



Enhancing Our Mine to Market Graphite Strategy

With the acquisition of the breakthrough
VHD Technology.



ASX:GCM

gcm minerals.com.au

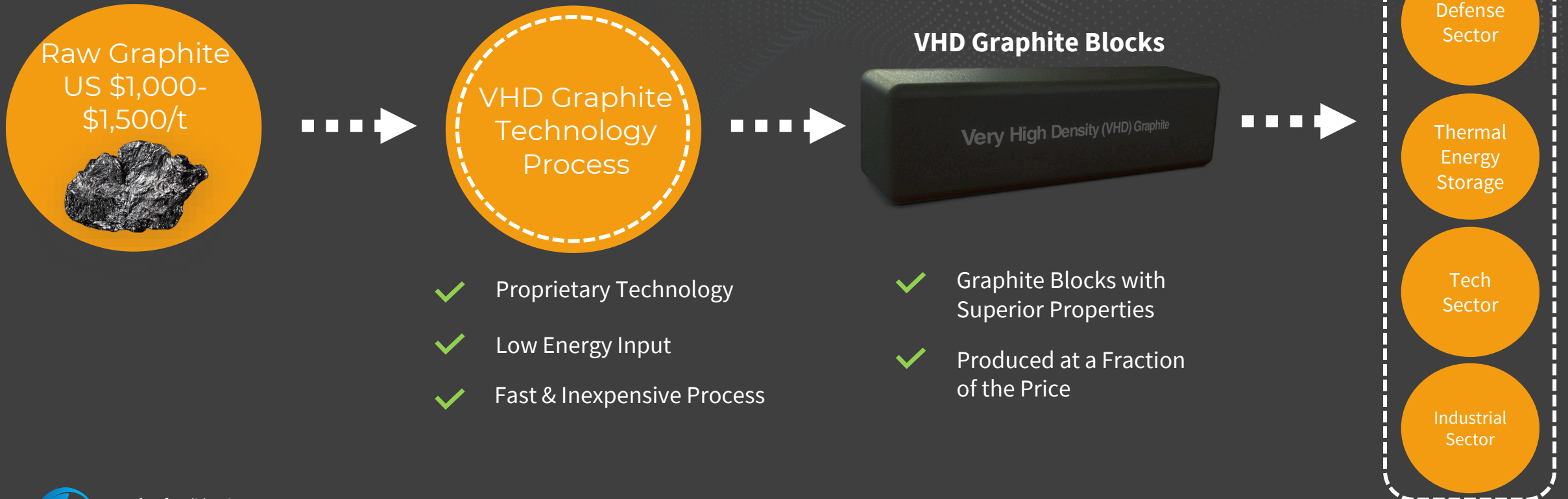
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VHD Graphite Technology

Potential to Disrupt a USD +\$700 Billion Market upon Commercialisation of Superior Graphite Blocks, in a Fraction of the Time and Cost²

2023
Market Size
US +\$700B¹



Why VHD Graphite?

Faster, Cheaper and Superior Qualities than its Peers: Pyrolytic and Nuclear



Superior Properties

Superior or comparable properties to Pyrolytic and Nuclear Graphite blocks.

Superior thermal conductivity and electrical resistivity.

Directional control of heat and electricity.

Very High Density /
Extremely low porosity.



Advanced Stage of Development

VHD Graphite can achieve initial product commercialisation in around 12 months

Targeting the growing demand for:

- Thermal management advances to support **Data Centres, AI, Supercomputers, Electronics, Automotive**
- **Solar-Thermal Energy storage advances** to support renewable energy and decarbonisation



Scalable

Further R&D has the potential to open additional markets:

- **Aerospace**
- **Defence**
- **Nuclear**
- **Batteries**
- **Fuel Cells**
- **Industrial Applications**

