

**Talga Group Ltd**  
**ASX:TLG**

# **Integrated Anode Production for Lithium-Ion Batteries**

**Event: South-West Connect**  
**Date: 28 Oct 2021**

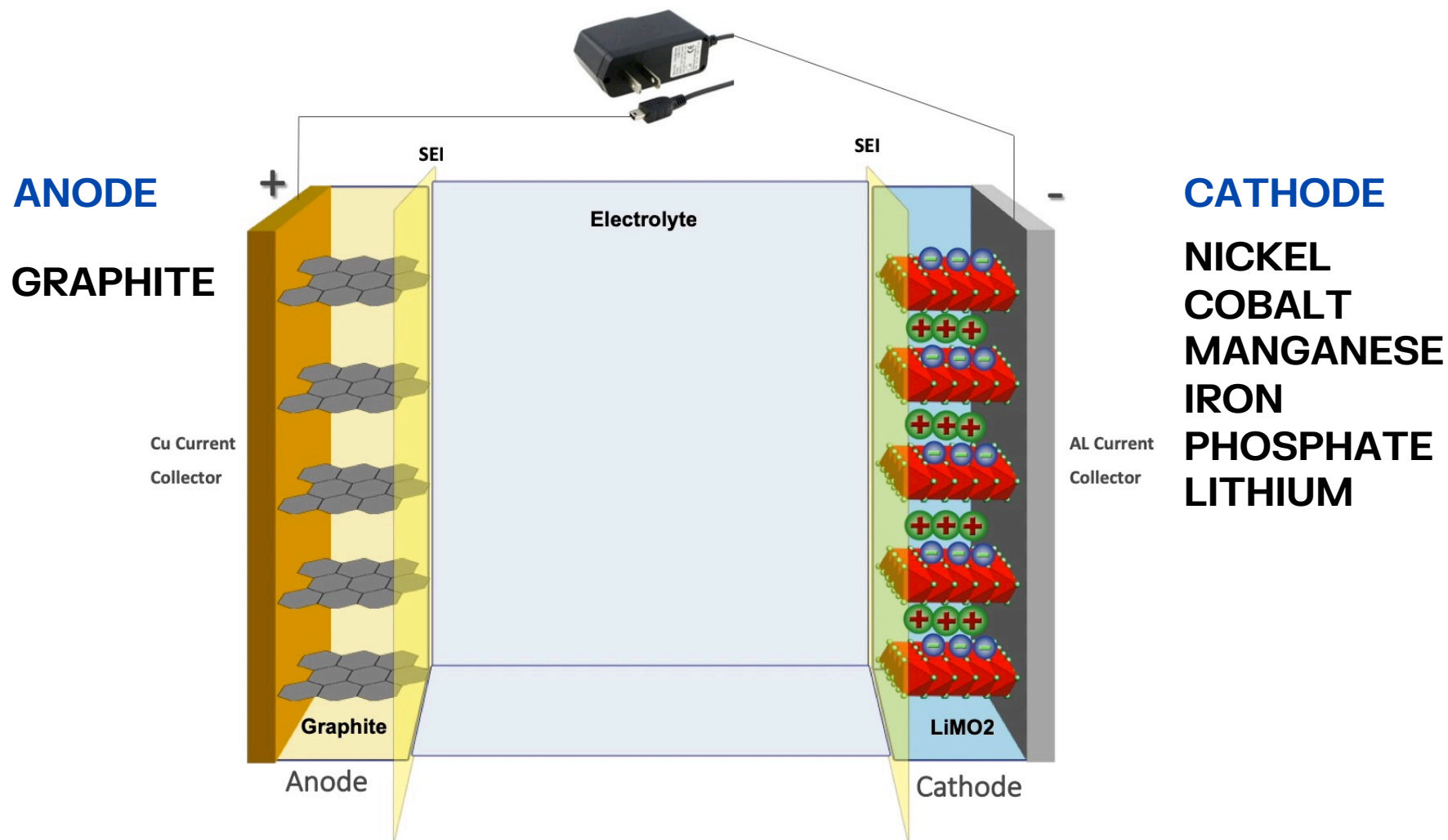
***talga***



# Our Mission

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

