High Value Manufacturing news
Issue 04

CATAPULT
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WELCOME TO HVM CONNECT

Your bi-monthly high value manufacturing update

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HVM Catapult
Communications
Director

For me, the end of the calendar year always feels like a time for reflection. This year that feeling has been heightened as – rather later than usual, I confess – the HVM Catapult publishes its annual review of the 2017/18 operational year. If you haven't seen a copy the link here will take you to it. The Review charts a year in which an informed, energised and energetic group of people have used their position at the fulcrum between industry and academia to help UK manufacturers harness the benefits of new technologies. The support they have delivered doesn't just help to improve the bottom line of the companies that they've worked with. It helps to deliver a UK economy able to hold its ground in even the most challenging markets, an economy fit for the future whatever it might bring. As I browse the daily news I know that help has never been more needed because, at least in my mind, innovation is the only robust response to the multiple uncertainties that face our companies

Knowing that, perhaps the high spot of our year for me was the confirmation, at the height of the summer, of a five-year funding package from Government that will help us to build on the strong track record we've already established. The weather may have cooled since then but our ambition for making sure that we deliver is burning brightly. This edition of HVM Connect brings you highlights from across our network, the perfect upbeat news to read with a festive mince pie and a glass of mulled wine.

My thanks to all who have worked with the HVM Catapult through 2018 and a happy Christmas to all our readers, may we all go to even greater strengths in 2019.

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HVM Catapult **Sit Ski wins award**

We are delighted to announce that the HVM Catapult sit ski project has won the Manufacturing Technology award in The Engineer Magazine's Collaborate to Innovate awards. Up against the likes of Gordon Murray Design, Bentley Motors, Rolls-Royce and Laing O'Rourke, this major achievement demonstrates that the HVM Catapult is at the cutting-edge of driving improvements through the deployment of advanced manufacturing technologies.

The project was completed as a collaboratively delivered technology demonstrator of low cost sensors and analytics, advanced composites, additive manufacturing and advanced design tools, showing that the HVM Catapult's collective capability can improve performance in a niche area, which is new to the organisation.

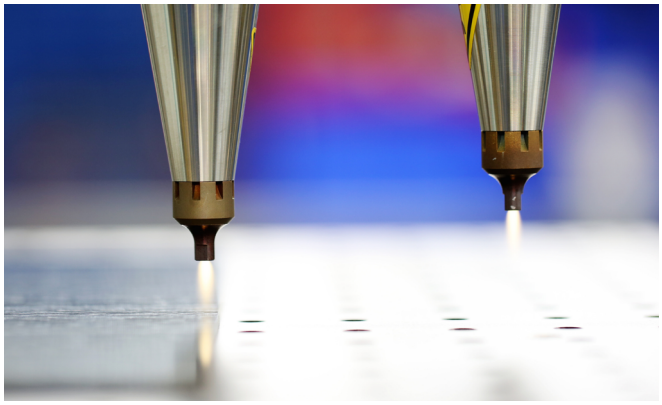
At the HVM Catapult, we know that harnessing the latest technologies and making best use of new materials isn't just good news for companies with major production lines. It can also transform lives.

Earlier this year, aspiring Paralympian Scott Hillier zoomed past a major milestone to complete the sit ski's first alpine testing in one of the world's most demanding ski resorts, Chamonix in France.

The ultimate goal of the project is to encourage innovators in manufacturing to embrace the possibilities of our technology capabilities and realise that we can make the unthinkable happen.

The successful testing of the sit ski shows the power of these high value manufacturing technologies to companies who adopt them. As Gary Capewell, Supply Chain Designer, Rolls-Royce commented:

"The digital measurement technology used in Sit Ski proved vital to help validate an improved supply chain. This mitigated a large equipment spend for us, with the ability to go five per cent higher on customer delivery, creating supply chain duality".



Industrial Strategy **one year on**

November 2017 saw the publication of the Government's Industrial Strategy 'Building a Britain fit for the future'. The document set a course to ensuring that the nation could achieve its full potential building on the five foundation stones of ideas; people, infrastructure, places and the business environment.

The HVM Catapult has a key role to play in helping to deliver the ambitions set out in the Industrial Strategy, not least the stretching target Government the strategy set for raising total research and development investment in the UK to 2.4% of GDP by 2027 from its current level of 1.7%. Given that manufacturing accounts for the significant proportion of existing private sector innovation spending we know that manufacturers will have an important part to play in helping to achieve this ambitious increase in spending. But we also know that, at a time when manufacturers are facing a world full of uncertainties, they need to feel confident that any investment will deliver a return. That's what working with the HVM Catapult helps them achieve.

The Strategy set four 'Grand Challenges' to put the UK at the forefront of the industries of the future: Artificial Intelligence and Data Economy, the Future of Mobility; Clean Growth; and the Ageing Society. 2017/18 saw us dedicate time towards mapping our technology plan and high-level priorities against these to ensure that we are focusing our efforts on the technologies with the greatest chance of success and, most importantly, impact. This mapping exercise was shared with a number of external organisations and stakeholders to help identify collaboration opportunities and drive the best outcomes and greatest benefits for the UK taxpayer from the UK's wider Research and Technology Organisation infrastructure.

Continued.

Construction Sector Deal

HVM Catapult, through the lead of the Manufacturing Technology Centre, has been at the centre of efforts to develop a national Construction Sector Deal to accelerate collaborative efforts by the construction industry to raise its game and to respond to the UK's wider productivity, skills and environmental impact challenges. The key contributions from the HVM Catapult include:

- Thought leadership in facilitating the launch of the Technology Roadmap for UK Construction and National Infrastructure.

- Developing the proposals (in partnership with the Centre for Digital Built Britain (CDBB), Innovate

UK, and Construction Industry Training Board (CITB) for the digitally enabled job roles of the future.

- Developing production system and product family architecture thinking for the industry working with CDBB and the Government Construction Board working group for Modern Methods of Manufacturing.

- Contributing to a joint submission to the ISCF which has resulted in the Transforming Construction: Manufacturing Better Buildings £170 million fund. This will deliver a range of capital facilities and R&D programmes to drive industry innovation.

