

# European Critical Raw Materials for the Green Transition

March 2025



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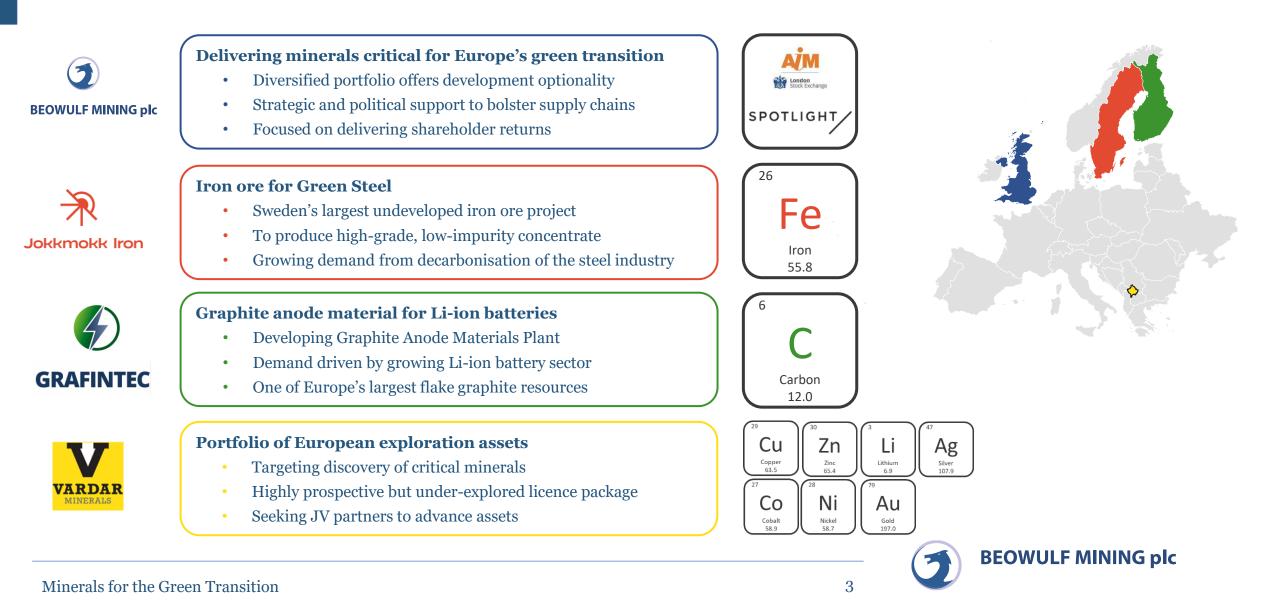
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### Investment case – right assets, location and timing

Developing a European portfolio of critical minerals



### Capital Raise: structure and timing

Funding to progress projects towards key milestones

#### **Proposed deal structure:**

- ▶ UK Placing: £1.0m/ SEK 13m
  - Board, Management and associates: £0.27m/ SEK 3.5m
- Swedish Rights Issue: up to £2.9m/ SEK38m
  - Guaranteed: £1.1m/ SEK15m
- ▶ UK Retail Offer: up to £0.7m/ SEK 9m
- Total if fully subscribed: £4.5m/ SEK 59m

#### Use of proceeds if fully subscribed:

- Complete the Kallak Pre-Feasibility Study ("PFS")
- > Submit the Kallak Environmental Permit application
- > Advance GAMP and exploration portfolio
- Provide working capital into 2026

#### **Timetable:**

- 21 March: Announcement of Capital Raise
- 4 April: Formal decision to proceed and terms & conditions announced
- ➢ 8 April: General Meeting
- ➢ 15 April: Swedish Prospectus published
- ➢ 16 April: Subscription Period and UK Retail Offer starts
- > 2 May: UK Retail Offer ends
- ➢ 5 May: Subscription Period ends



### Building blocks for a sustainable future

ESG embedded throughout the company as a core value

### Sustainability approach driven by:

- Transparency and Accountability
- Meaningful Stakeholder Engagement
- Environmental Stewardship
- Corporate Governance
- Innovation and Technology

#### Beowulf plans to:

- Build a sustainable minerals business
- Adopt innovation and technology
- Target carbon neutrality
- Support the green transition
- Generate value for all stakeholders





# R Jokkmokk Iron

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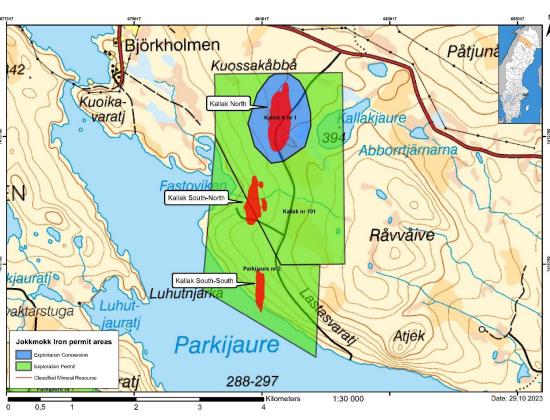
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# Kallak: high-grade, low-impurity iron ore

Critical product to decarbonise the steel industry

- Sweden's "largest undeveloped quartz banded iron ore deposit" and "of national interest"<sup>1</sup>
  - Measured & Indicated Resource<sup>2</sup>: 111Mt @ 28% Fe
  - Inferred Resource<sup>2</sup>: 25Mt @ 28.3% Fe
  - Significant exploration upside
- Potential to produce high-grade, low impurity concentrate
  - ~2.7Mtpa at >70% Fe with low gangue
  - Growing demand from domestic and international markets
- Well-located for existing iron ore infrastructure
  - Rail within 40km and multiple port options
  - Access to low-cost, clean energy
  - Skilled local work-force
- Significantly de-risked
  - Exploitation concession received
  - PFS and Environmental Permit application well-advanced
- 1: Government statement released on 18 January 2024
- 2: Based on 2021 PERC compliant Mineral Resource Estimate for Kallak North