Potential to scale **manufacturing globally.**

Acquisition Summary

Supports Rapid Commercialisation

- VHD Graphite **invented by renowned materials scientist**, Professor Charles Sorrell from the University of New South Wales
- Binding technology purchase agreement to **acquire 100% rights** of advanced stage revolutionary process to create very high density (VHD) graphite shapes and block products.
- Attractive terms agreed with **no** upfront consideration payable by GCM. Consideration based on revenue milestones, payable over three milestones and capped at \$5M. **No cost to GCM until revenue is generated.**
- Wide range of potential applications including **Defence Sector, Thermal Management, Solar-Thermal Energy Storage, Nuclear**, Batteries, Fuel Cells and Industrial Applications.
- Revolutionary manufacturing process with a production period of **24-36 hours** and at moderate graphitisation temperatures (1500 °C), compared with **up to twelve weeks for existing competitors at high temperatures up to 2900°C.**

Lower energy input, faster to produce and exceptional properties makes our VHD graphite products attractive to a wide range of industries and markets.



Research and Development Team

World Class Materials Scientist and Materials Engineers

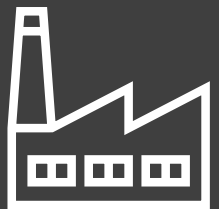
- **VHD Graphite invented by Professor Charles Sorrell - University of New South Wales**

- **Professor, School of Materials Science & Engineering**, University of New South Wales.
- **Winner of the 2006 Pfiel Award**, Institute of Materials, Minerals, & Mining
- Published 4 books, authored more than 20 book chapters and published ≈ 100 journal articles in the last five years



- **GCM Appointed Professor Andrew Ruys - Head of Research and Development**

- Ceramic Engineer, with a PhD from University of New South Wales.
- **Previously Professor of Engineering** at University of Sydney (School of AMME, Centre for Advanced Materials Technology and Discipline of Biomedical Engineering)
- **Co-founder of Modern Ceramics Pty Ltd**, at the time a leading manufacturer of silicon carbide ceramics globally, who also performed R&D on advanced graphite technologies.

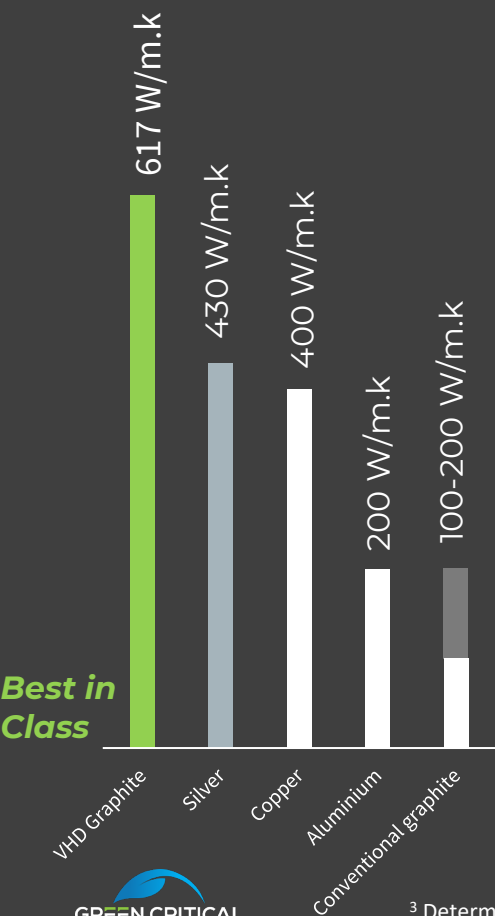


- Foundation member of Sirtex Limited (ASX:SRX) which IPO'd in 2000 **at \$15M and eventually acquired for \$1.9B** in 2018 by CDH Genetech Limited.

