

6 April 2022

## **Applied Graphene Materials plc**

**("Applied Graphene Materials", "the Group" or "the Company")**

### **Interim results for the six months ended 31 January 2022**

Applied Graphene Materials, the producer of specialty graphene materials, is pleased to announce its interim results for the six months ended 31 January 2022.

## **Highlights**

### **Operational highlights**

#### **Coatings**

- Increase in pipeline engagements in the past twelve months
- Completed projects leading to customer product launches
- Successful engagements with
  - UK Environment Agency
  - Alltimes Coatings
  - Stanvac
  - Protective floor applications
  - Launch of finished anti-corrosion primers
- Strong product range with continuing commitment to develop further for industrial coatings opportunities
- Chemical resistant coatings portfolio expected to launch in April 2022
- Car care sector progress continues apace with a number of customer products coming to market
- Pace of evaluation of our materials has slowed due to the COVID legacy and supply chain issues within the sector impacting customer R&D activity
- Growth in total pipeline engagements to 192 (2021: 135) including 24 completed developments (2021: 10) and resulting revenue potential to £3.2 million (2021: £3.7 million)

#### **Composites and functional materials**

- Growth in engagements for graphene in composites in the hydrogen storage sector
- Development of Thermal Interface Materials

#### **Distribution**

- Steady progress with deeper technical input has established greater distributor capability
- Addition of Rayoung Chemtech in Taiwan

### **Strategic highlights**

- Technology development continuing apace
  - Innovative coatings technology to meet the need for sustainable innovation and to support new opportunities in, for example, chemical resistance applications
  - Battery technology materials evaluations
  - Hydrogen fuel cells materials solutions and storage
  - IP platform grown
- Positive regulatory activity in the USA
- Continuing IP development

### **Financial overview**

- **Revenue** – £46,000 (2021: £42,000)
- **Operating expenses** - unchanged at £1.7 million (2021: £1.7 million)
- **EBITDA\*** – loss of £1.7 million (2021: loss of £1.6 million)
- **Loss before tax** – £1.9 million (2021: loss of £1.8 million)

- **Cash at bank** – £4.2 million (2021: £2.3 million)
- **Basic EPS** – loss of 2.6 pence per share (2021: loss of 3.3 pence)

\* EBITDA comprises loss on ordinary activities before interest, tax, exceptional costs, depreciation and amortisation.

**Adrian Potts, Chief Executive Officer, commented:**

“We continue to make excellent progress with our graphene nanoplatelet dispersion technology for a broad range of applications in the protective coatings, composites and functional materials sectors alongside our longer-range development activity into green energy. Despite the COVID-19 legacy, we have managed our in-house resources well which has the development of new applications for the chemical resistant coatings and composites industries. We look forward to actively marketing this data to the industry soon.

Commercial revenues have been slower to develop than we would have liked for the period due to the compound effects of COVID-19 and supply chain challenges across the liquid resins industry. Many of our customers have been challenged to source the raw materials needed for their standard products and have temporarily refocused resources away from research and innovation, which has led to a slowing of customer evaluation, formulating and testing of our products.

We have worked hard with our distributors through this period to support their efforts technically with their customers and we see this as a good investment for future potential. With the progressive re-emergence of the industry, we are anticipating increasing engagement with our graphene nanoplatelet products.”

This announcement contains inside information for the purposes of Article 7 of EU Regulation 596/2014.

Applied Graphene Materials' results presentation, with audio commentary, is expected to be made available on its website at <http://www.appliedgraphenematerials.com> in due course.

**For further information, please contact:**

**Applied Graphene Materials**

Adrian Potts, Chief Executive Officer  
David Blain, Chief Financial Officer

+44 (0) 1642 438 214

**Singer Capital Markets**

Peter Steel / Amanda Gray

+44 (0) 207 496 3000

**Allenby Capital Limited**

Nick Athanas / Liz Kirchner (Corporate Finance)  
Matt Butlin / Kelly Gardiner (Sales and Corporate Broking)

+44 (0) 203 328 5656

**Hudson Sandler**

Nick Lyon / Emily Dillon

+44 (0) 207 796 4133

**Notes to Editors**

**Applied Graphene Materials** - For the last decade, AGM has been at the forefront of harnessing the possibilities of graphene. Founded originally by Professor Karl Coleman, the Group has grown from an academic idea from Durham University to a world leader in the development and application of graphene nanoplatelet dispersions for customers in the coatings, composites and functional materials sectors.

The Group utilises its proprietary bottom-up manufacturing process to produce high purity graphene nanoplatelets. Its expertise in dispersion chemistry enables AGM to create optimised, stable and easy to handle dispersions that customers use in real-world industrial products. AGM's unique approach enables industries to fully realise the potential of graphene in a simple, safe and easy to formulate way.

AGM, based at the Wilton Centre on Teesside, was admitted to AIM in November 2013, raising £11 million. The Group successfully raised £8.5m in January 2016 and a further £9.8m in November 2017. Since August 2020, the Group's shares are also listed on OTCQB in the United States and, in January 2021, the Group successfully raised a further £6m gross. As a result of the funding support and its industry leading technology platform, AGM has been able to develop a significant sales distribution network covering Europe, North America and Asia. The Group continues to work closely with industrial partners, and has seen the successful launch of numerous commercial products enhanced by its Graphene Dispersions.

<https://www.appliedgraphenematerials.com/>

## **Overview**

### **Steady engagement**

In the industrial protective coatings industry, where the bulk of our current customer engagement currently sits, progress has been impeded by the continuing impact of COVID-19 and customers' supply chain challenges for basic raw materials. Whilst this has affected AGM somewhat less from an operational and technology development standpoint, we have seen a significant slowing of pace of activity at our customers. As a result, revenues for the period have been below our expectations. We are, accordingly, moderating our current year revenue expectations. Despite this, we have seen an increase in total engagements in the twelve months and five new products using our graphene dispersion technology have come to market in the past six months.

### **Long term sales prospects through distribution**

Supplying graphene in standard dispersions with a long shelf life is key to successful customer engagement through distribution. Our distributors have developed a solid appreciation for our products over the past months. Over the past year of integrating our products with our distributors, we have focused on a deeper level of technical support to enable them to be successful. We are now confident that momentum is being realised and that this will become a solid foundation for future growth.

