



High Value Manufacturing Catapult An overview



Our mission is to enable companies to improve their competitiveness through accelerating innovation:

- Bridging the gap between UK research and industry, translating research into innovative products and services
- Convening our extensive network to develop and deliver solutions including new technologies, processes, workforce development and broader business support
- Supporting and informing government in shaping and implementing industrial policy.

Contents

<u>Introduction</u>	<u>4</u>
<u>Our impact</u>	<u>6</u>
<u>Our goals</u>	<u>8</u>
<u>How do we work with companies?</u>	<u>10</u>
<u>Our key technology capabilities</u>	<u>11</u>
<u>Our centres</u>	<u>12</u>

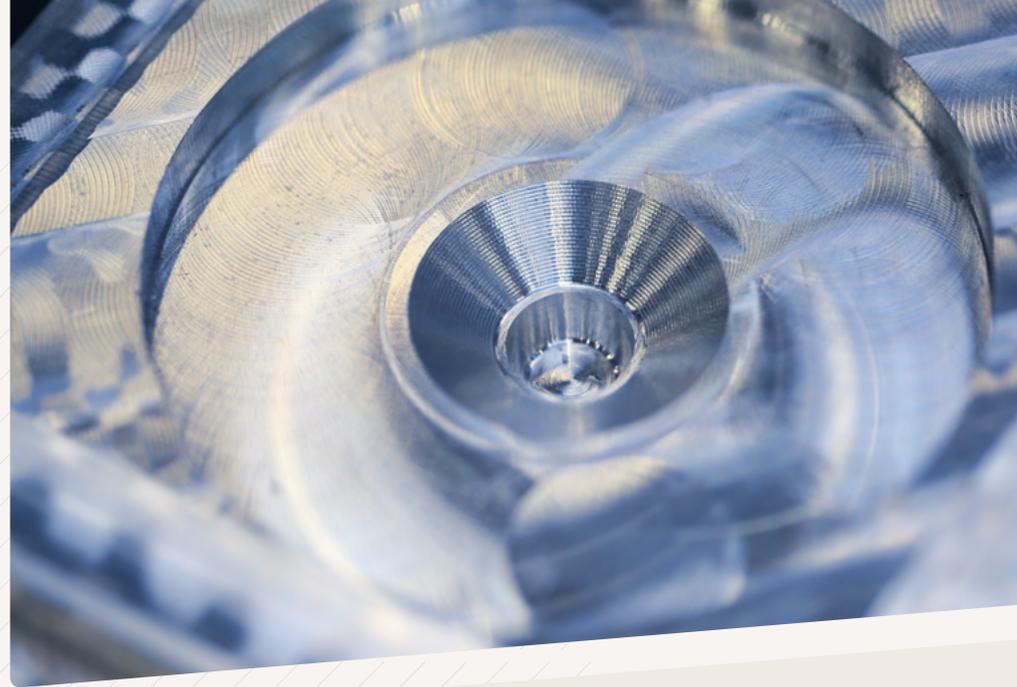


The UK has an outstanding track-record of generating good ideas and innovations. Too often however, we fail to turn those great ideas into commercial products in the UK and watch as others seize the initiative and the economic gain.

The High Value Manufacturing (HVM) Catapult is here to help UK businesses of all sizes accelerate new concepts to a commercial reality in a way that delivers impact and drives long-term benefits to the UK economy.

Working through our seven centres of industrial innovation, we connect the UK's world-leading research community with innovation-hungry businesses to deliver results. We provide access to the specialist equipment and expertise that firms need to help investigate new technologies and processes and test their application as they introduce new products and processes and sharpen their productivity. We help them strip away the risks of innovation and hold off making investment decisions until they have the proof they need that an idea can be scaled up to deliver successfully on a commercial scale.

Ultimately, the work we do is about giving UK businesses the confidence to face a challenging future: whether that challenge comes from fiercely competitive markets, from the need to solve difficult engineering problems, or from a desire to build prosperity and protect our environment. With help from our experts, the companies we work with are better placed to turn challenge into opportunity and cement the success of UK manufacturing.



