

Strategic Report

The directors present their Strategic Report for the year ended 30 June 2019

Haydale Graphene Industries Plc (“Haydale” or the “Group”) is the AIM listed group that uses tailored advanced materials, including graphene, boron nitride and silicon carbide micro-fibre (SiC) to enable its customers to improve the quality and performance of their products and thereby creating additional value and market edge. The Group’s vision is to be in the vanguard of nano advanced materials and dispersion to become a world leader in the creation of material change through understanding the potential of those materials through careful characterisation, and the incorporation of its bespoke and unique patented functionalisation process, as appropriate.

The Group’s regulatory approved proprietary graphene-based and other speciality inks and coatings for the print and biomedical sensor markets that it has developed continue to progress commercially and have now been supplemented by

offerings in piezo resistive and heating applications that are in commercial applications across several sectors. Progress in enhanced resins for the pre-preg carbon fibre market covering electrical, thermal and mechanical applications has also moved into the commercial phase.

In the USA, Haydale manufactures proprietary SiC micro-fibres and whiskers that strengthen ceramics and hard-edged cutting tools for fashioning jet engine turbine blades from solid super alloy billets. This application has now benefitted from substantial investment and moving up the value chain to produce blanks which incorporate the fibres and have helped to further strengthen the relationship with customers. Other applications including corrosion barriers for oil and gas pipelines and coatings where high scratch and wear resistant is required is another application that is addressed.

The Group has operational activities in its six chosen geographies worldwide. In summary, these are:

<i>Haydale subsidiary</i>	<i>Location</i>	<i>Principal activities</i>
Haydale Limited	Ammanford, Wales	Ex R&D operation now producing inks and supporting master batch production for direct sales to customers and other sites in the Group as a specialist functionalisation centre.
Haydale Composite Solutions Limited (“HCS”)	Loughborough, England	Sale of pre-preg, and consulting services in advanced composites, elastomers and other nano materials and including test services. Its R&D involvement in grants focuses on products that could lead to commercial production.
Haydale Technologies (Korea) Limited (“HTK”)	Seoul, South Korea	Dedicated sales servicing the fast-moving Korean, Chinese and Japanese markets.
Haydale Technologies (Thailand) Company Limited (“HTT”)	Bangkok, Thailand	Ex R&D facility now focused on commercial plasma functionalisation facilities. Services the APAC region and supporting the Far East sales teams.
Haydale Technologies Taiwan Ltd (“HTW”)	Kaohsiung, Taiwan	Established in July 2017 as the production facility and technical centre for sales of speciality inks, initially into the biomedical sensor market.
Haydale Technologies, Inc. (“HTI”)	South Carolina, USA	Haydale Ceramic Technologies is HTI’s wholly owned operating subsidiary which produces and sells novel SiC micro fibres and whiskers, as well as ceramic blanks to the cutting tool industry.

Strategic Report continued

Background to urgent business restructure and re-alignment

The lead in to FY19 was the trading statement announcement on 13 June 2018 which explained a delay in expected sales in FY18 and the intention of Ray Gibbs to resign as CEO in order to concentrate on business development. On 7 September 2018 David Banks stepped up from Non-executive Chairman to be appointed as Interim Executive Chairman and Keith Broadbent was appointed to the main board as Chief Operating Officer. On 9 November 2018, the Company announced that the planned \$1.5 million sale and leaseback of the capital tools equipment at its US facility would not be available and that the Group was considering alternative sources of finance. At the same time a £1 million reduction of annualised SG&A costs was announced as the start of a new direction of business prudence and refocus. On 21 December 2018, an announcement was made that additional working capital had been raised through a loan with the Development Bank of Wales and a new equity subscription, concurrent with a change to the board of Directors ("Board") with Laura Redman-Thomas being appointed as the new CFO and Matt Wood stepping down from that position, and Ray Gibbs and Roger Smith also resigning from their Board positions.

