FIRSTGRAPHENE

INVEST – Stuttgart

PureGRAPH® - revolutionising material performance and providing low carbon solutions for a greener future

26th - 27th April 2024

About First Graphene

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- Leading developer and manufacturer of **high-quality and commercial-scale** graphene products, called **PureGRAPH®**
- **PureGRAPH®** is **an additive that enhances material performance and properties of customers' products**, enabling cost-effective solutions to optimise energy capabilities and reduce emissions
- **Commercial applications** of **PureGRAPH®** include construction and infrastructure, energy and storage, and industrial materials industries
- **World-class manufacturing facility** at Henderson, Western Australia, with production capacity of 100tpa and readily scalable technology to cater for growing demand
- Development and commercialisation agreement signed with **UK's largest cement manufacturer**, Breedon Group (Oct 2023), following successful 'green cement' trials
- **Tier 2 partner at the Graphene Engineering and Innovation Centre (GEIC)**, with major R&D capability in Manchester, UK

Manufacturing facility at Henderson, WA

Established and operational production facility

PureGRAPH® graphene products

Remarkable properties of graphene

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Adding graphene enables significant performance improvements to just about any product and material

Thin

0.345nm or one carbon atom thick

Strong

200 times stronger than steel

Flexible

Stretches up to 20%

Impenetrable

Fully impermeable barrier, even to helium gas

Electrically conductive

1 million times more conductive than copper

Thermally conductive

5,000 W/mK in all directions (isotropic)

Transparent

Absorbs only 2.3% of visible light

PureGRAPH® products

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- **PureGRAPH®** is a **high performing graphene additive**, used across many consumer and industrial sectors
- Characterised by its **large platelet size, high aspect ratio and low defect levels**
- Batch-to-batch consistency ensured through strict, in-house quality control testing, and **established repeatable manufacturing process**
- Designed to be **dispersed in a broad range of materials**, including plastics, composites, rubber and elastomers, cement and concrete, and inks and coatings
- Product range includes a **growing list of masterbatch (MB) additives, with custom MB available upon request**
  - **PureGRAPH®** powder additives
  - **PureGRAPH®** AQUA dispersed additives
  - **PureGRAPH®** master-batch additives in LDPE, HDPE, EVA etc.

Fully integrated and robust supply chain

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✓ **Secure supply**	▪ Secure supply of high-quality raw graphite material ▪ Sourced from FGR's graphite mining facilities in Sri Lanka (DSO)[1] ▪ 99% graphite ore used, directly from the ground
✓ **Established manufacturing**	▪ Operational facility at Henderson, Western Australia ▪ Graphene production capacity of 100tpa ▪ Minimal capex required to scale plant to 1,000tpa
✓ **Proprietary Manufacturing process**	▪ Single-step electrochemical exfoliation process ▪ High-yield graphite-to-graphene conversion rates of >95%, providing significant operating cost advantage
✓ **Fully accredited**	▪ Full quality and product accreditations, including REACH UK & EUROPE, ACIS Australia ▪ Pending EPA in the US
✓ **Accessible and growing end market**	▪ >30 existing customers – with expanding use case ▪ Numerous trials with blue chip global partners underway at various development and commercial stages ▪ >500 of inbound interest for samples and trials ▪ Stable and competitive pricing

1. FGR is currently buying feedstock from a Government-owned mine. Under its current mining license, FGR has the ability to develop more tonnes of graphite to support any plant expansion.

Proprietary manufacturing process

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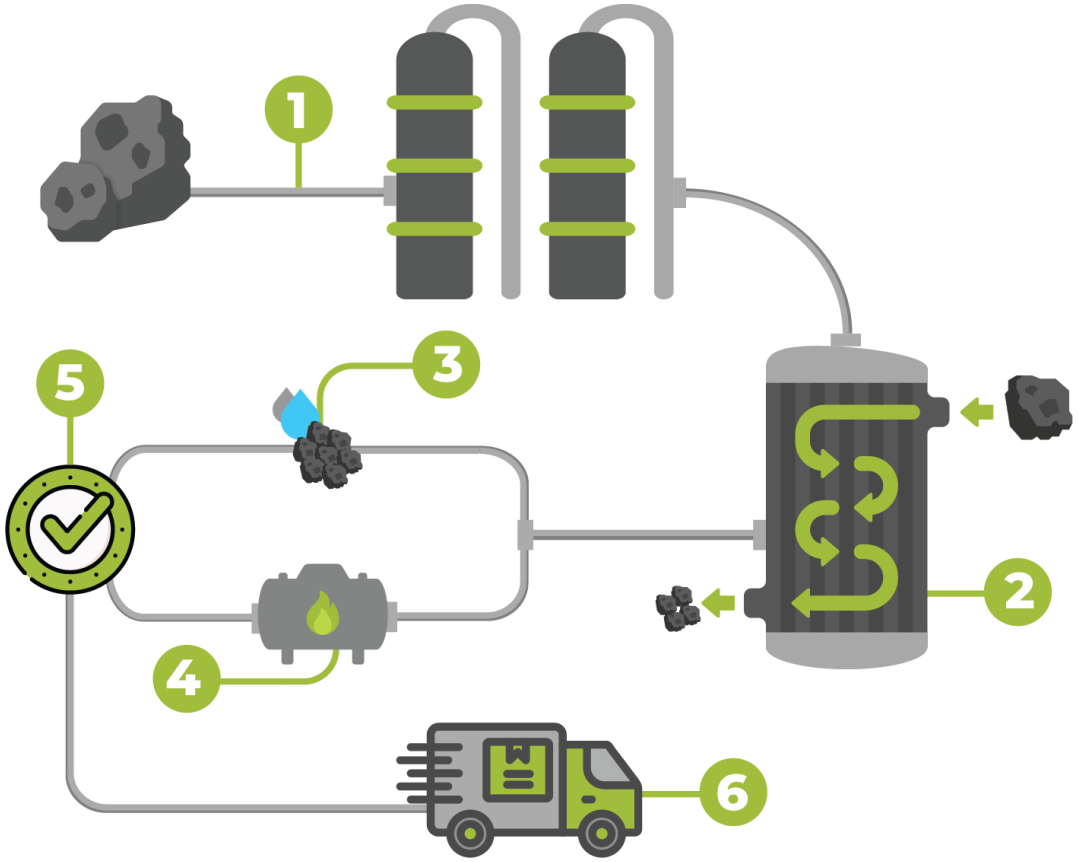
FGR's proprietary manufacturing process has readily scalable technology to cater for growing demand