Our centres



Our impact

Since its inception in 2011, the HVM Catapult has established itself as the 'go-to' place for advanced manufacturing technology.

Working with thousands of clients on thousands of projects, we have developed unique insights into manufacturing in the UK and have been central to many of the principal developments which will shape its future.

The companies we work with tell us that with our support they have been able to:

- Accelerate product and process development
- Improve productivity
- Reduce costs
- Reduce carbon emissions and harm to the environment
- Create and protect jobs
- Develop their workforce
- Strengthen their financial position



Small and growing manufacturers have the greatest direct impact on communities, creating valuable jobs and investment for local people. Making up 56% of our industrial partners, the HVM Catapult is supporting Britain's smaller firms to commercialise their ideas and access new markets across the globe.

More than a decade of growth

Over the last decade,
we have worked with

21,734
companies*

of which 11,840 (54%)
were SMEs*

And we have engaged
with SMEs another

28,484
times*

We have worked on
a total of

9,257

commercial and
collaborative R&D
projects*

We now work with
more than

5 times as
many SMEs

per year than in 2012/13.

We have grown from
493 experts in advanced
manufacturing innovation
(as FTEs) in 2012/13 to

3,112
in 2020/21

In 2011, we were supporting
advanced manufacturing at
seven sites across the UK.
Today, we reach out from
more than

17 locations
across Great Britain.

Our cutting-edge facilities have grown by

3.5 times to £828m of assets
in the last 10 years

giving more and more companies the access to
the specialist equipment they need for innovation.

*These cumulative figures have been reduced by the average rate of YOY project overlap 2018-2020 and may be conservative.

Our goals

Our ambition is to grow manufacturing businesses and the contribution the manufacturing sector makes to the UK economy.

We do that by providing open access to world-class innovation capability and the technical expertise that helps companies of all sizes embrace different ways of working, adopt new technologies and achieve a step-change in their performance.



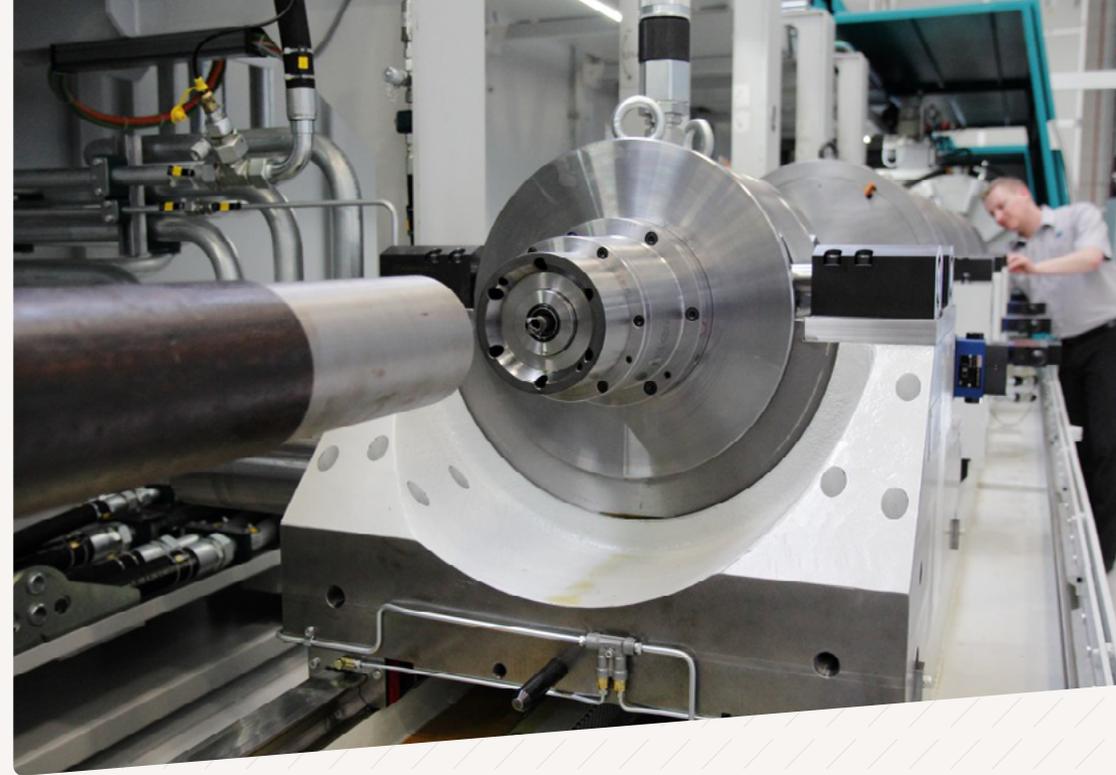
That's why the work of the Catapult centres is so important in helping businesses bridge the gap between concept and commercialisation. They support manufacturers to turn great ideas into reality by providing access to expertise and experience, which otherwise might be out of their reach. We are pleased to work with the High Value Manufacturing Catapult to link firms of all sizes to knowledge, facilities and skills that help them make that crucial leap forward.