The Group released its interim results on 22 February 2019 which continued to show a challenge on cash and short-term revenues. A proposed placing, subscription and open offer was announced on the same day which completed on 12 March 2019, raising £5.8 million (before costs). Following the General Meeting held on 12 March 2019, Keith Broadbent was appointed as the Group's new CEO and David Banks reverted to Non-executive Chairman.

Overall the year has been one of major reorganisation and resetting commercial priorities. In summary, this has meant that over the last six months:

- Board members reduced and new leadership team installed;
- A full review of the Group's business unit structure to ensure streamlining and efficiencies with a review of US and UK largely completed, with the review of the APAC region ongoing – with c£1.6 million of annual cost savings achieved to date;
- A major change of strategy whereby the focus is securely on commercial revenue, either project or product related, with grant income or free of charge R&D only to be used in applications where an imminent commercial opportunity was apparent;
- Core focus established in:
 - Growing the US business following significant investment (c\$1.5 million) on the blanks (SiC) business;
 - The redirection of Ammanford from cost centre to profit centre;
 - Development of the ink market;

- Composites focus to be maintained but with reduced resource given the timing of the major commercial revenues have been and are expected to be longer than first planned; and
- Business unit strategy has been modified into a global sales strategy – to sell technology across the various sites and geographies i.e. cross selling.
- Formation of a cross site / cross commodity sales team headed by Neil Taylor, VP of HCT in the US (expertise SiC), and with a UK Sales Director having been recruited post year end (Composites) and a UK sales engineer part of the team (Inks).

This reorganisation will continue throughout the new financial year as we look to opportunities to further rationalise in conjunction with entering the growth phase.

Globalisation of the Strategic Business Units

As mentioned in previous reports, the setting up of two business units in 2017 (Resins, Polymers and Composites ("RPC") and Advanced Materials (including SiC and inks) ("AMAT") delivered some limited success and growth in the business, but did not facilitate the global approach necessary to leverage the Group's geographical and technological commercial advances. Consequently, a part of this dual BU structure has been split to provide a third reporting entity, "APAC". This has created a more flexible structure which aligns with commodity or product focus on one hand insofar as SiC, Inks, Composites and Elastomers naturally have a site-based expertise, but also encourages Project Managers and Sales personnel to look to other geographical areas for potential revenue.

This change to allow greater potential of cross-selling has been supplemented and re-enforced with the formation of a global sales team with accountability across the Group; and a new VP Sales, Neil Taylor, promoted from within the business; and a new UK Sales Director, Simon Green, recruited externally. Initial success has been reported previously with commercial activities on coatings with SiC in progress in the UK, with live commercial enquiries involving pre-preg composites and graphene offerings underway in the US. The combination of the Group's ink expertise is being pooled and leveraged. This methodology is set to continue as the template for growth as the one company one team mantra takes further hold.

Sharing best practice in Operational and other business systems and practices such as Health and Safety and Quality (ISO9001) continues to gather force. This, together with more central reporting structures underway in finance, will assist in cross group communication and enhanced governance.

Progress on Core Element - Plasma functionalisation

Building on the progress from last year, the HDPlas™ functionalisation process continues to be the cornerstone of the Company's offering. Good progress has been made with several new and different key treatments enabling much more varied

offerings to customers' requirements. This enables a much greater range of graphene and other nano material treatments and facilitates potential improvements in dispersal and mechanical strength, electrical conductivity, and thermal conductivity. The loaded matrix can and is being added to commercial applications such as pre-preg, compounded into polymers or elastomers, or sold as Masterbatch in many ongoing programmes.

Key to the investment this year has been the research allowing ramp up technology to be much better understood and has, therefore facilitated increased commercial quantity requirements as and when required.

New applications for the plasma functionalisation process include projects developing the treatment of materials to re-life such as Carbon Black and processing larger types of components to support external surface enhancements, including greater adherence.