1. High-quality graphite feedstock introduced into an electro-chemical cell, where it is exfoliated into graphene platelets
2. Screening, filtration and refinement occurs, separating graphene from electrolyte and reducing platelet particle size, creating the **PureGRAPH®** product
3. **PureGRAPH® AQUA** is extracted and packaged
4. Drying and milling occurs, producing **PureGRAPH®** dry powder products
5. Final product QAQC measurements and process
6. **PureGRAPH®** products are packaged and distributed to partners and clients around the world



Wide variety of applications

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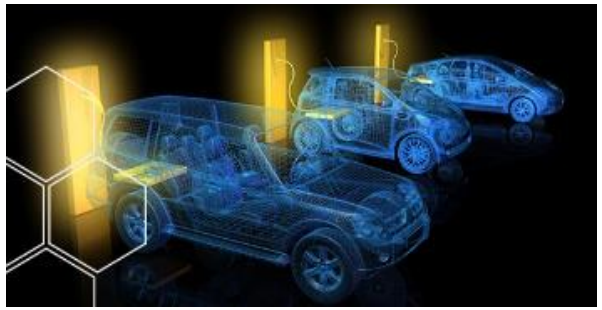
Adding graphene to products enhances properties and performance of industrial materials and technology

- **Lightweight, improved strength, optimised energy generation and storage**
- **Numerous benefits to high-growth and in-demand applications across a range of industries**

Cement and concrete

- Cement additives
- Enhanced dry mixing mortar
- Concrete Admixtures



Energy and storage

- Supercapacitors technology
- Hydrogen electrocatalysts
- Hydrodynamic cavitation technology
- Perovskite Solar

Composites and plastics

- Thermally conductive polymer compounds
- Enhanced FRP composites
- Unique heating devices
- Graphene-enhanced masterbatches

CASE and foams

- Electrostatic dissipative coatings
- Sporting apparel and footwear
- Noise and vibration dampening foams

Cement & concrete – priority target market

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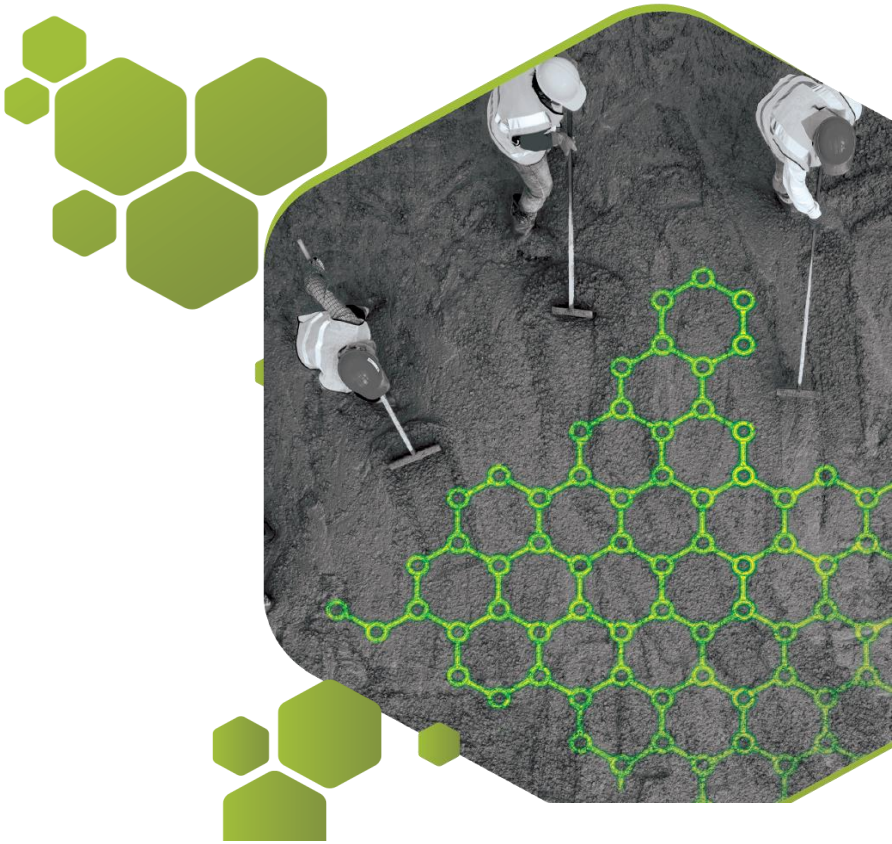
Cement production is one of the world's largest industrial carbon polluters – responsible for 8% of global emissions