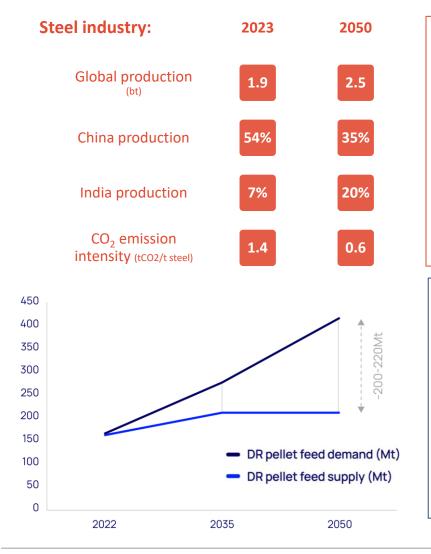


# High-grade iron ore: demand forecast to grow

Decarbonisation of steel to drive demand of low carbon feedstocks, primarily DRI

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- Steel industry currently accounts for  $\sim 7\%$  of global CO<sub>2</sub> emissions
- Industry targeting 60% decrease in CO<sub>2</sub> emission intensity by 2050 (and 90% by 2070)
- Electric Arc Furnaces (EAFs) are replacing highly polluting Blast Furnaces (BFs)
- Low-carbon feedstocks, primarily Direct Reduced Iron (DRI), will be essential to support EAF capacity
  - DRI produced with green hydrogen offers a real route to delivering low-carbon steel Source: IEA Sustainable Development Scenario
  - DRI currently accounts for  $\sim 5\%$  of supply to steel industry
- Significant supply deficit forecast
- Mines capable of supplying sufficiently high-quality material for DRI will not meet demand
- DRI will also likely need to be produced from lower quality iron ore but at a cost
- Supply constraints to drive premiums for high-quality concentrate Source: McKinsey, Wood Mackenzie



Decarbonisation of Steel Industry

### Kallak North Iron Ore Project

Basic project parameters

Open pit mining<sup>1</sup>:

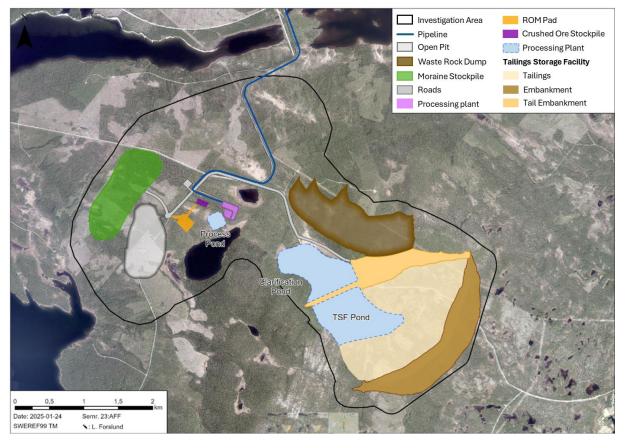
- 9 Mtpa of ore
- Ore from surface
- Low strip ratio of 0.5 : 1

Processing<sup>2</sup>:

- Standard crush, grind and physical separation
- Magnetic separation to 69% Fe product

• Final physical beneficiation to upgrade to DRI product Concentrate<sup>2</sup>:

- 2.7 Mtpa of concentrate
- >70% Fe, low impurities and <2.5%  $SiO_2 \& Al_2O_3$
- Conventional tailings management
- 1: Kallak North Scoping Study, January 2023
- 2: Updated as part of the ongoing Pre-Feasibility Study





Producing premium concentrate

### Location advantage

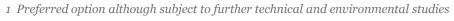
Well-located for domestic and international markets

Transportation solution:

- Mine-site to rail terminal 40km slurry pipeline<sup>1</sup>
- Rail to Narvik (deep-water and ice-free)
- Access to international markets

Northern Sweden - multi-decade history of iron ore mining

- Existing infrastructure
- Low-cost, renewable energy
- Skilled and experienced workforce
- Political support for sector
- Significant investment in Green Steel
- CBAM<sup>2</sup> a future benefit



<sup>2</sup> Carbon Border Adjustment Mechanism

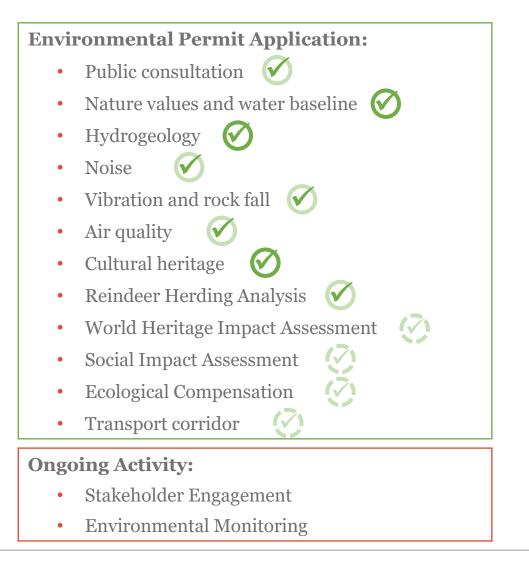




#### Well-located

### Project significantly derisked

Focus on developing a world class mine







High-grade, low-impurity

### Kallak advantage

Targeting a premium product

Enhanced economics:

- Premium product critical for decarbonising steel industry
- Highly sought after for domestic and international markets
- Focus on developing a sustainable world class mine
- Increased mine life potential from exploration upside

Scoping study base c	ase parameters <sup>1</sup>	Management Case <sup>4</sup>
NPV at 8%:	US\$177m	 US\$829m
IRR:	14.5%	31.8%
Payback period:	4.5 years	2.7 Years
Concentrate production:	2.5 Mtpa	2.7 Mtpa <sup>4</sup>
Concentrate split:	67% BF <sup>2</sup> , 33% DR <sup>2</sup>	100% DR4
Iron Ore Benchmark Price	US\$80/dmt <sup>3</sup>	US\$97/dmt <sup>4</sup>
BF premium:	US\$29/dmt <sup>3</sup>	
BF price:	US\$109/dmt	
DR premium:	$US$45/dmt^3$	US\$45/dmt <sup>3</sup>
DR price:	US\$125/dmt	US\$142/dmt



Source: https://tradingeconomics.com/commodity/iron-ore

#### Notes:

- 1. Scoping Study assumes initial capital expenditure of US\$386m and 14-year mine life
- 2. BF Blast Furnace feed and DR Direct Reduction feed
- 3. Scoping Study pricing assumptions assume premia archived over Platts 62% Fe benchmark price of US\$80/dry metric tonne ("dmt")
- 4. Management Case assumes:
  - 100% DR production and 2.7 Mtpa based on PFS Metallurgical test-work
  - All other project inputs based on Scoping Study numbers including the DR premium
  - Consensus 2029 62% Fe benchmark pricing



Significant upside

### Exploration upside

Untested potential

#### Kallak North

- M&I resource<sup>1</sup>: 111Mt @ 28% Fe
- Inf resource<sup>1</sup>: 25Mt @ 28.3% Fe
- *Exploration target<sup>2</sup>: 3-7.5Mt @ 20-30% Fe*

#### Kallak South

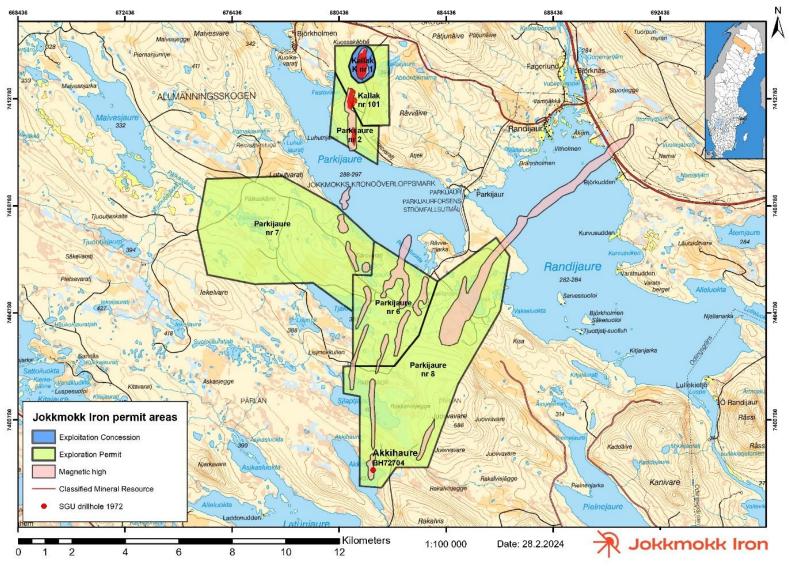
- M&I resource<sup>1</sup>: 21Mt @ 26.9% Fe
- Inf resource<sup>1</sup>: 14Mt @ 24.9% Fe
- *Exploration target*<sup>2</sup>: 25-75*Mt* @ 20-30% *Fe*

### Parkijaure nr. 6

• *Exploration target<sup>2</sup>: 45-135Mt @ 20-30% Fe* 

#### Parkijaure 6, 7 & 8

- Exploration potential<sup>3</sup>: 700Mt @ 21% Fe
- 1: Based on 2021 PERC compliant Mineral Resource Estimate
- 2: Defined as part of 2021 Mineral Resource Estimate
- 3: Defined by consultant Geovista in 2017





Mine life extension potential



### Grafintec

### Aiming to be a European leader in the sustainable supply of anode material

- Development of anode materials production facility in Finland
  - Creating secure domestic supply chain to support growing European lithium-ion battery sector
  - PFS completed in March 2025
    - ➢ Post-tax NPV8 of €924 million and IRR of 37% over 25 years (Phase 1)
    - ➢ Highly competitive operating costs at €2,381/ tonne of product
- Finland offers
  - Low-cost renewable energy
  - Skilled work force
  - Proximity to growing market
- Further upside
  - Phase 2 expansion
  - Integration of Grafintec's graphite projects Aitolampi is one of Europe's largest flake graphite resources
  - EU and Finnish initiatives to support decarbonisation agenda including grants and tax incentives



Emas

Luopioinen

Pirttikoski

Rääpysjärvi

Aitolamp

Anode

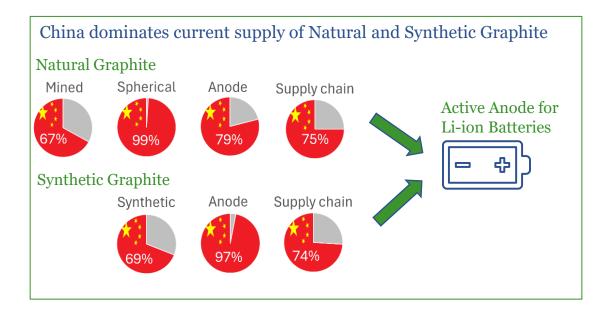
material plant

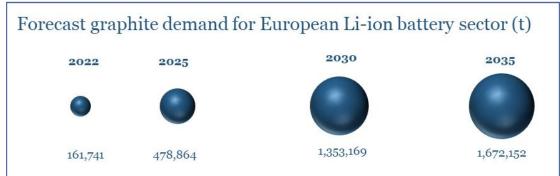
# d Finnish initiatives to support decar

