



# Talga Group Ltd

Corporate and Vittangi Anode  
Project Introduction

“Critical Minerals Forum”  
Macquarie Group  
28 June 2022



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An aerial photograph of a two-lane asphalt road that curves through a dense forest. A small red car is driving on the road. The text "Our Mission" is centered at the top of the image.

Our Mission

**to enable the world's most  
sustainable batteries and consumer products  
through innovative graphitic materials**

# Battery anode & advanced materials

Talga is building a European supply chain of advanced materials critical to our customers' innovation and the shift towards a more sustainable world

Vertical integration with 100% ownership of mineral resources, processing and product technology provides security of supply and creates long-lasting value

Our strong in-house expertise spans mineral exploration and mining, processing technology, advanced product R&D and battery markets



# Talga Operations

Perth, Australia

**Group head office**

Luleå & Kiruna, Sweden

**Anode production & integrated graphite mine**

Cambridge, UK

**Battery anode product & technology center**

Rudolstadt, Germany

**Metallurgical process pilot facility &  
EU customer network**

Osaka, Japan

**Commercial office and product development**



# Quality ESG Commitment

- ▶ 1st resource company committed to EU Principles for Sustainable Raw Materials.
- ▶ High standard of corporate governance with established framework.
- ▶ Social and Environmental Management Systems and Policies in place accords to Equator Principles.
- ▶ Sustainability and People report published annually. Environmental studies and stakeholder consultations completed with diligence and care. 11 years of operating experience in Sweden.
- ▶ Committed to positively contribute to development of communities and minimise adverse impact on the environment.



# Corporate Overview

## Becoming a Significant Vertically Integrated Producer of Lithium-ion Battery Anode Products and Technologies

- Talga is developing an integrated graphite anode facility in Sweden running on 100% renewable electricity, to produce ultra-low emission coated anode for greener Li-ion batteries.
- Proven high-performance anode products.
- Technically de-risked following successful commissioning of EVA plant.
- Qualification process with battery manufacturers and automotive OEMs underway, targeting commercial scale anode production in 2024.
- Full mine-to-product ownership resulting in cost and quality advantages with maximum margins.
- Tier 1 location: Sweden; proximal to European battery megafactories.
- Natural high-grade ore and industry-leading processing yields.

## CAPITAL STRUCTURE

ASX Listing Code:	TLG
Market Capitalisation:	\$359.8M
Listed Shares:	304.9M
Unlisted Options:	13.4M <sup>(1)</sup>
Cash as at 31 March 2022:	\$22M

## MAJOR SHAREHOLDERS

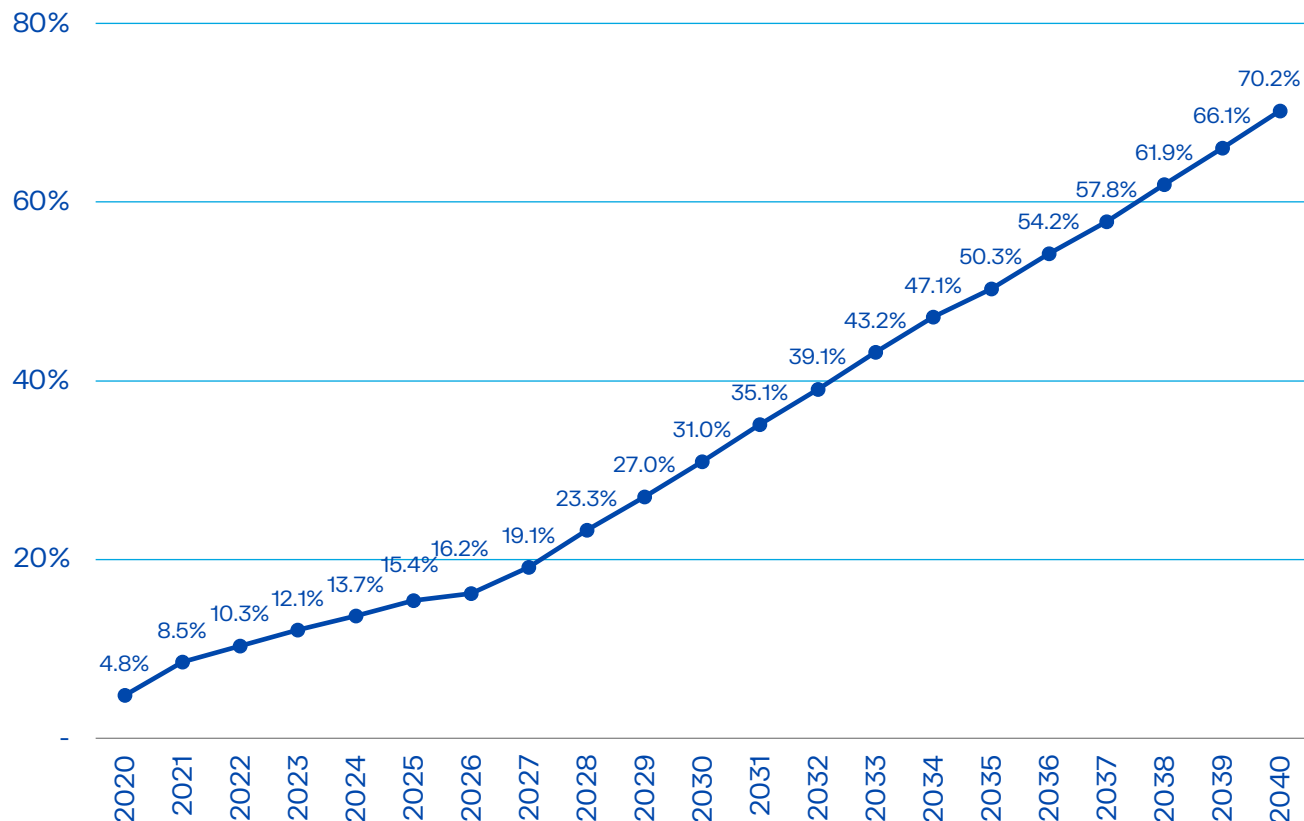
Mark Thompson – M. Director	4.7%
Kinetic Investment Partners	4.4%
Pentwater Capital Management	2.0%
Yandal Investment Pty Ltd	1.6%
TD Ameritrade, Inc.	1.6%