We were extremely pleased to add Rayoung Chemtech to the AGM sales network in March 2022, and their enthusiastic approach is already leading to product sampling for their prospective customer base. Regulatory support for all distributors is progressing to plan.

### **Right products for Protective Coatings progress**

The protective coatings industry is slowly emerging from the damaging effects of COVID and major supply disruption. Our efforts in technology development enable us to have confidence that as customer resources return, we will see improved progress in the use of our products – from customers in the evaluation stages through to increasing activity with launched products. Having a broad dispersion product range approach whereby graphene dispersions can contribute to a range of chemistries and end-user scenarios is a key enabler to future success in graphene application in this sector.

Our innovative solutions serve customer needs well for ease of materials adoption on a repeatable basis. Where innovators are looking to adopt more sustainable technical solutions, we have already established a solid product range to meet these opportunities. The industry push toward lower VOC and water-based solutions for higher performance coatings means our dispersions are well placed to fulfil this opportunity.

We are excited about the imminent marketing and application of our graphene dispersions into the Chemical Resistant coatings sector. A major data generation project for such coatings immersed in a range of harsh chemicals is expected to establish graphene as an important protective agent in this sector.

With stable dispersion products already established, we are well placed to pursue this sector with products that we know are easily integrated into end formulations. Similarly, we are also developing further additions to the product range with the inclusion of top coat product solutions to add to primer technologies in due course.

We are seeing positive opportunities emerging for our products in harsh environment coastal flood defence applications, construction, infrastructure, electrical, aerospace and concrete.

The car care sector continues to engage with graphene as a materials technology with a number of larger partners currently working with our materials. Once successful, these represent a potential step-change in volume use for this market.

### **Composites and functional materials technologies**

Our graphene dispersions offer specific technology progress opportunities in these sectors. Efforts in the hydrogen storage space are gathering momentum from the solid example established with Infinite Composites Technologies.

We are progressing the development of thermal interface materials from the platform of thermal adhesive technology. We anticipate a positive engagement in the automotive sector for such materials which embody high thermal conductivity and low weight gain through low density. Other speciality applications include the printing of conductive graphene inks.

### **Platform technology for broad application scope**

We have established a solid technology base of standard dispersions of a number of graphene types to enable breadth of engagement in the sectors in which we operate. As well as developing innovative solutions for the protective coatings industry for anti-corrosion and bringing new application opportunities for innovators to consider this material, we are now engaged in new products to generate future application possibilities for graphene. Evolution of the product range to enable industrial anti-static coatings is one such example.

Our longer-range technology development in the areas of material evaluation for battery technologies and hydrogen fuel and storage are progressing well. Our IP portfolio has been further increased, underpinning the value of the dispersion and application technology we have developed.

Our proactive approach to regulatory matters is making positive progress, particularly in the USA.

Sustainability is key to our product development and AGM offers both innovative products to meet the needs of product formulators wanting to integrate graphene into greener, more sustainable solutions. We are underpinning the efficiency of graphene in industrial coatings with a life cycle analysis study to demonstrate the sustainability benefits of use of this innovative material in such applications.

### Manufacturing base

Further leased space to accommodate an increase in dispersion capability is being contracted and equipment is on order to support the anticipated need for increased demand.

### COVID impact and supply chain

We have seen the direct impact on our customers' activity in terms of resourcing availability and continuity. When the severe impact of supply chain constraint is overlaid with the impact of COVID, it is clear that this has impacted our direct engagement with our customers insofar as progressing evaluation and use of graphene, as customers' priorities have shifted away from research and development. As activity levels begin to return to normal, we see AGM as well placed to engage with the industry, having managed our own COVID protocols well and progressed our technology development in the background.

## COMMERCIAL PROGRESS

### REVENUES

Trading has been difficult within our focus sector of industrial protective coatings due to the continuing impact of COVID and the challenges around supply chain issues for basic raw materials. With many engagements, we have seen a slowing of activity within our customers as their priorities have been centred on basic supply management with diminished resources. As a result, our revenues for the six months have proven to be disappointing. We are however positive about the gradual emergence of activity levels in the protective coatings sector and the potential to re-commence materials testing on a number of accounts. Behind the scenes, our technology team has been making good progress on developments to support new opportunities within the broader coatings sector, which we see ourselves as well placed to capitalise on.

### PIPELINE OF ENGAGEMENTS

We have seen progressive growth in our pipeline of engagements over the past 12 months, with an increase from 135 to 192, including now 24 completed products. It is pleasing to see this steady growth in the number of products being launched by our customers, which will drive our future sales of dispersed graphene materials. We believe steady, positive progress is being made in the evaluation of our graphene materials by customers interested in both graphene as a novel material and in the practical use of this innovative materials technology. The pace of a number of customer evaluations has unfortunately slowed as discussed due to the effects of COVID and the supply chain within the coatings industry. We see this as a timing issue only.

Opportunities by stage of development and pipeline value:

	1	2	3	4	5			
	Agreement on scope of sampling and engagement	Initial testing and interpretation of results	Repeat testing for consistency and review of results	Final product trials, formulation and specification	Final commercial agreement	Completed	Total	Value*
As at								
31.01.22	74	60	13	15	6	24	192	£3.2m
31.07.21	79	70	15	9	8	19	200	£3.7m
31.01.21	39	54	19	8	5	10	135	£3.7m

\* The value of development stages 1 - 5 is probability-weighted. The value of completed projects is at full sales opportunity.

The number of opportunities in the final stages of the pipeline (stages 4 and 5) has grown from 17 to 21 during the period as a result of eleven opportunities moving up the pipeline, 5 opportunities being completed and 2 opportunities discontinued. In total, net of additions to the pipeline, eight opportunities have been discontinued during the period.

The majority of our activity within the pipeline continues to be centred upon protective coatings technology. Protective coatings is our strategically important market where we have demonstrated the performance advantages of graphene nanoplatelet dispersions. Most of this activity is for industrial-focused customers with activity also in aerospace, oil/gas and marine.

We currently can identify six further customer engagements which we believe are close to commercial traction.