Marketing

The focus on Marketing for graphene profiling that has served Haydale well in the past has fundamentally shifted to product marketing for product sales. Alterations to the website in the year will be further enhanced in the new financial year with an incorporation of the US and Far East offering onto a single website and presenting the one global face of Haydale.

SITE SPECIFIC PROGRESS

Loughborough, East Midlands (RPC)

In context of the overall strategic direction, the Loughborough Site has seen an emphasis on reducing cost overhead, reducing grant income in preference to commercial paid-for projects whilst maintaining the progress in relation to the further development of the main technologies. The focus continues with the application specific customer solutions which now includes composites, elastomers, inks and SiC. The incorporation of nano materials into the bespoke solutions has become a core competence.

Highlights have included the progress from the funding grant announced in October 2018 with the Niche Vehicle Network, BAC Mono and Pentaxia as part of the consortia to further develop pre-preg for tooling and automotive parts, to the showcase of the BAC Mono "R" at Goodwood Festival of Speed with the composite parts integral in the vehicle being exhibited (announced post period in July 2019). This product development of the tooling and component enhanced pre-preg could well be a steppingstone for graphene-enhanced composite body panels and tooling reaching the wider automotive industry soon. Haydale's Composites Transition Piece (CTP) was also a product of previous grant collaboration, and now endorsed by the National Grid, is another example of product development targeting commercial revenues. This, together with the enhanced portfolio and other applications coming through the same route, bodes well for future revenues and growth.

Ammanford, Wales (RPC)

Ammanford's transition from an R&D cost centre to a commercial profit centre got underway in the second half of FY19. The focus has been on ink sales initially and, to that end, we have recruited an experienced Sales Engineer from that industry. As previously announced, Haydale, in collaboration with The Welsh Centre for Printing and Coating (WCPC), has developed and refined a range of proprietary printing inks utilising functionalised graphene. This includes the development of advanced ink technology to be embedded into a range of apparel for elite athletes in training for the 2020 Olympic and Paralympic Games.

In order to further support this transition and provide a pipeline going forward, Haydale is a partner in the Smart Expertise Programmes funded by the Welsh Government which is designed to speed up the process required to take products from proof of concept into volume and profitable products. This involves close collaboration with our Taiwan operations whose focus is also inks.

As part of the bigger sales team led by Neil Taylor in the US, the intention is to look to sell the full portfolio of products across all SBU's including ink, composites, elastomers and SiC.

Significant progress has been made in many areas of the functionalisation process, including the ability to increase treatment levels across several materials. Examples include treatment to increase hydrophobicity, as well as increase the ability to treat low bulk density materials such as high grade FLG's (few layered graphene) and recovered carbon blacks. Additionally, Haydale is collaborating with the National Physical Laboratory for further understanding of the functionalisation process as part of an Innovate UK grant as the focus continues on real life products. Key will be the ability to continue to improve material throughput. Collaboration with our key OEM on plans to design the next generation of HDPlas™ reactors to provide the ability to meet commercial volumes in anticipation of the breakthrough driven by the increasing scope of the core and patented technology has also been a priority.

We continue to have an office in Harwell Business Park, Oxfordshire, leased from June 2018, to provide a central location for business development alongside significant potential customers operating in the aerospace and advanced materials sectors.

Greer, South Carolina (AMAT)

The US operation, Haydale Ceramic Technologies LLC ("HCT"), continues to deliver the bulk of revenues for the Group and, in FY19, achieved sales of SiC of £2.7 million (FY18: £2.11 million). During the year, it developed and extended a previously announced four-year agreement to supply SiC micro-fibre to a global group selling tooling and wear-resistant solutions. HCT renegotiated and extended the term of the agreement. This new sole supply agreement has a potential sales value of more than US\$3.3 million over a now five-year term, which represented an increase of US\$1.35 million in the order book at the time.

