

28 February 2024

## Extending Commercialisation of PureGRAPH<sup>®</sup> across a wide range of industries

### Highlights

- **Home building: UK eco-home building company continues to use graphene enhanced construction materials to improve fire retardancy and strength**
- **Automotive Lubricants: Graphene enhanced bearing lubricant application moving to production for automotive and industrial segments**
- **Conveyor Belts: Large scale testing of longer lasting graphene conveyer belts for mining industry underway**
- **Wide breadth of opportunities progressing towards revenue contribution**

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First Graphene Limited (ASX: FGR; “First Graphene” or “the Company”) is pleased to announce the advancement of multiple applications to commercial scale trials or production in a variety of new segments.

While the cement and concrete segment remains the primary focus for the Company, the numerous benefits of graphene additives are rapidly being recognised across multiple applications including construction materials, lubricants, rubbers, electrostatic discharge (ESD) flooring and coatings.

These benefits are being realised via external trials conducted by First Graphene’s global clients, and while there are disclosure sensitivities regarding trial details and results, the wide variety of opportunities in these segments is endearing.

Excitingly, First Graphene can confirm this work is progressing towards commercial realisation, providing new avenues to solidify the Company’s reputation as a global material technology company.

The adoption by industry of a new material such as graphene doesn’t happen overnight. Effective commercialisation entails a qualification period during which potential customers conduct trials at ever increasing scale in order to determine the benefits of the new material. It is a cumulative process that gathers momentum with each new customer across a range of segments. Having been on this path for a number of years, First Graphene is starting to see an acceleration of market acceptance.

### Graphene enhanced sustainable construction materials

First Graphene has continued collaboration with UK based eco-home builder Vector Homes to enhance the strength and fire-retardant properties of their sustainable construction materials, imparting the benefits of the Company’s PureGRAPH<sup>®</sup> product.

The initial prototype of these eco-homes, which has graphene incorporated into the recycled High Density Polyethylene (HDPE) beams via a PureGRAPH<sup>®</sup> additive, has satisfied British building standards.

Two concept homes have already been constructed with additional PureGRAPH<sup>®</sup> enhanced sustainable construction material applications being investigated with Vector Homes as it continues to develop its prototype homes.

Vector Homes is a leading innovator in the UK, with its concept homes made of recycled and natural materials, and built sustainably and resourcefully, recently awarded “Best Sustainable Innovation” by the Housing Digital Innovation Awards.

This project reinforces graphene’s ability as a thermoplastic additive for fire retardant construction applications, which will become vital to enhancing durability of homes for the future.

Excitingly, this development marks another entrance into the construction market for First Graphene, expanding on the cement and concrete segment.

The value in this market provides commercial opportunities for the Company, with the Engineering Plastics Market in the United Kingdom alone worth USD\$1.34 billion, with a compound annual growth rate (CAGR) of 6.53%<sup>1</sup>.

### **Improved durability and wear resistance demonstrated for lubricants market**

Laboratory and commercial scale trials with a new multinational client looking at the enhancing capabilities of adding PureGRAPH<sup>®</sup> into lubricants has been successfully completed.

Results from the external trials demonstrate an increase in wear resistance and improved durability when graphene enhanced lubricants are applied to bearings.

These results have provided confidence to progress to full production use of PureGRAPH<sup>®</sup> enhanced lubricants this year.

This development creates a new application for PureGRAPH<sup>®</sup> and opens the door to the variety of segments who require lubricants, including automotive and industrial.

The United Kingdom lubricants market is worth approximately USD\$5.85 billion and expected to grow to more than USD\$7 billion by 2032<sup>2</sup>, presenting a significant market opportunity for First Graphene and its partners to capitalise on.

### **Enhanced conveyor belts for mining industry**

First Graphene has received positive results from lab testing of graphene enhanced conveyor belts, by a leading Australian conveyer belt company, for use in the mining industry.

The addition of the Company’s PureGRAPH<sup>®</sup> product in the manufacture of the rubber conveyor belts has shown to enhance mechanical properties of the rubber belts, increasing durability and longevity.