Food and Drink Sector Deal

Supporting the Food and Drink Federation (FDF) in creating a sector deal for food and beverage manufacture in the UK that focuses on productivity rather than food science or food technology. We are developing a technology roadmap with a particular focus on opportunities linked to automation, the drivers and challenges that firms face in adopting new technologies and the potential of 'cellular agriculture' to produce agricultural products in bioreactors rather than through raising livestock.

Made Smarter Review

We have worked with industry and academia on behalf of the Made Smarter project team to shape the outline for a proposed ISCF call for Made Smarter. We have helped to shape four research challenges and six innovation challenges that will deliver business outcomes such as improved productivity, reduced lead time and evolution of new business models through the advancement and adoption of industrial digital technologies. We have also supported the Made Smarter team with the formulation of the Made Smarter UK commission and strategic implementation group and the role out of the North West (NW) adoption pilot. HVM Catapult is mapping the NW innovation assets and proposing a framework for business engagement.

Advanced Materials For Future Mobility and Clean Growth

We have carried out extensive engagement across the national landscape to identify the future material needs of the product and services sector, understand why the UK has such a poor track record in transitioning the fruits from its world leading materials science base into downstream competitive advantage and how we might overcome some of the obstacles that hold us back. The work we have done has facilitated and provided submissions into ISCF Wave 3.

Nuclear Sector Deal

HVM Catapult, through the lead of the Nuclear AMRC, has been instrumental in shaping and coordinating the Nuclear Sector Deal. This work brought together key organisations from the research community, new nuclear build, decommissioning and marine to commit to developing and advancing the UK nuclear industry. The Nuclear AMRC will be working with the UK nuclear industry to develop advanced modular reactors and a fusion technology platform to ensure the UK stays at the forefront of nuclear innovation. The aim is to reduce the cost of new build and decommissioning by 30% and 20% respectively through development of advanced manufacturing and construction methods. Support to the UK supply chain will be provided through a national supply chain and productivity programme to assist companies to expand existing nuclear capabilities or develop capabilities from other sectors to enter the nuclear sector.

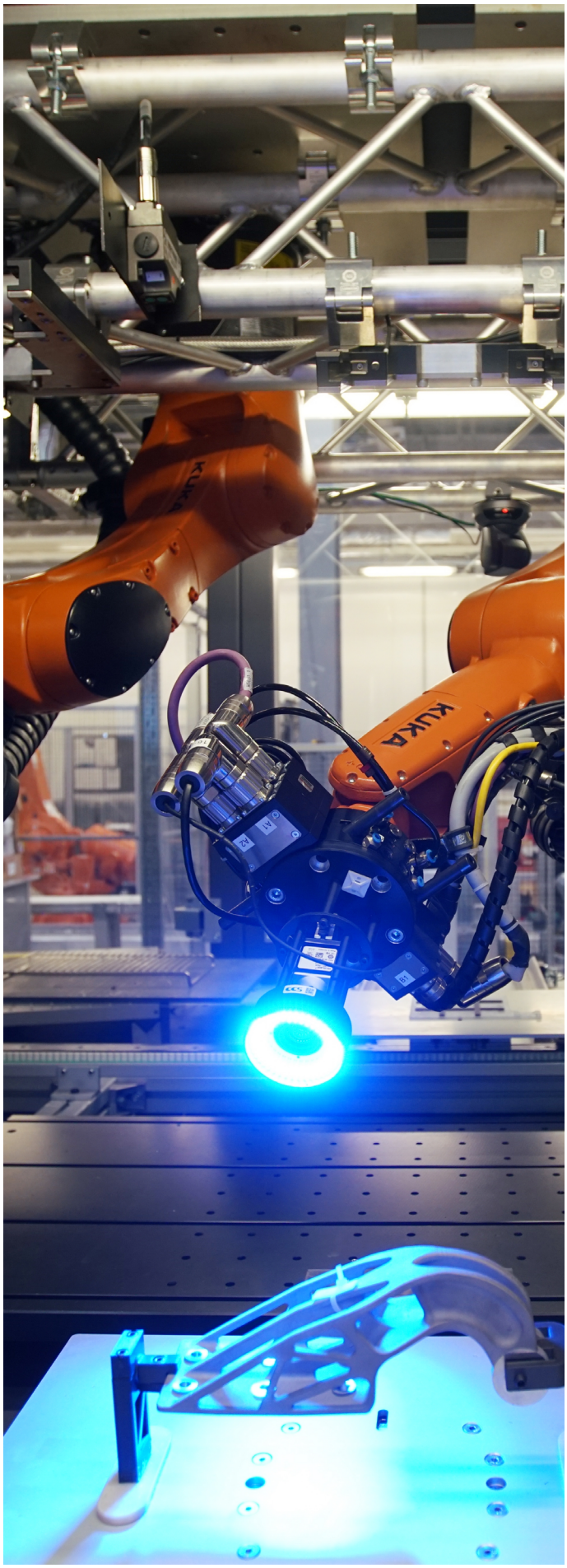
Faraday

Over the last 12 months, the HVM Catapult has played a key role in producing the Faraday Challenge a £246 million commitment over the next four years on battery development for the automotive electrification market proposal (announced by The Rt Hon Greg Clark, Secretary of State for Business, Energy and Industrial Strategy, in July 2017 as part of ISCF Wave 1). The strength of activities within the WMG team has been instrumental in the award of £80 million of Faraday funding to establish a new UK Battery Industrialisation Centre via a partnership between WMG, Coventry and Warwickshire Local Enterprise Partnership, and Coventry City Council (announced by the Secretary of State while attending an energy conference on the University of Warwick campus on 29th November 2017).

High Value Design

We have worked with the aerospace, automotive, defence and marine sectors, together with the Department for Business, Energy and Industrial Strategy (BEIS) to develop a proposition that will deliver a step-change in the processes for the design and assurance of high value complex engineering systems. A UK, with world leading High Value Design (HVD) capabilities, will secure and grow its role as solution architects for complex systems such as aircraft, cars, ships, submarines et al thereby increasing the potential to anchor downstream manufacture via UK based supply chains.

Click here to read our 2017/18 annual review to see what else we've been up to.



HVM Catapult: Guide for small businesses

At the HVM Catapult, we're keen to help SMEs realise their full business potential but we know that too often smaller firms may not know we're here to help them.