The probability weighted average sales value of the 168 projects in the pipeline at 31 January 2022 is £2.7m (31/7/21: £2.9m) reflecting the completion of 5 projects and the net discontinuation of 8 projects. The sales opportunity of the completed projects at that date is £0.5m (31/7/21: £0.8m) and this reduction in sales value reflects a more cautious valuation of these projects based on recent sales experience and the ongoing difficult trading environment.

### DISTRIBUTION NETWORK

Steady progress has been made with our distributor development, although the investigation of graphene as a new class of candidate technology has taken longer than desired with some of our distributors' customers. This has required targeted support from AGM

technical staff to enable product engagements to progress. However, we are confident that this investment will pay off in the successful outcomes that will be reached with our distributors. It is now a key objective to increase the quantum of engagements through our distribution partners to enable greater traction in commercial results.

Post period we were pleased to announce the addition of Rayoung Chemtech to the AGM team as our distribution partner for the Taiwan coatings and composites market. We are very encouraged by the level of activity already happening through them and the number of samples requested for testing. We are also anticipating adding further distributors to the team; progress has been made in Latin America and India and we anticipate further announcements in due course.

We continue to assist our distributors with product regulatory support for our products in the respective territories. This is particularly important for future volume sales of our A-GNP35-based dispersions in the United States, where engagement with the Environmental Protection Agency (EPA) is active in pursuit of a Pre-Manufacture Notice and TSCA listing.

### PROTECTIVE COATINGS SECTOR

As AGM's strategically important sector for delivery of our technology solutions, sales volumes have been slower to develop than expected. This is directly as a result of activity levels in the sector having been substantially reduced and this is due to:-

- COVID-19 has continued to adversely affect work patterns and continuity at a number of our customers – particularly those in early-stage evaluation of our products. This has resulted in much slower testing and adoption and hence a reduced stream of launched products to market. At some engagements, R&D programmes have been shelved altogether.
- Global supply chain issues in the coatings industry have significantly changed priorities for development, innovation and R&D staff. Unprecedented supply issues for many constituents of coatings including resins, solvents, additives have been significantly disrupted. In a number of cases, customers have reprioritised their R&D team efforts to solely address integration of alternate basic product supply; this has a direct impact on longer-range innovation activities, particularly when overlaid with the impact of disrupted work patterns from COVID.

Two years on, we are starting to see a return in activity in the industrial coatings space which is encouraging.

### Current Sector Products and Marketing

Despite the slow pace of customer activity, AGM has focused on continuing the important work of developing our comprehensive platform of technology and our product offerings for the protective coatings sector. These are supported by extensive data and guidance documents on exemplar formulations, arising from many months of testing. These data serve to equip customers on how to be successful with the use of graphene dispersions. Across the range of applications, we have products that which can fulfil requirements in:-

- general Industrial C3 anti-corrosion applications;
- use of graphene in harsher C4 to C5 applications in primers, and intermediate coats. This gives the end-user substantial flexibility to design systems where the graphene can be used throughout the various layers in a protective coatings assembly, or selectively in tandem with an existing primer system;
- dispersions that can confidently be used to achieve very harsh corrosion performance in CX type applications e.g. for coastal and offshore environments; and
- innovative water-based applications for sustainable advantage.

AGM's extensive product portfolio for this sector and beyond includes

- standard, stable, easy to use graphene dispersions to enable our end customer to formulate their own products using a range of additive chemistries from resins to solvents;
- a range of innovative low VOC and bio-based dispersion products to meet the needs of innovators looking for a greener sustainable solution;
- water-based dispersions specifically engineered for effective water-based solutions for coatings innovators;
- dispersions based on a range of types of graphenes to match customer need; and
- finished primers to enable customers to use directly or evaluate performance of a graphene-based product with ease.

We are planning a major marketing push in the area of chemical resistant coatings in April 2022. This application opportunity is anticipated to open up substantial new prospects for use of our graphene dispersions in a broader range of coatings possibilities beyond corrosion. This application portfolio is expected to include engagements in both the areas of protective coatings for diverse aggressive chemicals for storage, transport, flooring through to composite materials which are often used in chemical storage applications.

We are also expecting the successful development of a graphene-enhanced top coat product to complement the use of AGM's graphene-enabled primers and intermediate barrier coats. This will give the end user full flexibility in determining the specification of their protective coatings system developments.

Customer experiences of successfully formulated products using our graphene where we anticipate growing usage as these products become adopted include: -

### Harsh corrosion - UK Environment Agency (UKEA)

We have supplied our Graphene HC Primer to UKEA contractors for the first use of this finished coating on UK flood defence assets in the Northeast of England. We are pursuing the next phase of this engagement with sales of primer anticipated to further locations. This is an important project for AGM as it marks the practical use of a harsh environment corrosion primer in real-world applications where the objective is maintenance reduction through longer life graphene-enhanced coating systems in harsh, salty coastal environments. The coating deployed is the result of some 18 months of product formulation and extensive testing. As well as sales to UKEA, the use serves as an important demonstrator of graphene use in a new platform of coatings innovation for further harsh

environment applications. A further customer-focused development project is underway to finalise a top coat to complement the primer product for UKEA. It is collaborations where the customer has clear objectives which enable successful product outcomes underpinning sales potential for the longer term.

#### Industrial construction – Alltimes Coatings

Positive progress has been made with Alltimes Coatings and the use of their Advantage Graphene product on a growing number of roofing and construction cladding projects. Certification with architects of this product and technical solution is starting to gather momentum which is expected to lead to direct specification on future projects as the product of architect choice. Demonstrable performance of the product through rigorous testing is important to the certification process, and this is a key service AGM offers to our customers.

#### Automotive - James Briggs Ltd

JBL continue to take regular shipments of graphene dispersions for their aerosol products for their own brand and white label customers. Consistent repeatable quality of dispersions is vital to continuing repeat orders.

#### Industrial Plant - Stanvac-Superon

The Stanvac graphene-based conductive coating product designed for reducing losses on power transmission line connectors has been used to demonstrate superior performance through this new product offering. We confidently await formal customer approval of the Stanvac product, which in turn will enable wider adoption and a progressive increase in sales volume of dispersed materials. Stability of dispersion is a key attribute for shipping over large distances.

