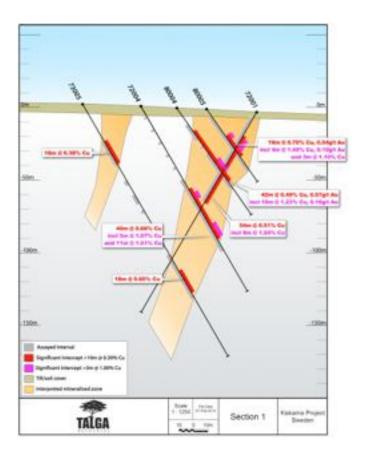


Svappavaara magnetite mine and mill owned by LKAB, approximately 30km by road from the Vittangi project and 60km from Masugnsbyn project. Photo©Fredric Alm/LKAB.

<sup>\*</sup>Fe or Fe<sub>mag</sub>, both refer to the calculated iron grade which is total iron less forms of iron other than magnetite (sulphides, silicates etc).

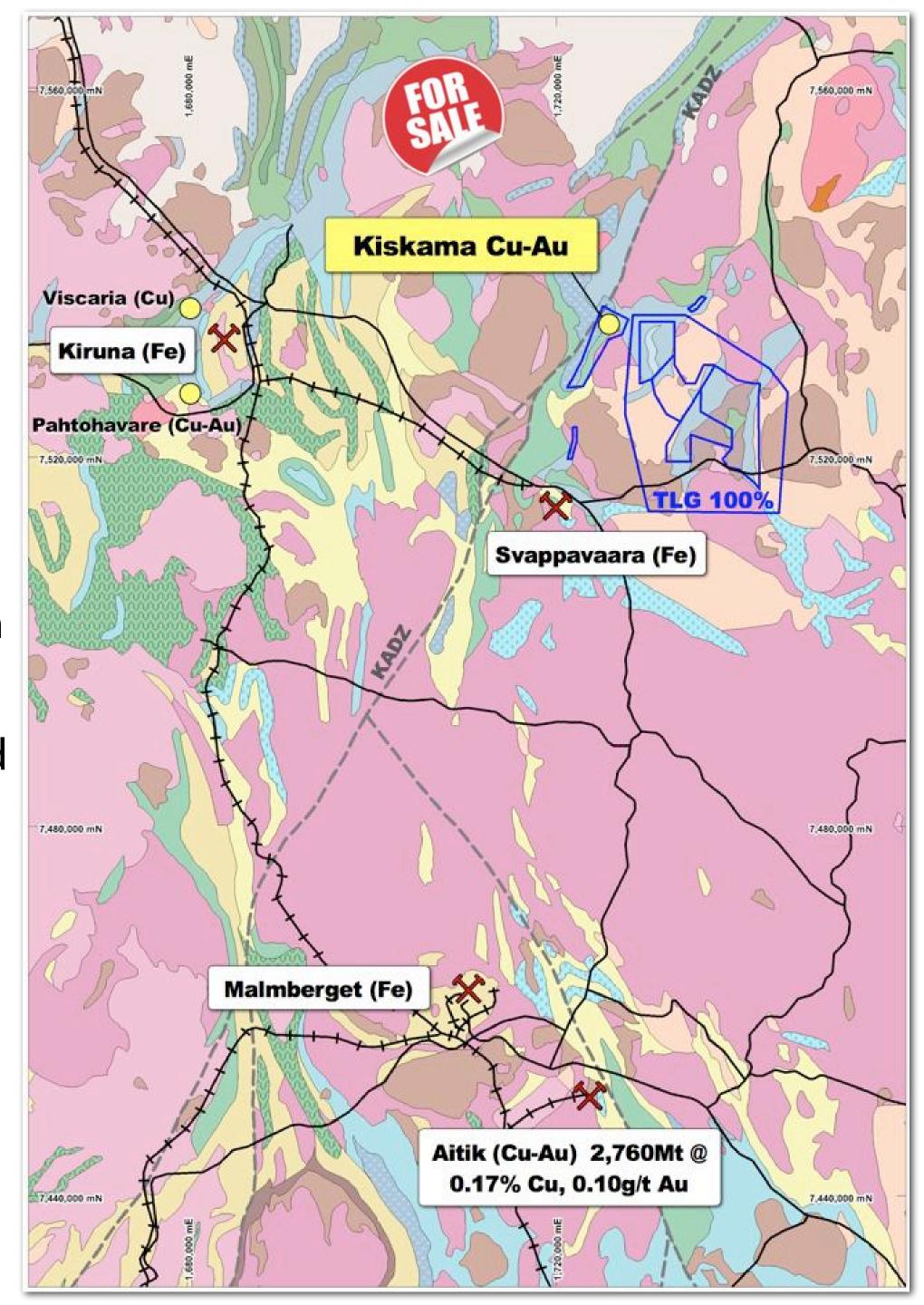
#### Divestment - Kiskama Cu/Au (Sweden)