Together with the British Chambers of Commerce, we have therefore developed a guide specifically for small businesses setting out what we do and how they can work with us.

Our seven centres can help businesses in many ways, including early-stage development, access to equipment, toolkits, collaborative R&D with a consortium and more. These activities are aimed at SMEs that want to improve their productivity, reduce costs, develop new products or processes and de-risk the use of technology.

By providing a no obligation introductory meeting and talking companies through their requirements and the possible technology solutions, both the centre and the company can assess scope for a future collaboration.

Click here to read our Guide

Click here to read blog post from the BCC's David Riches on how the HVM Catapult could help your business

CPI Supports PowerDrive Line to Develop Battery Charging

The Centre for Process Innovation (CPI) is collaborating on a solid-state lithium battery project as part of the Government's Faraday Challenge initiative to deliver ultra-fast battery charging for electric vehicles.

The PowerDrive Line project aims to develop next generation, solid-state battery cells to charge plug-in hybrid electric vehicles (PHEVs) and battery electric vehicles (BEVs). Safer and more power-dense battery systems are required to enable charging of these cars in as little as 15 to 25 minutes.

Working alongside lead partners Ilika, Ricardo and UCL (University College London), CPI is applying its knowledge across the formulation sector to help create a lithium-based solid-state Stereax® battery and establish a pre-pilot line for prototype cell technology.

CPI will use its ink formulation and scale-up expertise, including the use of high-throughput equipment for rapid formulation screening, to support the development of the pre-pilot line.

UCL will produce solid state electrolyte materials, via its novel hydrothermal processes, which will be transferred to CPI for formulation, with Ilika using its success in the manufacturing of micro solid-state batteries to progress the area of solid-state batteries for automotive applications.

The 30-month PowerDrive Line project, part of the Government's Faraday Battery Challenge, has received more than £4.4million in grant funding and is an integral aspect of the Industrial Strategy Challenge Fund.Seeking to lower carbon emissions and air pollution, this fund supports research and innovation around the development of new battery technologies for future electrified vehicles. This will further strengthen the UK solid-state materials supply chain.

Dr. Graeme Cruickshank, Director of Formulation at CPI, said: "We are delighted to be using our state-of-the-art formulation capabilities to re-apply our expertise from other advanced coatings to create these products for our greener tomorrow.

"While batteries don't look like a formulated product from the outside, in the way that a detergent or a paint does, the same science is required to achieve the desired complex material distribution and deposition needed to make these work.

"We are very excited to be part of this industrial revolution."

Click here to read more about the project

State-of-the-art visualisation suite opens at the AFRC

The University of Strathclyde's Advanced Forming Research Centre (AFRC) has opened a state-of-the-art digital visualisation suite at its premises in Inchinnan next to Glasgow Airport. The suite, designed and kitted out by the centre's tier one partner Virtalis, is the only one in Scotland with its unique set of capabilities available for commercial research and development work.

The visualisation suite is the latest addition to the AFRC's armoury of industrial scale kit and digital manufacturing capability. It sees the centre integrate fully-immersive virtual and augmented reality technologies with the wider industry 4.0 / smart manufacturing theme. This technology has the ability to significantly help companies in terms of planning for the future and making better decisions.

The centre-piece of the suite is a 10m2 Virtalis Active Wall, a fixed 3D stereoscopic projection system with head and hand tracking system that allows multiple users to view 3D content stereoscopically. The centre also has a portable Active Move system that can be taken to industrial premises. The suite's extensive kit list also includes a HTC Vive, an Oculus Rift and Touch along with numerous pieces of Microsoft, Apple, Google and Samsung equipment.

Speaking about the suite Danny McMahon, AFRC's team lead on digital manufacturing, said: "We're excited to bring this new capability to the manufacturing sector.

"The whole manufacturing sector is seeing a shift towards digital manufacturing, in line with the industry 4.0 concept, and visualisation plays a crucial role in this.

"The type of capability we have here at the AFRC can really help manufacturers of all sizes, from all industries embrace digital manufacturing.

"Working on fully-immersive virtual and augmented reality, we create content for companies allowing them to test different scenarios, such as the use of space, changes to the production line and implementing new equipment. This can help significantly in terms of planning and reducing wasted time, effort and money.

Click here to read the full story

Breaking down the barriers to SME innovation

A toolkit designed specifically to help small and medium sized manufacturing firms tackle business challenges will be available free of charge to firms who take part in an innovative AMRC project looking at how productivity in SMEs is linked to effective leadership and talent management.

The AMRC and the Sheffield University Management School (SUMS) are looking for companies to engage with them in a project designed to break down the barriers to innovation faced by smaller businesses.

Sectors like manufacturing are reliant on talented employees and the AMRC and SUMS believe good practices in recruitment, development and the management of people can help retain talent and therefore improve business performance.

The AMRC is on the lookout for manufacturing SMEs to take part in the project that will see a useful toolkit developed for SMEs on the adoption of good leadership and talent management practices to boost productivity and grow business.

The project will culminate in a workshop at the AMRC where the findings will be shared with participating businesses, along with a practice toolkit developed from the study that will help businesses address management challenges, illustrated with relevant examples, specifically for local manufacturers.

Click here to find out more

CPI working to cut plastic waste packaging pollution

The Centre for Process Innovation (CPI) is collaborating on a project to cut plastic pollution by driving forward the development of food packaging that is less damaging to the environment.

Working alongside industry partners, CPI is using its polymer chemistry research and materials processing and characterisation capability to support the development of alternatives to commonly used fossil-based polymers, which cannot be consumed by nature and have resulted in the continued pollution of land and seas when leaked to the natural environment.

Plastic packaging delivers a number of benefits, such as reducing food waste and enabling globalised distribution, however, waste mismanagement has resulted in rising global pollution, particularly in the world's oceans.

The project will develop next generation packaging that continue to prolong the shelf-life of foodstuffs, such as meats and salads, but, crucially, they will be made from biodegradable materials designed to degrade in a natural environment.

The project has received funding from the Innovate UK programme, Plastics Innovation: Towards Zero Waste, which promotes the development of new polymers, processes and recycling regimes to reduce the environmental impact of plastics while increasing UK productivity and economic growth.