This has now progressed towards commercial trials using prototype graphene enhanced belts, with results from this second stage expected by early 2024.

In addition to graphene conveyor belts, the Company has signed a Joint Development Agreement (JDA) with Australian-based Tribotech to develop graphene enhanced rollers for use by iron ore miners and producers in Western Australia.

Both of these arrangements mark a significant milestone for First Graphene, as the Company's materials expand into the high-performing, in-demand mining industry in Australia.

### **Other notable applications**

#### **Protective Clothing**

First Graphene has been working to develop a graphene enhanced coating using its PureGRAPH<sup>®</sup> product for use in the manufacture of protective clothing.

It's widely known graphene enhanced coatings can increase durability and strength of textile materials, which has been demonstrated during lab trials looking at enhancing protective clothing.

This has now moved into production trials, which has the potential to pave the way for widespread use of graphene enhanced textile coatings for improved durability and longevity of clothing.

#### **Floor Coatings**

First Graphene's products are also being used at low loadings to introduce conductivity into electrostatic discharge (ESD) flooring, protecting electronics from static electricity damage.

External production scale trials are now being conducted to measure the effectiveness of dispersing graphene into ESD floor coatings to prevent static charge build-up.

With multiple companies investigating different types of coatings to combat this, there is a significant opportunity for First Graphene to enter the market with its highly conductive material.

#### **3D Printing**

First Graphene has also progressed its activity in the 3D printing market, with the ability to produce commercial scale quantities of 3D printing filament recently demonstrated.

This follows the successful Graphene Hackathon at the University of Manchester in December, where PureGRAPH<sup>®</sup> powered 3D printing filament was supplied to participants.

The Hackathon provided First Graphene with the opportunity to trial its next generation of inks and 3D filaments, with the materials performing well.

These results have encouraged the Company to bring graphene enhanced 3D printing filaments to market, opening the doors to a sector estimated to be worth more than USD\$88.60 billion by 2032<sup>3</sup>.

**First Graphene Managing Director and CEO Michael Bell said:**

*“First Graphene is working hard to ensure different industries around the world can realise the true impact and benefits of graphene as a material-enhancing product.*

*The Company is making great progress in the cement and concrete segment but the opportunities to use PureGRAPH® to improve performance in other industries continues to grow and be resourced in the background.*

*We are excited to be progressing into large-scale trials in multiple ventures, including housing and construction, lubrication, mining and coatings.*

*First Graphene is globally known as a leading supplier of this remarkable product, and I anticipate further milestones in these sectors will solidify our position.”*

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<sup>1</sup> [Mordor Intelligence](#)

<sup>2</sup> [Expert Market Research](#)

<sup>3</sup> [Precedence Research](#)

**This release has been approved for release by the Chairman of the Board.**

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## About First Graphene Ltd (ASX: FGR)

*First Graphene Limited is focused on the development of advanced materials to help industry improve. The Company is a leading supplier of graphitic materials and product formulations with a specific commercial focus on large, high-growth global markets including cement and concrete; composites and plastics; coatings, adhesives, silicones and elastomers (CASE); and energy storage applications.*

*One of the key benefits of these advanced materials is the reduction of carbon dioxide emissions, whether directly through a reduction in output of these harmful greenhouse gases or lower energy usage requirements in manufacturing, or indirectly due to enhanced performance characteristics and extending the usable life of products.*

*First Graphene has a robust manufacturing platform based on captive and abundant supply of high-purity raw materials, and readily scalable technologies to meet growing market demand. As well as being the world's leading supplier of its own high performance PureGRAPH® graphene product range, the Company works with multiple industry partners around the world as a supplier of graphitic materials and partner to research, develop, test and facilitate the commercial marketing of a wide range of sector-specific chemical solutions.*

*First Graphene Ltd is publicly listed in Australia (ASX:FGR) and has a primary manufacturing base in Henderson, near Perth, WA. The company is incorporated in the UK as First Graphene (UK) Ltd and is a Tier 1 partner at the Graphene Engineering and Innovation Centre (GEIC), Manchester, UK, where it has a strong marketing and R&D capability.*