**TOP 20 SHAREHOLDERS** **27.7%**

**Total number of shareholders** **11,834**

# Rapidly rising EV and HEV penetration rates

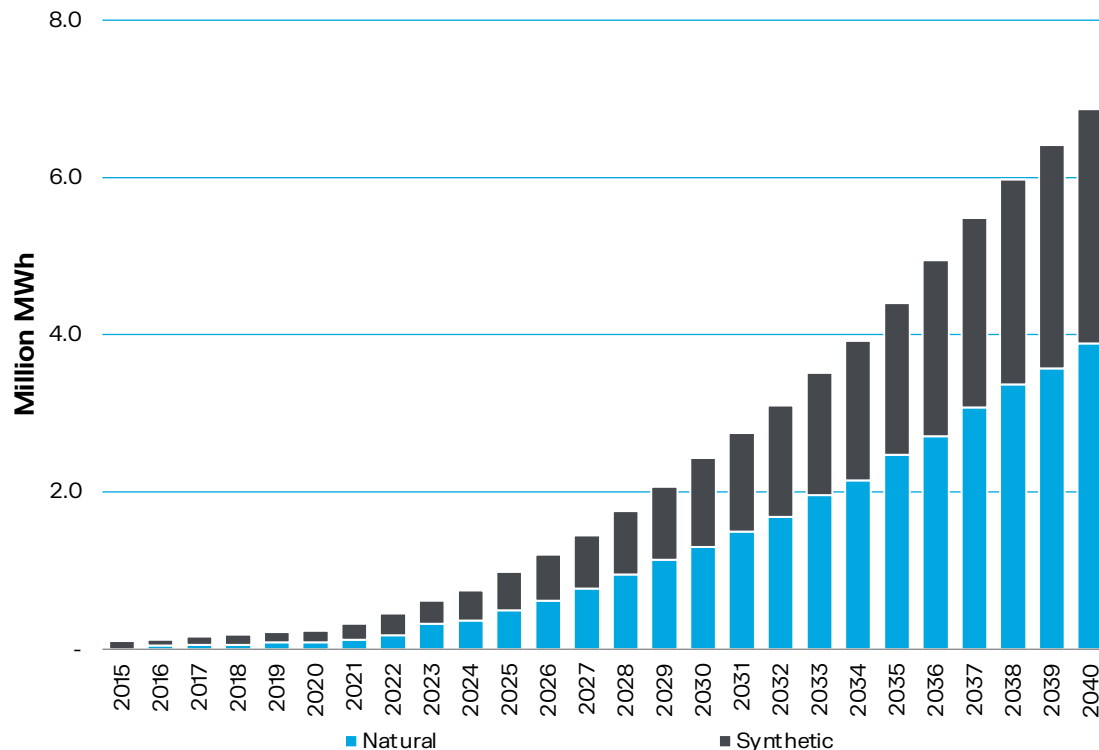
**Forecast:** EVs as a percent of total passenger vehicle sales



# Driving immense new graphite anode demand

Disruption of traditional (industrial) graphite markets and supply chains

## Forecast: Battery anode demand



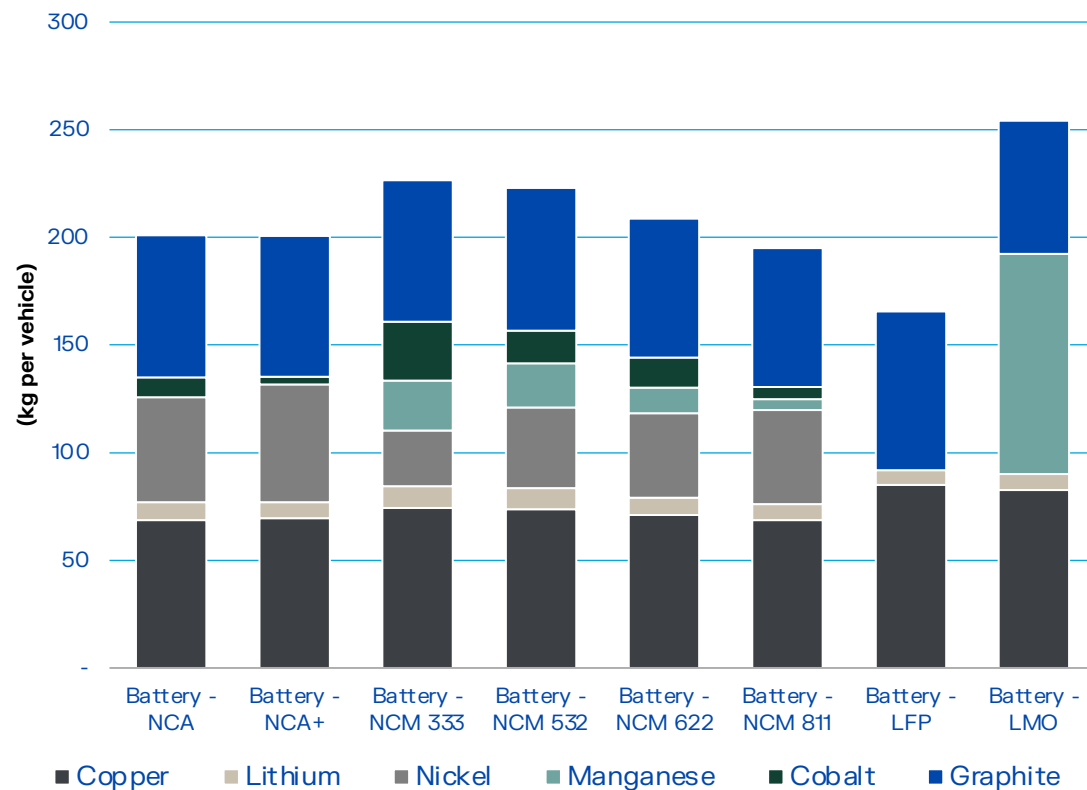
*Rising energy and input costs (needle coke, coal) for manufacture of synthetic graphite anode is expected to be a further fundamental catalyst for natural graphite anode demand<sup>1</sup>.*

- Almost all existing and new battery manufacturing capacity uses graphite anodes.
- **Natural graphite anode increasing market share due to favourable environmental footprint, lower cost profile and fast charge capability.**
- Silicon is expected to be an additive to graphite for enhancement while not replacing graphite anodes.