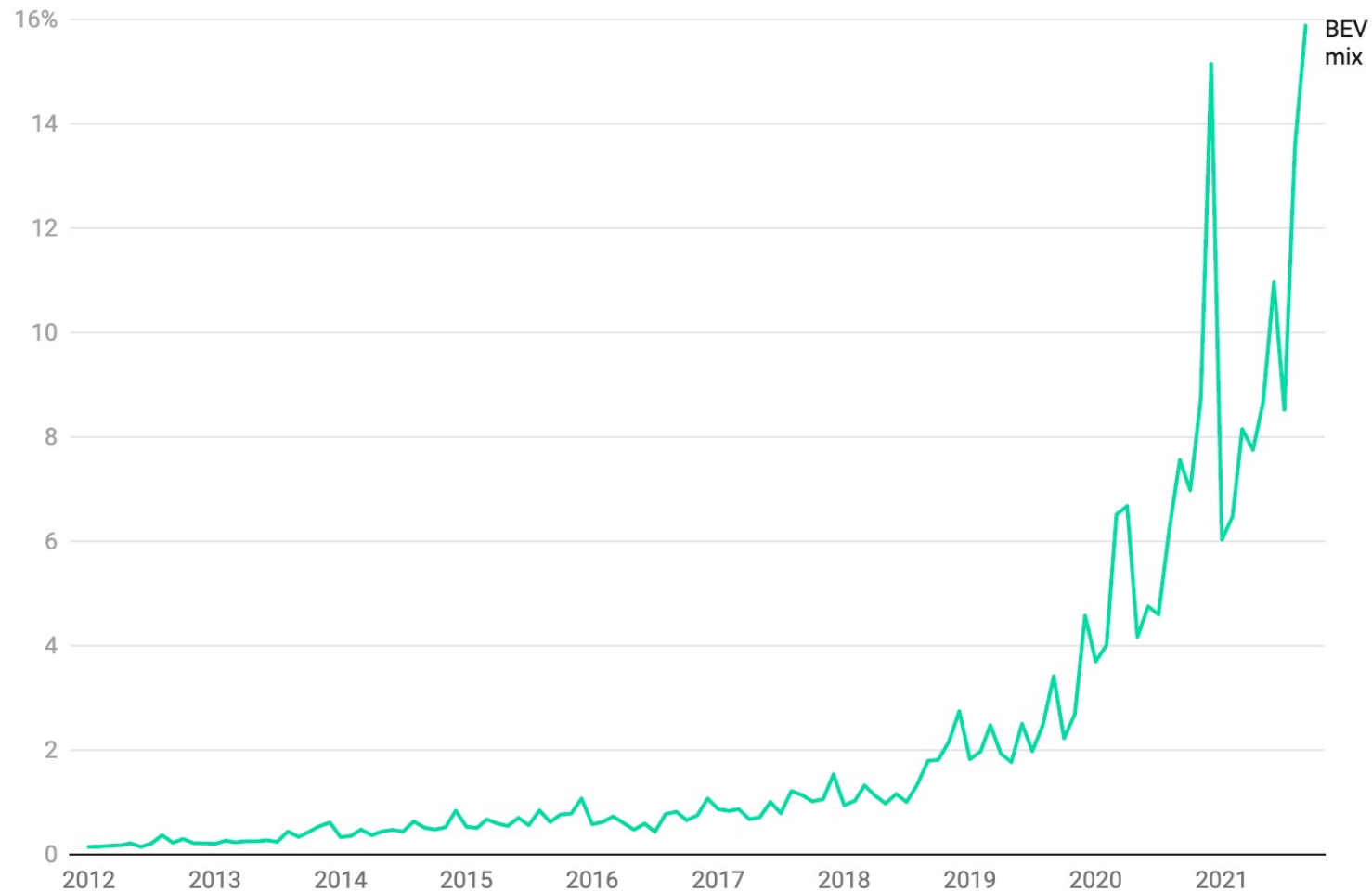
# Graphite Anode is Vital for Li-ion Batteries



VIDEO ON LITHIUM IONS INTERCALATING UNDER CHARGE/DISCHARGE CYCLES

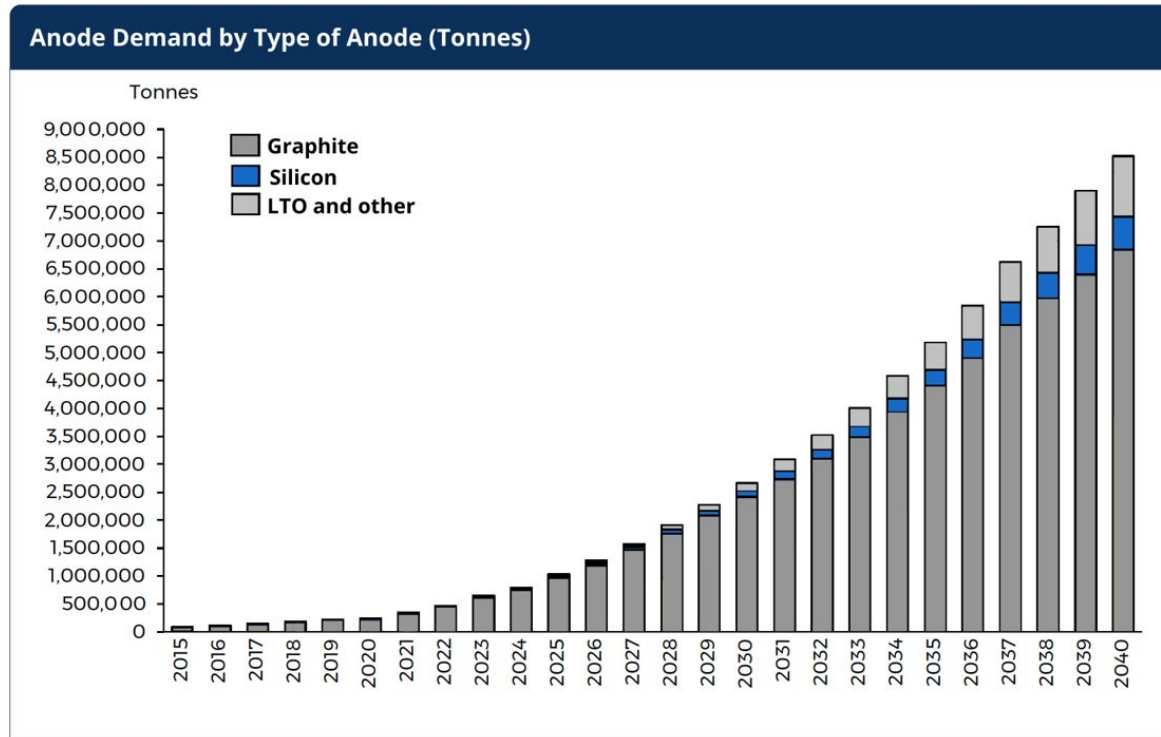
# Batteries booming as EV sales take off