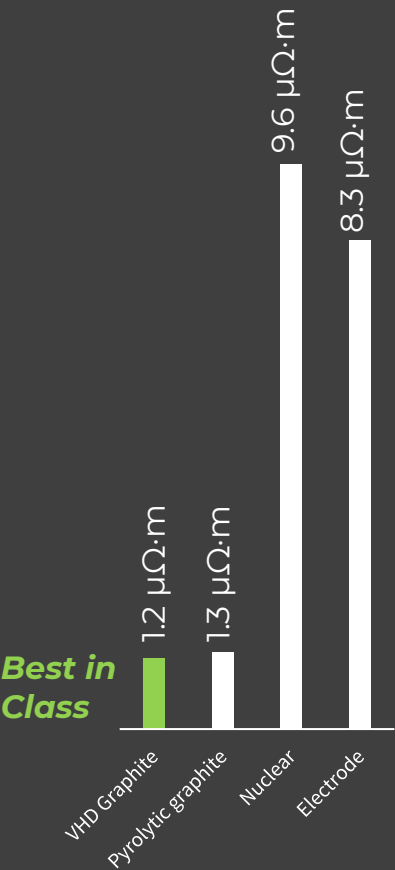
VHD Graphite's Properties³

Superior Material Properties from a Simple Manufacturing Process

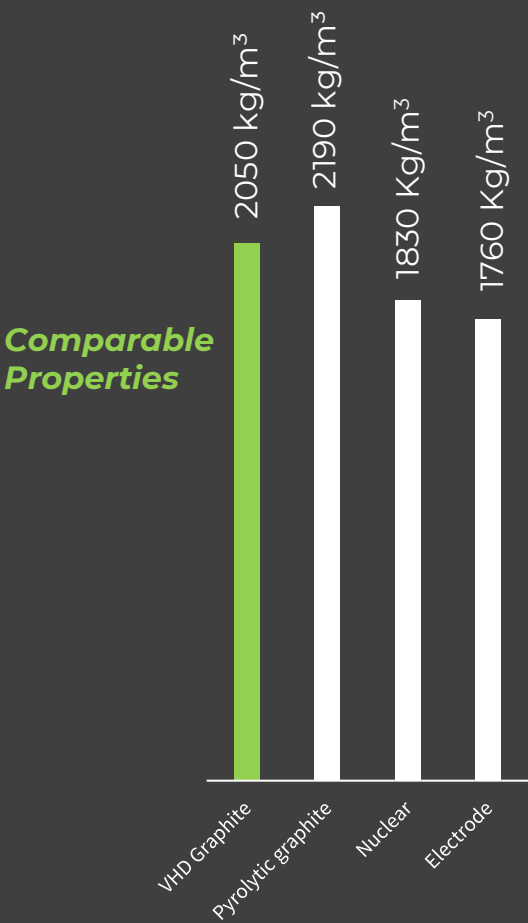
Thermal Conductivity
(for heat dissipation)



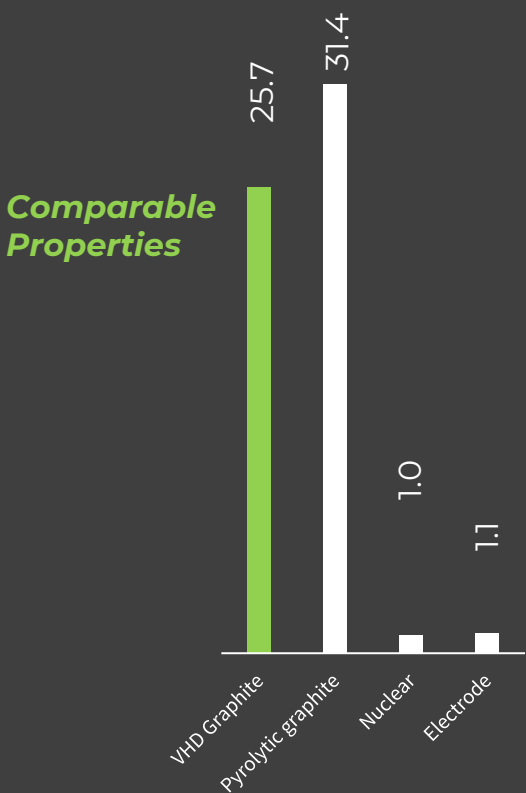
Electrical Resistivity
(along the grain)



Bulk Density



Degree of Anisotropy⁴
(electrical resistivities)



³ Determined from test work performed at the UNSW laboratories and not at a commercial scale at this stage. UNSW is ranked 31 in the entire world (and number 1 in Australia) for engineering & technology (QS World University Rankings by Subject 2024: Engineering & Technology).