Click here to read the full story

£20 million for West Midlands to create a UK Mobility Data Institute

The Chancellor of the Exchequer has announced that the West Midlands Combined Authority (WMCA) will receive up to £20 million, subject to approval of a satisfactory business case, to enable WMG at the University of Warwick to create the UK Mobility Data Institute. The Institute will be a focused research centre to collect, process and analyse transport data generated by new mobility technologies such as autonomous vehicles and smart charging of electrified vehicles.

Vast amounts of data is generated by CAV and EV trials and testbeds. The UK Mobility Data Institute will aggregate and analyse this to understand how people travel, and use this to improve public transport, reduce congestion, and develop the transport systems of the future.

Mayor of the West Midlands Andy Street said: "This will further cement the West Midlands position at the cutting edge of innovation in technology and communications. The region is already at the forefront of the development of 5G connectivity, connected and autonomous vehicles and electric vehicle technology. The Mobility Data Institute will enable us to make better use of our transport data to reduce congestion and improve public transports and make a difference to the people living and working in the West Midlands."

Click here to read the full story

Advanced Manufacturing degree to be launched by MTC

The Manufacturing Technology Centre (MTC) is launching a degree level programme to equip employees with high level manufacturing skills.

The Degree Apprenticeship in Product Design and Development will include a BEng (Hons) degree in Advanced Manufacturing. The four year course will be Apprenticeship Levy-funded, allowing students to get a degree while in full time paid employment, and without having to pay university fees.

The degree, run in conjunction with Liverpool John Moore's University, is aimed at existing Level 3 qualified employees who want to develop their skills. It will be delivered at the MTC's state-of-the-art Advanced Manufacturing Training Centre.

The course, which will be four years depending on manufacturing experience, includes engineering principles, materials, design, manufacturing processes, system design, automation and advanced manufacturing technology. Students are assessed throughout the apprenticeship via exams, coursework, work-based projects and case studies.

From left: Craig Lester, Deputy Director, Nuclear Strategy and NDA at Department for Business, Energy and Industrial Strategy (BEIS), The Rt Hon Greg Clark MP, Secretary of State for BEIS and Andy Storer, Chief Executive Officer at Nuclear AMRC.

Business Secretary hails new generation of power

Business secretary Greg Clark MP visited the Nuclear Advanced Manufacturing Research Centre back in October to see the centre's work in supporting the next generation of nuclear power and delivering the nuclear sector deal.

During a tour of the Nuclear AMRC workshop, Clark saw a range of advanced machining, joining and robotic technologies which can significantly increase productivity in the manufacture of a new generation of small and advanced modular reactors.

"This cutting-edge facility in Sheffield is pioneering innovative nuclear technology of the future, as the UK continues to seize the opportunities of moving to a greener, cleaner economy through our modern industrial strategy," Clark said.

"The UK was the first domestic nuclear power country in the world and this government commissioned the first new nuclear power station in over a generation. The development of small modular reactors as part of our landmark £200 million nuclear sector deal could unlock more jobs and more local growth."

Published in June, the nuclear sector deal supports a variety of initiatives to create a more competitive supply chain, using advanced manufacturing technologies to win work in the UK and worldwide. In return for funding support of up to £200 million total, the industry has committed to significantly reducing costs in nuclear new build and decommissioning, and growing the pool of skilled employees by improving gender diversity.

During his visit on 25 October, Clark was shown workpieces from an ongoing project to reduce production time for a small modular reactor pressure vessel. These include pressure vessel sections (above) which have been joined by electron beam welding, a technique highlighted in the sector deal as offering significant productivity and quality improvements by reducing weld cycle times from days to hours.

"The Nuclear AMRC is playing a vital role in delivering advanced manufacturing techniques and developing the supply chain for the nuclear industry," commented chief executive officer Andrew Storer. "I was delighted to show the Secretary of State some of our world-leading capabilities for industry-led research and development, which are part of the key to achieving the ambitious targets of winning work in the UK and overseas in the nuclear sector deal."

Clark and Storer also discussed the centre's work to improve the competitiveness of the UK supply chain, including proposals to expand and develop the established Fit For Nuclear (F4N) programme. Around 1,000 companies have already engaged with the programme, with 145 now granted F4N status after driving business improvements with support from the Nuclear AMRC.

An expanded national supply chain development programme, backed by the nuclear sector deal and linked to advanced manufacturing and construction R&D, could create or sustain up to 12,500 jobs and up to £2 billion domestic and international contract wins by 2030.

"Our supply chain development programme has already helped hundreds of companies become more competitive, and we're planning to expand that to help even more companies win work in nuclear," Storer noted.

Clark also met some of the centre's young engineers and apprentices during his visit.

"Diversity is a really important and provides confidence that we are developing scientists and manufacturers for the future," Storer said. "I was really pleased to introduce our apprentices and allow them to explain what they aspire to become."

The National Composites Centre: Powering the full exploitation of composites opportunities in the UK

The National Composites Centre's (NCC) mission is to accelerate the growth of UK industrial output by enabling design and manufacturing enterprises to deliver winning solutions in the application of composites.

The NCC is an open-access national centre that delivers world-class innovation in the design and rapid manfuacture of composites, and facilitates their widespread industrial exploitation.

The state-of-the-art building at the Bristol and Bath Science Park provides manufacturing faclities at an industrial scale and rapid manufacturing processes capable of building prototypes to validate design concepts. The NCC is the hub of the UK's effort to develop and implement rapid composite manufacturing technologies and systems.

The NCC leads the co-ordination of a strengthened network of regional centres of composites excellence, providing direction and focus for fundamental research and collaborative links with UK universities, and helping to develop and co-ordinate training to support the skills base necessary for applying advanced and specialist composite technologies.

The NCC's industrial-scale research and technology development facilities support the needs of all sectors, including aerospace, automotive, construction and FMCG, wishing to capitalise on the high-strength, low weight, corrosion-resistant qualities of composites. Working with the NCC offers the opportunity for companies to develop, scale-up and validate new and existing composites processes and technologies.

NCC Filton Grand Opening

On 21st November, The National Composites Centre (NCC) officially launched its new building in Filton, Bristol with a group of VIP guests, including representatives from Innovate UK/UKRI, the Department for Business, Energy and Industrial Straegy, Aerospace Technology Institute and its local authority. They also welcomed members and customers.