- **Global consumption of concrete stands at more than 4 billion tonnes per annum[1],** making it the **most consumed material after water** on the planet
- Global manufacturers **committed to cutting CO_2 emissions by 25% by 2030[2]**
- **Clinker**, the main binding agent in Ordinary Portland Cement, is the primary producer of carbon emissions in cement production
  - For every tonne of clinker produced, 800 to 900kg of CO_2 is emitted
- **PureGRAPH®** is proven to reduce clinker levels, delivering a green cement solution for the industry
- Following successful trials, **FGR secured an agreement with Breedon Group**, the leading cement manufacturer in the UK (Oct 2023)
- **Demand for green cement** continues to grow, with the industry forecast to be **worth US$56 billion by 2027**



1. Reference: Green and Sustainable Buildings Journal. 2. Reference: Global Cement and Concrete Association

Cement market opportunity

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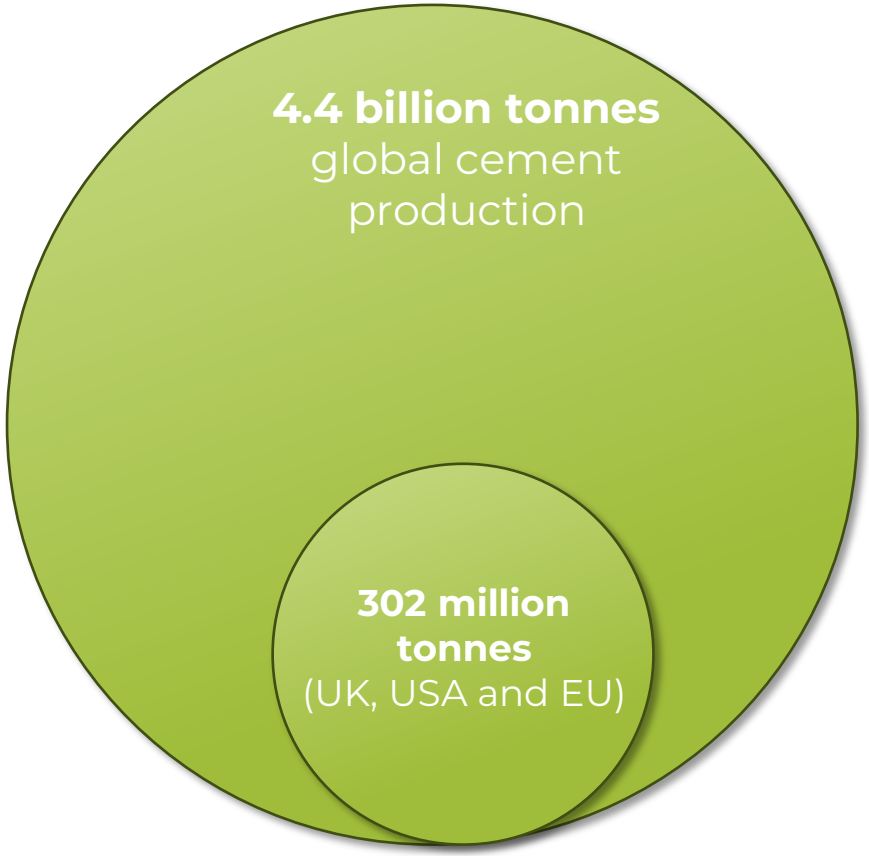
UK, USA and EU governments and industry are actively driving “green cement” demand to achieve decarbonisation objectives

- Total global cement production in 2020 was **4.4 billion tonnes**, and is forecast to grow at a rate of 5.1% per annum
  - UK, USA, and EU combined represented **302 million tonnes** of cement
  - This equates to a potential graphene demand of circa **211,000 tonnes**, based on industrial scale proven dosing rates
  - **1% of this graphene demand is equivalent to ~AUD$90m in annual graphene sales[1],** based on existing cost structure
- **Based on current clients FGR is working with, there is opportunity to provide 5-6% of global graphene demand**
- **This represents circa 12,000 tonnes of PureGRAPH®**
- **Tier 1 production facilities produce 1 million tonnes of cement, equating to ~300 tonnes of potential graphene demand**

Graphene addressable market



Note: 1. The graphene revenue estimates are for illustration only and are not in any way a forecast of revenue by First Graphene