#### Industrial - Blocksil

Blocksil launched a new graphene-enhanced primer which has been designed to complement their TopCoatMT product and hence effectively double potential volumes of dispersions to Blocksil projects, which include RTE and UK Network Rail. Regrettably, funding for the Network Rail trackside enclosure refurbishment has been substantially delayed and contractor issues for RTE and Avanti have meant these projects have stalled. We anticipate a gradual increase in activity with Network Rail as funding is anticipated to be restored in April.

#### Protective floor coatings

Our lead customer in this sector reports that the testing phase is complete and that they are moving towards the development of a marketing campaign for the graphene product. We eagerly anticipate the launch of this innovative concrete floor coating product where graphene is being used in a highly effective way to replace legacy materials at significantly lower loadings, giving the customer greater flexibility and manageable cost.

The imminent chemical resistant coatings technology product launch is expected to add to the number of engagements in this important sector opportunity.

We are also anticipating the further development and launch of an antistatic capability to floor coatings formulations to suit potential in, for example, the electronics sector.

#### Aerospace

The lead customer for this activity continues their testing process for the adoption of a graphene-loaded aluminium primer product with a view to eventual third-party approvals to enable use on flight assets. Whilst this represents a lengthy process to navigate involving multiple test stages with the customer, the certifying bodies and individual project applications, the focus is on timely completion of these steps and volume uptake of dispersions in this coating.

#### Other protective coatings

We continue to make good progress with a broadening range of application opportunities for graphene nanoplatelets as a protective barrier agent in a coating format. Sectors such as packaging and PPE represent active engagements.

#### Integration of finished products into the range

We launched two new primer products to the sector in the period to demonstrate directly the potential of graphene in protective coatings. One of the products is for general purpose “C3” industrial use and the second is for much harsher anti-corrosion protective applications, typified by the UKEA coastal flood defence application. These products also enable customers who wish to fast track their development to evaluate a finished graphene-enhanced formulation to demonstrate effectiveness in their specific application.

64% of the pipeline represents protective coatings engagements with the majority in the industrial coatings space.

#### Car care

When correctly formulated, the inclusion of graphene nanoplatelets can impart excellent UV resistance, chemical resistance and ease of incorporation and application in finished car care products. Typically, low loading levels of graphene material are required to make a positive contribution to the performance of the end customer's product. AGM's dispersion product offerings make it easy for the end user to integrate graphene into their products. We offer both water-based and a range of sector-relevant solvent-based dispersions of graphene nanoplatelets which are aligned well with the customers' needs.

Early customer launches with smaller, niche operators have demonstrated strong performance but unfortunately have not generated anticipated demand from their lower than anticipated retail product sales. As we engage with larger product formulators in the market, we anticipate better traction in volume-based revenues translating from product launches.

Post product launch, one of our USA customers continues to roll out their new technology to their dealer network and they anticipate progressively increased adoption and may require future inventory provision through our distributor.

The pipeline for engagements in this sector remains steady at 21% of the total with four customer evaluations at an advanced stage and completing testing. We are at an advanced product development stage of engagement with one larger car care supplier and are hopeful of a positive outcome for product integration and consequential sales volumes once testing is finalised.

We were pleased to be able to supply 3 dispersion products in volume to a further undisclosed USA customer in the car care products sector which will enable them to launch a graphene-based product range imminently.

A further customer in this space is completing product stability testing for water-based and solvent-based products, with a view to launching products to the US market.

#### COMPOSITES SECTOR

Use of our graphene nanoplatelets in composites structures enable very specific performance gains in these already high-performance materials. This means that a targeted use of GNPs to achieve specific performance gains can now be within reach for end users. As ever, it is the process of how the material is incorporated that determines the quality and success of the outcome – AGM's dispersed graphene systems are ideal for such targeted inclusion.

Work continues with Infinite Composites Technologies (ICT) as a platform demonstrator for high-pressure linerless tank systems for gas storage which incorporate our graphene dispersions to great effect.

Increased toughness and tensile strength of the composite plus enhanced leakage control under extremes of testing from the use of graphene in their matrix system contributes to higher performance and longer life. As ICT progressively increases build-rate momentum, we are encouraged to see demand for our specialty dispersed products for their pressure vessels, and we anticipate an increased volume of dispersions to be supplied to them in the coming months.

A number of additional current engagements in the area of pressure storage vessel technology are now actively evaluating our graphene dispersions. The appetite for the exploration of the use of graphene in this area is expected to continue to grow, given the increasing awareness and interest in hydrogen power to sit alongside current and future battery technologies. We anticipate a growing and longer-term demand in hydrogen storage applications and are confident that we are well placed with the end-to-end understanding of how to use graphene to enable specific, desirable benefits for a breadth of composites processing solutions for these demanding applications.

More generally, the effort to characterise the performance of graphenes in composites is progressing at the University of Maine's Advanced Structure and Composites Center in partnership with The Graphene Council. Further individual customer engagements are incorporating graphene into their systems, usually with customised dispersions, as the means of delivering graphene to suit individual processing methodologies - one of AGM's strengths.

#### FUNCTIONAL MATERIALS SECTOR

Customer approval for the Genable 4300 product for an aerospace client is still pending. Given the technical benefits of this family of products including high thermal conductivity and low density, we are now progressing the development of formulations to create a broader platform technology targeting the opportunity for heat dissipation with low mass for battery technology in lightweight automotive solutions. This short term development effort is expected to yield a number of product formats to enable broad engagement in the automotive sector and beyond.

Customer demand for printed ink materials has been challenging, with a specific customer project cancelled following initial evaluation. The technology platform still holds appeal for conductive printing applications and we continue to promote the potential on the basis that higher conductivity, low density printed technologies will be a requirement in the industry.

#### TECHNOLOGY DIRECTION

AGM's technology roadmap is focused on the successful integration of graphene nanoplatelets, principally in liquid product systems through our innovative dispersion technology. We have approached this foundational challenge by developing and establishing a robust range of dispersions to make graphene:-

- easy to integrate into end-use formulations;
- easy to handle;
- safe to handle;
- stable for extended shelf life;
- repeatable, consistent in outcome to give end-users confidence in the products they develop with graphene;
- available in custom solutions suitable for specific application opportunities; and
- having the relevant regulatory approvals.

Our know-how has enabled us to develop dispersions that also incorporate commercially available exfoliated graphenes in addition to our own in-house manufactured nanoplatelet products. This is important given the breadth of performance attributes of materials offered within the "graphene nanoplatelet" family of materials; the opportunity to serve the customer with the appropriate product offering against their technical need is important for successful outcomes.