Adam Marshall, Director General,
British Chambers of Commerce



With partners in business and Government, we drive progress in areas of strategic national importance. This includes work to:

- Increase the uptake of digital and automation technologies to increase UK productivity and global competitiveness
- Establish the UK as a global leader in additive manufacturing
- Make sure that the UK has a presence in the manufacture of the next generation aircraft wings and aero propulsion
- Increase the uptake of automation to create a more productive food and drink sector
- Develop and commercialise the technology for vehicle electrification to help government achieve its carbon reduction and emissions targets
- Establish a UK nuclear supply chain creating sector market share, jobs and growth in the UK
- Modernise UK construction practice and developing an affordable construction supply chain
- Create growth in the UK pharmaceutical and healthcare sectors by increasing efficiency and developing new products and processes
- Enable the shift from petrochemical based products to products and ingredients that are derived from sustainable bio-mass
- Increase the UK's share of the through-life services market by better integrating design, manufacturing and through-life performance
- Develop and commercialise the technology for vehicle autonomy
- Improve the competitiveness and resilience of the UK defence sector delivering better value for money for the taxpayer



Working with the MTC helped our company improve the lay-out of our new manufacturing cell, saving £140k in capital cost and over £280k per annum in operational cost, making the company globally cost-competitive

Andrew Churchill, Managing Director,
JJ Churchill Ltd

How do we work with companies?

Working through seven world class centres of industrial innovation, the HVM Catapult accelerates new concepts to commercial reality.



Being able to test our new tooling systems on the large-scale machining centres at the AMRC has allowed us to prove their value to the most demanding clients. We have won new business and grown our workforce as a result of the collaborative research and networking opportunities here.

Mark Kirby, CEO, Technicut

We do this by providing access to the specialist equipment and expertise companies need to investigate new technologies and processes and test their application. We help to strip away the risks of innovation and allow companies to make investment decisions when they can be certain that a new 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 small firms deep in the supply chain. They include:

- **capability which spans 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; and**
- **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 manufacturing businesses and the contribution of the manufacturing sector to the UK economy.

HVM Catapult centres offer a free no obligation introductory meeting to talk through the challenges a company is facing and the possible technology solutions. We do charge for the projects we go on to support, but our business development teams are able to guide firms to potential sources of funding that may offset some of their costs for example through Innovate UK – the UK's Innovation Agency.

