Haydale FY23 Results

Keith Broadbent - CEO Patrick Carter - CFO



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Presenters



Keith Broadbent, CEO Keith joined Haydale in July 2017 and was appointed the Group's Chief Executive Officer in March 2019. Previously Keith has held several senior positions at Princess Yachts International, Sunseeker, TT Electronics and Ultra Electronics.



Patrick Carter, CFO Patrick joined Haydale in June 2023 and is a qualified Chartered Accountant and Barrister. Previously Patrick has held senior financial positions at Aukett Swanke Plc, Charteris Plc and at a number of private equity backed, UK and Asia based renewable energy companies. John-Mark Seymour, **Site Director** John-Mark joined Haydale in 2013 and is now responsible for supporting the day to day running of the production facility in Wales as UK Site Director. Alongside the development of innovative solutions, John-Mark manages materials production through the HDPlas technology.





Introduction

4

Haydale is a global technology solutions company with two principal activities:

- 1) Using Haydale's patented HDPlas[®] plasma functionalisation process to treat nanomaterials to enhance their mechanical, thermal and electrical conductivity properties to create superior end products.
 - Significant addressable markets include heating products (underfloor and thermal fluids), sensors, tyres, and raw nanomaterial suppliers.
 - Customers include Saint-Gobain, Vittoria, Cadent, Viritech, Petronas, Prodrive and United Utilities.
- Manufacture and distribution of Silicon Carbide powder, Silicon Carbide cutting tools and associated tools for the automotive, aerospace and end mill industries
 - Customers / Manufacturers Reps include : OTT (North Central); ISG (Texas); Next Generation Tooling (West Coast); FactoryLink (Midwest); RWA (Southeast); Scott Sales (East Coast)



FY23 Headlines

- Revenue increased by 48.3% to £4.3m (FY22: £2.9m)
 - Driven by investment in US to move up the value chain into tooling
 - Gross margin 56% (FY22: 60%) reflecting sales mix
- > Adjusted operating loss £3.49m (FY22: £3.33m)
 - Reflects full year impact of FY22 planned investment in functional capability and production capacity required to deliver growth
- Raised equity finance of £5.1m (gross) in October 2023



Accelerated Path to Commercialisation

- Haydale is totally focused on the commercial exploitation of its patented nano-material plasma functionalisation process and platform technology.
- Haydale is developing collaborations with partners and end customers to take its services and products to market including contracts recently signed with Saint Gobain, Cadent and Petronas.
- The opportunities are manifold with Haydale concentrating on three that it believes offer market scale and demand: heating, sensors and tyres – plus functionalising nanomaterials for large customers such as Saint-Gobain and Petronas.
- Installed plasma functionalization capacity of up to 90 tonnes¹ can deliver profitability.
- Silicon carbide is a complementary activity that will provide near term US operational profitability and cash flow to fund graphene product development and functionalisation of powders.



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Powder Functionalisation to End Product





CARBON NANOTUBES (CNTs)



OTHER NANOMATERIALS (BORON NITRIDE)



Highlights: UK

Continued Consolidation in UK of nanomaterial functionalisation technology offering leading to key partnership arrangements anticipated to form a solid base to continued commercial progress:

- continued to optimise and extend the functionality of the HDPlas[®] HT1400 plasma reactor acquired in 2022 which allows us to functionalise nanomaterials for third parties on an industrial scale winning an award from the Engineering and Manufacturing Awards
- Signed commercial agreements with industry partners Saint Gobain, Cadent and Petronas who are potentially able to use our functionalisation process for their materials and, due to their market reach and capability, can help take products to market;
- ➢ Working with several other nanomaterial producers and end customers where our HDPlas[®] process can bring additional value to their end customers.
- Attained financial support from the Welsh Government to continue the development of our key underfloor heating technology
- Re-orientated our Thermal fluid technology to focus on Graphene by signing an agreement with an industry partner with expertise in the field and with market access

Highlights: USA

US sales continued to progress with growth in their core aerospace and automotive markets.