- ▶ Large Iron Oxide Copper-Gold ("IOCG") mineralisation system.
- ▶ Pre-1992 drilling by government agencies included 101 drillholes for 13,836m. Only 27% assayed for Cu and less than 2% assayed for Au.
- Significant shallow, wide intercepts of copper-gold including: 42m at 0.49% Cu, 0.07g/t Au including 10m at 1.23% Cu, 0.16g/t Au (from 20m, hole 80004)
  - **21m at 1.02% Cu, 0.25g/t Au** including **6m at 1.98% Cu, 0.54g/t Au** (from 16m, hole 77001).
- Drill focus only 1km strike; remains open in all directions. A further 7km of strike remains largely untested and forms high priority target zone.
- ▶ Proximal to **railway links** to **Aitik**, Europe's largest operating copper-gold mine<sup>2</sup> (resource<sup>1</sup> **2,760 Mt** @ **0.17% Cu, 0.1g/t Au**). Potential toll treatment opportunity. See ASX:TLG 10 Feb 2014 for details.





Breccia-hosted magnetite-hematite-sulphide mineralisation from **Kiskama** deposit (view 10cm).



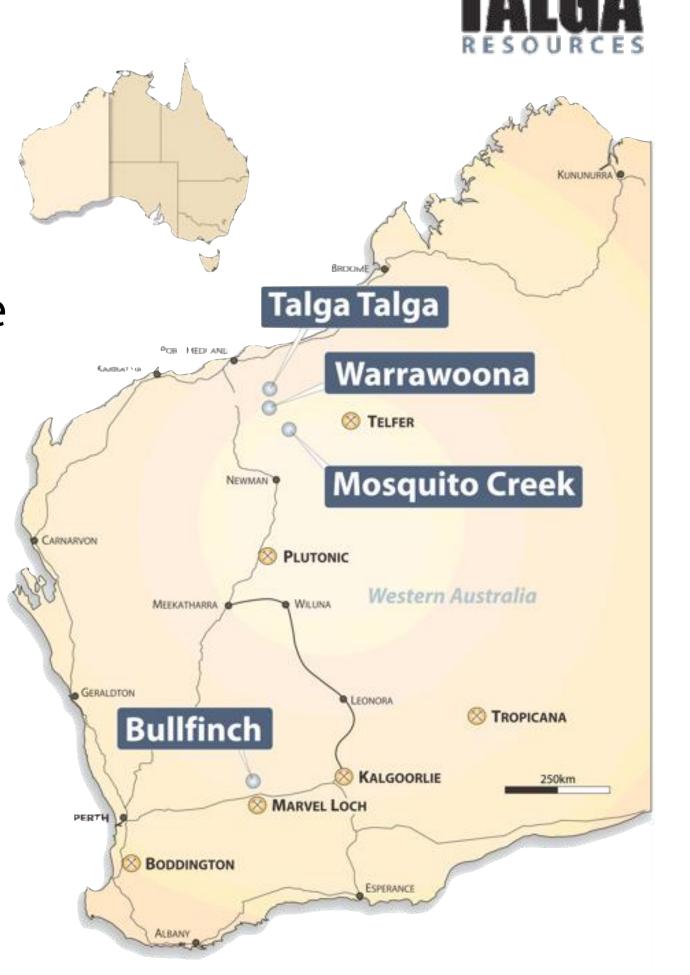
# Divestment Project - Gold



- The company wholly owns multiple gold projects in Australia which consist of early to advanced exploration-stage projects with very high grades of gold in surface sampling and drilling.
- Highlights to date include drilling intercepts of **7m** @ **14.4g/t Au** and **3m** @ **24.8g/t Au** at **Talga Talga**, and the discovery of **gold-tellurium-bismuth** zones in the Ghooli dome at **Bullfinch**, where surface samples return up to **107.5g/t Te**, **34.6g/t Au** and **0.2% Bi**.
- The next steps on the projects are further drilling towards defining resources and bulk sampling to advance the near-surface gold towards short term production.
- ▶ The projects are 100% owned, and several projects are within trucking distance (70km) to operating gold mills. Divestment/JV opportunity