Source: Benchmark Mineral Intelligence. (1) Fastmarkets, [Rising synthetic graphite costs may push battery makers to rely on natural material](#)

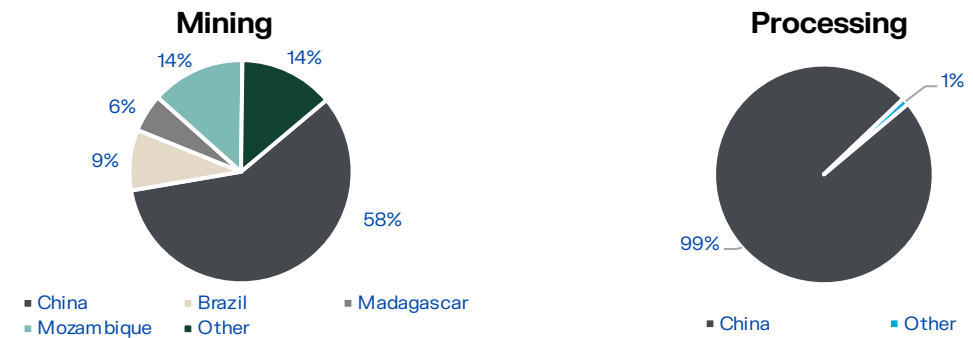
# Graphite is major mineral of Li-ion batteries but supply chain reliant on China, akin to Rare Earths

Typical use of minerals in battery electric vehicles



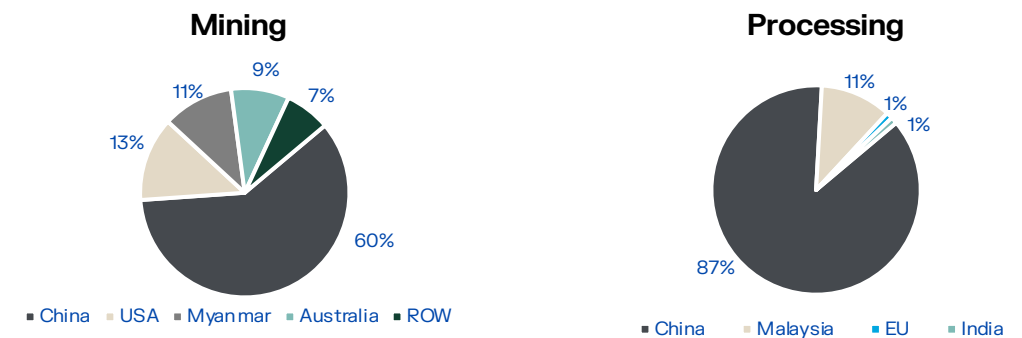
Source: IEA, The Role of Critical Minerals in Clean Energy Transitions, Mar 2022

Natural Graphite Supply Chains



Source: Wood Mackenzie, The implausibility of accelerated decarbonisation pathways, 16 February 2022

Rare Earth Oxide Supply Chains



Source: European Raw Materials Alliance, Rare Earth Magnets and Motors: A European Call for Action. Sep 2021

# Fast-growing European battery market capacity ~960GWh by 2031 (requiring 1.1Mt anode/annum)

VOLKSWAGEN

northvolt

Panasonic

VOLVO

MORROW

FREYR  
Renewable energy storage

MES  
MAGNA ENERGY STORAGE

STELLANTIS

ITALVOLT®

CATL

InoBat

VERKOR

SAMSUNG

ACC  
AUTOMOTIVE CELLS Co

Envision  
AESC

microvast

VARTA®

BRITISHVOLT

FARASIS

TESLA

Leclanché  
Energy Storage Solutions

LG Chem

SVOLT  
蜂巢能源

amte

SK innovation

FAAM

Integrated Operations  
in northern Sweden

Vittangi graphite mine  
and concentrator



Luleå Anode Plant

talga

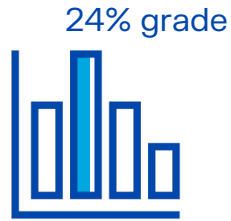
# Talga Leads European Graphite Assets

Graphite Mineral Resources classified to JORC or NI43-101 standards

	Company	Project	Mineral Resource	Contained Graphite (Million tonnes)	Battery Capacity equivalence <sup>2</sup>
1	Talga	Vittangi	30.1Mt @ 24.1%Cg	7.2	4,625 GWh-eq
2	Talga	Jalkunen	31.5Mt @ 14.9%Cg	4.7	3,055 GWh-eq
3	Oy Fennoscandian Resources	Aitolampi	26.7Mt @ 4.8%Cg	1.3	
4	Leading Edge	Woxna	13.3Mt @ 7.6%Cg	1.0	
5	Mineral Commodities	Traelen	1.8Mt @ 22.0%Cg	0.4	
6	Talga	Raitajärvi	4.3Mt @ 7.1%Cg	0.3	195 GWh-eq
<p>Talga is in the process of expanding its Natural Graphite Resource at Vittangi and has defined a JORC Exploration Target approximately <b>6-7 times larger</b> (170 - 200 million tonnes at 20 - 30% graphite)<sup>1</sup> yet to be drilled.</p> <p><i>Note that the potential quantity and grade of the Exploration Target is conceptual in nature, there has been insufficient exploration to estimate a Mineral Resource and it is uncertain if further exploration will result in the estimation of a Mineral Resource.</i></p>					<b>7,875 GWh equivalence</b>

Sources: Company public reports and stock market filings. Note several non-mineral resource compliant but historic producers at Zavalievsky, Ukraine (6%Cg) and GK-AMG mine in Germany. See slide 29 for peer comparison information. (1) TLG ASX Announcement 20 July 2021. (2) GWh equivalence calculation assumes: 78% Contained Graphite to Anode yield (TLG:ASX 1 July 2021); and 1.2kg of Coated Purified Spherical Graphite per 1kWh of battery capacity (Benchmark Minerals Intelligence).

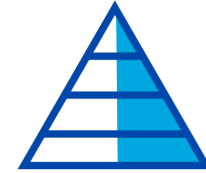
# Talga advantages for OEMs and Cell Makers



Low-footprint, long life natural graphite supply in Sweden.



100% of graphite used to make battery products.



Vertically integrated mine-to-anode plant offers 100% supply chain control.



Within 24-hour drive to deliver to European cell makers.