#### Supply of Critical Raw Materials

## European graphite market

Supply / demand imbalance





Natural Graphite offers significant environmental advantages over Synthetic Graphite

	Natural	Synthetic
Carbon Intensity (tonne CO2/ tonne uncoated graphite)	6.59	23.71
Estimated anode composition	56%	44%

EU Critical Raw Materials Act to secure EU supply:

- >10% extracted from EU
- >40% processed within EU
  - >25% from recycling

\* \* \* \* \* \* \* \* \*

<65% from a single country

To meet CRM targets, the EU needs to:

- Mine >200,000 tpa by 2030 currently no production
- Process >800,000 tpa by 2030 currently no production



### **Graphite Anode Materials Production**

Finland offers significant advantages





State and EU support: grants and tax incentives



Dedicated sites for battery technologies



Low-cost renewable energy



Skilled workforce



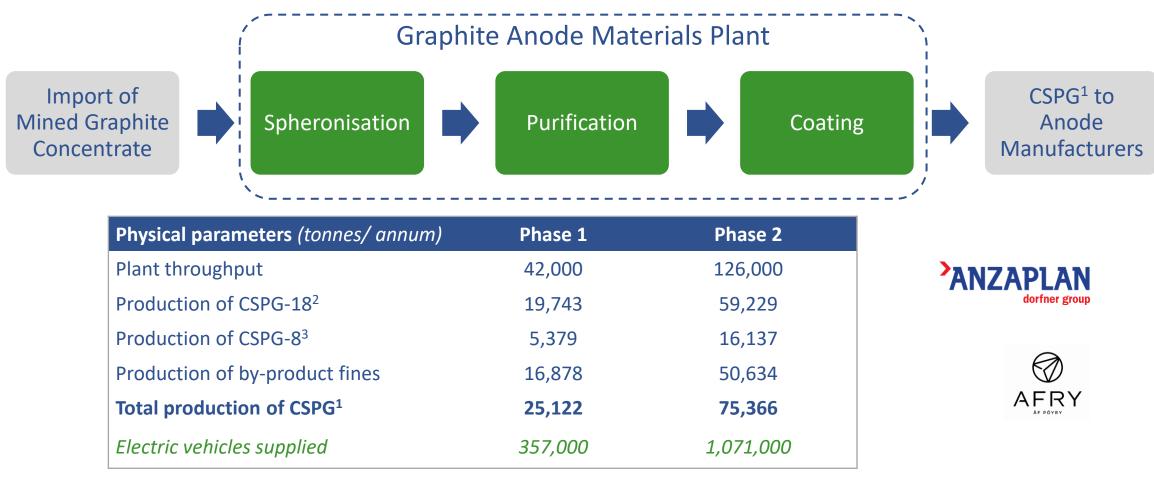
Proximity to European customers



Supplying graphite to the Li-ion battery industry

### **Graphite Anode Materials Production**

Pre-Feasibility Study complete



1 CSPG: Coated Spherical Purified Graphite

2 CSPG-18: CSPG with particle size of 18  $\mu m$ 

3 CSPG-8: CSPG with particle size of 8  $\mu m$ 



### **Graphite Anode Materials Production**

Pre-Feasibility Study: robust economics

Economic parameters	Phase 1	Phase 2
Post-tax NPV <sub>8</sub>	€924m	€2,178m
Post-tax IRR	37%	38%
Pre-tax NPV <sub>8</sub>	€1,173m	€2,763m
Pre-tax IRR	42%	42%
Capital expenditure	€225m	€675m
Payback period	2.9 years	
Life of operation	25 years	25 years
Revenue per year	€218m	€653m
Operating cost per year	€60m	€179m
EBITDA per year	€150m	€451m
Free cash flow per year	€120m	€361m

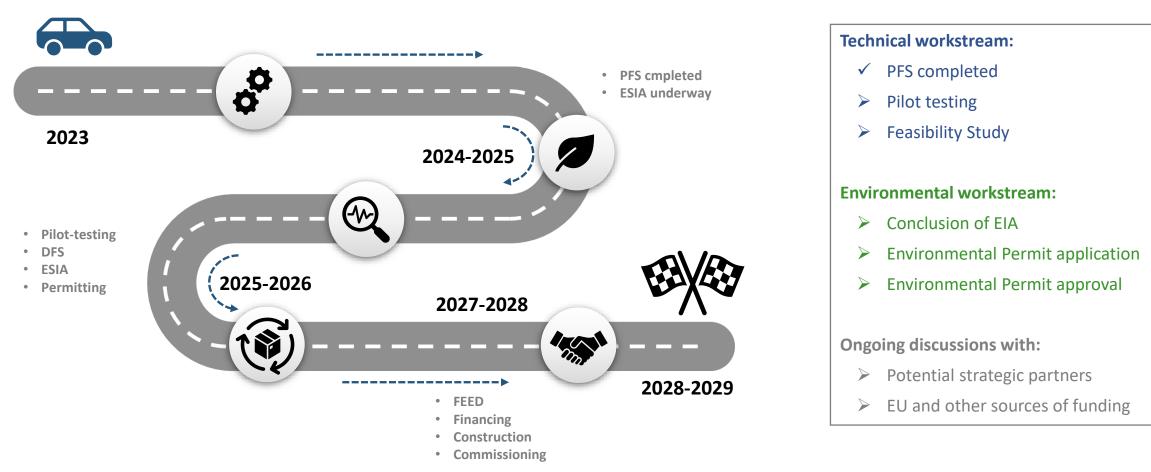
Unit prices and costs	US\$/ tonne
Concentrate purchase price	568
Operating cost per tonne feed	1,424
Operating cost per tonne product	2,381
CSPG-18 realised price	7,800
CSPG-8 realised price	10,260
Fines realised price	500