The building has been commissioned to meet the ever expanding capacity needs of the NCC as it works with partners across multiple sectors including aerospace, automotive, energy and construction.

The composites sector is incredibly fast growing, at 12% per year – with an anticipated value of £12bn to the UK economy by 2030. The NCC is the UK hub of composites capability and expertise; having invested over £200m to date to help industry and boasting over 500 composites specialists from cutting-edge research to innovation and manufacturing scale-up.

As part of the VIP launch a number of exhibits and demonstrators were set up in a gallery to showcase some of the innovative work undertaken at the NCC since its opening in 2014. This included one of its ongoing successes, the Dymag Boxstorm wheel, which the NCC helped create at 1/3 of the cost in 1/3 of the time, and is currently helping with scale-up. Its latest exhibit – a composite braided Aerofoil, which was recently made during factory acceptance tests of the NCC's giant axial braider – the largest of its kind in the UK - which will be available for use from the New Year.

Largest ever UK Government R&D investment will make UK composites world leader

£36.7m investment for National Composites Centre

Lead funders include ATI, Local Enterprise Partnership and High Value Manufacturing Catapult

Major boost to UK aerospace, automotive and construction sectors

The National Composites Centre, a world-renowned focal point for innovation and excellence, hosting over 300 specialist researchers, engineers and innovators, today announced a major new research and development (R&D) investment programme that will help define the future of composites.

£36.7m is being invested in 10 new technologies, tailor-made to the NCC's specifications, in order to push the state of the art and speed the development of new processes for all forms of composite manufacturing. Funded, in part, by the Aerospace Technology Institute (ATI), the iCAP programme will bring composites into the digital age, increasing production rates and quality while improving efficiency and reducing cost (iCAP stands for Digital Capability Acquisition Programme).

NCC partners, in sectors ranging from aerospace and transport to construction and FMCG, will gain access to next generation technology and be able to test new techniques alongside the NCC's expert team. The ultimate aim of the programme is to help companies boost productivity and secure the UK's position at the forefront of high value manufacturing.

Read the full story here

The NCC celebrates news of new GKN facility in Bristol

The NCC is delighted by the announcement by the Secretary of State for Business, Energy and Industrial Strategy, Greg Clark, and the Chief Executive of GKN Aerospace, Hans Büthker, of plans for GKN Aerospace to create a new Global Technology Centre in the UK.

GKN Aerospace has announced plans to create a new Global Technology Centre in Bristol. This will further cement Bristol as a world leading hub for advanced engineering. It joins a multitude of facilities that support the UKs position as a world leader in aerospace R&D. Not least the NCC – the UK's Composites innovation catapult – one of the organisations that produced a strong letter of support for the endeavour while the project was being scoped and funding sought.

The new centre - funded by a £17m commitment from GKN Aerospace and a £15m commitment from the UK Government, through the Aerospace Technology Institute - is expected to open in 2020. It will include collaborative space for research and development with universities, the UK's Catapult network and GKN Aerospace's UK supply chain.

The Bristol centre joins a growing list of GKN Aerospace Centres of Technical Excellence around the world. Each centre has a unique technology focus - covering AM, thermoplastics and smart aero-engine systems - and is supported and linked by a clear digital strategy.

Richard Oldfield Chief Executive of The National Composites Centre said 'We are delighted to see more public-private sector investment in R&D in the South West. The GTC will compliment some of the activities we undertake at The National Composites Centre not least some of the work we are currently doing with GKN on the Airbus led 'Wing of Tomorrow' programme.

NATIONAL COMPOSITES CENTRE

Caption: Karren Brady meets with female apprentices and engineers at the Manufacturing Technology Centre in Coventry.

Karren Brady urges female engineers to be ambitious

The UK's most high profile businesswoman, Baroness Karren Brady, has told apprentices and young engineers at the Manufacturing Technology Centre (MTC) that they should value themselves, be ambitious and not tolerate prejudice against them.

Speaking to an audience of over 200 MTC employees, she said that women who have chosen engineering as a career should be intolerant of any unequal treatment they may receive, and speak up against unacceptable sexism.

She was speaking as the MTC revealed that, of its 2018 apprentice intake, more than 20 per cent were female, which compares with just nine per cent of the engineering workforce in the UK as a whole. Only six per cent of registered engineers and technicians in the UK are female, compared with 30 per cent in India.

The "Audience with Baroness Karren Brady" event at the Advanced Manufacturing Training Centre on Ansty Park, Coventry was organised by the MTC's Tilly Shilling Initiative – a programme to promote diversity and inclusivity in engineering.

Karren Brady, chief executive of West Ham United football club who features alongside Sir Alan Sugar in BBC TV's "The Apprentice" told the audience that success in business required leadership, ambition, determination, resilience and a positive attitude.

"Don't lower your standards, and speak up for what is unacceptable. Most importantly, value yourself and don't let others undervalue you. As someone who was usually the only woman in a room of more than 90 men, you have to have confidence and self esteem," she said.

Baroness Brady began her business career straight from school, and by the age of 23 was managing director of Birmingham City FC, taking the club from administration to its 2009 sale for £82 million. She moved to West Ham where she has taken the club into the top five fastest-growing brands in world football.

The Tilly Shilling Initiative organises several events for young engineers, as well as promoting engineering as a career through teacher education, school and university careers events and STEM activities.

Read more about the MTC's Tilly Shilling initiative here- encouraging diversity and inclusivity in engineering

WMG to lead new £11 million programme partnering with Highways England to evaluate connected and autonomous vehicles

WMG, at the University of Warwick, is leading a new £11 million programme to evaluate connected and autonomous vehicles which will work with a range of partners including Highways England. It further establishes Coventry, Warwickshire and the West Midlands as the heart of connected and autonomous vehicles research and development in the UK.

The £11 million Meridian 3 programme is funded by Innovate UK and brings together Highways England with Midlands Future Mobility, which is led by WMG at the University of Warwick.

This addition to the Midlands Future Mobility project will enable connected and autonomous vehicle technologies, that have been developed using simulation and test tracks, to then be evaluated on roads in real-world driving situations, providing invaluable additional learning that will enable them to become a commercially viable and desirable means of road-transport.