PureGRAPH® 'greener' cement & concrete

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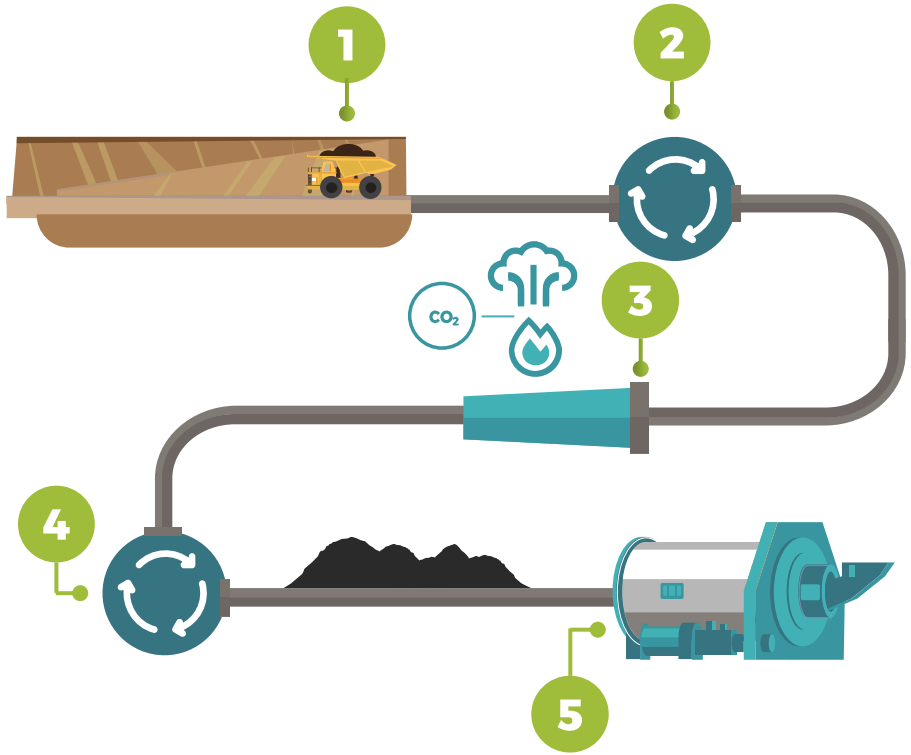
In the cement production process, where do CO_2 emissions come from?

Clinker is the main binding and strength component used to produce Ordinary Portland Cement

- **For every tonne of clinker produced, 800kg to 900kg of CO_2 is produced**

Lower carbon cements are made possible by adding PureGRAPH® - reducing the required clinker volume

1. Raw material extraction – calcium (commonly a limestone quarry), silica, alumina and iron
2. Raw meal preparation – crushing, proportioning, and grinding
3. Rotary kiln – calcination of the pre-calcined raw meal occurs, **generating CO_2 emissions**
4. Clinker – cooled and stored
5. Final grinding: clinker + gypsum + mineral addition = cement



Significant agreement with Breedon

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- Following successful trials, **FGR secured an agreement with Breedon Group**, the leading cement manufacturer in the UK
- World-leading graphene-enhanced cement trials resulted in **15% reduction in carbon emissions** and **10% increase in compressive strength**
- Significant milestone for FGR and validates the quality and industrial scale demand potential for **PureGRAPH®**
- Collective goal of enhancing Breedon's cement properties to improve compressive strength and reduce carbon footprint
- Graphene-enhanced grinding aids and cement admixtures formulated and supplied by FGR along with methods for addition into cement production facilities
- Phase three trials set to commence next quarter