AGM's strategy is to apply our platform dispersion technology in the areas of protective coatings (principally anti-corrosion), composite materials and functional (or specialty) products. Latterly we have extrapolated our application strategy further to address areas including:-

- chemical resistant coatings;
- Top Coat products to complement primer products (eg for UKEA etc);
- hybrid dispersion formulations for broader utility for a range of anti-corrosion opportunities;

- long term coastal exposure testing of exemplar protective coatings formulation to demonstrate long term performance of such coatings;
- development of floor coatings expertise to include anti-static attributes;
- coatings for wind turbine applications to combat erosion;
- life cycle demonstration of graphene-enhanced protective coatings;
- dispersions suitable for textile application;
- thermal interface materials for battery applications;
- battery applications for our graphene coatings products including:-
  - o LTO Project at St Andrew's University;
  - o Dielectrics project at WMG; and
  - o Silicon-Lithium project at Northumbria University;
- applications of novel graphene structures for hydrogen fuel cells; and
- further development of Graphene in composite pressure vessels

## IP

We have made positive progress with continuing to build an IP portfolio around both the effectiveness of graphenes and the application of these materials through dispersion technology. During the period a UK Patent was granted for the use for graphene nanoplatelets in water-based coatings. Post period, patent grants were notified in Singapore for Corrosion protection for metallic substrates comprising one or more 2D materials platelets. We anticipate the Chinese Patent Office granting our patent for Aluminium corrosion protection with graphene. The **Genable** trademark has been granted in USA and Turkey.

We have further been informed that a patent covering water-borne corrosion has been cleared for grant in Canada.

## REGULATORY

We continue to work with the REACH consortium to review graphene materials and the various morphologies available under the group-based volume approval we have in place.

Brexit has placed additional parallel demands on EU REACH. A consortium is expected to be established to deal with the detail of Graphene registration in the UK in due course. In the meantime, AGM has put in place the necessary documentation for Downstream User Import Notification and Poison Centre Notifications.

Efforts for registration in other regions continue apace to support distributor opportunities. The most challenging area currently for regulatory approval is in the USA and we are well underway with filing for approval for a TSCA listing with the Environmental Protection Agency (EPA). The cost of such activity is not insignificant but the commitment to regulatory approval will fundamentally underpin long-range volume opportunity in this area.

We continue to input and interact with various other bodies with an interest in graphene classification and regulatory aspects. The Graphene Council, of which we are a member, is taking a positive inter-agency approach with a view to maturing the process of standardization and classification of the substantial range of materials that fall under the 2D carbon umbrella.

## MANUFACTURING

Focus in the period has been on manufacturing footprint for dispersions, the technology for which continues to be developed. We are in the process of completing a lease on extending our space in the Innovation Centre at Wilton to enable an expanded dispersion plant to be added. Equipment is on order and we anticipate completion in the summer of 2022.

We continue to evaluate a broader range of product offerings to ensure we have the best combination of materials to suit the end-customer's application. As the industry develops, the consistency of graphene in the customer's hands will be crucial to successful, repeatable outcomes for graphene adoption. We are focused in this area to deliver the highest quality, most consistent dispersed graphene materials to enable our customers to achieve these goals time after time.

## SUSTAINABILITY

Our focus on sustainability has centred on our product offerings and the power of graphene to bring about a more sustainable solution as compared with conventional materials offerings.

The application of our coatings with UKEA is illustrative of the potential of a longer life cycle between maintenance events to reduce cost of maintenance and reduce the environmental impact of stripping and recoating large assets. In pursuit of this, a Life Cycle Analysis study is being completed to review the impact of graphene-based coatings.

As the coatings industry is moving towards a more water-based focus, our water-based graphene dispersions offer an ideal opportunity for end users to innovate with an easy-to-use solution to introduce new technical solutions to the coatings applications. A UK patent was granted for this technology in the period. In pursuit of a more sustainable basis for coatings products, we also offer lower VOC and bio-based product dispersions.

## COVID-19 IMPACT

COVID-19 has had a deeper impact on our business revenues as the effects of the pandemic have progressed. As noted earlier, this has been seen most clearly in the impact on our customers, work patterns, availability of customer R&D resources and the refocus on basic raw materials in an industry that is extremely supply-chain challenged.

We are confident that with the emergence of the protective coatings industry from this situation, we will start to gather momentum again and see positive progress in the coming months.

We have managed our in-house capability well, although latterly have seen a greater disruption with the more transmissible Omicron variant.

## OUTLOOK

Whilst we have seen a significant slowing of activity levels in the industrial protective coatings industry, we have continued with our efforts to develop, test and demonstrate practical graphene solutions for end-users to adopt. Given the current operational conditions in our sector we are reducing our short term revenue expectations but we remain confident about the long term future. Our product range is designed to meet the needs of innovators in the industry evaluating substitution with graphene into conventional chemistries and those looking for more advanced sustainable solutions. We are also adept at customising graphene solutions to suit specific opportunities and customer needs.

We believe that AGM is extremely well placed to engage with these opportunities as the industrial coatings sector returns to more normal product development activity levels. Offering a broader platform of technology, supported with regulatory positioning and additional capacity, is key to serving emerging customers well. We are committed to developing this platform further in the areas of chemical resistance and adjacent requirements for the sector such as anti-static performance.

Our global distribution platform is now well trained in the utility and use of our products and we are anticipating stronger performance from them to drive the number of engagements in our pipeline.

Emerging opportunities in the areas of battery technology and hydrogen fuel and storage are progressing as we develop our technology platform to support this sector.

Our cash resources continue to extend beyond 31 January 2023. The Board is confident that the technology positioning of AGM will enable solid future opportunities.

**Adrian Potts**

***Chief Executive Officer***

6 April 2022

# Financial review

With David Blain

## Summary

- Revenues increased to £46,000 (2021: £42,000), with the lower than anticipated growth reflecting the effect of COVID-19 and various issues faced by our customers.
- The knock-on impact of the ongoing conflict in Ukraine on industry, the economy and our cost base continues to add uncertainty to our operational performance.
- Operating costs reduced by £14,000.
- EBITDA loss of £1.72 million (2021: £1.58 million loss).
- Cash at bank of £4.2 million (2021: £2.3 million).
- EPS loss of 2.6 pence per share (2021: loss of 3.3 pence per share).