The evaluations will not just be on the exciting new technologies for the vehicles and infrastructure, but also on how the technology can be used and developed to bring new and enhanced services to drivers and passengers, and to enable such vehicles to provide a range of new services to communities and business.

The current Midlands Future Mobility consortium is already delivering a full suite of urban environments, in Coventry and Birmingham, to test CAVs and their related technologies and services, in order to accelerate their deployment in the real-world, benefitting the region and UK companies. This new project extends the capability to include rural and highway environments, both of which will provide new opportunities for future CAV deployment and adoption.

Business Secretary Greg Clark said: “Self-driving cars will revolutionise the way we move goods and people around the UK. These Industrial Strategy projects and investments are exciting examples of our long-term plan in action - ensuring we build on our strengths to reap the rewards as we accelerate towards our ambition to have autonomous vehicles on UK roads by 2021.

“Autonomous vehicles and their technology will not only revolutionise how we travel, it will open up and improve transport services for those who struggle to access both private and public transport.

“The UK is building on its automotive heritage and strengths to develop the new vehicles and technologies and from 2021 the public will get to experience the future for themselves.”

Click here to read more

New research project uses Artifical Intelligence to test driverless vehicles

WMG at the University of Warwick has long believed that simulation is the key to testing and certification of CAVs. WMG’s 3xD simulator provides a platform with which to bridge the virtual world and real world.

In October 2018, a new £2.7m project was launched that will enable the creation of a highly accurate virtual reality simulator environment to test CAVs. The OmniCAV project was funded by the Centre for Connected and Autonomous Vehicles (CCAV) and Innovate UK, and is led by Latent Logic in Oxford, in collaboration with a consortium of 11 organisations including WMG.

The idea is to feed highly detailed scans of real roads, traffic camera data, accident data and near-miss analyses into a realistic model. The model will be populated with realistic artificial intelligence (AI) based road users, to understand how CAVs react in different scenarios.

The results of the simulator tests will be compared with results of real-world testing on proving grounds and open roads. The project will culminate in a CAV being put through an entire end-to-end testing programme, starting with the simulator, progressing to testing in a controlled environment, and finally on-road testing.

OmniCAV will lay the foundations for the development of a comprehensive, robust and secure simulator. This will provide a certification tool that can be used by regulatory and accreditation bodies, insurers and manufacturers to accelerate the safe development of CAVs.

Deep Dive: The Knowledge Transfer Netork

Interview with Ben Peace, Head of Manufacturing at KTN

1. What is the KTN and what does it do?

The Knowledge Transfer Network (KTN) helps businesses get the best out of creativity, ideas and the latest discoveries, to strengthen the UK economy and improve people's lives.

As a network partner of Innovate UK, KTN links new ideas and opportunities with expertise, markets and finance through our network of businesses, universities, funders and investors.

From agri-food to autonomous systems and from energy to design, KTN combines in-depth knowledge in all sectors with the ability to cross boundaries.

Connecting with KTN can lead you to potential partners, horizon-expanding events, bespoke support and innovation insights relevant to your needs.

2. Are there specific services that you offer that could help manufacturers? Does your help cost anything?

The Knowledge Transfer Network's Manufacturing team helps manufacturers to innovate, and innovators to manufacture. This includes, in particular, helping manufacturers to improve their processes (eg. via digital or additive manufacturing). We do this by connecting businesses to the right partners and the right funding channels, at no cost.

We are driven by the needs of the individual manufacturer and make these connections on an impartial basis, based upon great subject knowledge allied with unparalleled knowledge of cutting edge and emerging technologies, innovation and facilities in the UK and abroad.

We can also help find the right funding and finance that is appropriate for your innovation project - be that Innovate UK grants, loans, KTPs etc. or beyond (some examples can be found here. For new applicants we provide a free review service. We know what the assessors are looking for and our support has been shown to improve your chances of success.

Our monthly newsletters provide details on events, funding opportunities and industry news relevant to the manufacturing sector. Sign up here.

3. Sounds good – do businesses have to fulfil any particular criteria to tap into your services? Who are you most looking to work with?

We are best able to help businesses that are serious about innovation and/or its deployment - that recognise the tremendous opportunities out there and are open to collaboration and willing to deploy their resources in pursuit of these opportunities. We don't expect you to be expert in innovation. In fact, we are best able to add value to those businesses that are not familiar with the latest technologies, innovation processes, funding, or collaboration.

We recently helped traditional manufacturing company Autocraft Drivetrain solutions digitise their manufacturing production which outlines the key services of the KTN manufacturing team. You can view the case study here.

4. Who works for you? Innovation hungry businesses don't want to waste their time talking to people who don't understand their challenges.

The manufacturing team talk the language of manufacturers. We understand the challenges manufacturers face in terms of growing and scaling their business as well as developing new ways to innovate. All of our team are driven and motivated to help find the right solution for each individual manufacturing business we work with.

We also have dedicated sector teams in areas such as chemistry, health, food, infrastructure, transport, etc. allied with dedicated teams in what you could call the enabling technologies - eg. biotech, materials, robotics & AI, digital, immersive technology, sensors, etc. Our full range of sectors can be found here.

We have 185 staff, spread across the country, each with their specialist knowledge and extensive network of connections.

5. A key worry for innovative firms is that someone else will poach their best ideas and steal a march on the market. How do you make sure that discussions they might have with you don't leak out?

Confidentiality is fundamental to what we do. We only share the information that you are happy for us to share, and with the partners that you want us to. You can see our privacy policy here. Of course, we are compliant with the new GDPR regulation which focuses on protecting your interests.

6. So are you part of the new UK Research & Innovation organisation then? How do you fit into the innovation ecosystem?

We often talk about the Innovate UK "family", along with the Catapults and the Enterprise Europe Network. And now that Innovate UK has merged with the Research Councils to form UKRI, we are starting to talk about the "UKRI" family. We help create links into and across all the different parts of this family as part of our remit to help open up conversations between industry, academia, funders and government.

We work closely with and on behalf of Innovate UK, however we are one step removed, which means for instance we can (a) assist businesses with their funding applications, and (b) provide impartial support – e.g. signposting and support into funding and finance beyond Innovate UK.