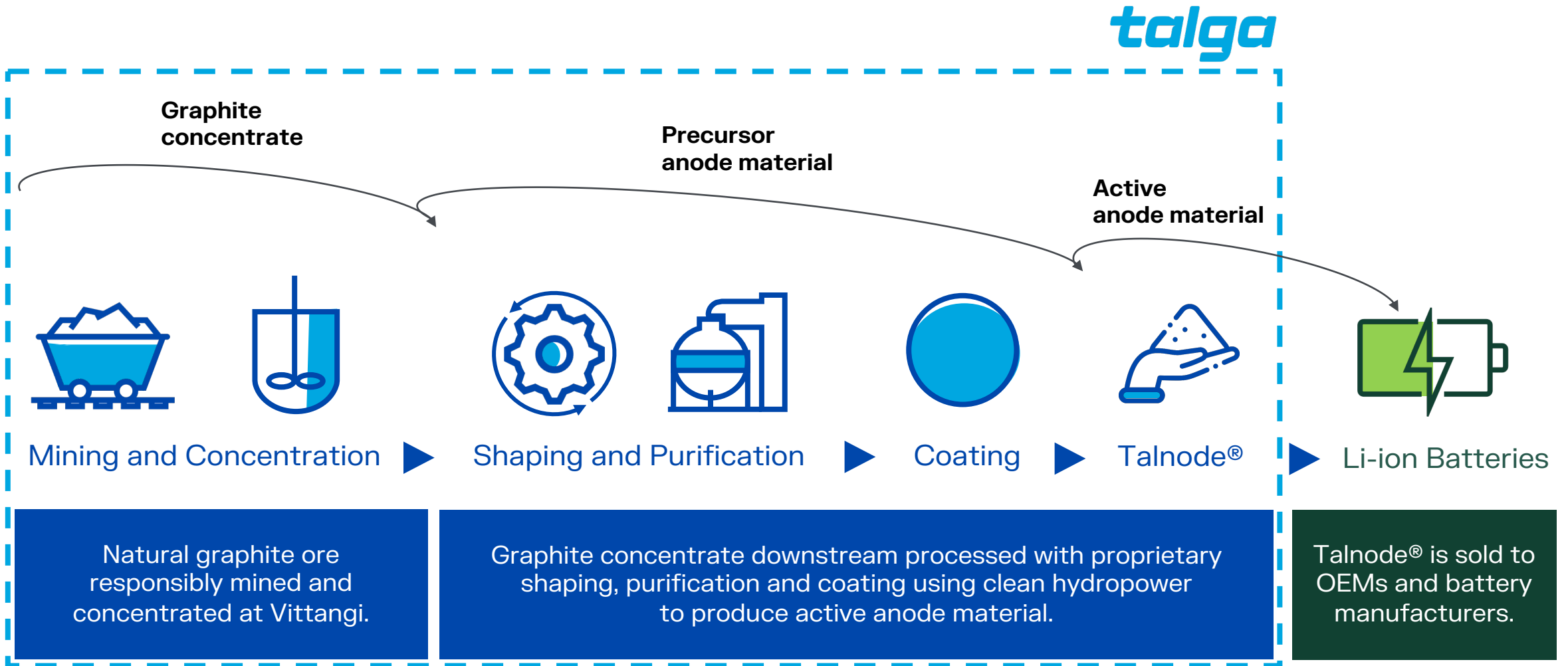


Production using 100% sustainable, low-cost renewable power in Sweden.



Processing and products use green proprietary Talga technology.

# Integrated and 100% controlled anode operation



# Production processes tailored to maximise benefits of unique graphite resource

## Trial Mining Program



- Permitted trial mine for 25,000 tonnes of feed ore.
- First ~2,500 tonne phase at Niska South completed in 2021 with balance to be mined in Q3 2022.
- Results demonstrate consistent and high-grade graphite mineralisation at or near surface.
- Ore in storage ready for purification and anode production.

## Purification Plant



- Demonstrated capability to produce battery grade purity via chemical and thermal purification processes.
- Currently operating a European-based alkali roasting and acid washing plant producing on a continuous basis at  $\geq 99.95\%$  specification (in accordance with DFS).
- Developing and innovating supply chains for purification to enhance sustainability credentials even further.

## EV Anode Plant



- Located in Luleå, Sweden, the EVA is the first coated anode production plant in Europe.
- Producing active anode material for EV batteries at large quantities with over 20 customers engaged and receiving product samples.
- Integrated battery lab and product quality control facilities onsite.
- Commissioned and fully operational since end of March 2022.

## Additives Pilot Facility



- Blending with synthetic graphite in German plant for certain customers.
- Piloting of process technologies for battery (Talnode®) and advanced (Talphen®) materials.
- Milling, exfoliation and concentration with filter and drying stages, mixing, coating and packaging.
- Product quality control laboratory and coating testing facility - REACH and ISO certified.

# Talga Electric Vehicle Anode Plant, Luleå Sweden



## Images

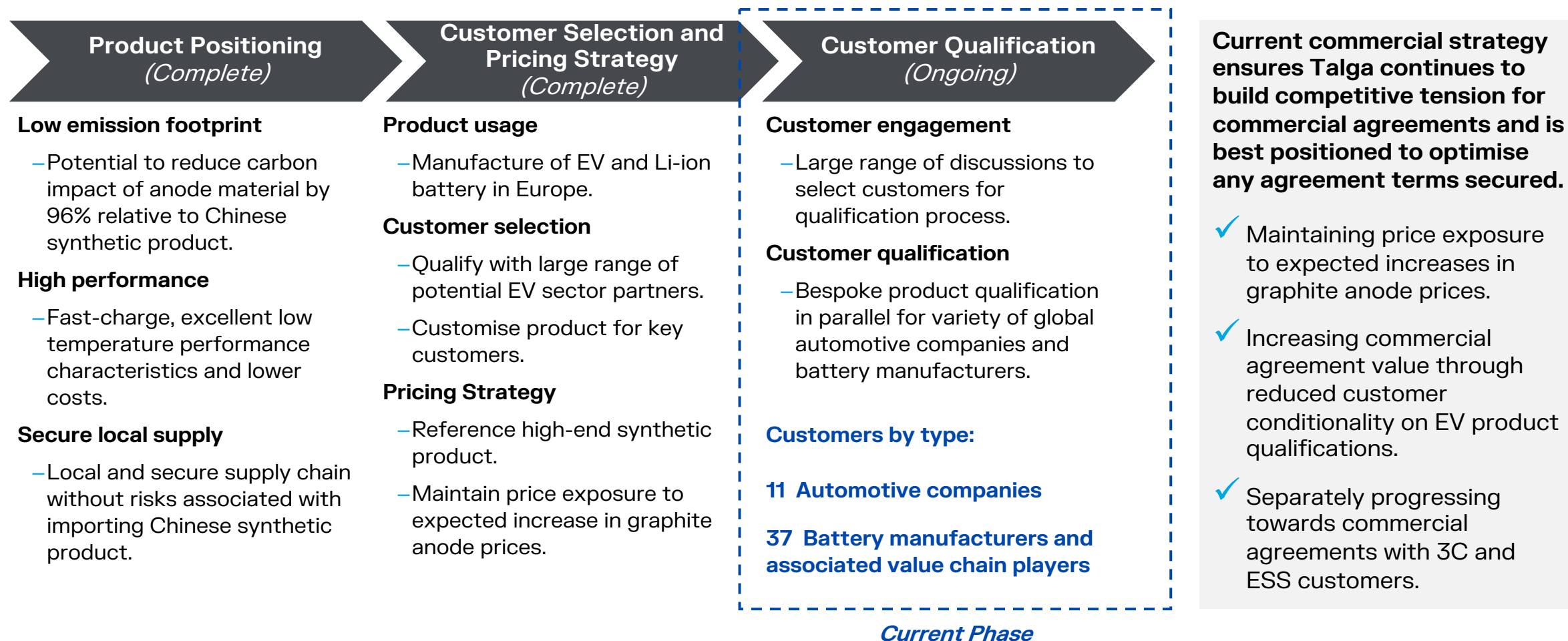
Left: EVA main processing hall.