Strategic Report continued

The commissioning and installation of the equipment invested in last year at \$1.5 million to produce engineered SiC ceramic blanks for the cutting tool industry has been well received and qualified with major jet engine and aerospace manufacturers worldwide and the team are now working towards scaling up to commercial production quantities. There have been some initial teething issues with the ramp up, but progress is being made and the expectation of good revenue growth is still very much anticipated. The support of customers in this process has been significant as the teams work together to realise the joint opportunities.

Efforts to introduce SiC in the powder-coating anti-corrosion market have continued with revenues also expected to grow in the current financial year. This application has been the subject of a paid for commercial contract in the UK and work is underway between the US and UK sites to develop a bespoke coating process to further address this market opportunity.

HCT has a long-term sales order book for delivery of SiC and, as at 12 September 2019, stood at approximately \$3.55 million (\$4.22 million, 10 September 2018).

Thailand Bangkok (APAC)

HTT, our high-class facility in the prestigious Thailand Science Park in Bangkok, has progressed well in the year and is also moving into more commercial project applications, including functionalisation projects of some of the by-products of a large petrochemical processor and entering first stages of their own bespoke product sales, in particular, PATit. PATit is Haydale's software driven anti-counterfeiting device that "reads" the unique conductive transparent and opaque inks when printed onto a product label, proving the authenticity (or otherwise) of the goods. There is currently an agreement that has been signed with TKS Siampress Management Co., Ltd to use the technology in commercial applications on an exclusive basis in Thailand and one other territory to be decided by the parties. Furthermore, there is another customer working with the technology to develop a different bespoke application.

The site continues additionally to be a technical and sales support service for our Korean and Taiwan activities.

Taiwan Kaohsiung, (APAC)

HTW continues to provide graphene and other speciality inks in lower quantities, principally to leading biomedical sensor printers in the diabetes testing market. We are receiving regular repeat orders from customers, albeit still in relatively small quantities and the joint development agreement with STAR RFID. The previously announced intention to relocate to bigger premises will be dependent on the sales achieving commercial volumes and will be reviewed as part of the ongoing strategic review.

Korea Seoul (APAC)

Our sales office in Seoul remains a good access route to Chinese and Japanese markets as we continue to progress in the commercial sphere. Our sales engineer is now part of the global sales structure and this will assist revenue growth going forward. The new PATit sales opportunity described above was one that originated from this source.

FUTURE STRATEGIC DIRECTIONS

FY19 has been a transitional and challenging year for Haydale and the much-discussed potential for a commercial focus to develop a sales team and reduce overheads has been affected. This will be the fulcrum of business in FY20 and onwards. The cross selling of products: pre-preg and Inks in the US; Composite technologies in the APAC regions; and SiC in the UK and Europe, is a crucial element in this growth direction. The new global sales team that is now in place has very specific objectives to leverage this geographical reach and expertise across all the focus product groups with robust back up of the core and unique functionalisation process to underpin the drive.

Further improvements in characterisation, dispersion, capital equipment modification, material treatment levels and innovations continue as part of customer paid for process, and the concurrent development of further know-how with additional potential IP is, of course, an essential element of this new intensity, which in turn helps support more business. Examples of this were evident at the innovations in elastomers recently announced at the IRC 2019 (International Rubber Conference) where we launched a range of functionalised nanomaterials pre-dispersed in process oils for improvements in mechanical and thermal conductivity of customer's rubber products. We also continue to spread this learning, expertise and best practice throughout the Group to our people.

Central to our future success is also our partnerships which have continued to be developed over the last twelve months and where we are looking to expand further. WCPC is part of Swansea University and is fully committed through the part-funded Smart Expertise Programme to support the path to commercialism. The combination of WCPC's significant expertise and equipment and Haydale's newly created commercial focus assists in expediting products to quality volume to deliver to customers' needs.