Industrial scale trials with Breedon

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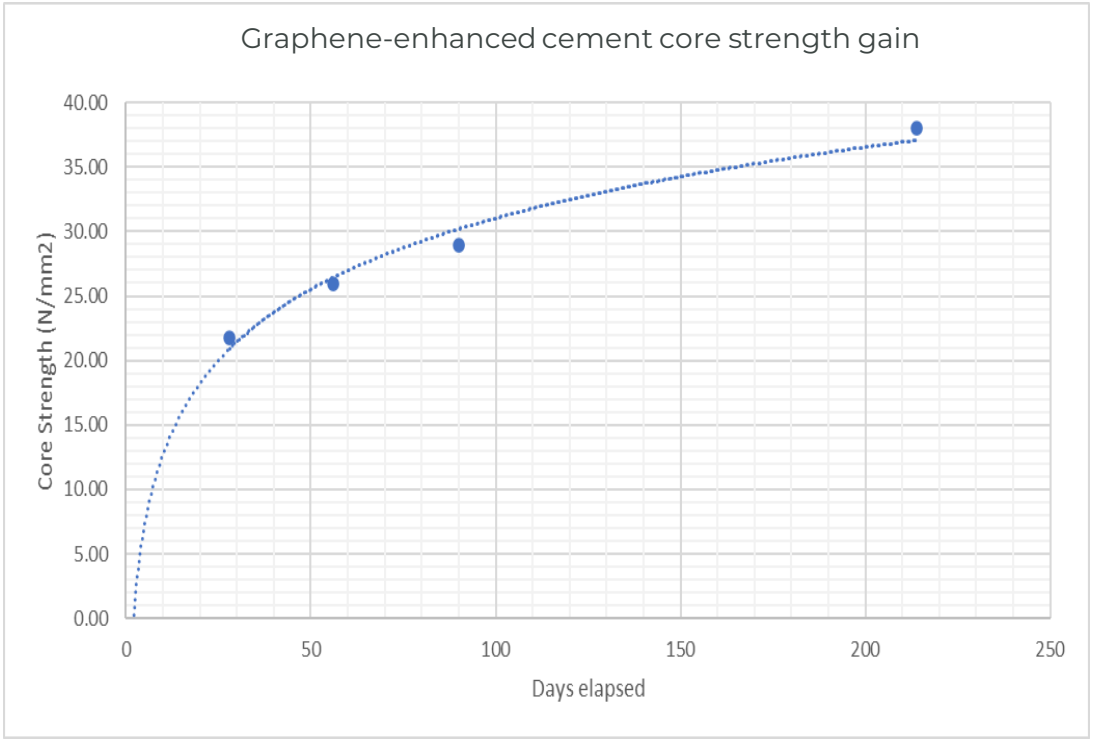
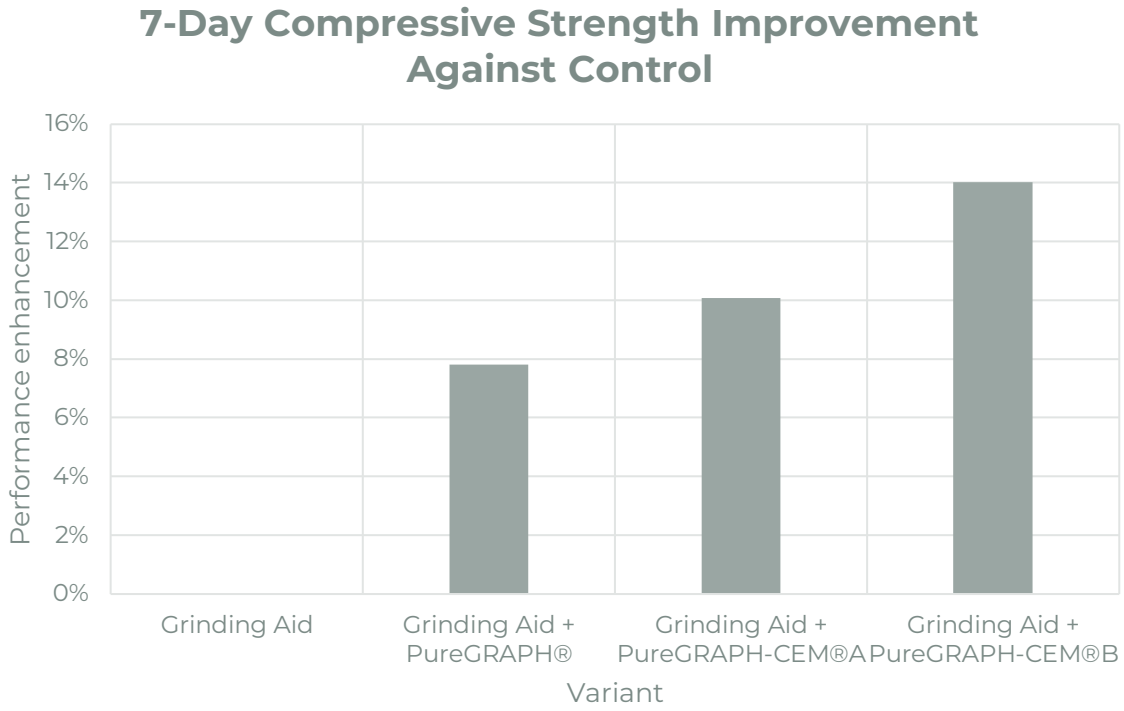
- Phase one of **world-leading trials** in United Kingdom at Breedon's Hope Cement Works in Derbyshire produced positive initial results, including:
  - Up to **10% increase** in early-stage compressive strength of CEM II cement
  - Immediate **15% reduction** in CO2 emissions as a result of lower clinker factor
- Graphene-enhanced concrete slab poured as part of wheel washing facility at a major highway infrastructure project in south-east England
- Strength and integrity maintained after +200 days of operation, with core samples showing absence of defects, damage or deterioration
- CEM II production increasing in line with Breedon's commitment to carbon reduction and sustainability targets



Graph 1: *Increase in core strength of graphene-enhanced cement used in concrete slab.*

Industrial scale trials with Breedon

- **Phase two trials** focused on optimising dosing methods, amounts, and general processing metrics
  - Four tonnes of grinding aid containing **PureGRAPH®** successfully produced 600 tonnes of graphene-enhanced cement at production scale
- **Phase three trials** will test an optimised formulation of FGR's new **PureGRAPH-CEM®** under full scale production conditions
  - Specialised product optimised for use in cement grinding mills, removing need for additional processing equipment
  - Over two tonnes of new aqua-dispersed product will be used to produce up to 1,000 tonnes of cement
  - Trial scheduled to begin Q1 2024/25 financial year
  - Lab-scale milling by industry trusted Kirton Concrete Services has shown **PureGRAPH-CEM®** can improve compressive strength
  - Research indicates FGR's new product is compatible and complementary with existing grinding aids, reducing need for alternative additives



Cement and concrete success

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Actively working with over 30 clients globally

FOSROC

BREEDON

MORGAN SINDALL

CEMEX

LKAB

Applications		
	Features	**Benefits**
Cement additives	▪ Green cement manufacturing	▪ Reduction of carbon emissions
Enhanced dry mixing mortar	▪ Shotcrete and pumping applications	▪ Durability and strength
Concrete Admixtures	▪ Concrete manufacturing	▪ Strengthen, improve durability and increase corrosion resistance

Energy generation and storage

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- Conductivity and strength of **PureGRAPH®** makes it ideal as an electrode additive in batteries and supercapacitors
- Continued development and evaluation of new material opportunities for graphene-enhanced energy storage devices