⁴ Determined by comparison of electrical resistivities across grain and along grain: $[r_{\text{across grain}}/r_{\text{along grain}}]$

A Quantum Leap in Graphite Production

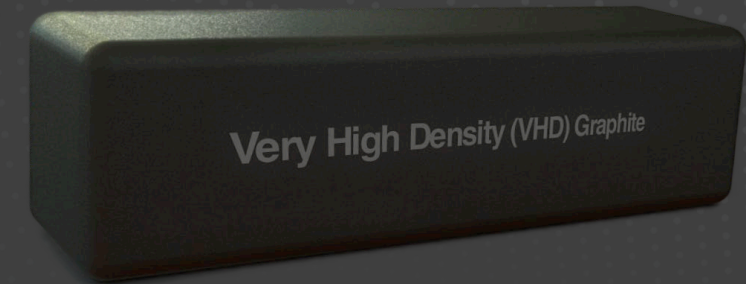
Simple, Scalable & Fast Manufacturing Process – Reduces Waste and Emissions⁵

Superior Properties in a Class of its Own

- Amongst the **highest thermal conductivity** of any block graphite material - ideal for heat management applications.
- Exceptionally low resistivity – **ideal for semiconductor, high performance computing, AI, datacentres**, EDM, electrodes and glass manufacturing.
- Higher bulk density than conventional graphite - increasing durability and performance in high stress environments.
- 99% purity, meets specification for primary synthetic block graphite – for increased performance and reliability.
- Highly directional anisotropic properties – allows for **precise engineering and machining** of parts and components requiring conductive and insulating properties.
- Potential to be **net-shape formed** to customer requirements - for faster production, less waste and reduced costs.

Efficient to Produce

- Can be **produced in 24-36 hours** compared with up to 12 weeks for primary synthetic graphite.
- Significantly lower graphitisation temperature for production of **1,500° C** compared to up to **2,900° C** for primary synthetic graphite.
- **No specialised infrastructure or complex manufacturing techniques** required- potential to replicate globally and grow rapidly.



VHD Graphite is not just another form of carbon block. It represents a new class of material with properties that are tailor-made for high-value applications.

Thermal Management Applications

Immediate Opportunities

- **AI, Data Centres, Supercomputers, Battery Management Systems** are all experiencing significant growth
- Items are getting smaller, using more power and generating more heat
- **Thermal management**, the process of moving heat from where it is generated to where it will not damage an item, **is critical to support these advancements**
- Rapidly advancing high performance items demand break-through technology to manage heat generation.
- **VHD Graphite is the break-through technology** - offers superior heat transfer properties and provides the ability for control of heat dispersion
- **Over the next 12 months** GCM will produce samples, initiate engagement with strategic customers and provide samples for product testing to support successful commercialisation



Future Opportunities

- **Defence, Aerospace and Nuclear** all require premium products to support their technological advances
- This includes advances in thermal management
- **GCM's R&D** efforts will support the required product advancements for these markets

Solar-Thermal Energy Storage

Immediate Opportunities

- **Decarbonisation of energy grids** requires innovative thinking and technological advances.
- Renewable energy sources require **storage solutions to support base load** power demands.
- Current solutions are expensive and require vast quantities of materials.
- The **superior thermal properties** of VHD Graphite, coupled with **existing technology** like **CSP** and steam turbines, has game changing potential.
- Providing the ability to **produce constant, clean energy**.
- GCM is focussed on producing VHD Graphite slabs over the next 12 months and engaging with potential customers and power generation companies to **bring to market a new, clean constant energy source**.