The relationship with University of Manchester's £60 million Graphene Engineering Innovation Centre ("GEIC") is similarly a major bridge in the commercialisation drive which, from June 2019, has one of our HT60 functionalisation reactors installed and commissioned. As a Tier One member of the GEIC, Haydale gains access to the materials knowledge, applications engineers and both analytical and processing equipment within the GEIC. This gives Haydale, through the GEIC's world-renowned development facilities, a quicker route to market and access to a greater reach and range of customers.

We continue to target the less regulated markets, including sporting goods, which provide potential significant short-term revenue opportunities for Haydale. An example of which has been the supply during the year of graphene-enhanced masterbatch to a customer involved in the hockey and lacrosse supply industry. However, any significant sales orders are predicated on the adoption of our products and technologies by our commercial partners and customers, timing of which is outside our control. The excellent work we have done over the last nine months to focus on our core products and expertise, an example of which is our datasheets on graphene enhanced pre-pregs and elastomers, has been extremely well received by industry and our newly created sales team are following up on these new leads.

Grant Funded Projects

Grant funded projects have continued over the last twelve months with the new emphasis that only projects that lead to commercial products in the short to medium term or add significantly to the Group's knowledge bank on applications with commercial potential in defined time scales will be undertaken. The type of projects involved have included the large petrochemical customer work detailed above in Thailand but most focus has been in the UK at our Ammanford and Loughborough sites. An example of this includes the development of graphene enhanced functionalised additives for use in elastomers. This involves highly loaded nanomaterial dispersions in process oils to offer enhanced mechanical, physical, electrical and thermal properties of elastomer compounds. The technical datasheet and product information was launched at IRC in September 2019.

Other examples include a plan of work to create a graphene sensor that will be able to detect defects in composite materials during both the manufacturing process and the normal service life of a component, to improve the electrical conductivity of epoxy resin structural adhesives using functionalised nanomaterials, and a product readiness project to produce graphene enhanced composite tooling using thermal pre-preg, and graphene enhanced components using mechanically improved pre-preg.

Further work is also underway on the enhancement of the electrical pre-preg offering for EMS shielding and lightning strike, and it is anticipated this will result in another product specified for FY20.

This structured approach to development is facilitating the internal learning experiences and potential product to fit with the organic growth momentum at the centre of our strategic drive.

Management and Personnel

We have looked to make reductions in overheads this year whilst at the same time investing in the training of our staff as we continue to build organisational capability.

In September 2018, Keith Broadbent was promoted to the newly created role of the Group's Chief Operating Officer and as a director of the Company and, following the equity fundraise in March 2019, became the CEO of the Group, replacing David Banks who reverted to his previous role as Non-executive Chairman.

In December 2018, several directors decided to stand down, including Matt Wood, as part-time Finance Director, who was replaced by Laura Redman-Thomas as full-time CFO. Ray Gibbs also stepped down as a director of the Company in December 2018 and Roger Smith, NED, stepped down in January 2019.

Having discussed with our advisers and key shareholders, it is the Board's intention over the coming weeks to adopt a new EMI and Group wide share option scheme in order to incentivise, retain and recruit our staff. The new scheme will replace the Group's existing share option schemes and all options granted under the previous schemes are expected to be surrendered. Further details of the new scheme and any grants of options made will be issued in due course.

Cost Savings

Our focus on cost savings, which started in October 2018 and continued following the Group's securing of a loan from the Development Bank of Wales in December 2018 and through the equity fund raising that completed in March 2019, has achieved annualised savings to overheads of approximately £1.6 million to date. These predominantly relate to Senior Management salary costs, consultancy costs and travel.

Impairment Review

At the end of FY19, the Board, following extensive discussions with its advisors including its auditors, took the decision to impair the carrying value of intangible assets relating to the UK (RPC) composites business by £1.78 million. This was despite good pipeline opportunities and takes into consideration the company's current share price, its resulting market cap and the change in the composites business since its acquisition in 2014 from a predominantly grant funded sales business to a product sales business.