# To get further information or register interest in a divestment project contact:

Mark Thompson - Managing Director
1st Floor, 2 Richardson St West Perth WA 6005
Australia
Tel +61 89481 6667
admin@talgaresources.com
www.talgaresources.com

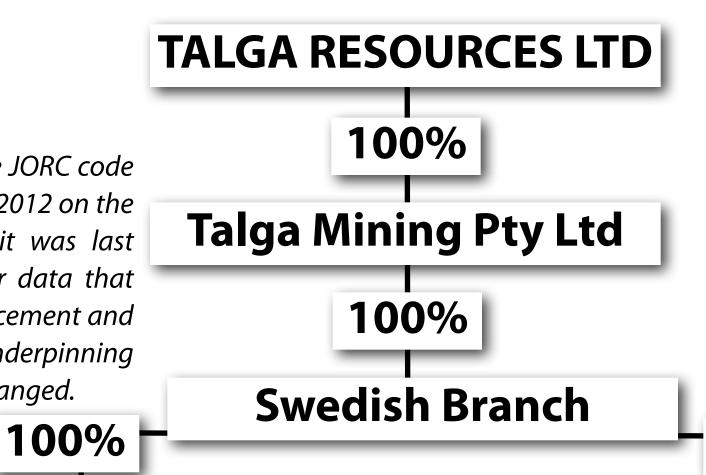


MASX: TLG

#### Appendices

#### **Talga Asset Structure and JORC** (2004) Resources\*

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.





**GRAPHITE** 

**Nunasvaara** Graphite Mineral Resource @ 10% Cg lower cut-off Nov 2012

	Tonnes	Graphite
Classification	(Mt)	(%Cg)
Indicated	5.6	24.6
Inferred	2.0	24.0
Total	7.6	24.4

Raitajärvi Graphite Mineral Resource @ 5% Cg lower cut-off Aug 2013

Classification	Tonnes	Graphite
	(Mt)	(%Cg)
Indicated	3.4	7.3
Inferred	0.9	6.4
Total	4.3	7.1

IRON Iron Mineral Resources @ 20% Fe lower cut-off July 2013

100%

Deposit	Tonnes	Grade	JORC Category
Deposit	(Mt)	%Fe	Jone Category
Vathanvaara	51.2	36.0	Inferred Resource
Kuusi Nunasvaara	46.1	28.7	Inferred Resource
Mänty Vathanvaara	16.3	31.0	Inferred Resource
Sorvivuoma	5.5	38.3	Inferred Resource
Jänkkä	4.5	33.0	Inferred Resource
Masugnsbyn	87.0	28.3	<b>Indicated Resource</b>
Masugnsbyn	25.0	29.5	Inferred Resource
Total	235.6	30.7	

## Appendices

#### Graphite size classification.

Trade Name	microns	US Mesh Size
Amorphous/Ultrafine	<10	na
Amorphous/Fine	10-75	-200
Small	75-150	200-100
Medium	150-180	100-80
Large	180-300	80-50
XL/Jumbo	>300	50+

Source: Industrial Minerals Natural Graphite Report 2012 cross referencing various sources. Many terms are proprietary or mixed use; there are few if any industry standards in naming principles.

# Common natural graphite concentrate product sizes, grades and prices

Size (microns)	Size US Mesh	Purity % C	Quote US \$/tonne
300+	50+	94-97	>1700
180-300	80-50	94-97	1275
		90	1125
	150-180 100-80	94-97	1100
150-180		90	950
		85-87	750
75-150	200-100	94-97	900
		90	775
-75	-200	80-85	525

Source: Industrial Minerals Magazine Feb 2014.

Most prices FCL, CIF European Port.

Note prices averaged from low-high range and selected as common commercial products where natural graphite sold as concentrate. Many specialty grades with much higher prices are traded but do not represent the bulk of market demand.

#### References & Qualified Persons



1 Resource Note: All Talga owned resources referred to in this report are based on information prepared and first disclosed under the JORC code 2004. They have 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.

#### **Kiskama IOCG References**

- <sup>1</sup> Boliden Annual Report 2012 resource statement as of Dec 31st 2012
- <sup>2</sup> Boliden corporate website

#### **Competent Person's Statement**

The information in this report that relates to Exploration Results is based on information compiled and reviewed by Mr Darren Griggs and Mr Mark Thompson, who are members of the Australian Institute of Geoscientists. Mr Griggs, a consultant, and Mr Thompson, an employee of the Company, both 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 Griggs and Mr Thompson 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 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.