## Revenue

Revenue for the period was £46,000 (2021: £42,000) arising from the supply of production orders of graphene and evaluation quantities of graphene to commercial partners. Revenues increased marginally during the period reflecting the very difficult operating conditions endured by the industries that our customers operate in, as reflected in the CEO's statement.

## Cost of sales

Cost of sales reflect the cost of operating the production facilities during the period and increased by £132,000 to £278,000 (2021: £146,000). The increase in costs primarily reflects increases in staff and utility costs.

## Operating costs

Operating costs for the period were £1,674,000 (2021: £1,688,000). The reduction in costs of £14,000 reflects the increase of staff and insurance costs of £90,000 offset by reductions in depreciation and legal fees totalling £104,000.

## Loss on ordinary activities before tax

A loss on ordinary activities before tax of £1,906,000 (2021: loss of £1,794,000) was recognised.

## Loss on ordinary activities before interest, tax, exceptional costs, depreciation and amortisation (EBITDA)

The EBITDA loss for the Group increased to a loss of £1,723,000 for the six-month period ended 31 January 2022 (2021: loss of £1,578,000). The losses incurred in the period relate to the day-to-day costs of the business and include the ongoing costs associated with research and development of new applications of graphene together with the technical input provided to our commercial partners as they look to evaluate and incorporate graphene into their product lines. The EBITDA loss for the period under review was £145,000 greater than the previous period, primarily due to an increase in the gross loss of £128,000 and an increase in operating costs (excluding depreciation) of £17,000.

## Net finance expense

Net finance expense for the period was £nil (2021: £2,000).

## Tax

R&D tax credits for the current year are accrued on a monthly basis, resulting in a credit of £207,000 for the period (2021: £178,000).

## Earnings per share

Basic earnings per share was a loss of 2.6 pence per share (2021: loss of 3.3 pence per share).

## Dividend

No dividend has been proposed for the period ended 31 January 2022 (2021: £nil).

## Cash flow

Net cash used in operations was £1,914,000 (2021: £1,294,000). The increase in cash utilised in operations was caused by the increased operating loss and an increase in net working capital.

Capital expenditure of £114,000 (2021: £106,000) was incurred in the period mainly relating to the development of intellectual property assets.

## Balance sheet

Net assets increased to £6,036,000 (2021: £3,828,000), principally reflecting the new shares issued in February 2021 offset by the trading loss for the period.

Cash at bank at 31 January 2022 was £4,214,000 (2021: £2,291,000). Monies are on deposit with a small number of financial institutions for time periods ranging between instant access and up to 95 days in maturity.

The property lease at Wilton is in the process of being renewed in April 2022, and will result in the recognition of an additional Right of Use (ROU) asset of £600,000 and a lease liability of £600,000. The lease will include additional space and is for a period of three years with a break clause after two years.

## **Accounting policies**

The Group's consolidated financial information has been prepared in accordance with International Accounting Standards in conformity with the requirements of the Companies Act 2006. The Group's significant accounting policies, which are consistent with those set out in the audited financial statements for the year ended 31 July 2021, have been applied consistently throughout the period.

## **Principal risks and uncertainties**

Risk management forms an integral part of the business planning and review cycle. The principal risks and uncertainties remain unchanged from those set out on pages 33 to 35 of the Annual Report for the year ended 31 July 2021. As disclosed in the Annual Report, cash balances continue to fund operations beyond 31 January 2023.

Forecasting the timing and quantum of revenues at this stage of development continues to be a key difficulty faced by the Group as this is heavily dependent upon the product development cycle of our customers and, therefore, is not under our control. However, we are encouraged by the growing number of products that our customers have launched, the expansion of our distribution through new appointments in 2020 and the strength of our sales pipeline. The knock-on impact of the ongoing conflict in Ukraine on industry, the economy and our cost base continues to add uncertainty to our operational performance.

## **Cautionary statement**

The Business and Financial reviews have been prepared for the shareholders of the Company, as a body, and no other persons. Their purpose is to assist shareholders of the Company in assessing the strategies adopted by the Group and the potential for those strategies to succeed, and for no other purpose. The Business and Financial reviews contain forward-looking statements that are subject to risk factors associated with, amongst other things, the economic and business circumstances occurring from time to time in the sectors and markets in which the Group operates. It is believed that the expectations reflected in these statements are reasonable, but they may be affected by a wide range of variables which could cause actual results to differ materially from those currently anticipated. No assurances can be given that the forward-looking statements in the Business and Financial reviews will be realised. The forward-looking statements reflect the knowledge and information available at the date of preparation.

**David Blain**

***Chief Financial Officer***

6 April 2022

# Consolidated income statement and statement of comprehensive income

for the six months ended 31 January 2022

	Note	Unaudited 6 months to 31 January 2022 £'000	Unaudited 6 months to 31 January 2021 £'000	Audited year ended 31 July 2021 £'000
Revenue	5	46	42	123
Cost of sales		(278)	(146)	(363)
<b>Gross loss</b>		(232)	(104)	(240)
Operating expenses		(1,674)	(1,688)	(3,319)
<b>EBITDA</b>		(1,723)	(1,578)	(3,150)
Depreciation of tangible fixed assets		(183)	(214)	(409)
<b>Operating loss</b>		(1,906)	(1,792)	(3,559)
Net finance (expense)/income		—	(2)	(6)
<b>Loss on ordinary activities before tax</b>	5	(1,906)	(1,794)	(3,565)
Tax on loss on ordinary activities	3	207	178	391
<b>Loss for the period attributable to equity shareholders</b>		(1,699)	(1,616)	(3,174)
Other comprehensive income		—	—	—
<b>Total comprehensive loss</b>		(1,699)	(1,616)	(3,174)
<b>Earnings per share (pence per share)</b>				
Basic	6	(2.6)	(3.3)	(5.6)

EBITDA comprises loss on ordinary activities before interest, tax, exceptional costs, depreciation and amortisation.