Applications

	Features	Benefits
Supercapacitors technology	▪ Metal oxide decorated products	▪ Improved activated carbon
Hydrogen catalysts	▪ Fuel cells	▪ Cheaper production of hydrogen
Hydrodynamic cavitation technology	▪ Petroleum feedstock conversion to synthetic graphite/graphene	▪ Cheaper alternatives to platinum

Clients and opportunities

SENERGY

- Government-funded trial on thermally conductive solar water heating and heat exchangers for 2,000 homes in the UK, with aim of expanding to 250,000 homes
- Currently scaling up compounding production of conductive polymer and running commercial trials

GREATCELL AUSTRALIA

- Manufacturing perovskite solar cells at Wagga Wagga facility in New South Wales
- Graphene additive significantly reducing materials costs in manufacturing process
- AUD$2m CRC-P grant awarded for collaboration to commercialise perovskite technology through the development of industrial scale production processes

EMDAD

- MOU signed to fund, design, build, and commission a small-scale hydrodynamic cavitation reactor using FGR's Kainos Technology
- Process will convert petroleum feedstock to battery-grade graphite, graphene and hydrogen

Composites and plastics

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- **PureGRAPH®** -enhanced composites provide a significant improvement in material performance
- Fibre-Reinforced Polymer (FRP) composites use glass, carbon, aramid or natural fibres, in combination with polymer resins
- **PureGRAPH®** mixed with polymer resin prior to combination with the textile reinforcement

Applications

	Features	Benefits
Thermally conductive polymer compounds	▪ Polymer solar thermal cells	▪ Increased conductivity ▪ Greater efficiency
Enhanced FRP composites	▪ Advanced fibreglass swimming pools	▪ Durability and strength ▪ Reduced water permeability
Unique heating devices	▪ Retrofitted to gas-fired heating units	▪ Greater efficiency ▪ Reductions in nitrous oxide and CO_2
Graphene-enhanced masterbatches	▪ Advanced polymer materials	▪ Improving electrical and thermal conductivity ▪ Increased strength of polymers

Clients and opportunities

aquaticleisure technologies	▪ Australia's largest swimming pool manufacturer supplying **PureGRAPH®**-enhanced fibreglass pool basins to international customers
Duromer	▪ Anti-static polymers for underground mining applications, as an alternative to carbon nanotubes and carbon fibres
Vector Homes Sustainable Living	▪ Utilising **PureGRAPH®** in structural beams to increase fire retardancy, strength, durability, thermal and acoustic performance, with prototype launched in September as R&D phase transitions to validate mass production
tribotech	▪ JDA signed for the development of **PureGRAPH®**-enhanced composite conveyor rollers, aiming to boost mechanical performance and wear life of existing material
Hubron.	▪ FGR's UK compounding partner manufacturing optimised masterbatches tailored for food safe material packaging

CASE and foams

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- **PureGRAPH®** used to produce fire retardant foams & coatings, mechanically-enhanced rubbers and elastomers
- Wear linings for specialist footwear with **PureGRAPH®** have increased tensile strength, elongation, abrasion resistance, electrical and thermal conductivity
- **PureGRAPH®** benefits for coatings and ink include anticorrosion, protection from degradation, exceptional electrical conductivity, improved durability and fire retardancy
- Customers can achieve market growth through product superiority and cost savings for end users

Applications

	Features	Benefits
Electrostatic dissipative coatings	▪ Electrostatic dissipative flooring	▪ Reducing static discharge by increasing conductivity
Sporting apparel and footwear	▪ Membranes and footwear products	▪ Increasing compression and reducing abrasion to elongate lifespan
Noise and vibration dampening foams	▪ Lightweight materials transportation	▪ Reducing weight while increasing performance

Clients and opportunities

newGen GROUP	▪ Protective mining wear liners and elastomer coatings with enhanced abrasion and corrosion resistance, with FGR securing a minimum phased commitment of 4,800 kgs of **PureGRAPH®** (Sept-21)
	▪ Developing ESD coatings using **PureGRAPH®** which have achieved conductivity targets, working on scale up feasibility
	▪ Developed **PureGRAPH®**-enhanced coating for increased tribology and wear resistance, with demonstrated performance increased using **PureGRAPH® 5** and scale up trials currently running
K&M KEYSER & MACKAY ADDING VALUE TO YOUR PRODUCTS	▪ Secured exclusive distribution deal with €160 million turnover organisation, providing deeper market penetration with access to sales expertise of 30 K&M representatives, based in 7 European countries

Note: CASE stands for coatings, adhesives, sealants and elastomers.

Market opportunity

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Energy creation and storage

- Key value proposition: energy efficient, electrical and thermal conductivity
- Market size by 2027:
  - Solar Water Heating - $6.6 billion
  - Perovskite - $3 billion
  - Supercapacitor - $0.9 billion
- Companies working on market disruptive technology using **PureGRAPH®** present an addressable market size of 300 – 500 tonnes per annum by 2027
- Represents <1% of global market opportunity

	Approx. annual graphene revenue[1]	
Total addressable demand	**0.3% of Target Market**	**0.6% of Target Market**
Global market size of $10.5 billion	AUD$30m	AUD$60m

Industrial applications

- Key value proposition: physical strength, electrical and thermal properties
- Wear liners and industrial parts
- Wheels and rollers
- Stator elastomers
- Insulation panels

	Approx. annual graphene revenue[1]	
Total addressable demand	**25% Conversion**	**50% Conversion**
100 – 200 tonnes of **PureGRAPH®**	AUD$30m	AUD$57m