- Established a regionalised manufacturer's representative network which is already showing signs of generating improved commercial traction within the North American steel mill, aerospace and automotive sectors for our finished tooling.
- As part of the commercial rollout, published full tooling parts catalogue and now building stock to support growth
- We plan to drive further market penetration as additional distribution agreements are concluded.
- Added additional internal sales support with plans to add further technical support in Q2 FY2024





Raw Material Suppliers as Customers













Saint-Gobain are using functionlised hBN to develop the next generation of products for the electronics, automotive and metal forming industries. There is an increasing drive to upcycle waste materials as companies look for new clean chemical engineering solutions to meet the demands for sustainability and improved 'green' credentials in industries such as electronics, energy storage and coatings. We are working with Petronas in the petrochemical industry who are looking for Haydale to functionalise their nano-material waste product for use in a number of applications such as battery cells and coatings.



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Product Focus – Heating Products

Underfloor Heating

- Haydale's graphene heater inks are energy efficient needing less power and potentially offer a cheaper way to deliver decentralised heating in domestic and commercial properties.
- The printed heater panels are easy to install under traditional flooring materials such as laminate, carpet and vinyl and run on low power so can be connected to a battery or potentially other low voltage sources of power.
- Backed by Welsh Government innovation grant
- Haydale working with Cadent, the UK's largest gas distribution network, to develop other graphene ink-based low-power heating solutions. Two initial orders received of £135k and £350k to develop products.

Thermal Fluids

- Certain functionalised nanomaterials are excellent heat conductors and can be dispersed into ionised water to potentially offer cost effective, energy efficient, low CO2 emission heating solutions (such as in radiators).
- Agreement signed with industry expert partner to develop graphene based thermal fluids and patent applied for.



Product Focus – Sensors

- Haydale's biomedical inks present next generation solutions for monitoring chronic conditions such as diabetes and detecting other medical conditions.
- Off the shelf inks are available for glucose monitoring and diabetes management.
- Graphene sensors are highly sensitive and can be chemically tailored to detect a range of conditions.
- They can be cost effective, non-invasive and environmentally friendlier than currently available solutions due to reduced use of metallics.
- > Ongoing validation with a large biomedical company.
- Working with an international company on non-medical sensors for smart bandages and pool quality testing (chlorine) with short term development potential (as lower barrier to entry) for drinking water.



Product Focus – Tyres and Elastomers

- Haydale and Italian bicycle tyre manufacturer Vittoria have co-developed improved rubber compounds for better tyre performance.
- Vittoria is one of the largest producers of bicycle tyres with an annual production of over 7 million tyres.
- First order of 1 tonne of functionalised Graphene for Vittoria's high-performance bicycle tyres¹ has been shipped.
- Technology is transferable into other rubber-based products with the potential to improve properties such as slip, UV and wear resistance, giving better performance while reducing weight.



1. Announced in March 2022.

Product Focus – Cutting Tools Assisting Cash Flow & Profitability

- Haydale US facility is manufacturing cutting tools for a range of applications in aerospace, steel mill roll turning and automotive.
- Manufactured using Haydale's Silar® silicon carbide whiskers offering fracture resistance; increased hardness and toughness; and heat and wear resistance.
- With growth seen in tools supplied into the North American automotive and aerospace sector, anticipating being adjusted EBITDA positive from Q4 FY23/24 in US.
- Product catalogue released and manufacturer reps (distributors) appointed covering the US over the last 6 months are: OTT (North Central); ISG (Texas); RWA (Southeast); Scott Sales (East Coast).
- Global silicon carbide cutting tool market worth \$900 million¹ with sales opportunities also identified in UK and Europe.

¹Source: Global Silicon Carbide Fibres Market By Type, Application and by Forecast from 2021 to 2028 Market Insights Reports.