Battery and Hybrid EV sales and market penetration rates now rapidly increasing





# Driving Immense New Anode Demand



- Battery demand will drive multi-decadal growth for anode and disrupt supply chains
- Current EV anodes are predominantly synthetic graphite but natural anode increasing market share due to favourable environmental footprint and rising cost of synthetic feedstock
- Silicon will be additive to graphite-dominant blends
- New technologies (solid state) expected to take time to commercialise and will see limited mainstream uptake due to cost and manufacturing limitations



# The Talga Story

- **2010** Talga founded by Mark Thompson in Perth and listed on Australian Securities Exchange (code TLG)
- **2011** Acquires first graphite permits in Sweden for Li-ion battery market
- **2012** Drills out world's highest grade graphite mineral resource
- **2014** Develops large-scale graphene production process and establishes in-house science/technical capability with sales and marketing division
- **2015** Trial mining starts in Sweden and German pilot processing facility comes online. Trial mine expanded in 2016
- **2017** Product development team established in Cambridge, UK
- **2018** Breakthrough battery anode results/start of Talnode® range
- **2020** Swedish JORC Mineral Resources lifted >50Mt.
- **2021** Vittangi Anode Project Detailed Feasibility Study completed. LKAB and Mitsui sign LOI for project development/Joint Venture.
- Talga anode being progressing with >48 battery customers, including 11 automotive OEMs and majority of global battery manufacturers. Production ramping up to commercial stage in 2023-24.



# Enabling green electrification

Electric vehicles and batteries are crucial to reducing greenhouse gas emissions. And green batteries require **green anodes**.



Graphite anode is up to 40-50% volume of the active materials in batteries



LCA<sup>1</sup> shows Talga anode production emits 96% less CO<sub>2</sub>



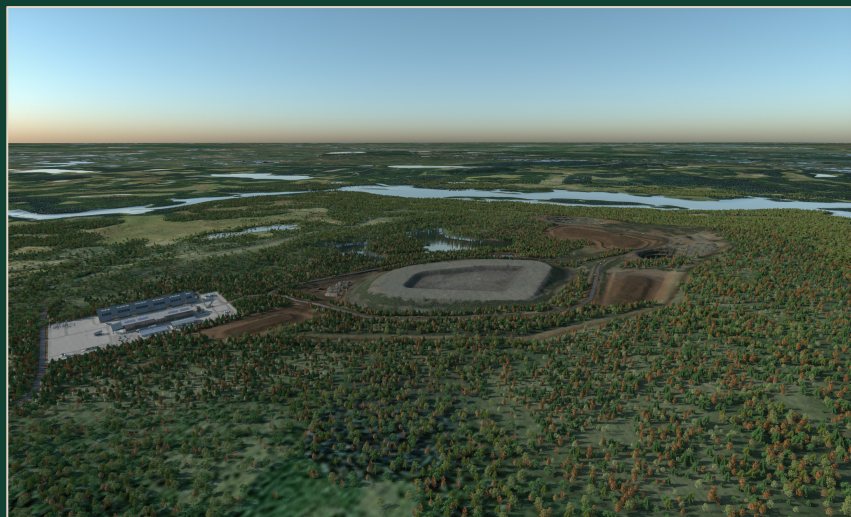
Equaling -2.9 tonnes CO<sub>2</sub> reduction per EV produced<sup>2</sup>

1. Talnode®-C Life Cycle Assessment results presented in Talga ASX release on 12 August 2021.

2. Assumes 76.5KWh battery pack being average of VW ID.4 1st and Tesla Model 3 Performance. Note: 1KWh = 1.2Kg anode (Source: Benchmark Mineral Intelligence report).



# Vertically Integrated Anode Production



**Vittangi**

Mine & Concentrator



**Luleå**

Anode Plant





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## Coated Anode Production

The world's greenest  
battery anodes for EVs

Powered by clean  
Swedish hydropower

Fed by high-grade  
Vittangi graphite





***talga***

## with Integrated Graphite Mining

Highest grade graphite  
resource (JORC)

Responsible mining  
and best practice  
closure planning

Highest anode yield per  
tonne minimises impact



# Vittangi Anode Project

- Outstanding economics of maiden DFS
  - 19,500tpa of Talnode®-C sales
  - NPV<sub>8</sub> of US\$1.05 billion
  - 24-year life of mine
  - IRR of 30%
  - Annual estimated revenue of US\$240 million
- Initial project based on market-target output several years ago. Expressions of interest for multiples of production lead to growth options being scoped.