# Consolidated statement of changes in shareholders' equity

for the six months ended 31 January 2022

	Share capital £'000	Share premium £'000	Merger reserve £'000	Retained earnings £'000	Unaudited total £'000
<b>As at 31 July 2020</b>	989	27,473	1,231	(24,408)	5,285
Comprehensive loss	—	—	—	(1,616)	(1,616)
Issue of shares (net)	5	87	—	—	92
IFRS 2 share based payments	—	—	—	67	67
<b>As at 31 January 2021</b>	994	27,560	1,231	(25,957)	3,828
Issue of shares (net)	293	5,167	—	—	5,460
Comprehensive loss	—	—	—	(1,558)	(1,558)
IFRS 2 share based payments	—	—	—	(35)	(35)
<b>As at 31 July 2021</b>	1,287	32,727	1,231	(27,550)	7,695
Comprehensive loss	—	—	—	(1,699)	(1,699)
IFRS 2 share based payments	—	—	—	40	40
<b>As at 31 January 2022</b>	1,287	32,727	1,231	(29,209)	6,036

# Consolidated balance sheet

as at 31 January 2022

	Note	Unaudited 31 January 2022 £'000	Unaudited 31 January 2021 £'000	Audited 31 July 2021 £'000
<b>Assets</b>				
<b>Non-current assets</b>				
Intangible assets		501	369	427
Right-of-use assets		7	148	73
Property, plant and equipment		1,125	1,268	1,202
		1,633	1,785	1,702
<b>Current assets</b>				
Inventories		115	77	93
Trade and other receivables		225	236	276
Corporation tax recoverable		619	662	413
Cash		4,214	2,291	6,308
		5,173	3,266	7,090
<b>Liabilities</b>				
<b>Current liabilities</b>				
Trade and other payables		(763)	(1,075)	(1,023)
Lease liabilities		(7)	(148)	(74)
		(770)	(1,223)	(1,097)
Net current assets		4,403	2,043	5,993
<b>Net assets</b>		6,036	3,828	7,695
<b>Shareholders' equity</b>				
Called up share capital	8	1,287	994	1,287
Share premium account		32,727	27,560	32,727
Merger reserve		1,231	1,231	1,231
Retained earnings		(29,209)	(25,957)	(27,550)
<b>Equity shareholders' funds</b>		6,036	3,828	7,695

# Consolidated cash flow statement

for the six months ended 31 January 2022

	Note	Unaudited 6 months to 31 January 2022 £'000	Unaudited 6 months to 31 January 2021 £'000	Audited year ended 31 July 2021 £'000
<b>Operating activities</b>				
Net cash used in operations	7	(1,914)	(1,294)	(3,019)
Finance income/(expense)		—	9	(6)
Tax received		—	—	461
<b>Net cash used in operating activities</b>		<b>(1,914)</b>	<b>(1,285)</b>	<b>(2,564)</b>
<b>Investing activities</b>				
Purchase of intangible assets		(74)	(93)	(151)
Purchase of property, plant and equipment		(40)	(13)	(67)
<b>Net cash used in investing activities</b>		<b>(114)</b>	<b>(106)</b>	<b>(218)</b>
<b>Financing activities</b>				
Issue of shares (net of costs)		—	71	5,552
Capital element of lease obligations		(66)	(74)	(147)
<b>Net cash generated from financing activities</b>		<b>(66)</b>	<b>(3)</b>	<b>5,405</b>
<b>Net decrease in net cash and cash deposits</b>		<b>(2,094)</b>	<b>(1,394)</b>	<b>2,623</b>
Opening net cash and cash deposits		6,308	3,685	3,685
<b>Net cash and cash deposits at end of period</b>		<b>4,214</b>	<b>2,291</b>	<b>6,308</b>
Net cash and cash deposits include:				
Cash (maturity less than 95 days)		4,214	2,291	6,308
<b>Net cash and cash deposits at end of period</b>		<b>4,214</b>	<b>2,291</b>	<b>6,308</b>

# Notes to the Interim Report

## for the six months ended 31 January 2022

### 1 General information

The principal activity of Applied Graphene Materials plc is the manufacture, dispersion and development of applications for graphene. The Group operates principally in the United Kingdom.

The Company is incorporated and domiciled in the United Kingdom and its registered number is 8708426. The address of the registered office is The Wilton Centre, Redcar, Cleveland TS10 4RF. The Company was incorporated on 27 September 2013.

The interim financial information was approved for issue on 6 April 2022.

### 2 Basis of accounting

The consolidated interim financial information for the period ended 31 January 2022 has been presented under the historical cost accounting convention, as modified by financial assets and liabilities at fair value through the income statement and share based payments at fair value, and in accordance with International Accounting Standards in conformity with the requirements of the Companies Act 2006 and IFRIC interpretations. The consolidated interim financial information has been prepared on a going concern basis.

The accounting policies used in the consolidated interim financial information are consistent with those set out in the audited financial statements for the year ended 31 July 2021. These accounting policies are drawn up in accordance with adopted International Accounting Standards (IAS) and International Financial Reporting Standards as issued by the International Accounting Standards Board and adopted by the EU.

AIM-quoted companies are not required to comply with IAS 34 Interim Financial Reporting and accordingly the Company has taken advantage of this exemption.

Further IFRS or interpretations may be issued that could apply to the Group's financial statements for the year ending 31 July 2022. If any such amendments, new standards or interpretations are issued, then these may require the consolidated financial information provided in this report to be changed. The Group will continue to review its accounting policies in light of emerging industry consensus on the practical application of IFRS.

The preparation of financial information in conformity with IFRS requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Although these estimates are based on management's best knowledge of the amount, events or actions, actual events ultimately may differ from those estimates.

The consolidated interim financial information does not include all financial risk management information and disclosures required in the annual financial statements.

The consolidated interim financial information for the six months ended 31 January 2022 and for the six months ended 31 January 2021 contained within the Interim Report does not constitute statutory financial statements within the meaning of Section 434 of the Companies Act 2006 and is unaudited. The comparative figures for the year ended 31 July 2021 have been extracted from the audited financial statements.

### *New and amended standards adopted by the Group*

No new or amended standards have been adopted by the Group in respect of the interim period ended 31 January 2022.

### 3 Taxation

The Group has not recognised any tax assets in respect of trading losses from previous financial years. Research and development tax credits for the period up to 31 January 2022 have been accrued after having taken into account the anticipated level of research and development work carried out in the period.