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FY23 Income Statement

> 48% increase in YoY revenue

- driven by strategic investment in US, people and equipment in order to move up the value chain.
- Gross margin of 56% slightly down on FY22 due to sales mix.
- Full year impact of investment in operational capability led to increase in Adjusted Admin Expenses but no step changes required to be able to support forecast revenue growth

> Adjusting administrative items

 Share based payment expense increase due to issue of c138m warrants (FY22 fundraise)

ROFIT & LOSS	Jun-23	Jun-22 Audited £'000		
	Audited £'000		Change	
			£'000	%
Revenue	4,301	2,901	1,400	48.3%
Gross Profit	2,390	1,745	645	37.0%
Gross profit margin	56%	60%		-4%
Other Operating Income	377	442	(65)	-14.7%
Adjusted Admin Expenses	(6,260)	(5,520)	(740)	-13.4%
Adjusted Operating Loss	(3,493)	(3,333)	(160)	-4.8%
Adjusting Administrative items:				
Share based payment exp.	(589)	(39)	(550)	
Dep'n & Amort'n	(1,552)	(1,308)	(244)	
Impairment	(531)	(375)	(156)	
Total Trading Admin Expenses	(8,932)	(7,242)	(1,690)	-23.3%
Loss from Operations	(6,165)	(5,055)	(1,110)	-22.0%
Finance Costs	(407)	(187)	(220)	-117.6%
Loss before Taxation	(6,572)	(5,242)	(1,330)	-25.4%
Taxation	407	433	(26)	-6.0%
Loss from Cont. Ops.	(6,165)	(4,809)	(1,356)	-28.2%



FY23 Balance Sheet

> Balance sheet remains consistent

- Fixed assets reflect normal depreciation plus impairment of SiC facilities in US
- Inventories reflect increase in US periodic Silicon Carbide stock production to meet demand
- Presentational offset between other receivables and other current payables
- Pension obligation fallen due to actuarial revaluation
- Other non-current payables relates to paying down of lease liabilities
- £25m of tax losses available to shield future profits

BALANCE SHEET	Jun-23	Jun-22			
	Audited	Audited	Chan	Change	
	£'000	£'000	£'000	- %	
Non-current Assets					
Goodwill & intangibles	2,445	2,443	2	0%	
Tangible fixed assets	5,915	7,579	(1,664)	-22%	
	8,360	10,022	(1,662)	-17%	
Current Assets					
Inventories	1,733	1,515	218	14%	
Trade receivables	564	667	(103)	-15%	
Other receivables	852	1,073	(221)	-21%	
Cash	1,378	1,186	192	16%	
	4,527	4,441	86	2%	
Current Liabilities					
Trade & other payables	(1,899)	(2,199)	300	14%	
Other current liabilities	(114)	(79)	(35)	-44%	
	(2,013)	(2,278)	265	12%	
Non-current Liabilities					
Bank loans	(1,363)	(1,341)	(22)	-2%	
Pension obligations	(577)	(1,356)	779	57%	
Other payables	(1,962)	(2,440)	478	20%	
	(3,902)	(5,137)	1,235	24%	
Total Net Assets	6,972	7,048	(76)	-1%	



FY23 Cashflow Statement

> Operational cash outlay should reduce through FY24

- As the near-term potential of silicon carbide is realised, monthly net cash burn should decline through 2023/24 and improve further through FY25, as graphene revenues start to build
- No significant fixed asset investment planned/required.

Successful fund raise in October 2023

- £5.1m gross proceeds
- Options to raise debt in US looking positive.

> Debt at Jun 23 of £1.37 m (YE 22: £1.35 m)

- Innovate & Covid related govt debt
- Interest only repayments due for 12 month.