Operating cost breakdown		
Supply of concentrate	41%	
Power	12%	
Water	4%	
Reagents	14%	
Maintenance	7%	
Laboratory & Other	5%	
Sustaining Capital	11%	



### **Development Timeline**

Environmental and Technical Workstreams



With the successful conclusion of the Environmental and Technical workstreams, the GAMP project will enter Front-End Engineering Design (FEED), financing and ultimately construction phases with first production targeted for 2028-2029.



#### Focused on delivery

### Strategic resources

One of Europe's largest flake graphite deposits

### Aitolampi

Mineral resource

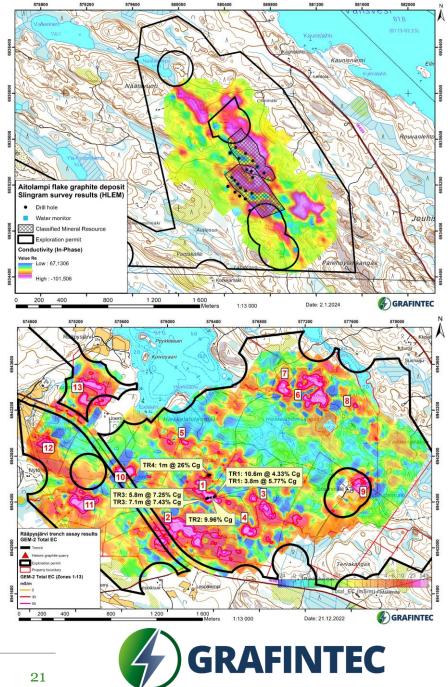
Metallurgical testwork

### Rääpysjärvi

Exploration work

Metallurgical

- Indicated and Inferred 26.7Mt at 4.8% graphite for 1,275,000 tonnes of contained graphite (Indicated and Inferred)
- Several untested EM conductive areas
- 96.8% to 97.5% graphite concentrates produced suitable as a pre-cursor for graphite anode materials production
- Purification tests achieved >99.95% graphite
- Spheronisation and battery application tests completed
- Located 8km from Aitolampi
- EM conductive anomalies are more extensive potential for a larger tonnage of graphite mineralisation in the area
- >50% graphite assayed *(limitation of the analysing methodology)* from grab sample at historic graphite quarry at Zone 1 potential for localised very high-grade mineralisation
- Four trenches revealing significant flake graphite mineralization, including 1.0m at 26.00% graphite & 7.1 m at 7.43% graphite
- Composite surface grab sample with a head grade of 19.8% graphite
  - 97.4% graphite concentrate produced with 18.8% in the large/jumbo flake fraction



testwork

# **Exploration Assets**

### Vardar – focused on discovery

### Tethyan Belt – a major metallogenic province

Timok deposit (Zijin), Serbia:

- Zijin acquired Nevsun Resources Ltd. for US\$1.4b in 2018, after Nevsun acquired Reservoir Minerals Inc. for US\$365m in 2016
- Total resources of 1.8bt @ 0.9% Cu & 0.2g/t Au
- Forecast 2023 production of 3Mt for 181kt Cu & 156koz Au

Skouries deposit (Eldorado Gold), Greece:

• Total resource of 308Mt @ 0.6g/t Au & 0.5% Cu

Stan Terg mine (Trepca), Kosovo:

• Reported historic resource of 63Mt @ 3.5% Pb, 2.3% Zn & 80g/t Ag

Sasa deposit (Central Asia Metals), North Macedonia:

- Acquired for US\$402.5m in 2017
- Total resources of 22.3Mt @ 4.2%Pb, 2.5% Zn & 20.5g/t Ag
- 2022 production of 807kt @ 3.6% Pb & 3.2% Zn

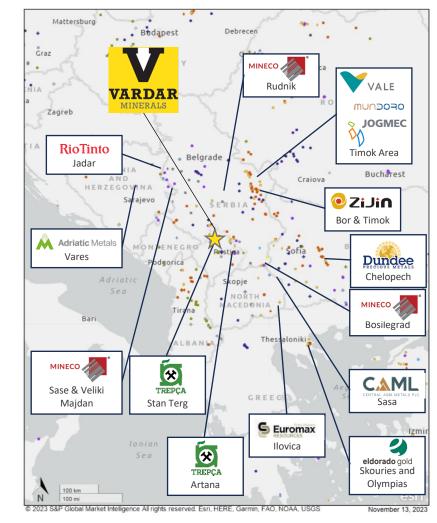
Vares deposit (Adriatic Metals), Bosnia & Herzegovina:

- Targeting commercial production in Q4 2024, US\$244.5m finance raised
- Total resource of 21.1Mt @ 156g/t Ag, 4.3% Zn, 2.8% Pb, 1.2g/t Au, 0.4% Cu, 0.2% Sb & 27%BaSO<sub>4</sub>
- Forecast production of 15Moz Ag equivalent pa for first 6 years

Jadar deposit (Rio Tinto), Serbia:

• Total mineral resource of 144Mt at 1.8% Li & 14.3%  $B_2O_3$ 

Source: Company websites and reports





#### Focused on discovery

# Vardar – systematic exploration

### First-mover in highly prospective Kosovo

#### Kosovo:

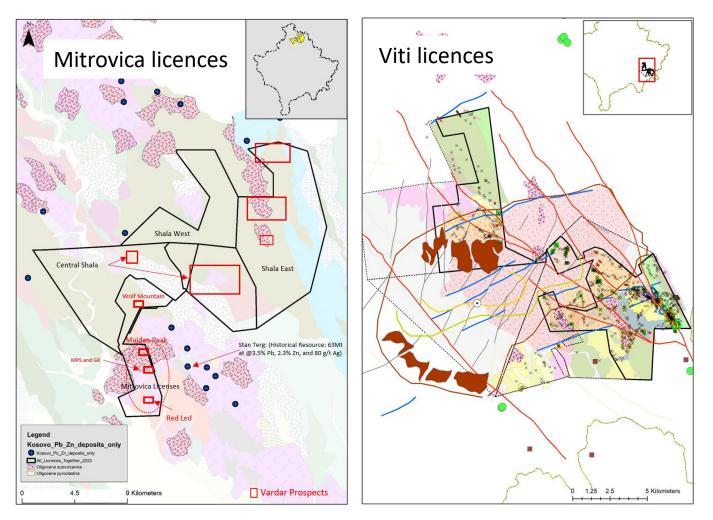
- Highly prospective for base and precious metals
- Limited to no exploration since the 1980s

Mitrovica licence area:

- Km-scale hydrothermal alteration systems identified comparable in size to world-class base and precious metals deposits
- Multiple high-quality targets defined by mapping, geochemistry, geophysics and drilling
- Red Lead priority Zn target yet to be drilled, similarities and proximal to Stan Terg
- Significant drill results to date include:
  - MP6: 10.8m at 0.48 g/t Au, 0.1% Cu and 18 g/t Ag
  - MP6: 6.8m at 4.1% Pb, 0.6% Zn and 15 g/t Ag
  - MP15: 44.4m at 0.2 g/t Au

Viti licence area:

- Anomalous copper and gold from surface sampling and drilling
- Potential for Jadar-like lithium mineralization up to 1,260 μg/l Li and 10,500 μg/l B from spring water



Note: The Mitrovica, Viti North and Viti East licences are currently under application

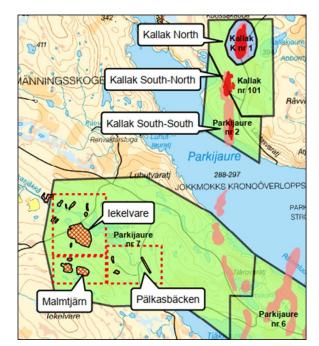


### Exploration assets

Optionality and leverage

#### Parkijaure nr 7, Sweden – possible IOCG copper target

- 14.6% copper, 0.56% zinc, 119g/t silver and 0.35g/t gold boulder sample (March 2024)
- **6.2m** @ **1.53%** Cu from 133.08m (including **3.6m** @ **2.45%** Cu) and **2.6m** @ **0.96%** Cu from 95.59m in diamond drillhole 74002
- 110m of 0.42% Cu, 0.54g/t Au and 0.16% Zn from 34.80m (including a higher-grade zone of 37.6m at 0.63% Cu, 0.87g/t Au and 0.21% Zn from 91.4m) in diamond drillhole MAJ04001.
- 22.12 km<sup>2</sup> exploration license, 7 km to the south-west of the Kallak North Exploitation Concession





#### **Emas, Finland – nickel-cobalt target**

- 10.5 m @ 0.8% Ni and 0.11% Co from 32.5m, including 2.15 m @ 2.79% Ni, 0.58% Co, 0.14% Cu and 0.32 ppm Au from 33.7 m
- Identified by the Geological Survey of Finland (GTK) in 2019
- GTK completed ground magnetic, multi-frequency electromagnetic (EM) and gravity surveys before 2 drilling campaigns



### Summary and Outlook

Right commodities in the right place at the right time

### **Core assets supporting the Green Transition:**

- Kallak has the potential to produce a market-leading, high-grade, low impurity iron concentrate
- Grafintec aims to develop graphite anode material plant and holds one of Europe's largest flake graphite resources
- Both assets completing PFS and EIAs

#### Prime location to establish secure European supply chains:

- Nordic assets are located close to leading Green Steel and Gigafactory investments
- Access to low-cost and clean energy, established infrastructure and skilled work force
- Kosovo is located at the heart of the highly prospective Tethyan Belt

### Asset development aligned with demand fundamentals:

- Demand being driven by supply chain security and decarbonisation agenda
- Core assets at major de-risking inflection points, exploration portfolio provides optionality
- Value driven by forecast supply deficits in core minerals



# Appendices

### Corporate summary

Experienced Board & Management

Market Data (as at 20 March 2025)		
Listing	AIM/ Spotlight	
Ticker	BEM/ BEO	
Share price	21.0p/ SEK 4.00	
Shares outstanding	38.8 million	
Market Capitalisation	£8.2 million	
Cash (31 December 2024)	£0.9 million	
Debt (31 December 2024)	Nil	
Shares held in Sweden	81%	
Average daily volume (LTM)	95,000	



#### Johan Röstin

Non-Executive Chairman

Former CEO of shipping and port companies with significant experience in infrastructure, logistics, capital investments and permitting processes



Mikael Schauman Non-Executive Director

Former SVP Commercial for Lundin Mining responsible for worldwide sales, with more than 40 years' experience of base metals