Patents, IP and Licensing

Haydale's critical IP remains its processing, mixing and dispersion knowledge and know-how derived from the work we have carried out in conjunction with Huntsman, together with the FDA-approved ink formulations that have been developed in the Far East.

The Group currently holds patents in the US, UK, Europe, China, Japan and Australia.

Strategic Report continued

Key Performance Indicators (“KPIs”)

The Group’s KPIs are its financial metrics, being its revenues, gross profit margin, adjusted operating loss, cash position, total borrowings and long-term sales order book as follows:

	FY19 (£'000)	FY18 (£'000)
Revenue	3,467	3,403
Gross profit margin	55%	59%
Adjusted operating loss	(4,180)	(4,880)
Cash position	4,688	5,092
Borrowings	1,247	896
Long-term sales order book, inclusive of grants*	3,557	4,674

* unwinding of multi-year contracts in the US of £0.8 million and timing in UK Composites £0.29 million

FINANCIAL REVIEW

The Financial Review should be read in conjunction with the consolidated financial statements of the Group and the notes thereto. The consolidated financial statements are presented under International Financial Reporting Standards as adopted by the European Union and are set out on pages 32 to 67. The financial statements of the Company continue to be prepared in accordance with FRS 101 and are set out on pages 68 to 74.

Statement of Comprehensive Income

In the year under review, the Group’s three principal areas of income were: Sale of SiC fibers, whiskers and blanks, Specialty Inks and graphene enhanced composites. There is a further category of grant funded turnover which will be discussed separately.

The Group’s total income for the year ended 30 June 2019 of £4.25 million (FY18: £4.23 million), comprised commercial revenues of £3.47 million (FY18: £3.40 million) and grant income of £0.79 million (FY18: £0.83 million). The increase in revenue from the US SiC business of £0.50 million and £0.14 million increase in APAC inks was offset by a £0.58 million reduction in the UK RPC business, where the focus was redirected towards commercial sales and well-funded, commercially viable grant related projects for longer-term growth. Although revenue was flat year on year, the Group’s second half income increased by 12% compared to the first half of the year and by 35% on the same period in FY18, predominantly driven by growth in the US.

The Group’s gross profit, which excludes the income from grant funded projects was £1.90 million (FY18: £2.0 million) delivering a gross profit margin of 55% (FY18: 59%). The reduction in margin was primarily due to a different sales mix and a below average yield from the US operations in the first half of FY19. This was further impacted by higher than expected graphite costs in the

US, and pricing strategies as the business seeks to expand the markets for its products.

The Group’s adjusted operating loss before non-cash items, such as depreciation, amortisation, share based payment charges, impairments, and one-off restructuring costs was a loss of £4.18 million (FY18: £4.88 million). The loss from trading, including one-off restructuring costs of £0.35 million was £5.85 million (FY18: £6.02 million). The Directors consider that adjusted operating loss is a more useful measure of the Group’s performance and comparative performance than loss from operations, as it excludes a non-cash accounting adjustment for the impairment of intangible assets.

As stated in the Strategic Report, at the year end, the Board, following extensive discussions with its advisors including its auditors, took the decision to impair the carrying value of intangible assets relating to the UK (RPC) composites business by £1.78 million. This was despite good pipeline opportunities and takes into consideration the current share price, the resulting market cap and the change in the composites business since its acquisition in 2014, from a predominantly grant funded sales business to a product sales business.

During the year, we invested significantly in the US blanks business, realigned and refocused resource throughout the Group, particularly reducing the cost base in the UK composites business. R&D was redirected towards commercially viable products expected to deliver future strategic growth. Overall third-party R&D spend for the year was £0.76 million (FY18: £1.05 million), of which £0.49 million was expensed during the year (FY18: £0.88 million), with the balance of £0.22 million being capitalised, (FY18: £0.18 million).