Top Right: Talga staff training on kiln process stage.

Bottom right: Integrated EVA battery lab and quality control.

# Commercial Strategy: European EV manufacturers

Talga is in the final stage of a long technical qualification process with numerous EV and battery manufacturers



# Talnode®-C attractive performance characteristics



## Energy Density

High energy density for increased range or lighter weight.



## Faster Charging

Fast charge rate outperforms existing commercial anodes.



## Lower Cell Resistance

High conductivity material decreases thermal build up, improving safety.



## Cold Temperature Performance

Outstanding cold condition capacity retention.

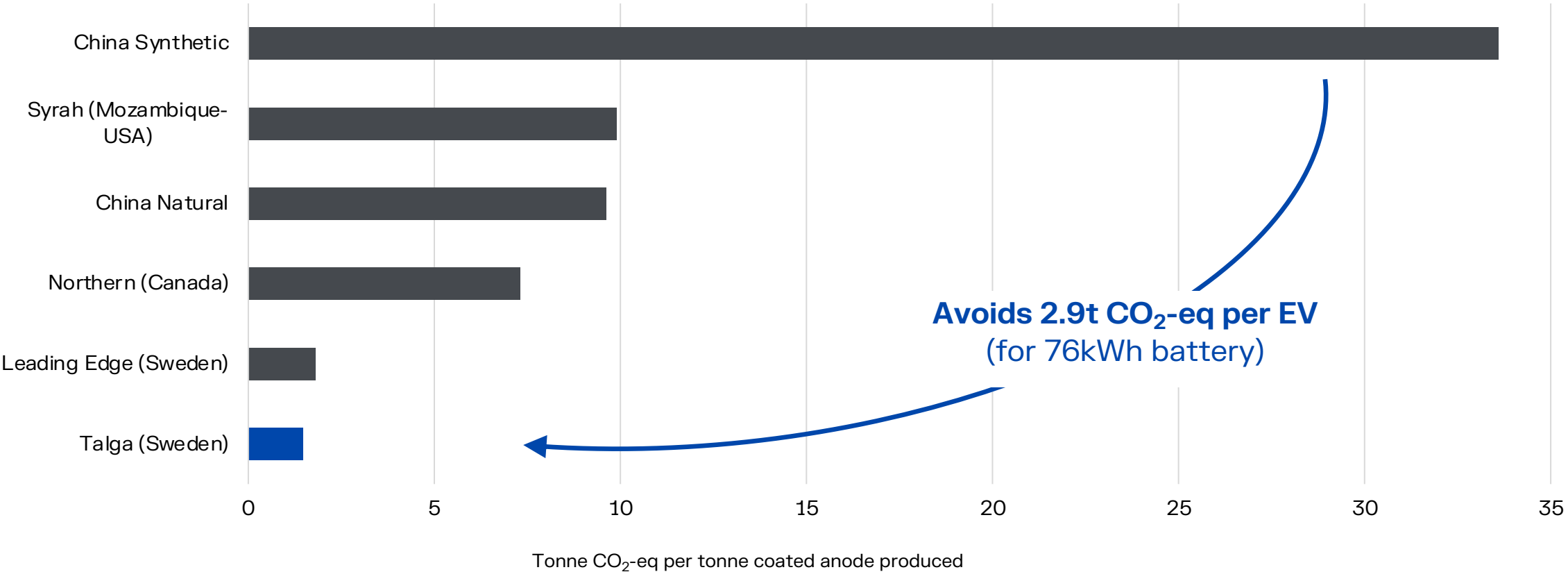


## Regenerative Braking

High energy recovery compared to existing commercial anodes.

# Delivering the World's Greenest Anode

Talnode®-C cradle-to-gate LCA accords to ISO 14040-14044 and German Association of Auto Industry



Source: Talga – Life Cycle Assessment by Hitachi ABB Power Grids (ASX:TLG 12 Aug 2021); Leading Edge Materials – public announcement 21 June 2021; Northern Graphite – public announcement 14 Feb 2022; China Natural – Engels et al, 2022, “Life cycle assessment of natural graphite production for lithium-ion battery anodes”; Syrah Resources, public announcement 31 Jan 2022; China Synthetic (ASX:TLG 15 Dec 2020, Investor Presentation, Source: Recruit Report)

# Project Funding – European Financiers

- ▶ Letter of Intent to finance a portion of construction costs of Vittangi Project provided by Swiss Export Risk Insurance (SERV). Swiss content linked to ABB, major contractor for process controls, automation and related scopes.
- ▶ Letter of Interest received from Nordic Investment Bank to explore the possibility of providing financing to Talga's integrated Vittangi Anode Project.
- ▶ Talga is targeting securing further project funding support from other European Export Credit Agencies (ECAs) and 'green deal' agents.
- ▶ **Critical Mineral development and funding support:** The European Commission has established active mandates to support the development of natural graphite in Europe.



## European Critical Minerals and Battery Development & Funding Initiatives



*The European Commission provides funding support under the Important Projects for Common European Interest and European Battery Innovation programs.*



*The European Investment Bank, the world's largest multilateral development bank, is targeting to make climate related investments of >€1 Trillion by 2030.*