Our key technology capabilities

Through our seven centres we offer technology innovation and scale-up capabilities across the spectrum of process and discrete manufacturing industries in the following areas:



Advanced Assembly



Automation



Biologics



Biotechnology



Casting



Composites



Design



Digital Manufacturing



Electronics



Flexible Manufacturing



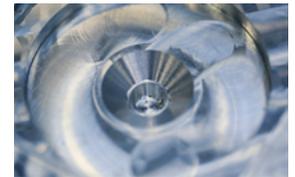
Formulation



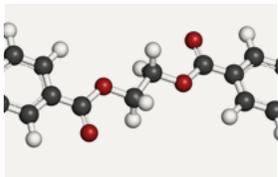
High Temperature Processing



Joining



Machining



Manufacturing with Polymers



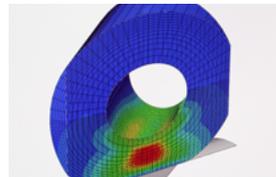
Materials Characterisation



Metal Forming and Forging



Metrology



Modelling and Simulation



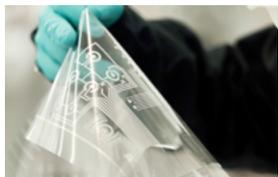
Net Shape and Additive Manufacturing



Powder Technology



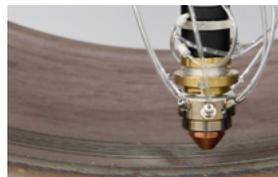
Power and Energy Storage



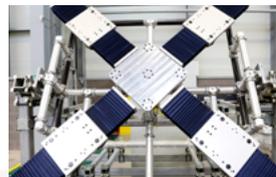
Printable Electronics



Resource Efficient and Sustainable Manufacturing



Surface Engineering



Tooling and Fixtures



Visualisation and Virtual Reality

National coverage

Through our seven centres we have capabilities and competences which span basic raw materials through to high integrity product assembly processes.

The main base for each of HVMC's seven centres is shown on the map. When satellite sites are taken into account, locations total 18.



The National Manufacturing Institute Scotland (NMIS) is a group of industry-led manufacturing R&D, innovation and skills facilities supported by a network of Partners across Scotland, all working together to transform the future of manufacturing. It is where industry, academia and the public sector work together on ground-breaking manufacturing research to transform productivity levels, make companies more competitive and boost the skills of our current and future workforce.



National Manufacturing Institute Scotland Group

The National Manufacturing Institute Scotland Group facilities are all located within the Advanced Manufacturing Innovation District Scotland (AMIDS) in Renfrewshire.

T: +44 (0) 141 534 5200

F: +44 (0) 141 562 3387

E: info@afrc.org.uk

www.nmis.scot

The NMIS Group includes the University of Strathclyde's Advanced Forming Research Centre (AFRC), Lightweight Manufacturing Centre and the NMIS Digital Factory all with teams of industry experienced engineers and researchers working with companies across the manufacturing community in Scotland, the wider UK and beyond – from aerospace giants to renewable energy disruptors, first-time inventors to household automotive names.

NMIS is operated by the University of Strathclyde and is part of the High Value Manufacturing Catapult. It is supported by Scottish Government, Scottish Enterprise, Highlands and Island Enterprise, Skills Development Scotland, Renfrewshire Council and Scottish Funding Council.



University of Sheffield Advanced Manufacturing Research Centre
University of Sheffield AMRC, Factory of the Future, Advanced Manufacturing Park, Wallis Way, Catcliffe Rotherham, S60 5TZ

T: +44 (0) 114 222 9588
E: enquiries@amrc.co.uk
@theAMRC
www.amrc.co.uk

The Advanced Manufacturing Research Centre (AMRC) is a network of world-leading research and innovation centres working with advanced manufacturing companies of any size.

The AMRC has a global reputation for helping companies overcome manufacturing problems and has become a model for collaborative research involving universities, academics and industry.

They transform industrial and economic performance by making step changes in productivity, increasing competitiveness, developing new products and processes and training new talent and skills.

Their clients include a host of innovation hungry SMEs as well as global giants at the head of supply chains like Boeing, Rolls-Royce, BAE Systems and Airbus.

The AMRC's manufacturing expertise spans machining, hi-tech assembly and automation, augmented and virtual reality, robotics, casting, welding, additive manufacturing, composites manufacturing, design, structural testing and training for the aerospace, automotive, energy, medical and other high-value manufacturing sectors.