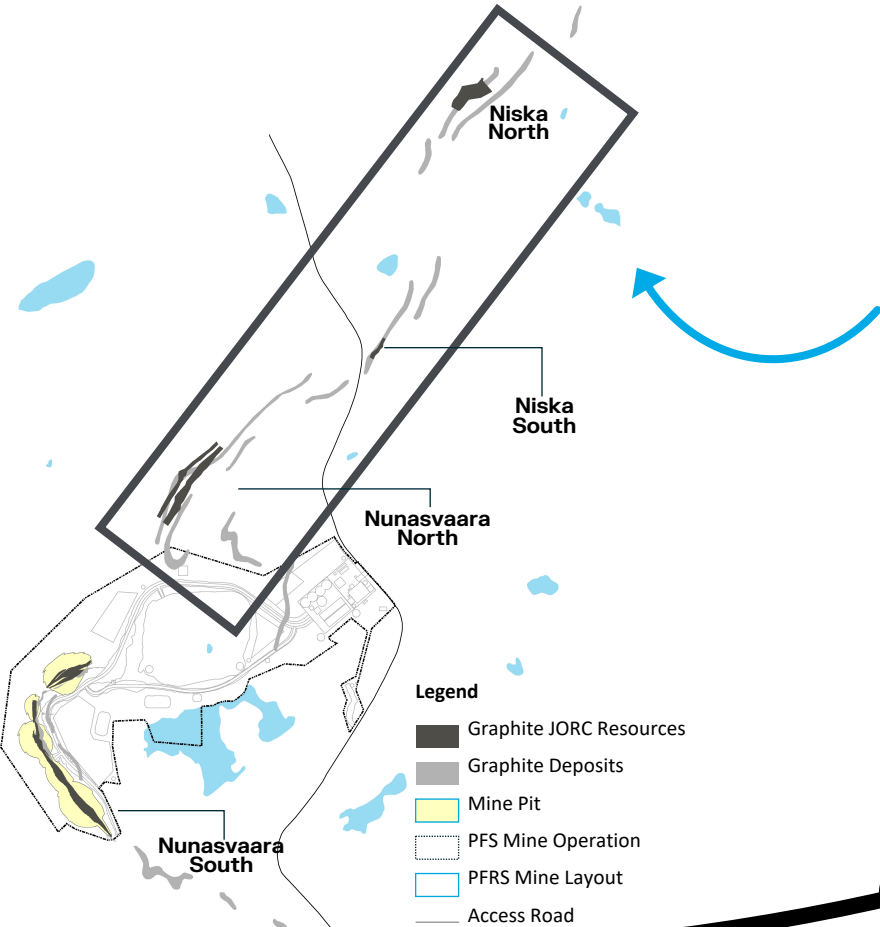




# Path to >100,000tpa Anode Production

Niska adds to Vittangi to make Talga the largest anode producer outside China

Vittangi Project  
Total JORC (2012)  
Mineral Resource  
**19.5 Mt @ 24% Cg**



Niska Expansion <sup>(1)</sup> (2020 Scoping Study)	
Talnodel-C	84,700tpa
Talphenel	8,470tpa
Life of Mine	14 years
Pre-tax NPV <sub>8</sub> base case	US\$3,540M
Pre-tax IRR	47%
Capex (inc. contingency)	US\$1,246M <sup>(2)</sup>

2020-22  
DEVELOPMENT  
EVA PLANT

2024  
COMMERCIAL 19,500tpa

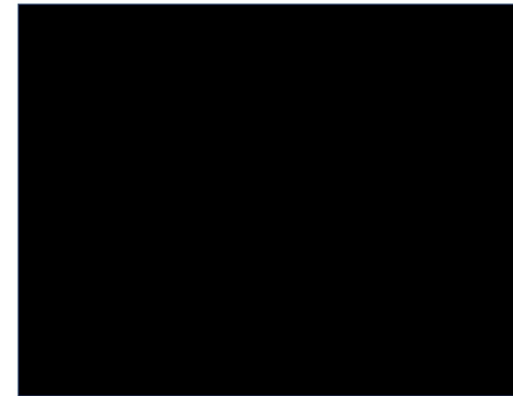
2025  
EXPANSION TO  
~104,000tpa

SEE: ASX:TLG 23 MAY 2019; 24 JUNE and 7 DEC 2020; 1 JULY 2021  
(1) REFER TO THE CAUTIONARY STATEMENT IN RESPECT OF THE NISKA SCOPING STUDY ON PAGE 2. (2) INCLUDES US\$171M MINE AND CONCENTRATOR, PURIFICATION PLANT US\$197MM, ANODE PLANT US\$304MM, INDIRECT REFINERY US\$168MM, INFRASTRUCTURE US\$202MM and CONTINGENCY US\$206MM AS PER SCOPING STUDY RELEASED 7 DECEMBER 2020.