The Group’s adjusted administrative costs of £6.87 million (FY18: £7.71 million) exclude non-cash items of depreciation, amortisation, share based payment charges as well as one-off restructuring costs of £0.35 million to facilitate strategic change and future cost base reductions. Total administrative expenses for the year were £8.53 million (FY18: £8.85 million).

In the year the cost base was realigned achieving annualised savings of approximately £1.6 million of which £0.50 million was realised in the second half of FY19. Overall, the loss before tax for the year was £7.76 million (FY18: £6.12 million) and included non-cash items of £3.10 million and one-off costs of £0.35 million. Non-cash items included impairment of intangible assets, amortisation, depreciation and share based payment charges.

Total comprehensive loss for the year was £7.12 million (FY18: £5.41 million), including the £1.78 million non-cash charge for the impairment of intangible assets and one-off restructuring costs of £0.35 million.

At the year end, the Group's contracted order book stood at £3.56 million (FY18: £4.67 million) and, since the year end, additional long-term orders have been secured resulting in an order book as at 10 September 2019 of £3.55 million to be delivered over the coming years.

The loss per share for the year reduced to £0.06 (FY18: £0.21 loss).

Statement of Financial Position and Cashflows

As at 30 June 2019, net assets amounted to £11.25 million (2018: £12.54 million), including cash balances of £4.69 million (2018: £5.09 million). Other current assets increased to £3.13 million at the year-end (2018: £2.56 million), and current liabilities increased to £3.12 million as at 30 June 2019 (2018: £2.51 million). Net cash outflow from operating activities, before working capital movements for the year was £4.59 million (2018: £4.83 million). The principal contributing factors being the adjusted operating loss of £4.18 million (2018: £4.88 million) plus the one-off restructuring costs of £0.35 million. Capital expenditure of £1.2 million (FY18: £0.72 million) was predominantly for the US blanks equipment which utilised a significant portion of cash during the year.

Capital Structure and Funding

As at 30 June 2019, the Company had 317,723,848 ordinary shares in issue (2018: 273,287,773). During the year, the Company issued 290,395,075 new ordinary shares in connection with the Company's placing and offer for subscription which raised £5.81 million (before expenses) and was completed on 13 March 2019. No options were exercised into ordinary shares during the year (FY18: no options were exercised).

The Group repaid borrowings of £0.5 million during the year (FY18: £0.45 million), principally in relation to the Group's US borrowing facilities which are secured on the Group's US based tangible assets. A new loan was secured on 19TH December 2018 with the Welsh Development Bank for £0.75 million. The net result left Haydale's financing costs in line with the previous year at £0.12 million (FY18: £0.10 million). The Group's total borrowings at the year-end were £1.25 million (2018: £0.90 million), £0.58 million of which was in the UK and the balance held by the Group's US subsidiaries.

Haydale's objectives when managing capital are to safeguard the Group's ability to continue as a going concern in order to provide return to equity holders of the Company and benefits to other stakeholders and to maintain an optimal capital structure to reduce the cost of capital. The Group manages this objective through tight control of its cash resources to meet its forecast future cash requirements.

PRINCIPAL RISKS AND UNCERTAINTIES

The Board considers that the principal risks and uncertainties facing the Group may be summarised as follows:

Health and Safety

Many of the Group's products of advanced materials are nano in size and, although there is little actual evidence of any health risks associated with the handling of the Group's products, there is a theoretical risk that the Group's products could be a danger to health if an individual is exposed to and/or inhales/ingests some of the Group's products. The Group takes health and safety very seriously and manages the potential health and safety risk by regular staff training and restricting activities to only certain qualified individuals.

Acceptance of the Group's Products

The success of the Group will depend on the market's acceptance of, and attribution of value to, advanced materials technology developed by the Group based on successfully mixing and dispersing raw, mined graphite and other synthetically produced graphenes into customers' existing products in order to improve the mechanical, thermal or electrical properties of the customers' existing products.