### 4 Dividends

No dividend has been proposed for the period ended 31 January 2022 (2021: £nil).

### 5 Segmental analysis

Operating segments are defined as components of an enterprise about which separate financial information is available that is evaluated regularly by the Chief Operating Decision Maker (CODM) in deciding how to allocate resources and in assessing performance. The Group's Chief Executive Officer has been identified as the CODM. The Group has one operating segment: the manufacture, dispersion and development of applications for graphene. Revenue and profits arising from that operating segment are the same as presented on the face of the consolidated income statement and statement of comprehensive income. As the business evolves this is an area that will be assessed on a regular basis and additional segmental reporting will be provided at the appropriate time.

### 6 Earnings per share

Basic earnings per share is calculated by dividing the earnings attributable to Ordinary shareholders by the weighted average number of shares in issue during each period. The weighted average number of shares in issue during the period used in the calculation of basic earnings per share was as follows:

	Unaudited 6 months to 31 January 2022 'm	Unaudited 6 months to 31 January 2021 'm	Audited year ended 31 July 2021 'm
Weighted average number of shares for basic earnings per share	64.3	49.6	56.4

The Group was loss making for the periods ended 31 January 2022 and 31 January 2021 and also for the year ended 31 July 2021. Diluted loss per share has not been presented as the effect of share options issued is anti-dilutive.

## 7 Notes to the cash flow statement

	Unaudited 6 months to 31 January 2022 £'000	Unaudited 6 months to 31 January 2021 £'000	Audited year ended 31 July 2021 £'000
<b>Loss for the period attributable to equity shareholders</b>	<b>(1,699)</b>	<b>(1,616)</b>	<b>(3,174)</b>
Tax on loss	(207)	(178)	(391)
Net finance income	—	2	6
Depreciation of property, plant and equipment	183	214	409
<b>EBITDA</b>	<b>(1,723)</b>	<b>(1,578)</b>	<b>(3,150)</b>
Depreciation of property, plant and equipment	(183)	(214)	(409)
<b>Operating loss</b>	<b>(1,906)</b>	<b>(1,792)</b>	<b>(3,559)</b>
Depreciation of tangible fixed assets	183	214	409
IFRS 2 share based payments charge	40	67	32
(Increase)/decrease in net working capital	(231)	217	99
<b>Net cash used within operations</b>	<b>(1,914)</b>	<b>(1,294)</b>	<b>(3,019)</b>

## 8 Share capital

	Unaudited number of Ordinary shares	Unaudited total £'000
<b>Allotted, called up and fully paid</b>		
At 31 July 2020 Ordinary shares of 2 pence each	49,429,380	989
New shares issued	14,909,058	298
At 31 July 2021 Ordinary shares of 2 pence each	64,338,438	1,287
New shares issued	—	—
<b>At 31 January 2022 Ordinary shares of 2 pence each</b>	<b>64,338,438</b>	<b>1,287</b>

## 9 Related party transactions

Transactions between Applied Graphene Materials plc and its subsidiaries, which are related parties, have been eliminated on consolidation and are not disclosed in this note.

### Transactions with shareholders

The following transactions with shareholders of the Group were recorded, excluding VAT, during the period:

	Unaudited 6 months to 31 January 2022 £'000	Unaudited 6 months to 31 January 2021 £'000	Audited year ended 31 July 2021 £'000
<b>Top Technology Limited (controlled by shareholder)</b>			
Non-Executive fees and expenses	—	8	10

## 10 Seasonality

The Group experiences no material variations in performance arising due to seasonality.

## 11 Availability of Interim Report

It is anticipated that the Interim Report will be sent to all shareholders on 21 April 2022. Electronic copies of the report will also be available on Applied Graphene Materials' website at [www.appliedgraphenematerials.com](http://www.appliedgraphenematerials.com).

# Glossary of terms

Term	Meaning
Anti-corrosion	A type of coating made with neutral or slightly alkaline pigments and a water resisting vehicle for use as a primer on steel and other metals to prevent or inhibit corrosion
Barrier system	A method of preventing corrosion by using barrier materials within the coating that restrict the movement of water and other chemicals towards the metal surface
Coat/coating	When used as a verb, “coat” means to cover or apply; as a noun, the word signifies the amount of finishing material applied to a surface during one or more applications without a drying period between applications
Composites	A material made up of resin and reinforcement
Conductive inks	An ink that results in a printed object which conducts electricity
Conductivity – electrical	The degree to which a specified material conducts electricity, calculated as the ratio of the current density in the material to the electric field which causes the flow of current
Conductivity – thermal	The rate at which heat passes through a specified material, expressed as the amount of heat that flows per unit time through a unit area with a temperature gradient of one degree per unit distance
Dispersion	A mixture in which very small pieces of one substance are scattered within another substance
Elasticity	The property of a film that allows it to stretch or otherwise change size or shape and return to its original condition without breaking or rupturing
Fracture toughness	Resistance to cracks, crazing or delamination resulting from physical damage
Functional fluids	Sustainable base oil products – enhanced with graphene nanoplatelets – offer exceptional performance, and friction and wear protection, especially for lubricants and machining fluids used in automotive and industrial applications
Mechanical	Strength, hardness, toughness, elasticity, plasticity, brittleness, ductility and malleability are mechanical properties used as measurements of how materials behave under a load
NATEP	National Aerospace Technology Programme
Polymer	A long-chain molecule, consisting of many repeat units
Prepreg	A factory-made combination of reactive resins and reinforcing fibres, plus other necessary additive chemicals, ready to be moulded
Primer	A substance used as a preparatory coat on wood, metal or canvas, especially to prevent the absorption of subsequent layers of paint or the development of rust
Resin system	A polymer with indefinite and often high molecular weight and a softening or melting range that exhibits a tendency to flow when subjected to stress
Substrate	A material which provides the surface on which something is deposited or inscribed
Thermal paste adhesive	A thermally conductive paste applied to mating surfaces to bond them together by surface attachment in order to transfer heat across the materials
Tie coat	Paint specifically formulated for situations and conditions to provide a transition from a primer or undercoat to a finish coat. Tie coats are used to seal the surface of a zinc-rich primer, to bond generically different types of coatings, or to improve the adhesion of a succeeding coating