# World's greenest anodes

- Hitachi LCA<sup>1</sup> shows Talga anode production emits 96% less CO<sub>2</sub> than existing EV anode
- Responsibly extracted natural graphite
  - *not oil or coal-based synthetic graphite*
- 100% sustainable electricity processing
  - *not fossil fuel-powered production*
- Locally produced materials
  - *shortest and strongest supply chain*

## CO<sub>2</sub>-eq emissions to make 1 Tonne battery anode



**33.6 Tonnes of CO<sub>2</sub>-eq**  
**Typical synthetic graphite**

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**1.5 Tonnes of CO<sub>2</sub>-eq**  
**Talnode®-C in North Sweden**

# Electric Vehicle Anode Plant



*Talga EVA anode coating oven under construction*

- First coated anode production plant in Europe (Luleå, Sweden)
- Critical step in progressing automotive OEM procurement processes
- Plant will produce active anode material for EV batteries at large-scale quantities aligned with customer requirements
- Commissioning starts Q4 2021 for customer production H1 2022



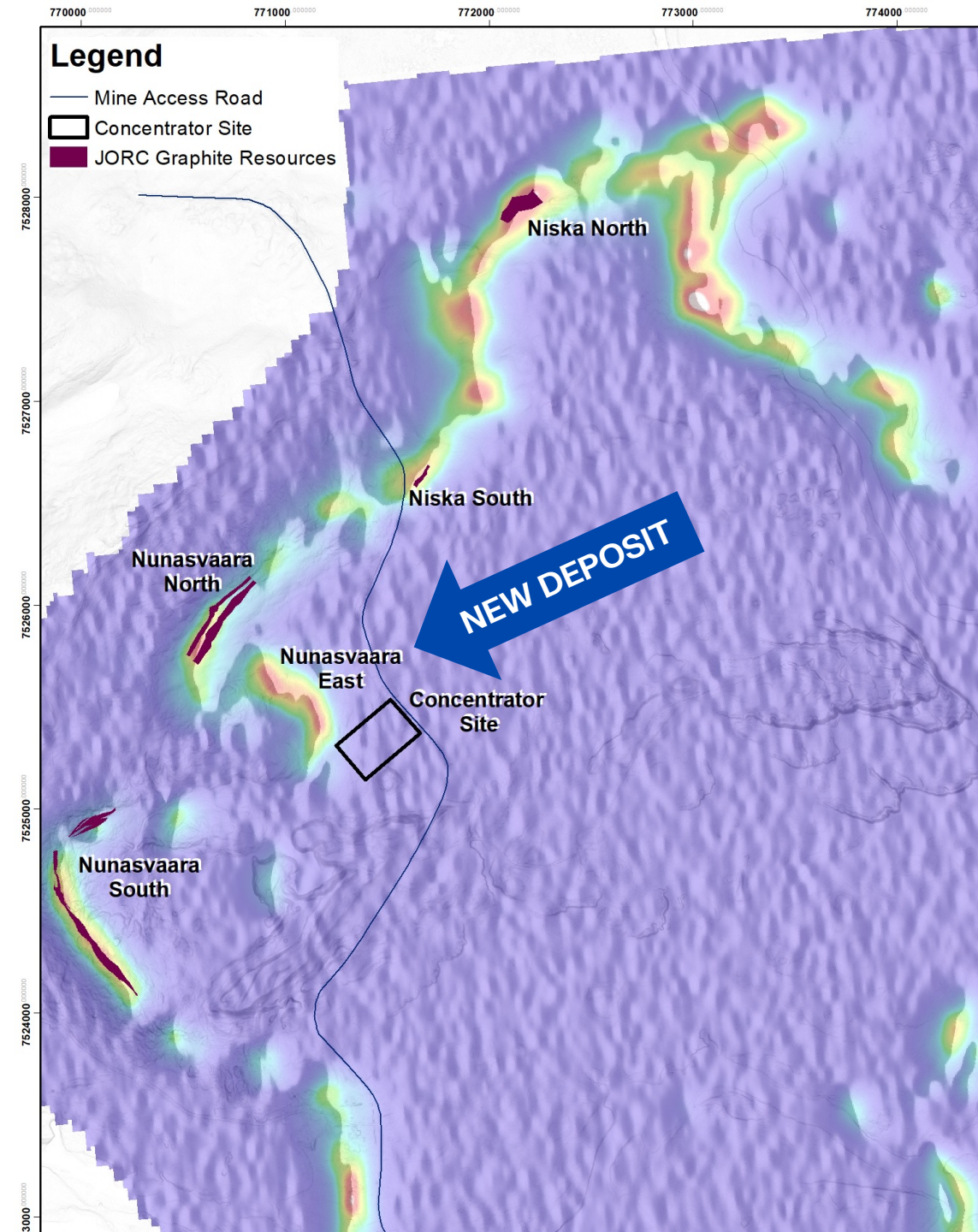
# Trial Mine

- In Q3, trial mining commenced at Talga's Niska South deposit
- 25,000 tonnes of feed ore (mined over 2021 and 2022) will be subsequently refined into Talnode®-C for large scale production testing in the EV supply chain.
- Exploitation concession applications for the Niska expansion have been submitted to Swedish authorities.
- Applications pertain to expansion plans defined in the Niska Scoping Study form a pathway for Talga to produce a total of more than 100,000tpa anode for Li-ion batteries.