More recently the AMRC has begun applying that expertise to the construction sector, where advanced manufacturing techniques are now being seen as essential to increasing capacity, overcoming skill shortages and shortening lead times.



Centre for Process Innovation
Wilton Centre
Wilton
Redcar
TS10 4RF

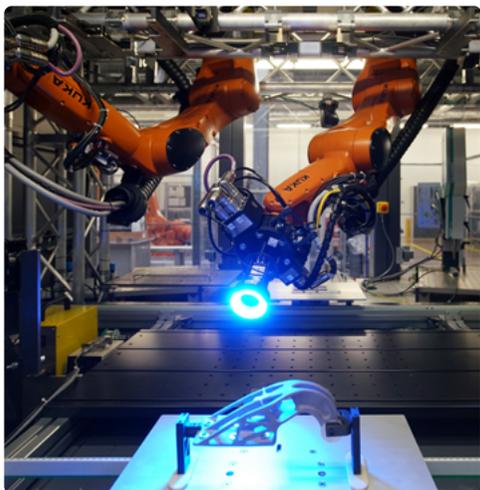
T: +44 (0) 1642 455 340
E: info@uk-cpi.com
@ukCPI
www.uk-cpi.com

The Centre for Process Innovation (CPI) uses applied knowledge in science and engineering combined with state of the art development facilities to enable our clients to develop, prove, prototype and scale up the next generation of products and processes.

CPI work with its partners to develop products and processes that enhance health and well-being, protect and improve our environment and increase productivity across industries. In doing so, CPI supports the development of next-generation manufacturing organisations which require highly-skilled jobs and will result in sustained economic growth for the UK.

CPI's partners operate across diverse markets including Healthcare, Food & Agriculture, FMCG, Electronics, Energy, Transportation and Construction. CPI is able to support such a broad-base of industries through their unique innovation processes, together with a diverse and expanding platform of technological expertise.

Overall, the combination of CPI's innovation processes and outstanding scientific expertise enables their partners to get more products to market faster, and at a lower overall cost.



Manufacturing Technology Centre

Ansty Park
Coventry
CV7 9JU

T: +44 (0) 24 7670 1600
E: rmtcreception@the-mtc.org
@the_MTC_org
www.the-mtc.org

The Manufacturing Technology Centre (MTC) develops and proves innovative manufacturing processes and technologies in an agile, low risk environment, in partnership with industry, academia and other institutions. They focus on delivering bespoke manufacturing system solutions for our customers.

The MTC operates some of the most advanced manufacturing equipment in the world, and employs a team of highly skilled engineers, many of whom are leading experts in their field.

This creates a high-quality environment for the development and demonstration of new processes and technologies on an industrial scale.

The MTC's areas of expertise are relevant to both large and small companies and are applicable across a wide range of industry sectors. Research partners include the University of Birmingham, University of Nottingham, Loughborough University and TWI Ltd.



National Composites Centre

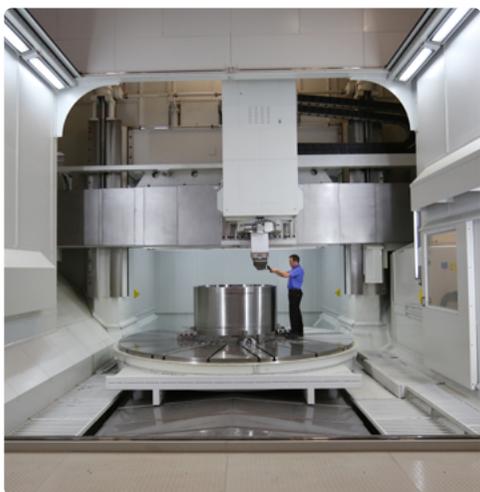
Bristol & Bath Science Park
Feynman Way Central
Emersons Green
Bristol BS16 7FS

T: +44 (0) 117 370 7600
E: info@nccuk.com
@NCCUKinfo
www.nccuk.com

The National Composites Centre (NCC) is the world leading authority on composites, bringing together the best minds and the best technologies, to solve the world's most complex engineering challenges.