Focused R&D to Leverage Product Expansion and to Power Growth

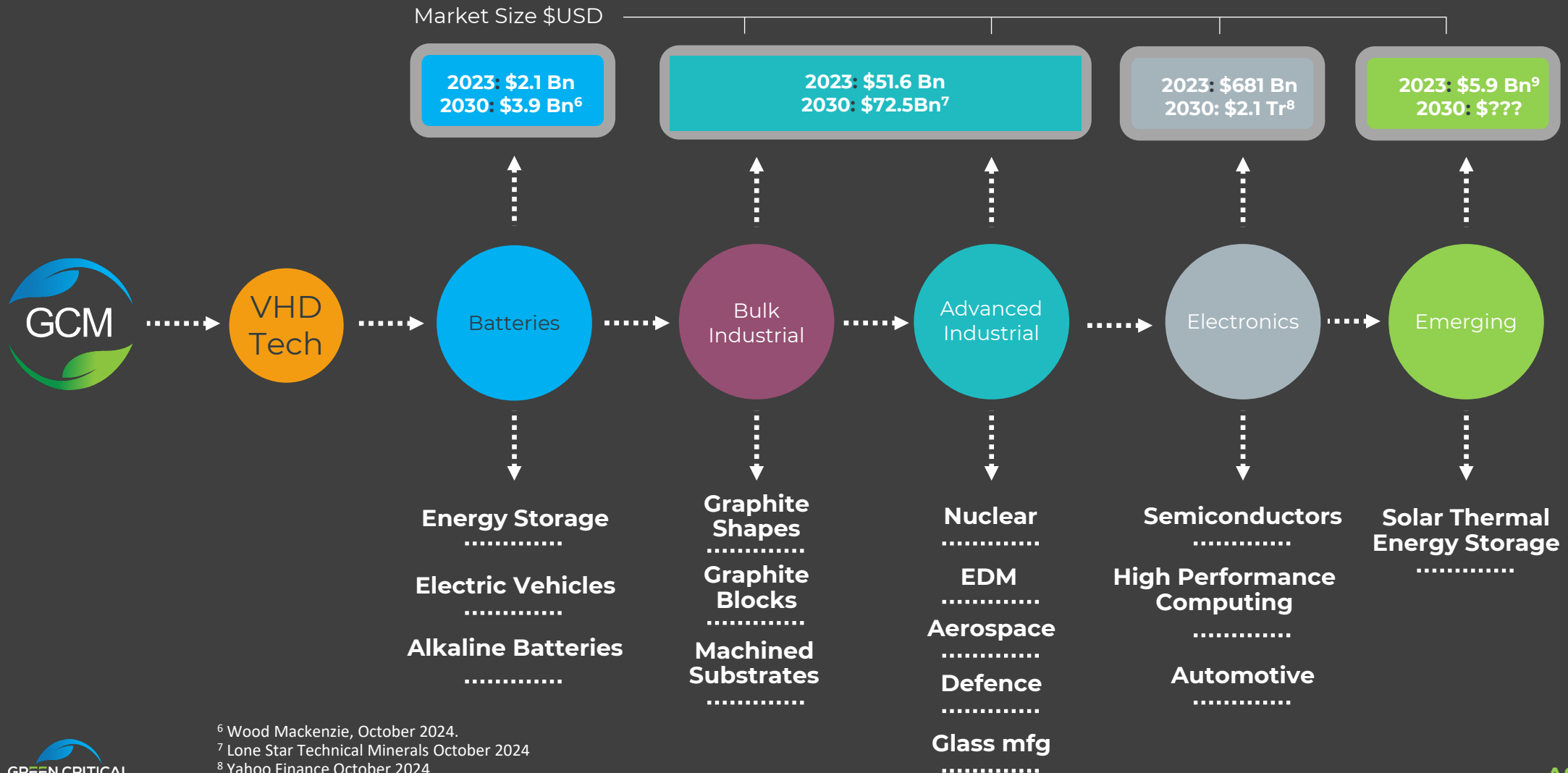
Future Opportunities

- **Graphite is an extremely versatile material**, universally used in products in demand today
- From industrial applications like glass manufacturing, to precision engineering of micro level components, to underpinning steel and aluminium production, to high performance electronics and computing, and the energy sector
- VHD Graphite, with its **superior properties and revolutionary manufacturing** process has the potential to manufacture products to support these sectors
- GCM intends to become a **leading supplier of graphite products** across these sectors, leveraging the **product development potential** of VHD Graphite to supplement the initial product range of thermal management and solar-thermal to develop products for battery anode, nuclear, defence, aerospace, automotive, and heavy industries



Immediate and Scalable Market Opportunities

Global Demand across Rapidly Growing Markets



⁶ Wood Mackenzie, October 2024.