7. Does that mean you have particular targets to meet? (ie what are they)

Our targets relate to engagements, introductions, collaborations and value delivered to the UK economy. We also aim to grow our audience and produce a compelling group of case studies that illustrate the full breadth of what we do and the value we add to manufacturers.

8. Businesses sometimes get frustrated with the way innovation support works in the UK. Do you share what your advisers pick up with policy makers?

Part of the remit of the KTN is to share data, insight and propose recommendations with Government and its agencies around the areas of new opportunities, areas of concern and key trends. This information helps inform Government decisions which we have seen through key initiatives such as Made Smarter and the Industrial Strategy Challenge Fund (ISCF) where we have been convening industry over the last couple of years to inform what this £4.7bn funding opportunity should look like.

9. Since you joined the KTN, what would you say has been the greatest success?

Earlier this year we launched our 4Manufacturing® tool which is an industry aligned support framework that helps manufacturers deploy digital technologies and realise the 4th Industrial Revolution. Developed with the support of Innovate UK, BEIS and HVM Catapult, 4Manufacturing® has now been deployed in engagements with 230 SMEs across the UK, providing one-to-one support to drive productivity, competitiveness and growth. 4Manufacturing® is now been rolled out in pilot regions and it is looking likely that it will play a key part in the government sponsored 'Made Smarter' initiative.

The 4th Industrial Revolution is a key opportunity for manufacturing companies and we are delighted that our solution is helping manufacturers take their first steps on this journey. 4Manufacturing® has been endorsed by Jürgen Maier, CEO of Siemens who said 'Industry 4.0 is a revolution which is happening at a pace at which all types and sizes of businesses can get on board. So, if you're an SME, it is not too late to be part of this revolution. My advice is to work out which technologies work for you to improve your productivity and find support such as 4Manufacturing® within our excellent ecosystem, to signpost and de-risk your project.' Jürgen Maier, Siemens

10. In recent years it's been hard to keep pace with the changes in the Government's research and innovation landscape – what does the future hold for the KTN?

Change can seem a constant but here at KTN a big part of our job is always to help inform industry of the latest opportunities. At the moment, with ISCF, we are on an upward trajectory and we're excited about our growing international programme and the opportunity to work more closely with the research councils as a fellow part of the UKRI family.

We have ambitions to grow, to be ever more effective in what we do, and to demonstrate, evidence and extend our impact.

Find out more about the Manufacturing team at the KTN here.

The 4Manufacturing® website can be accessed here.

Innovate UK
Knowledge Transfer Network

BHGE and AFRC join forces to push limits of advanced manufacturing for oil and gas

Our Scotland-based centre, the Advanced Forming Research Centre (AFRC), has joined forces with Baker Hughes, a GE company (BHGE), to explore how some of the latest advanced manufacturing tools and processes can drive more efficient, smarter ways to reduce cost and increase productivity across BHGE's operations.

Joining the world-renowned research centre as a tier one member, BHGE will work with the AFRC's team of expert engineers and researchers to improve its manufacturing processes and delivery of services. Using its expertise and state-of-the-art equipment, the AFRC will help BHGE identify opportunities to cut costs and cycle time, while extending the lifespan of oilfield equipment required for operations in increasingly high temperature and extreme pressure environments.

This collaboration will see BHGE have a seat on the AFRC's managing and technical boards, as well as supporting the centre's core research programme.

Image credit: GE Montrose

Together with the AFRC's other tier one members, BHGE will help to steer the wider research agenda and share cross-sector learnings and best practice.

"It is exciting to be working with such a dynamic organisation and one that is truly focused on improving what they do for the sake of the wider subsea and oil and gas community. We are certain the work we do together will have a positive impact in terms of supporting Scotland's international reputation for innovation in the oil and gas sector" – Paul Cantwell, Oil & Gas Knowledge Exchange Fellow, AFRC.

Click here to read more

CPI Supports Work on Next Generation Wind Turbine Blades

The Centre for Process Innovation (CPI) has provided support to help move forward the development of next generation wind turbine blades.

Working with ACT Blade Limited, CPI carried out testing to help the SME advance its unique renewable energy technology.

The Scotland-based company has engineered a turbine blade with the potential to be lighter and longer compared to existing market alternatives, which works to increase energy generation while reducing electricity costs.

CPI's main involvement in the project centred upon validation testing, to ensure ACT Blade's product is strong enough to withstand a decade of offshore operation.

In conjunction with the Offshore Renewable Energy (ORE) Catapult, based in Blyth, Northumberland, CPI provided advanced materials testing to drive fundamental understanding of their interaction and generated data for materials modelling.

It also provided the ability to predictively forecast behaviour for lifespan and repair scheduling.

Dr Graeme Cruickshank, Director of Formulation at CPI, said: "By supporting our customer with this validation testing, they will be in a position to provide this critical data to the manufacturers to grow confidence in the development of the product, which is vital for future success."

Praising CPI's support, Dr Donald MacVicar, ACT Blade Co-Founder and Chief Technology Officer, said: "We needed an organisation that had expertise and equipment for testing textiles to determine the lifetime of the material under our dynamic loading conditions.

"The work here was the first step to characterise the long-term creep behaviour of the material.

"Test facilities with the flexibility to run non-standard tests are difficult to find, so the results have provided useful input for the next phase of the development."

Working out of its state-of-the-art NETPark-based formulation facility, CPI has helped ACT Blade Limited advance its renewable energy technology

Working out of its state-of-the-art NETPark-based formulation facility, CPI has helped ACT Blade Limited advance its renewable energy technology.

Click here to read more

Current Innovate UK funding opportunities

Ocean plastic solutions investment accelerator: reducing plastic pollution

UK businesses can apply for a share of up to £2 million to develop solutions that tackle the environmental crisis of plastic pollution in the world's oceans.

This is an investment accelerator competition providing simultaneous grant funding and private investment from Sky Ocean Ventures for early stage projects led by Innovate UK, part of UK Research and Innovation.

Up to £1 million of grant funding and £1 million of private investment is available to support business-led innovation. This is to develop solutions that tackle the environmental crisis of plastic pollution in the world's oceans.

The competition is open to single UK small and micro companies whoa re looking for grant funding or who want to establish an equity relationship with Sky Ocean Ventures.