# Mine and Anode Plant Permitting

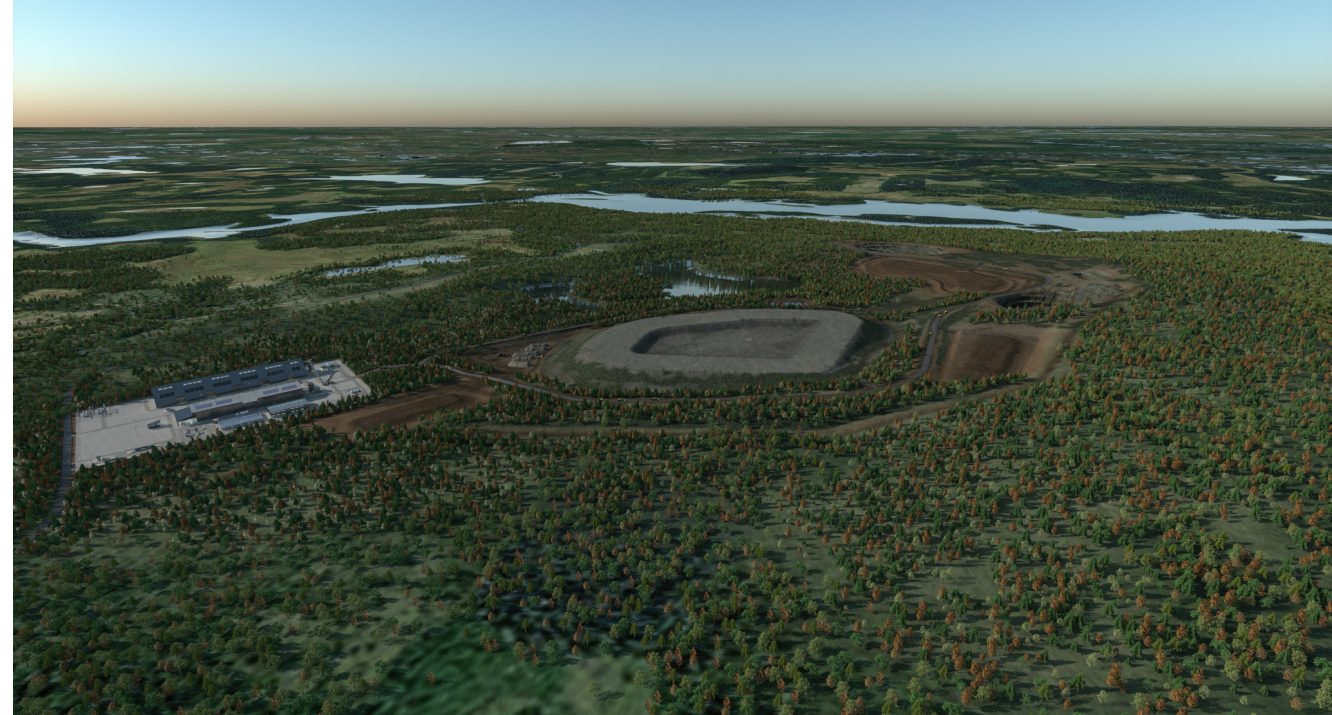
Fully permitted 2015/2016 Nunasvaara South trial mine successfully completed and rehabilitated.

Fully permitted 2021/2022 Niska South trial mine to be completed in Q3 2022.

DFS Nunasvaara South commercial mine permits progressing for 19,500tpa anode production. Environmental permit Court hearing planned for Q3/Q4 2022, has received positive submissions

Niska expansion mining concession applications for additional 85,000tpa anode production submitted in August 2021.

Company finalising environmental permit for Luleå anode production site.



# Path to >100,000tpa anode production

Niska adds to Vittangi to make Talga one of the largest anode producers outside China

## Nunasvaara South<sup>(1)</sup> (2021 DFS)

Talnode®-C	19,500tpa
Life of Mine	24 years
Pre-tax NPV <sub>8</sub>	US\$1,054M
Pre-tax IRR	30%
Capex	US\$484M <sup>(2)</sup>

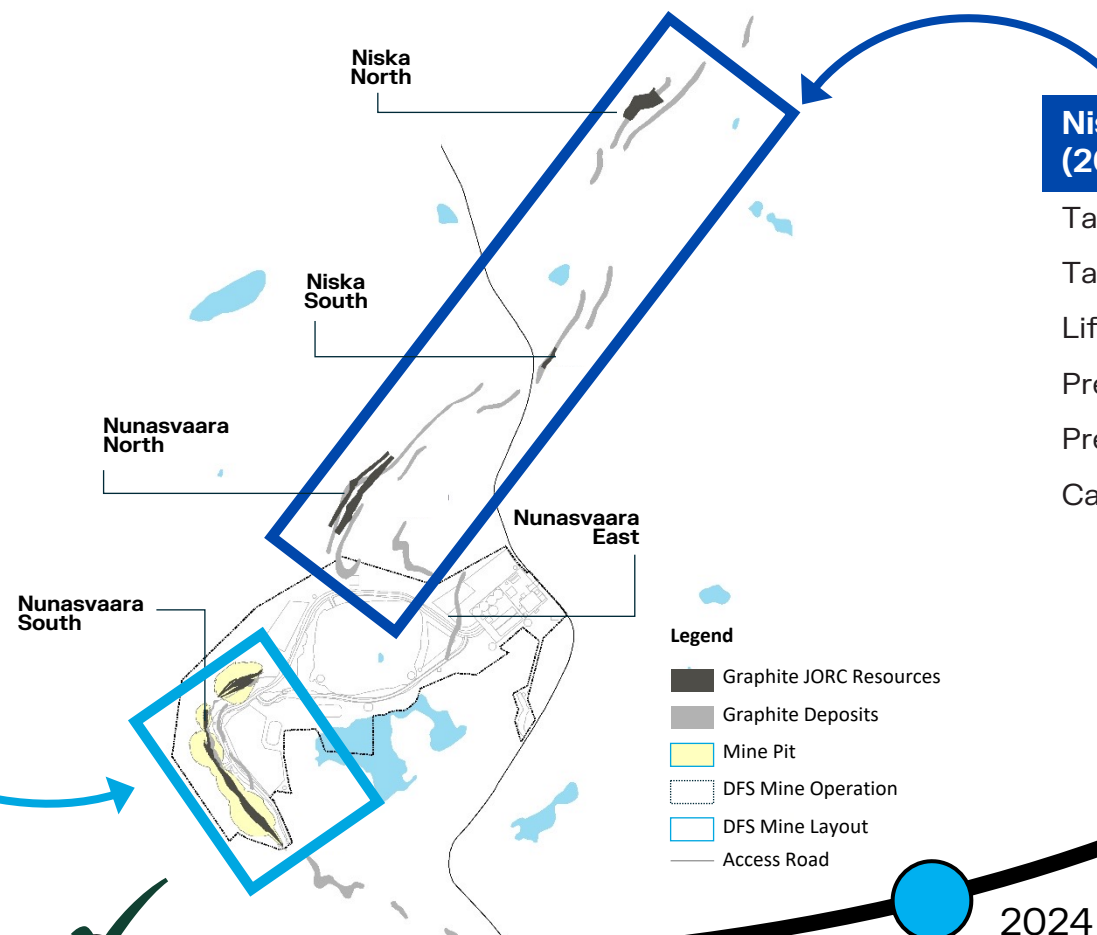
## Niska Expansion<sup>(1)</sup> (2020 Scoping Study)