**Dmytro Siergieiev** 

Project Director, Kallak Former team leader of Sweco's mine environment team with extensive experience in environmental and permitting assignments



#### **Ed Bowie** Chief Executive Officer

Over 20 years' experience in corporate, advisory and fund management roles and across a broad range of commodities and jurisdictions



Chris Davies Non-Executive Director

Exploration geologist with over 40 years' experience across multiple commodities and jurisdictions



**Rasmus Blomqvist** MD, Grafintec Exploration geologist with sig

Exploration geologist with significant experience across Scandinavia. Founder of Grafintec



### **BEOWULF MINING plc**

# Supply chain security

Political initiatives

### EU Critical Raw Materials Act to secure EU supply:

- >10% extracted from EU
- >40% processed within EU
- >25% from recycling
- <65% from a single country

US Inflation Reduction Act (IRA) to support clean-energy industries and supply chains:



~US\$370 billion in spending and tax credits

EU's Carbon Border Adjustment Mechanism (CBAM):



Carbon tariff on industrial goods entering the EU







US–Japan Critical Minerals Agreement on battery minerals (lithium, nickel, cobalt, graphite and manganese):

• to help Japanese automakers and critical minerals processors access the benefits of the 2022 US Inflation Reduction Act.

The Indian Ministry of Mines JV company, Khanij Bidesh India Ltd. (KABIL) to ensure the supply of critical minerals:

actively seeking offtake agreements and has already signed
with Argentina and Australia



Minerals Security Partnership (MSP)

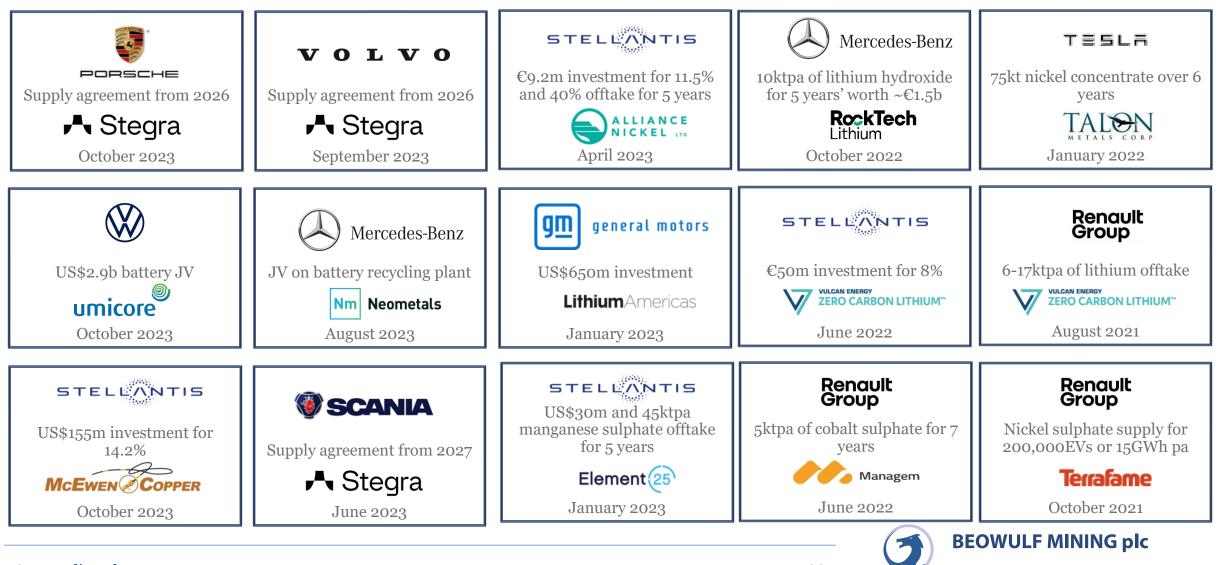
- led by the US Department of State, to stimulate government and private-sector investment
- Partner governments include Australia, Canada, Finland, France, Germany, Japan, South Korea, Sweden, the UK, the US and the EU.
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#### Supportive political backdrop

# Supply chain security

Driving investment in critical minerals



Commodity advantage

# High-grade iron ore: demand forecast to grow

Decarbonisation of steel to drive demand of low carbon feedstocks, primarily DRI

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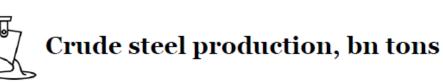
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2018

- Electric Arc Furnaces (EAFs) are replacing highly polluting Blast Furnaces (BFs)
- Low-carbon feedstocks, primarily DRI, will be essential to support EAF capacity.
- DRI produced with green hydrogen offers a real route to delivering lowcarbon steel
- New hubs will develop in countries with abundant low-cost renewables energy and competitive green hydrogen capacity