Competition opens: Wednesday 2nd January 2019

Competition closes: Wednesday 13th March 2019

Click here to find out more

Innovate UK

The HVM Catapult has a wealth of quantitative and qualitative data on the impact it is having on the companies we work with. Our case studies give a good impression of the value we have added to many companies across all sizes and all sectors. Maybe we could help your business? There is a cost involved, but we can signpost sources of funding, for example, through Innovate UK. Email us at info@hvm.catapult.org.uk if you'd like more information or to discuss working with us.

CPI helps build world's largest radio telescope

cpi

CPI is reaching for the stars with help to build the world's largest radio telescope.

Working alongside the University of Malta and Printed Electronics Limited, CPI is supporting the Square Kilometre Array (SKA) project.

The programme will use ten million radio antennae, spread across the deserts of Australia, South Africa, Botswana and seven other African countries, to collect information on map the universe, chart the effects of spacetime and search for extra-terrestrial life.

CPI helped the university design a prototype advanced instrumentation platform capable of processing the colossal data bank, known as a Mid-Frequency Aperture Array (MFAA).

Making and rolling out printed electronics needed for MFAA sheets, CPI delivered an antenna array to the university, which was used to build a 100sq metre prototype.

Successfully reading electromagnetic performance of tightly coupled dense arrays, the unit also calculated complex simulations needed to send information for analysis.

"CPI has extensive experiences in the development and scale up of printed electronics based applications, said Steven Bagshaw, business development manager. "We can help companies move from lab scale processing right through to pre manufacturing volumes, and our core expertise relies in the field of printable electronics.

"The technology offers a key solution for further scale up to mass volumes."

Mr Bagshaw said the next step in the process is to present the high-grade garden telescope to the SKA organisation as a candidate antenna for the MFAA.

He added: "We are proud to have been involved in such a monumental, global project.

"Thanks to our infrastructure in printed electronics, we were able to successfully and productively collaborate with PEL and the University of Malta and help this ground-breaking endeavour move one step closer to the stars."

The SKA project consists of a core consortium of ten countries.

Further support from more than 100 institutions from another 20 countries will help build the telescope over the next seven years.

Dates for your diary

EEF National Manufacturing Conference 2019

19th February 2019

QEII Centre, London

Join us at the EEF National Manufacturing Conference on the 19th February 2019.

The year's most unmissable event brings together industry and thought leaders along with key policy makers for a day of analysis and inspiration - just one month from the UK's departure from the EU. It's an opportunity to ensure you're clued up and business ready, whether it is for new customs arrangements or for supply chain mapping processes.

But it's not all about Brexit. At a time of unprecedented technology-driven change, the conference will delve into key issues such as trade, the next generation, effective leadership, the digital future and a sustainable steel industry.

Hear from industry peers already delivering solutions and gain insights into how you can emulate their sucesses.

Some of this year's headline speakers include: Andrew Neil, Journalist and Broadcaster, the Rt Hon Greg Clark, Secretary of State for Business, Energy and Industrial Strategy, the Rt Hon Jeremy Corbyn MP, Leader of the Opposition, Dame Katherine Grainger PhD, Most decorated female Olympic athlete, and many more.

Click here to find out more

Click here to see the **conference programme**

WORK WITH US

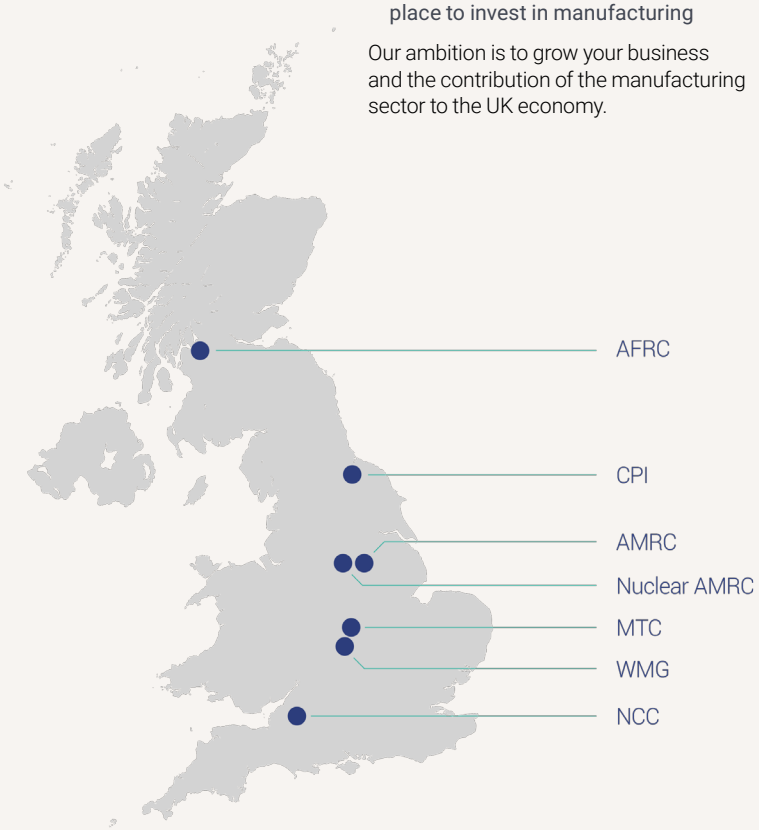
The High Value Manufacturing (HVM) Catapult is here to help UK businesses of all sizes accelerate new concepts to commercial reality.

Working through seven world-class centres of industrial innovation, we provide access to the specialist equipment and expertise you need to help investigate new technologies and processes and test their application. We can also help you to improve existing processes. We're here to help you strip away the risks of innovation and make investment decisions when you are confident that an idea can be scaled up to deliver on a commercial scale.

Our services are available to firms of all shapes and sizes, from FTSE-listed companies to SMEs deep in the supply chain. They include:

- Capability which spans from basic raw materials through to high integrity product assembly processes
- World-class facilities and skills to scale-up and prove high value manufacturing processes
- A network of leading suppliers who contribute to key UK industry supply chains
- A partnership between industry, government and research in a shared goal to make the UK an attractive place to invest in manufacturing

Our ambition is to grow your business and the contribution of the manufacturing sector to the UK economy.



For more information or to discuss working with the HVM Catapult, please contact:

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