Notwithstanding the technical merits of the processes developed by the Group, and the extensive market and product research carried out by management to assess the likelihood of acceptance of the Group's products, there can be no guarantee that its targeted customer base for the processes will ultimately purchase the Group's products. Nevertheless the excellent work undertaken over the last nine months to focus on the Group's core products and expertise, an example of which is Haydale's datasheets on graphene enhanced pre-pregs and elastomers, has been extremely well received by industry and the Group's newly created sales team are following up on these new leads.

Rapidity of product take up

While the Group makes every effort to establish sensible timelines for customer engagement and purchasing of Haydale's products, there are often unforeseen delays (by both parties) in forecasting the commencement of sales. There may be regulatory hurdles to overcome and end customer risk aversion in accepting a new nanomaterial enhanced product. Additionally, a change of senior management or a corporate event such as a merger can cause revisions in customer requirements and often cessation of product development.

Strategic Report continued

The improvement in focus and direction has been a recent change to ensure commercial product sales are an absolute priority not withstanding that the timing and adoption of Haydale's newly developed product lines remains difficult to predict.

Intellectual Property Risk

The Group's success will depend in part on its ability to maintain adequate protection of its IP portfolio, covering its manufacturing process, additional processes, products and applications, including in relation to the development of specific functionalisation of graphene and other types of carbon-based nanomaterials for use in particular applications. The IP on which the Group's business is based is a combination of granted patents, patent applications and confidential know-how.

The Group aims to mitigate any risk that any of the Group's patents will not be held valid if challenged, or that third parties will claim rights in, or ownership of, the patents and other proprietary rights held by the Group through general vigilance, regular international IP searches as well as monitoring activities and regulations for developments in copyright/intellectual property law and enforcement.

Growth Risk

Expansion of the business of the Group may place additional demands on the Group's management administrative and technological resources and marketing capabilities and may require additional capital expenditure. The Group monitors the additional demands on resources on a regular basis and strengthens resources as necessary. If the Group is unable to manage any such expansion effectively, then this may adversely impact the business, development, financial condition, results of operations, prospects, profits, cash flow and reputation of the Group.

Competition Risk

The Group's current and potential competitors include companies and academic institutions, many of whom have significantly greater financial resources than the Group and management regularly reviews the competitive landscape. There can be no assurance that competitors will not succeed in developing products that are more effective or economic than any developed by the Group or which would render the Group's products non-competitive or obsolete.

Dependence on Key Personnel

The Group's business, development and prospects are dependent upon the continued services and performance of its Directors. The experience of the Group's personnel helps provide the Group with a competitive advantage. The Directors believe that the loss of services of any existing key executives, for any reason, or failure to attract and retain necessary additional personnel, could adversely impact on the business, development, financial condition, results of operations and prospects of the Group.

The Group aims to mitigate this risk by providing well-structured and competitive reward and benefit packages that ensure our ability to attract and retain key employees. A new share-based incentive scheme is expected to be adopted by the Group in the coming weeks.

The impact of Brexit

The UK vote to leave the EU (Brexit) has not had a direct material impact on the Group's performance in the current reporting period. However, Brexit is likely to bring uncertainty in the following areas:

- **Materials:** the ability of the Group to import graphene and export its products, together with fluctuations in the value of Sterling may, have an impact on the Group's operations.
- **Regulations:** the Group is subject to the relevant regulations, including materials handling, within the jurisdictions that it operates, which include the EU. Any material adverse changes to the requirement for UK based business to adopt additional regulations as a result of Brexit may have a detrimental effect on the Group's operations.
- **Grant income:** the Group has previously benefitted from EU grant funds, specifically the Horizon 2020 Research and Innovation programme. However, the Group has, in the last 18 months, offset the loss of access to Horizon 2020, with additional grant awards from Innovate UK.

The Group will respond to the challenges that Brexit brings once negotiations are at an advanced stage.

By order of the Board

David Banks

Chairman

14 October 2019