Note: 1. The graphene revenue estimates in the tables above are for illustration only and are not in any way a forecast of revenue by First Graphene

Financial performance

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Commercial momentum

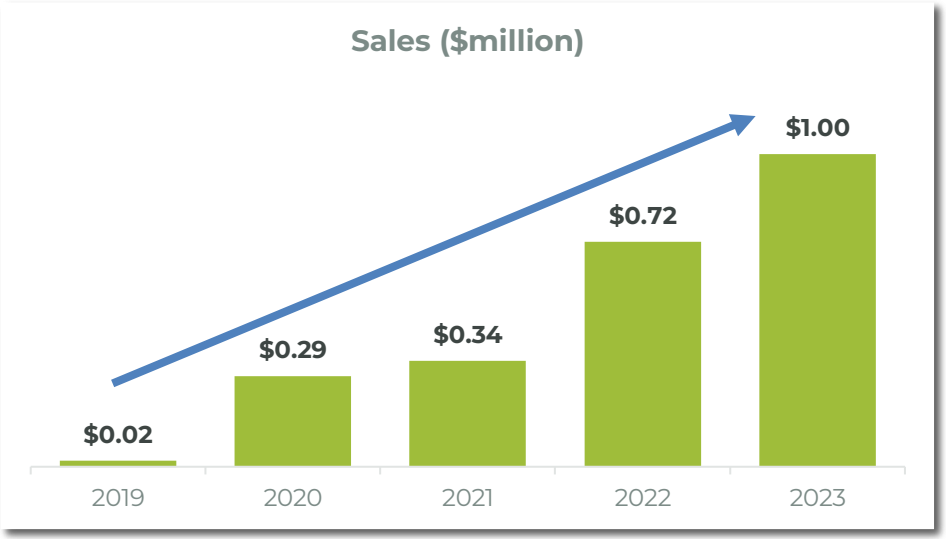
- Continue to increase sales and consistent revenue growth
- Cement and concrete segment nearing to mature sales profile
- Early adopter's footprint increasing through organic growth
- Diversifying sales through provision of Development services

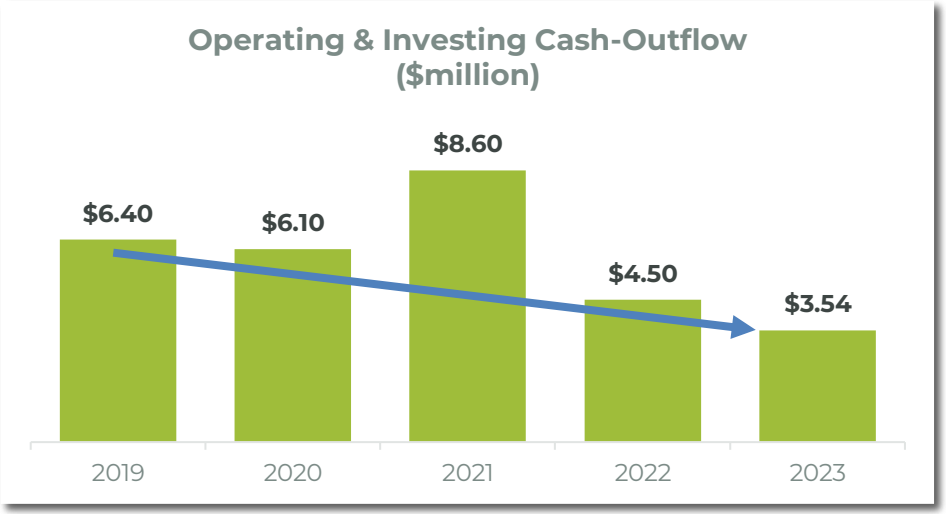
Decreasing cash burden each year

- Reducing non-critical spend
- Utilising non-cash incentive plans

Forward outlook FY24

- Forward-looking order book of circa A$550,000
- Setting the stage for continued revenue growth and results





Note: Refer to 2023 Annual Report for more details:
https://app.sharelinktechnologies.com/announcement/asx/cdb777a41547d45c651f273cda5fc590

Growth pillars and pathway

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	Pre-2020	2021	2022	2023 - beyond
SCALABLE PRODUCTION CAPABILITY	▪ Established a **world-class production capacity** with scalable technology	▪ Unique, **commercial-scale capability** and repeatable quality of graphene production	▪ **Readily scalable** technology to address growing demand ▪ **Optimisation trials** to enhance production process and improved energy saving outcomes	▪ **Further optimisation** to refine production processes, improve efficiencies, further reduce carbon footprint and cut output costs
GLOBAL SUPPLIER OF MATERIALS TECHNOLOGY	▪ Valuable **IP portfolio,** renowned application development and R&D service ▪ **PureGRAPH®** incorporated into Steel Blue Safety Boots	▪ Signed collaboration agreement for HDPE enhancement ▪ Novel **PureGRAPH®** Bitumen masterbatch formulation launched	▪ Secured **collaboration with global manufacturer** Fosroc ▪ Technology partnership secured with NeoGraf ▪ FGR led consortium secures UK grant for low-carbon cement	▪ Secured Breedon **Development and Commercialisation** agreement ▪ Commenced world-leading **PureGRAPH®** cement and concrete trials in the UK ▪ FGR & partners **awarded $A2m** for solar cell research ▪ **Secured strategic partnerships** for distribution and tech investment
WORLD-LEADING PIONEER	▪ Successful demonstration of **commercial scale PureGRAPH®** rubber compounds ▪ Secured **supply agreement** with global pool manufacturer (ALT)	▪ Developed **PureGRAPH®** based supercapacitor materials ▪ Acquired green hydrogen cavitation patents	▪ JDA **opens path** to global heating market ▪ Patented next generation **battery tech**	▪ Commercialise cutting edge green-materials technology for **high-growth** and **in-demand** industries ▪ Accelerate additional large scale infrastructure projects ▪ Transform valuable IP portfolio