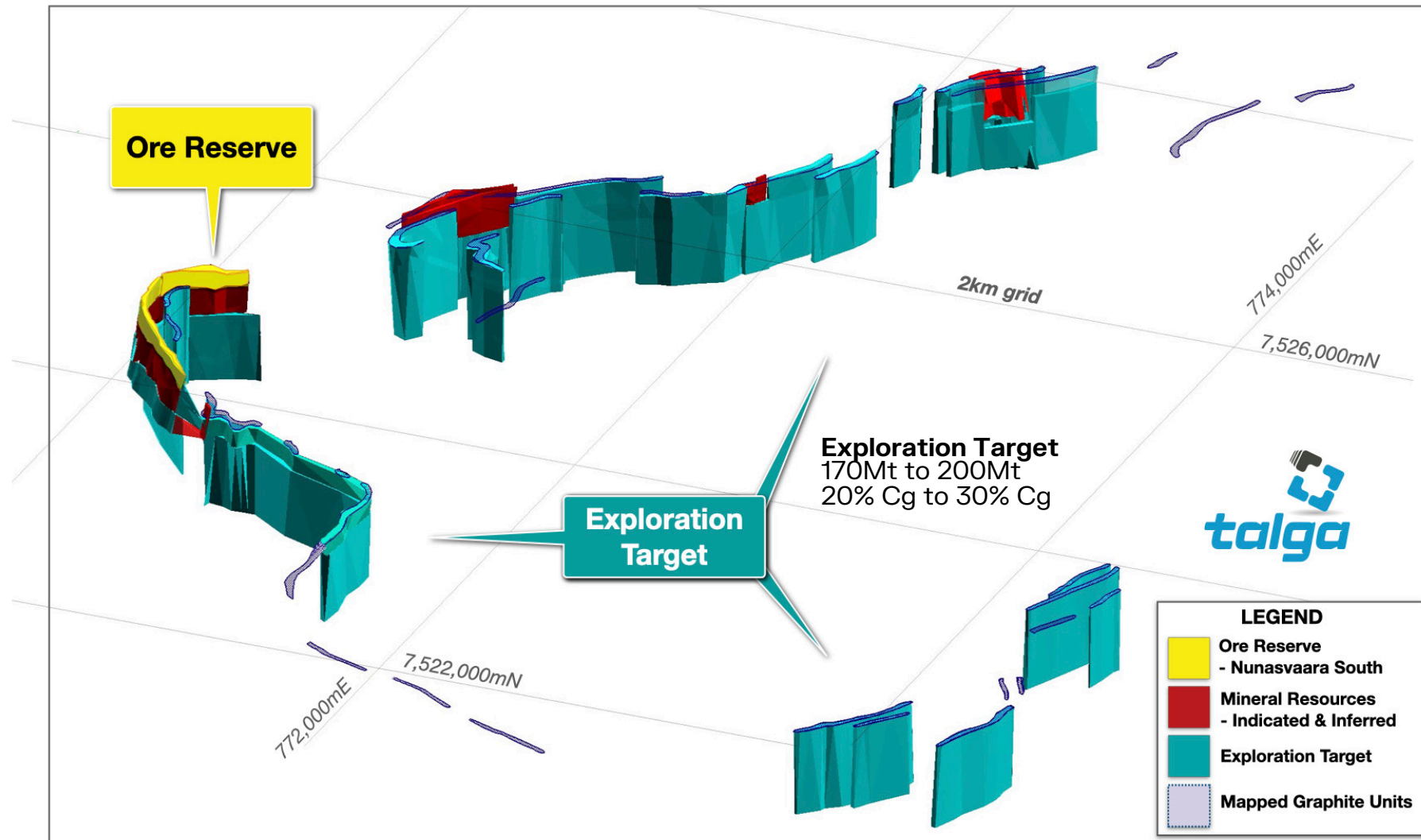
# Exploration Restarts

- **Market growth for anode drives exploration to define more resources and grow reserves**
- **Recent Exploration**
  - SkyTEM geophysical survey reveals Vittangi graphite-bearing units more continuous than previously recognised.
  - Significant new high-grade target between Nunasvaara North resource and planned mill called Nunasvaara east. Being drilled now.
  - Drilling of extensions of resources and new targets completed. Assay results due to start flowing in November.