Its world-class, open access facilities are based in Bristol, UK – the heartland of Britain's high tech composite engineering R&D. Its technology innovation centres bring together over 500 composites specialists with cutting-edge digital manufacturing technology for the design and development of new composite products. The NCC specialises in providing industrial solutions all the way from the lab to developing large-scale production.

The NCC offers advice and training, design and simulation, metrology, digital manufacturing, automation and tooling, materials and processing. It is able to work with organisations of all sizes and in all states of maturity from starts-ups through micro organisations to scale-ups and large OEMs. It has a proven track record of helping small companies adopt composite solutions as well as partnering the world's most significant engineering companies with their biggest R&D programmes. It brings its broad cross-sector knowledge to new sectors looking for sustainable engineering solutions and, working with the HVM Catapult network, offers a one stop shop for any manufacturing challenge.



NUCLEAR AMRC

Nuclear AMRC

University of Sheffield
Advanced Manufacturing Park
Brunel Way
Catcliffe
Rotherham S60 5WG

T: +44 (0) 114 222 9900
E: enquiries@namrc.co.uk
@NuclearAMRC
www.namrc.co.uk

The Nuclear Advanced Manufacturing Research Centre helps UK manufacturers win work across the nuclear sector – in new build, operations and decommissioning – and in other quality-critical industries.

The Nuclear AMRC combines academic innovation with industry expertise to help UK manufacturers improve capabilities and performance along the supply chain. Its facilities and services are open to all.

The centre's engineers and sector specialists work with companies to develop innovative techniques and optimised processes for large-scale high-precision manufacturing. Companies can use the Nuclear AMRC's state-of-the-art workshops to develop and test new processes on production-scale machines without losing capacity in their own factories.

The Nuclear AMRC also provides a range of supply chain development support to help manufacturers enter the nuclear market and compete worldwide. The Fit For Nuclear programme is a unique diagnostic tool which lets companies measure their operations against the standards required to supply the nuclear industry and take the necessary steps to close any gaps.

The Nuclear AMRC is backed by industry leaders and government and owned by the University of Sheffield. As well as its core research factory on the Advanced Manufacturing Park in South Yorkshire, the centre operates a modularisation R&D facility in Birkenhead, and additional workshops in Derby to develop new technology areas.



WMG

International Manufacturing Centre
University of Warwick
Coventry
CV4 7AL

T: +44 (0) 24 7652 4871
E: wmgbusiness@warwick.ac.uk
@WMGBusiness
wmg.warwick.ac.uk

WMG is at the heart of the UK towards Vehicle Electrification and Connected and Autonomous Vehicles (CAV), and is active in deploying Digital Manufacturing technologies to improve supply chain competitiveness.

It brings world-leading expertise in automation, digital manufacturing technologies and supply chain and operations to these challenges, enabling more efficient and low-cost manufacturing processes in connected supply chains.

WMG's vision is to develop and enhance the UK's automotive manufacturing capabilities to enable the development of cleaner, safer and smarter vehicles.