Talnode®-C	84,700tpa
Talphone®	8,470tpa
Life of Mine	14 years
Pre-tax NPV <sub>8</sub>	US\$3,540M
Pre-tax IRR	47%
Capex	US\$1,040M <sup>(2)</sup>

2022  
Trial Mine  
& EVA Plant  
Operating

2024  
Commercial  
Production Start

2025-26  
Expansion  
to total 104Ktpa  
commences



# Significant Growth Potential

Resource upside with ability to strategically support European battery supply chain for decades

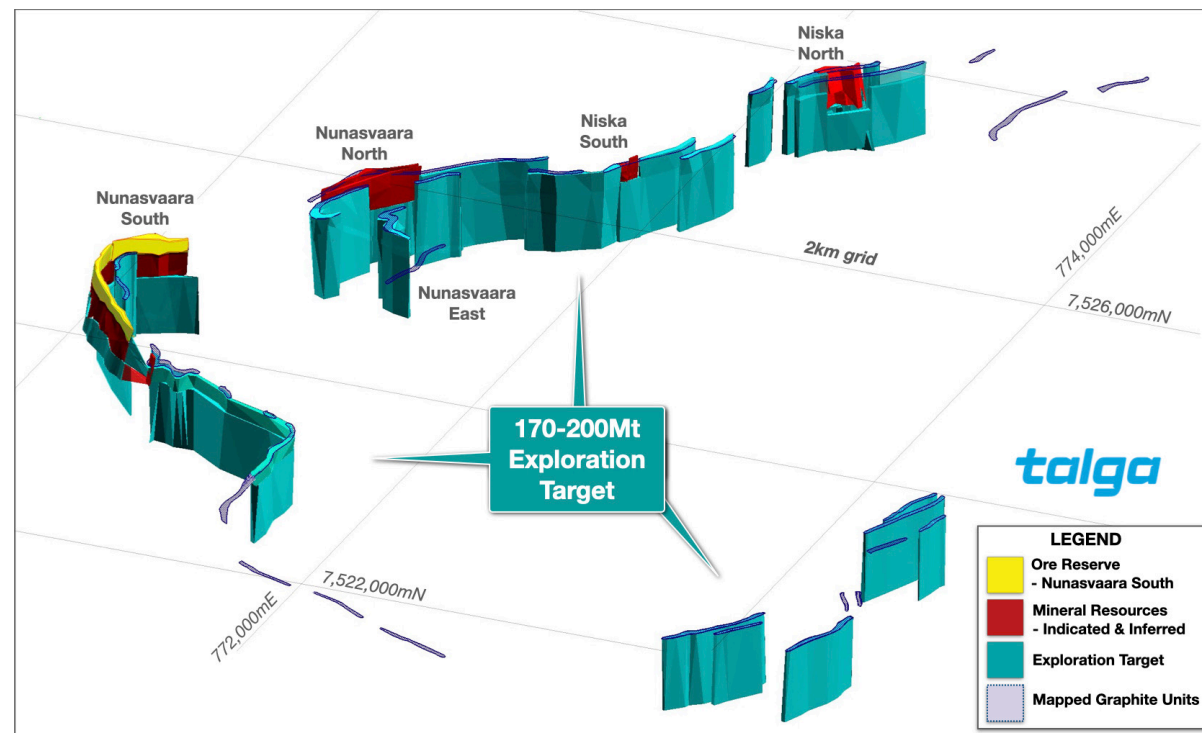
2021 Vittangi drilling returns world-class grades (e.g. **90m @ 30.8% Cg**) with subsequent mineral resource update boosting Vittangi Graphite Mineral Resource by **54%** to **30.1Mt at 24.1% Cg**.

Resources remain open along strike and depth.

**Only fraction (10-20%) of Exploration Target has been drill tested to date.**

New 30-hole diamond drillhole program completed in May 2022 for **further resource update expected late H2 2022**.

Exploration Target will be re-calculated in H2 2022 to reflect conversion of portion into Mineral Resources and latest drilling.



*Note that the potential quantity and grade of the Exploration Target is conceptual in nature, there has been insufficient exploration to estimate a Mineral Resource and it is uncertain if further exploration will result in the estimation of a Mineral Resource.*

# Developing future technology

Market focused R&D and development of next generation battery and advanced materials for future commercialisation

- ✓ Fast-tracked decision for mass-producible Talnode®-Si **silicon anode**.
- ✓ Continued development of **solid state** Talnode®-E battery anode technology.
- ✓ CALIBER **cathode additive** program.
- ✓ Talphone® **graphene** product development across numerous commercial customer programs and in co-funded research projects.



# Partnerships for a Greener Future

Working with respected battery customers and development partners under public partnerships and non-disclosure, including global automotive OEMs and majority of European battery producers



# Company Update – Delivering on Strategy

**Europe's first Li-ion battery anode plant successfully commissioned and operating**

**Talga is delivering on its strategy to become a Significant Vertically Integrated Producer of Li-ion Battery Anode Products and Technologies**

## 2021/2022 Milestones reached

- ✓ Completed DFS for 100% owned Vittangi Mine-to-Anode Project. FEEDs and project optimisation near completion.
- ✓ Commissioned (on time, under budget) and operating EVA Plant. Qualification uses graphite concentrate to produce Talnode®-C.
- ✓ Environmental permit application progressed.
- ✓ Vittangi 54% resource increase completed.
- ✓ Commenced 2022 trial mine at Niska to extract 22,500 tonnes ore.

## Targeted upcoming catalysts/milestones

- CY2023 project financing and commencement of construction.
- Commercial agreements: >20 battery and automotive customers receiving Talnode®-C for large-scale EV battery qualification and procurement processes.
- Planned Q3/Q4 2022 court hearing for environmental permit for Vittangi graphite mining operation.
- Further Vittangi resource growth in late H2 2022.
- First commercial scale Talnode®-C production in CY2024.



# Talga Group Ltd

ASX Code: TLG

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# JORC Graphite Reserve and Resources

Ore Reserve <sup>3, 5</sup>	Tonnes	Graphite (% Cg)
Nunasvaara (JORC 2012)	2,260,140	24.1
Probable	2,260,140	24.1

Mineral Resources <sup>1, 2, 4, 6, 7, 8</sup>	Tonnes	Graphite (% Cg)
Vittangi (JORC 2012)	30,100,000	24.1
Indicated	22,600,000	24.9
Inferred	7,500,000	21.8
Jalkunen (JORC 2012)	31,500,000	14.9
Inferred	31,500,000	14.9
Raitajärvi (JORC 2004)	4,300,000	7.1
Indicated	3,400,000	7.3
Inferred	900,000	6.4
<b>Total Mineral Resources</b>	<b>65,900,000</b>	<b>18.6</b>

- Note:
1. Mineral resources are inclusive of ore reserves.
  2. Mineral Resources are reported at various cut off grades: Vittangi 10% Cg, Jalkunen 5% Cg and Raitajärvi 5% Cg.
  3. Ore Reserve is reported at a cut off grade of 12% Cg.
  4. Errors may exist due to rounding.