Note: ALT = Aquatic Leisure Technologies

Upcoming milestones

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- [x] Development of phase three graphene-enhanced cement trial with Breedon, focused on optimisation performance of **PureGRAPH-CEM®** at full scale production
- [ ] Launch **PureGRAPH-CEM®** as Cement Additive for both Breedon (UK exclusivity) and global cement partners
- [ ] Finalise trial plans with multiple domestic and international Tier 1 cement and concrete companies
- [ ] Complete of development of perovskite solar cells with HaloCell
- [ ] Continue broader application adoption across composites, plastics, coatings etc
- [ ] Further optimisation improvements to manufacturing process and increase **PureGRAPH®** production to meet anticipated demand – on going

Key takeaways

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World-leading advanced materials supplier focused on fast-growing graphitic technologies

Established global industry partnerships in place to leverage paths to major markets

World-class production capacity with readily scalable technology

Established international customer base, primed for substantial growth

New revenue streams through product research and development services

Targeting traditional and emerging markets, critical to decarbonising the global economy

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Appendices

April 2024

Manufacturing process and technology

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Modular and scalable production plant

- Plant based in Henderson, WA
- Current capacity of 100tpa of **PureGRAPH®** graphene products
- Operating at ~10 tpa as sales book is built (break-even at ~20tpa)
- Capable of scaling to 1,000tpa with minimal investment (~$1.0-1.5m over 3 years)
- Potential to establish additional manufacturing facilities close to key markets
- 600t of graphite feedstock stored near WA facility
- Continued process optimisation to reduce cost of production increasing available margin
- Recently acquired and commissioned new grinding mill from Retsch to further enhance capabilities particularly in energy storage applications

Proprietary processing technology

- Utilises own proprietary process of electrochemical exfoliation for producing graphene from graphite
- Process works by applying a voltage which drives certain ions to intercalate (become inserted) into the carbon layers, expanding and pushing the layers apart
- High-yield exfoliation process enables graphite-to-graphene conversion rates above 95%, providing significant operating cost advantage over other graphene suppliers
- Continued investment in R&D to enhance processing capabilities across all applications
    - Cavitation chemistry – prototype process for direct conversion of petroleum to high value graphene and graphite products

PureGRAPH® graphene products (cont'd)

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	NPA	AQUA	MB-LDPE	MB-EVA	MB-EVA-B
Description	For dispersion across a range of solvents, polymer resins, elastomers and water-based formulations	Easy-to-use graphene paste for formulation into water and polar solvent-based formulations	Pelletised additive designed for use in polyolefin systems including polyethylene and polypropylene	Extends applications for blending in elastomers such as rubber systems and plastics, as well as thermoplastics	Designed for blending into asphalt mixtures to improve mechanical properties and stability
Form	Powder (available in 3 sizes)	Paste	Pellet	Pellet	Pellet
Application	Fibre-reinforced plastic composites, elastomers, plastics, coatings, textile materials, energy storage and concrete	Paints, inks, latex, polymer and cement composites	Compatible with a wide range of materials and easily added into thermoplastic production processes such as, injection molding, blow molding and extrusion	Blended to thermoplastics and elastomers such as rubber systems and plastics; potentially compatible with resins, waxes, adhesives	Binder for bitumen used in asphalt systems
Benefits	Increased flexural and compressive strength, reduced water and chemical permeability, anti-corrosion, fire retardancy	Improves mechanical performance, abrasion resistance, anti-corrosion, fire retardancy and thermal and electrical conductivity	Enhances mechanical and thermal properties, tensile strength, fatigue resistance	Softness, flexibility, polarity	Easy to incorporate using standard processing techniques, supplied in pellet form as a MB for ease of dosing and handling
Sectors	Mining services, leisure equipment, textiles, automotive components and construction	Construction, automotive, leisure products, textiles, coatings	Mining services, leisure equipment, textiles, automotive, construction, coatings	Mining services, leisure equipment, textiles, automotive, construction, coatings	Construction of roads and other asphalt surfaces

WORLD-LEADING GRAPHENE ENHANCED CEMENT TRIALS

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Validating PureGRAPH® as a viable product to reduce carbon emissions

- FGR-led consortium commenced graphene enhanced cement and concrete trials in June 2023
- Graphene enhanced cement used to create a real-world wheel washing facility at a major infrastructure project in the UK
- Initial results demonstrated:
  - **15% reduction in carbon emissions**, providing cement and concrete industry a solution to meet environmental sustainability targets
  - **10% increase in compressive strength,** meeting performance expectations and criteria
  - **Confirmed viability of producing industrial-scale quantities** of graphene enhanced cement
- Phase 2 trials aimed at optimising dosage rates and addition methods