⁷ Lone Star Technical Minerals October 2024

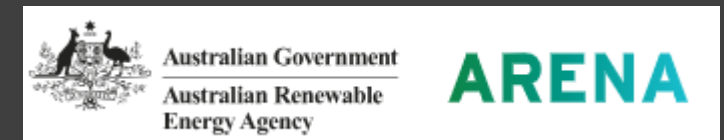
⁸ Yahoo Finance October 2024

⁹ Fortune Business Insights September 2024

Grant Funding Opportunities

Opportunities Identified and Discussions Commenced

- **VHD Graphite is an extremely versatile material**, universally used in products in demand today.
- Graphite is **recognised universally as a critical mineral**, with a wide range of applications to the technology and renewable energy sectors.
- **Australia** and the **USA** provide **grant funding opportunities**, via agencies such as:
 - **Australian Renewable Energy Agency**
 - **US Department of Defense**
 - **US Department of Energy**
- Opportunity to **accelerate the commercialisation process without diluting shareholder equity**.

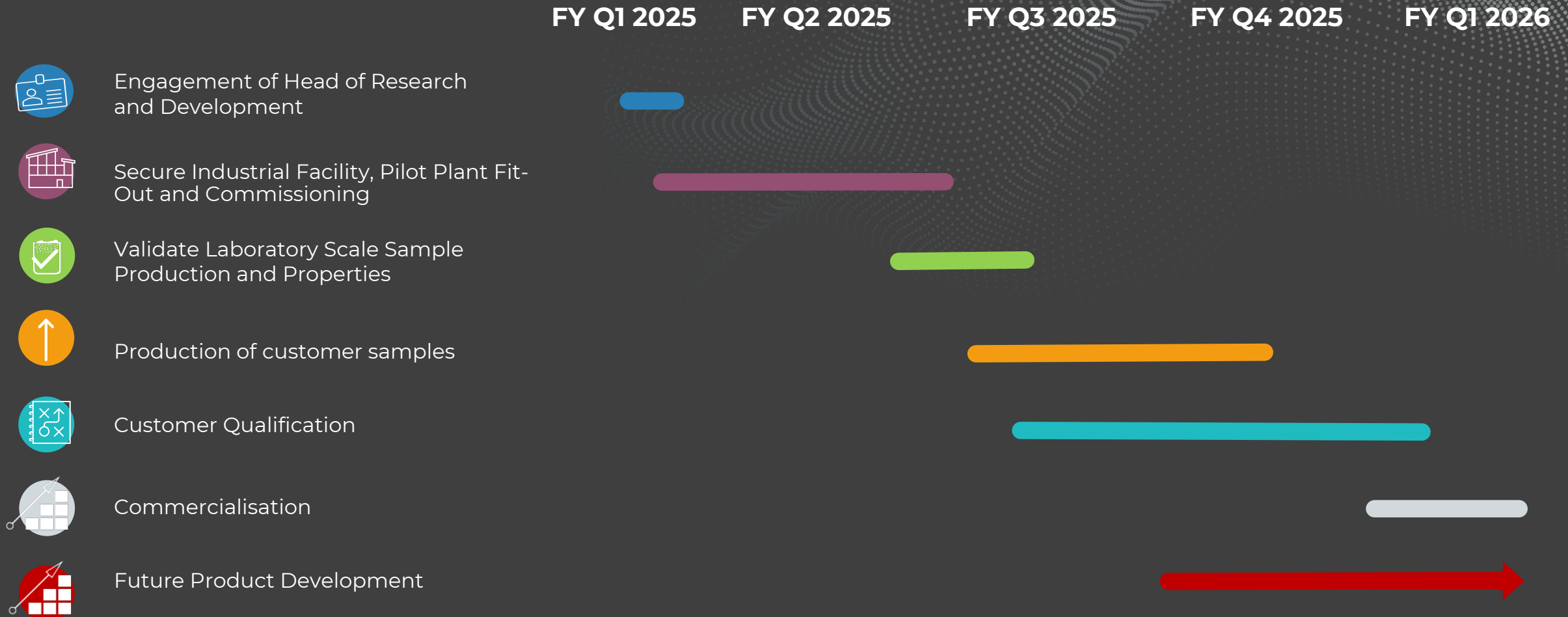


Near Term Milestones

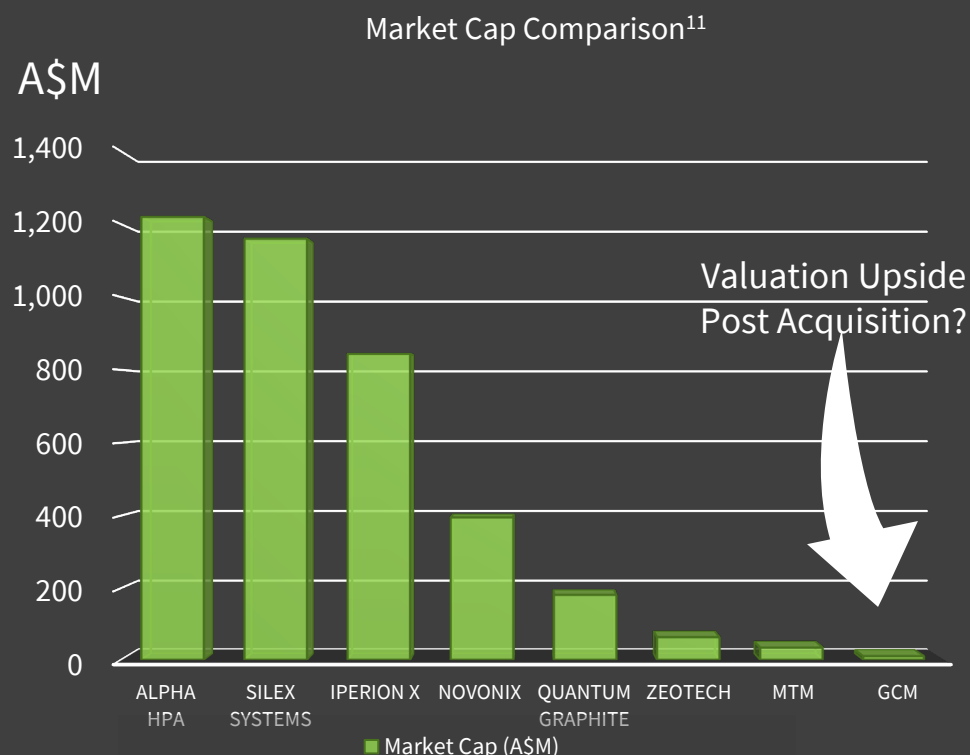
to Support Commercialisation and Transition to Revenue

- **Personnel** – Appoint a Head of Research and Development to lead R&D activities.
 - **Pilot Plant** – Commission pilot plant capable of producing graphite blocks for use in heat sinks and also for solar-thermal applications. Binding heads of agreement signed, furnace acquired, pilot plant design progressed
 - **Customer Qualification** – Provide graphite blocks for customer product testing, prototyping, and acceptance.
 - **Non-Dilutive Funding** – Progress grant funding applications to provide off-balance sheet funding.
 - **Strategic Partnership's** – Engage with tier one end users of graphite block products to open new markets for graphite blocks e.g. solar-thermal, defense, aerospace.
 - **Commercialisation** – Customer acceptance of VHD Graphite blocks and transition to supply phase and production scale-up
- ✓ Professor Andrew Ruys **appointed**.
 - ✓ Binding heads of Agreement **signed** for industrial facility.
 - Pilot plant **design in progress**.
 - Acquisition of key equipment **commenced**.
 - ARENA funding **opportunities identified**, and preliminary discussions initiated.