# European Natural Graphite Peer Comparison

Company	Project	Study	Resource	Tonnage	Grade	Contained Tonnage	Information Source
Talga	Vittangi	DFS	Indicated	22,600,000	24.9	7,249,000	Talga Group, Company Announcement, 27 May 2022 <a href="https://talgagroup.eu-central-1.linodeobjects.com/app/uploads/2022/05/27124246/20220527VittangiResourceUpgrade_ASX.pdf">https://talgagroup.eu-central-1.linodeobjects.com/app/uploads/2022/05/27124246/20220527VittangiResourceUpgrade_ASX.pdf</a>
			Inferred	7,500,000	21.8		
Talga	Jalkunen	-	Indicated	-	-	4,693,500	Talga Group, Company Announcement, 27 August 2015 <a href="https://talgagroup.eu-central-1.linodeobjects.com/app/uploads/imports/asx-announcements/357c05f9-817b-416f-b7a9-299eb85d5dd3/TalgaTreblesGraphiteResourceToGlobalScale.pdf">https://talgagroup.eu-central-1.linodeobjects.com/app/uploads/imports/asx-announcements/357c05f9-817b-416f-b7a9-299eb85d5dd3/TalgaTreblesGraphiteResourceToGlobalScale.pdf</a>
			Inferred	31,500,000	14.9%		
Beowulf (Oy Fennoscandian Resources AB)	Aitolampi	-	Indicated	11,000,000	4.9%	1,275,000	Beowulf Mining, Company Announcement, 30 October 2019 <a href="https://polaris.brighterir.com/public/beowulf_mining_plc/news/rns/story/w1o096r">https://polaris.brighterir.com/public/beowulf_mining_plc/news/rns/story/w1o096r</a>
			Inferred	15,700,000	4.7%		
Leading Edge	Woxna	Producer	Indicated	9,810,000	7.5%	1,020,000	Leading Edge Materials, Company Announcement, 9 June 2021 <a href="https://leadingedgematerials.com/leading-edge-materials-announces-positive-preliminary-economic-assessment-results-for-its-woxna-graphite-anode-project-with-us317m-pre-tax-npv-and-42-9-pre-tax-irr/">https://leadingedgematerials.com/leading-edge-materials-announces-positive-preliminary-economic-assessment-results-for-its-woxna-graphite-anode-project-with-us317m-pre-tax-npv-and-42-9-pre-tax-irr/</a>
			Inferred	2,510,000	8.1%		
			Measured	960,000	9.21%		
Mineral Commodities	Traelen	Producer	Measured	67,000	30.2%	434,000	Mineral Commodities, Company Announcement, 16 November 2021 <a href="https://www.mineralcommodities.com/wp-content/uploads/2021/11/Traelen-Maiden-Ore-Reserve.pdf">https://www.mineralcommodities.com/wp-content/uploads/2021/11/Traelen-Maiden-Ore-Reserve.pdf</a>
			Indicated	719,000	25.2%		
			Inferred	1,058,000	22.0%		
Talga	Raitajärvi	-	Indicated	3,400,000	7.3%	307,300	Talga Group, Company Announcement, 26 August 2013 <a href="https://talgagroup.eu-central-1.linodeobjects.com/app/uploads/imports/asx-announcements/930169d0-25cf-407b-9738-3e56a71d7375/500IncreaseinContainedGraphiteatRaitajarviProject.pdf">https://talgagroup.eu-central-1.linodeobjects.com/app/uploads/imports/asx-announcements/930169d0-25cf-407b-9738-3e56a71d7375/500IncreaseinContainedGraphiteatRaitajarviProject.pdf</a>
			Inferred	900,000	6.4%		

# Competent Person Statements

The Vittangi Mineral Resource estimate was first reported in the Company's announcement dated 27 May 2022 titled 'Talga's battery anode growth ambitions boosted with 54% graphite resource increase'. The Company confirms that it is not aware of any new information or data that materially affects the information included in the previous market announcement and that all material assumptions and technical parameters underpinning the Resource estimate in the previous market announcement continue to apply and have not materially changed.

The Nunasvaara Ore Reserve statement was first reported in the Company's announcement dated 1 July 2021 titled 'Robus Vittangi Anode Project DFS'. The Company confirms that it is not aware of any new information or data that materially affects the information included in the previous market announcement and that all material assumptions and technical parameters underpinning the Reserve estimate in the previous market announcement continue to apply and have not materially changed.

The Jalkunen Mineral Resource estimate was first reported in the Company's announcement dated 27 August 2015 titled 'Talga Trebles Total Graphite Resource to Global Scale'. The Company confirms that it is not aware of any new information or data that materially affects the information included in the previous market announcement and that all material assumptions and technical parameters underpinning the Resource estimate in the previous market announcement continue to apply and have not materially changed.

The Raitajärvi Mineral Resource estimate was first reported in the Company's announcement dated 26 August 2013 titled '500% Increase to 307,300 Tonnes Contained Graphite in New Resource Upgrade for Talga's Swedish Project'. The Company confirms that it is not aware of any new information or data that materially affects the information included in the previous market announcement and that all material assumptions and technical parameters underpinning the Resource estimate in the previous market announcement continue to apply and have not materially changed.

The Company first reported the production targets and forecast financial information referred to in this announcement in accordance with Listing Rules 5.16 and 5.17 in its announcements titled 'Robust Vittangi Anode Project DFS' dated 1 July 2021 and 'Positive Niska Scoping Study Outlines Pathway to Globally Significant Battery Anode Production' dated 7 December 2020. The Company confirms that all material assumptions underpinning those production targets and forecast financial information derived from those production targets continue to apply and have not materially changed.

The Information in this presentation that relates to prior exploration results for the Vittangi Graphite Project is extracted from ASX announcements available to view on the Company's website at [www.talgagroup.com](http://www.talgagroup.com), with information on the exploration target first released to ASX on 20 July 2021. The Company confirms that it is not aware of any new information or data that materially affects the exploration results included in the relevant original market announcements. The Company confirms that the form and context in which the Competent Person and Qualified Person's findings are presented have not been materially modified from the relevant original market announcements.