# Growth Potential for Expansions

Current DFS Ore Reserve a fraction of Resource, which are a fraction of Exploration Target



*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. See ASX:TLG 20 July 2020.*



# Next Steps

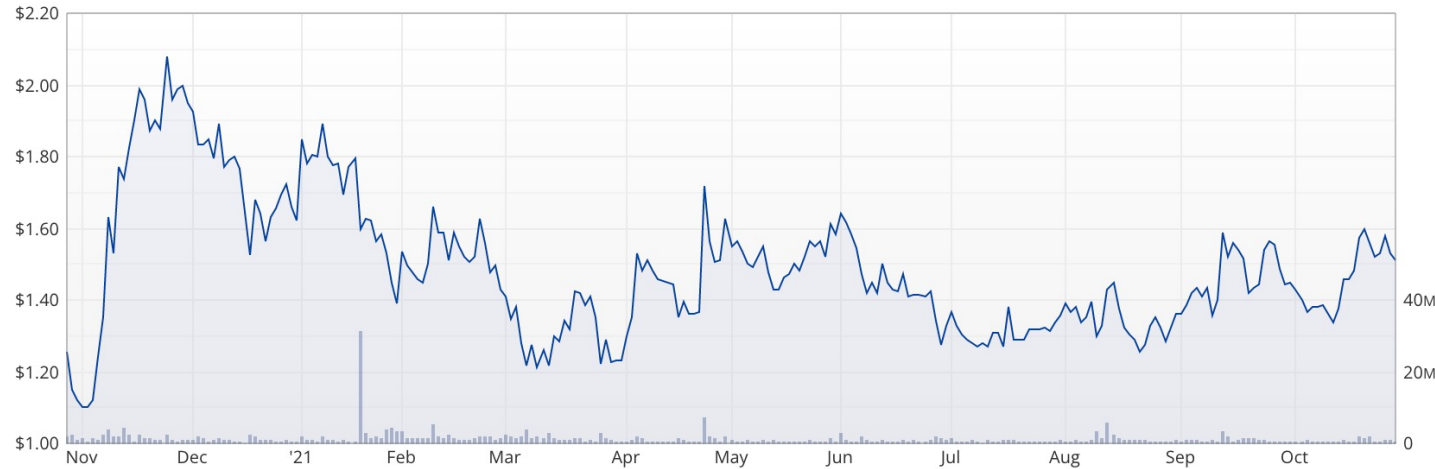
- **Project financing process and Joint Venture partner discussions progressing on track**
- EVA plant construction and commissioning
- **Drilling results**
- Customer and commercial product developments
- **Silicon anode expansion and commercialisation options**
- Divestment of legacy iron ore and cobalt-copper projects in Sweden





# Corporate Overview

## ASX:TLG PERFORMANCE (12 MONTHS)



## STOCKMARKET CODES/TICKERS

Primary listing in Australia on the ASX (TLG)  
with OTC trading in Germany (TGX) and US (TLGRF)

## CAPITAL STRUCTURE

ASX Listing Code:	TLG
Market Capitalisation:	\$463.9M
Listed Shares:	303.2M
Unlisted Options:	15.4M (1)
Cash as at 30 June 2021:	\$52.5M

## MAJOR SHAREHOLDERS

Mark Thompson – M. Director	4.7%
Kinetic Investment Partners	4.4%
UBS AG	2.1%
UBS Securities Australia	2.0%
Charles Schwab & Co. Inc	1.7%

**TOP 20 SHAREHOLDERS 30.0%**

**Total number of shareholders 11,058**

NOTE: MARKET CAPITALISATION AS AT 27 OCTOBER 2021, SHAREHOLDERS AS AT 2 AUGUST 2021.

(1) UNLISTED OPTIONS INCLUDE PERFORMANCE RIGHTS SUBJECT TO VESTING CONDITIONS.



## TALGA GROUP LTD

ASX Code: TLG

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**Website:** [www.talgagroup.com](http://www.talgagroup.com)