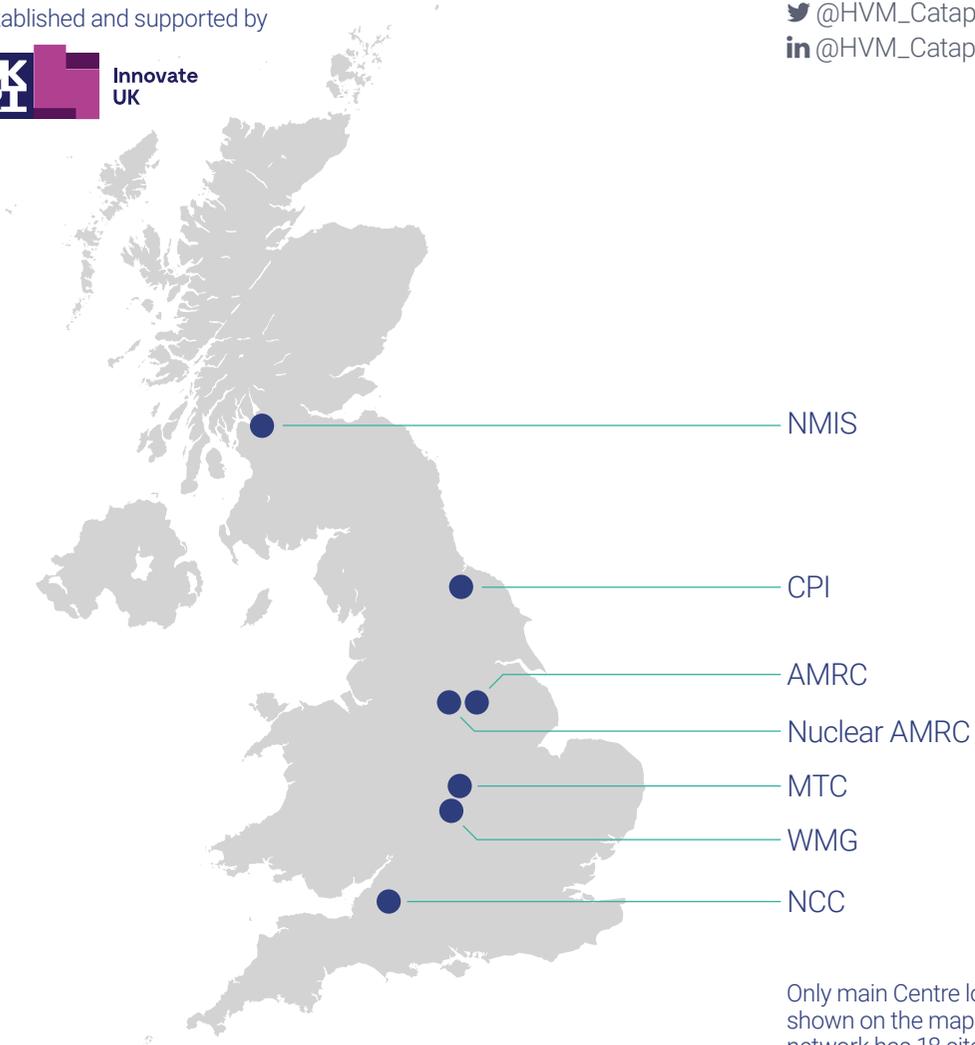
Looking beyond automotive, WMG has a 40 year track record of transferring knowledge into other sectors, such as aerospace, rail, health and motorsport, demonstrating how well industry and academia work together. WMG delivers this vision by collaborating with UK-based manufacturing companies and their supply chains, helping them innovate to overcome existing challenges and develop new technologies.

Established and supported by



HVM Catapult
hvm.catapult.org.uk

Twitter: @HVM_Catapult
LinkedIn: @HVM_Catapult



Only main Centre locations are shown on the map. The HVMC network has 18 sites in total.

FAQs

Where do I start and how can I get in contact with the HVM Catapult?

If you're not sure where to start, get in touch with us through info@hvm.catapult.org.uk. Our central team will connect you with the best centre to help with your needs.

How much will working with the HVM Catapult cost my business?

Every project is different, and some businesses may be able to tap into funding available from Innovate UK or other agencies, so it's hard to give a simple answer. An initial conversation with one of our business development officers is free and would give a sense of likely costs and funding sources.

What technology support do you offer?

We have capability in a wide range of technologies that can help manufacturers improve their productivity or develop new products and processes. Page 11 of this brochure gives you an at-a-glance view of our capabilities.

What industries do you cover?

We're here to help anyone involved in manufacturing.

Where can I find out more about the HVM Catapult?

You can find out more about the work we do through our website at www.hvm.catapult.org.uk.