CASH FLOW	Jun-23 Audited	Jun-22 Audited	Change	
	£'000	£'000	£'000	%
Operating cash flow before				
working capital changes	(3,674)	(3,416)	(258)	-8%
Working capital movement	(417)	244	(661)	
R&D Tax Credit Received	427	371	56	
Net Cash used in Operations	(3,664)	(2,801)	(863)	-31%
Purchase of tangible assets	(203)	(996)	793	
Purchase of intangible assets	(421)	(340)	(81)	
Net cash used in investing activities	(624)	(1,336)	712	53%
Cash flow used in financing activities				
Finance costs	(209)	(63)	(146)	
Finance costs - right of use asset	(116)	(125)	9	
Payment of lease liabilities	(261)	(548)	287	
Gross proceeds from share issue	5,510	5,103	407	
Share issue costs	(371)	(309)	(62)	
Net Loan drawdown/(repayment)	(53)	(388)	335	
	4,500	3,670	830	23%
Effect of Exch diffs	(20)	9	(29)	
Net change in cash	192	(458)	650	
Balance at Year end	1,378	1,186	192	16%



Summary

- Silicon carbide is a growing complementary activity that will provide near term profitability on back of move into SiC tooling manufacture and sale.
- Patented functionalisation technology unlocks the potential of graphene and widespread applications.
- Production capacity has increased by c.8x in the past 2 years with limited capex required for further gains.
- Number of key clients secured over the last 6 months capable of leading to significant volume
- Focused on 3 key graphene products plus functionalisation of powders, and achievement of near-term profitability through silicon carbide cutting tool sales.





Appendix

Unlocking Graphene



Board of Directors





Keith Broadbent, CEO Keith joined Haydale in July 2017 and was appointed the Group's Chief Executive Officer in March 2019. Previously Keith has held several senior positions at Princess Yachts International, Sunseeker, TT Electronics and Ultra Electronics. Patrick Carter, CFO Patrick joined Haydale in June 2023 and is a qualified Chartered Accountant and Barrister. Previously Patrick has held senior financial positions at Aukett Swanke Plc, Charteris Plc and at a number of private equity backed, UK and Asia based renewable energy companies.



David Banks, Non-Executive Chair David joined Haydale as Non-Executive Chair in July 2017. David worked in stockbroking for over 35 years, raising money for many successful small and medium sized industrial PLCs and is responsible for liaison with our major shareholders.



Theresa Wallis, Independent Non-Executive Director & Chair of Audit Committee Theresa joined the Board of Haydale in June 2020. Theresa worked previously as Principal Executive of ANGLE plc and has held several non-executive directorships.



Graham Eves MA, Independent Non-Executive Director Graham worked for GKN plc before establishing his own consultancy. He has worked with Mechadyne (now part of Rheinmetall Automotiv AG) and AB Dynamics plc. Graham has also been on the AIM advisory committee of the LSE.



Customer Testimonials



"The graphene enhancements have **increased the stiffness of our product by 11%** reducing resonance and improving sound quality. We look forward to working with Haydale on further developments aimed at making our products even better."

> Colin Dilliway, Rega Design Co-Ordinator

Product: Mechanically Enhanced Prepreg "The use of graphene has exceeded our expectations. **Now 30% lighter going from 23kg to 16kg**, we are sure that this will set a new standard of what is possible to do with a sea kayak. We have never seen this kind of impact strength on light weight sea kayaks in our 20 years' experience in the kayaking business."

Kjetil Sandvik, Norse Kayak Founder

Product: Mechanical Masterbatch Vacuum Infusion





"We have been producing duplicate parts with both our standard and the nano-enhanced version and can say with confidence that the Haydale material has **delivered more than 500 parts without any deterioration of the mould surface**. Using the standard version, we would expect approximately 250 pulls from a tool before it is replaced."

Matt Bradney, Prodrive Director of Business Development

Product: Graphene Prepreg Composite Tooling "Our unique know how of graphene helps us make the **most advanced bicycle tyres on the planet**. We are very pleased to partner with Haydale to further innovate in this field and have local production of graphene in Thailand as a common goal."

Stijn Vriends, Vittoria Group President and CEO