### GLOBAL OPERATIONS

**Talga Sweden:** Vänortvägen 2, 981 32 Kiruna, Sweden

**Talga Sweden:** Storgatan 7, 972 38 Luleå, Sweden

**Talga UK:** The Bradfield Centre, 184 Cambridge  
Science Park, Cambridge CB4 0FQ, UK

**Talga Germany:** Prof.-Hermann-Klare-Str. 25, 07407  
Rudolstadt, Germany

**Talga Japan:** Takatsuki, 569-1046, Osaka, Japan

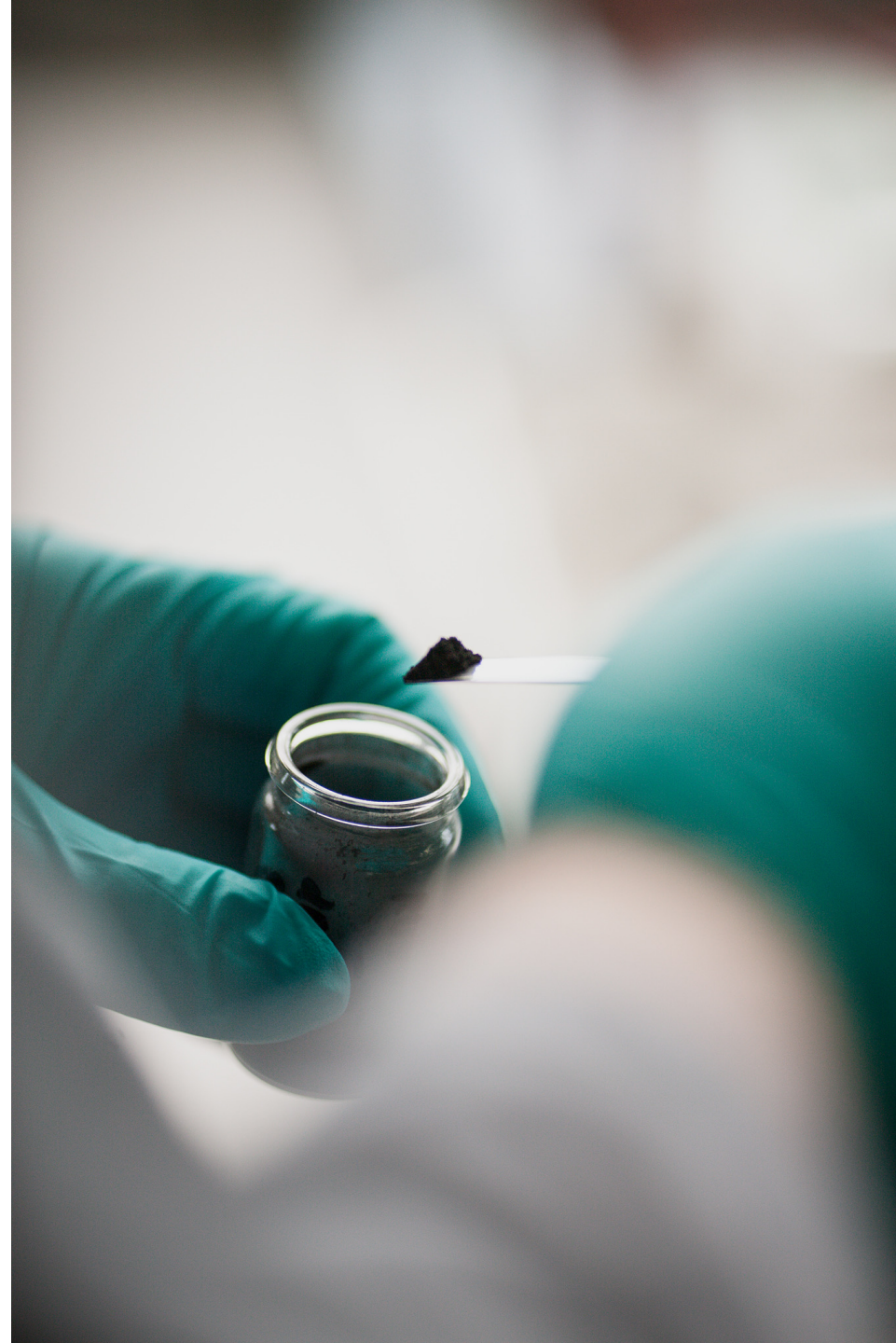
*Talga Vittangi graphite  
ore sculpture*





# Talnode®-C Anode

- Highly engineered graphite anode material
- Excellent charging performance at high load and low temperature
- High rate and excellent capacity retention (>90%) during fast charging
- Effective for applications that require a higher rate (> 10C) such as for PHEVs and HEV.
- Greenest anode in the world



# Talnode®-Si Silicon Anode

- For higher energy density sought by customers battery roadmaps
- Drop in additive for existing commercial anode blends
- Talga technology enables silicon-loaded anodes to stabilise/not pulverise
- High volume lower cost production process
- Produced as byproduct from Talga's Talnode®-C process/lower cost
- EV and 3C customer testing and scale-ups underway



*Talga Vittangi drillcore on  
Talnode®-Si silicon source material*



# JORC Graphite Reserve and Resources

Ore Reserve <sup>3, 6</sup>	Tonnes	Graphite (% Cg)
Nunasvaara (JORC 2012)	2,260,140	24.1
Proven	0	0
Probable	2,260,140	24.1
Mineral Resources <sup>1, 2, 4, 5, 7, 8, 9</sup>	Tonnes	Graphite (% Cg)
Vittangi Nunasvaara (JORC 2012)	14,900,000	23.4
Indicated	10,400,000	25.6
Inferred	4,500,000	18.3
Vittangi Niska (JORC 2012)	4,600,000	25.8
Indicated	4,600,000	25.8
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>55,300,000</b>	<b>17.5</b>

NOTE: 1 MINERAL RESOURCES ARE INCLUSIVE OF ORE RESERVES.

2 MINERAL RESOURCES ARE REPORTED AT VARIOUS CUT OFF GRADES: NUNASVAARA AND NISKA 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.

SEE: ASX:TLG (5) 17 SEP 2020, (6) 1 JUL 2021, (7) 15 OCT 2019, (8) 27 AUG 2015 AND (9) 26 AUG 2013.

# Competent Person Statements

The Niska Mineral Resource estimate was first reported in the Company's announcement dated 15 October 2019 titled 'Talga boosts Swedish graphite project with maiden Niska resource'. 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 Mineral Resource estimate was first reported in the Company's announcement dated 17 September 2020 titled 'Talga Boosts European Natural Graphite Resources'. 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 reported in the Company's announcement dated 1 July 2021 titled 'Robust 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 presentation in accordance with Listing Rules 5.16 and 5.17 in its announcement titled 'Robust Vittangi Anode Project DFS' dated 1 July 2021. 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). 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.