Fast Track to Commercialisation¹⁰



Comparable ASX Listed Companies¹¹



Company	ASX Code	Market Cap ¹²	Stage
Silex Systems Limited	SLX	\$1.34Bn	Production
Alpha HPA Limited	A4N	\$1.09Bn	Production
Zeotech Limited	ZEO	\$77.86M	Production
IperionX Limited	IPX	\$1.11Bn	Pilot
Novonix Limited	NVX	\$355.50M	Pilot
Quantum Graphite Limited	QGL	\$179.39M	Pilot
MTM Critical Mineral Limited	MTM	\$27.49M	Pilot
Green Critical Minerals Ltd	GCM	\$12.21M	Pilot

¹¹ The peer comparison presented in this slide is subjective and based on GCM's internal assessment of industrial tech companies operating within similar sectors of mineral processing and extraction. This comparison does not necessarily adhere to any industry-recognised standards and should not be interpreted as an exact like-for-like comparison in terms of stage of development, market cap, or technology maturity. GCM's VHD Graphite technology is currently at a development / pilot plant stage. The companies compared are in various stages of development (as noted in the table), and their progress is based on publicly available information as of the date of this presentation. The development stages referenced in this comparison are for indicative purposes only and are not meant to represent a formal independent analysis based on industry standard.. GCM notes that entities listed may be selling different commodities (compared to GCM) or may be selling to different customers / end users Investors are advised to consult independent sources for a detailed assessment of each company's projects and their stage of development. GCM does not warrant the accuracy of third-party data used for this comparison.

Cost-Effective Manufacturing & Scalability

- **Competitive Advantage:** VHD Graphite is produced via a **cost-effective, scalable process** that takes as little as **24 hours** at lower graphitisation temperatures (**below 1500°C**) compared to many months for traditional pyrolytic graphite and up to six weeks for iso-moulded graphite. This results in a significant reduction in **energy consumption, manufacturing complexity** and **manufacturing costs**.
- **Key Investor Benefit:** The ability to rapidly scale production with minimal infrastructure enables **higher profit margins** and flexibility to meet market demand and specifications, creating a strong case for **near-term commercialisation**.

Immediate Revenue Potential & Market Entry

- **Competitive Advantage:** VHD Graphite can be immediately commercialised in key markets such as **industrial, electronics and battery**. These markets are experiencing significant growth, and valued at **+USD\$700billion** in 2023¹³.
- **Key Investor Benefit:** Near-term revenue generation is feasible by focusing on a select number of high-demand products, allowing GCM to quickly capture market share. This sets up **early-stage revenue streams** while positioning the company for long-term expansion into other sectors like **aerospace, high performance electronics** and **nuclear reactors**.

Value Summary

Future-Proof Technology & R&D Expansion

- **Competitive Advantage:** VHD Graphite's versatility allows for continuous R&D and the creation of **next-generation products** in sectors such as **energy storage, high-performance computing, electrical discharge machining (EDM)** and **medical devices** (e.g., heart valves, implants). The potential to introduce new, tailored products gives GCM a sustainable **innovation pipeline**.
- **Key Investor Benefit:** Investors are attracted to the strong potential of **long-term growth** through product diversification, underpinned by **R&D investment**. GCM can capitalise on this, ensuring **revenue longevity** as new applications and markets emerge.

Technical Superiority & Differentiation

- **Competitive Advantage:** VHD Graphite excels in key technical attributes - **thermal conductivity (617 W/m·K), ultra-low electrical resistivity (1.2 $\mu\Omega\cdot\text{m}$), 100% grain alignment**, and **high bulk density (2050 kg/m³)¹⁴** - making it superior to **pyrolytic, and machined or extruded electrode graphites** across multiple applications.
- **Key Investor Benefit:** Investors looking for differentiated technology will see **VHD Graphite** as a clear **technical leader**, which enhances the company's **competitive moat** and opens opportunities for **premium pricing** in advanced applications.

¹³ Wood Mackenzie, 2024; Lone Star Technical Minerals, 2024.

¹⁴ Determined from test work performed at the UNSW laboratories. UNSW is ranked 31 in the entire world (and number 1 in Australia) for engineering & technology (QS World University Rankings by Subject 2024: Engineering & Technology)



Thank You

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