Source: Wood Mackenzie, Fastmarkets and Emirates Steel



1,91

1,34

0,57

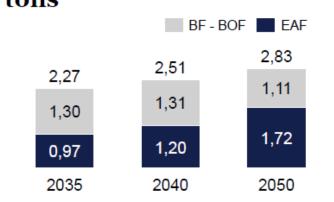
2023

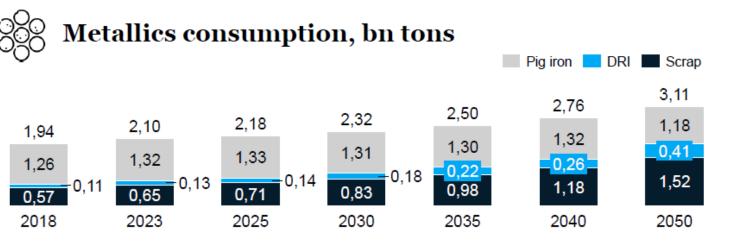
1,99

1,36

0,63

2025





2,11

1,35

0,76

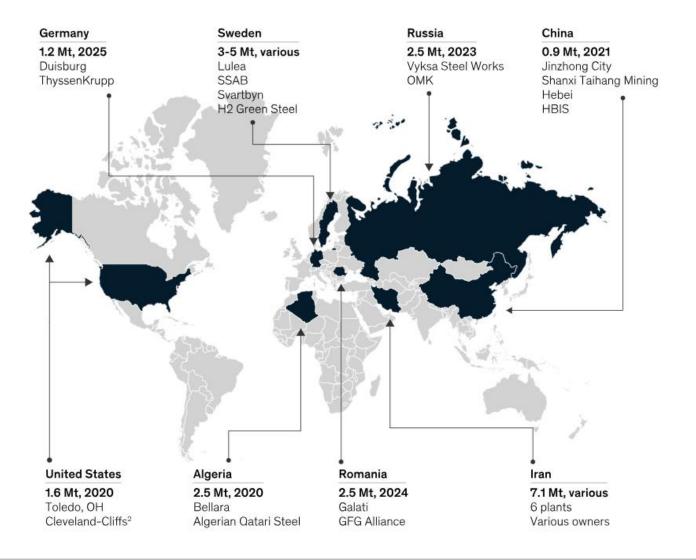
2030



Decarbonisation of Steel Industry

### Forecast growth in steel from DRI

Planned and under-construction DRI plants and capacity<sup>1</sup>



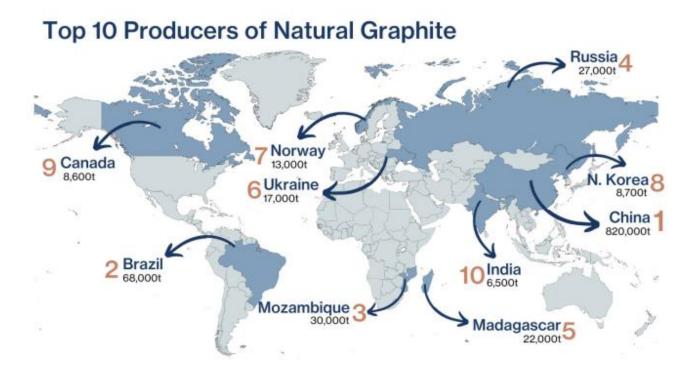
- 1 Estimated metric tonnes of steel based on DRI capacity, expected utilization, and raw material yields
- 2 Began operations in 2020

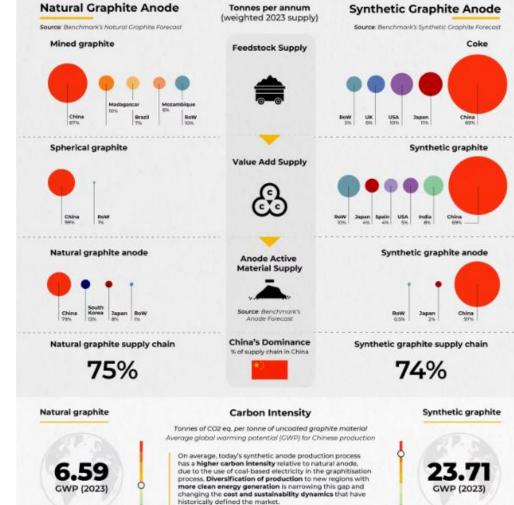
Source: McKinsey & Company



# **Global Graphite Supply**

Dominated by China

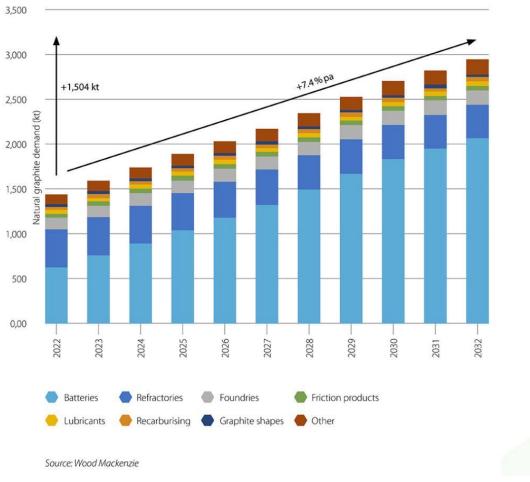




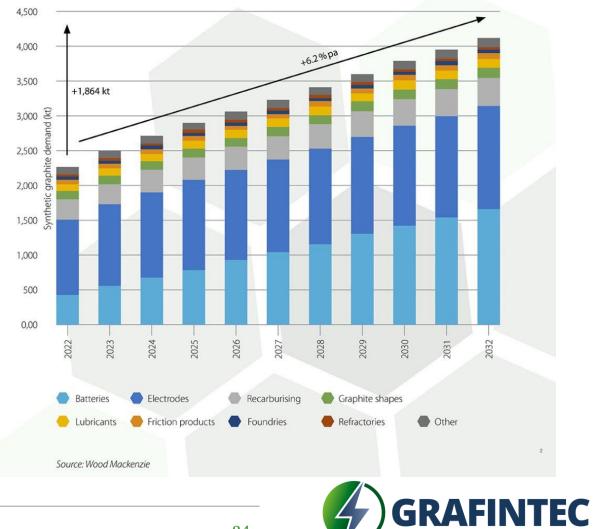
Source: Benchmark Mineral Intelligence

### Global Graphite Demand Dominated by China

#### Global demand of natural graphite



Global demand of synthetic graphite



Growing demand for Natural Flake Graphite





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