Catapult centres were introduced by the Government in response to revitalising our economy by stimulating innovation and accelerating growth for the UK. The High Value Manufacturing (HVM) Catapult will be the catalyst for the future of manufacturing in the UK.

WMG centre High Value Manufacturing Catapult

Focusing on the global challenge of Low Carbon Mobility

For more than 30 years WMG has engaged in collaborative R&D with industrial partners, delivering sustainable competitive advantage by embedding numerous innovations into products and processes across a wide range of sectors. WMG’s success is based on connecting industry and academia and the successful fusion of fundamental and applied research coupled with leading knowledge transfer expertise.

The WMG centre HVM Catapult builds on this pedigree. Through industrial collaboration the global challenge of Low Carbon Mobility will be addressed, driven by two key priorities in the technology roadmaps of the automotive, commercial (truck and bus), off-road (agricultural and construction), rail and marine transport sectors.

Our research focus is on Lightweight Product/Systems Optimisation and Energy Storage and Management. These are underpinned by developments in Digital Validation and Verification, with the aim of reducing time to market and the cost of prototyping new solutions.

The WMG centre HVM Catapult receives core funding from the Technology Strategy Board (TSB) which is used to support strategic research and facilitate collaborative working with industrial partners. The core funding is matched with contributions from private sector partners and by public/private collaborative R&D funding won competitively from other sources including the TSB, UK Research Councils and the EU. This funding model ensures that the WMG centre has the critical mass of people and equipment to make a real difference in the chosen areas of research and to grow over time to be an undisputed national centre of excellence with global influence.
WMG was founded by Professor Lord Bhattacharyya in 1980 to help reinvigorate UK manufacturing. From its inception WMG’s mission has been to improve the competitiveness of organisations through the application of value adding innovation, new technologies and skills deployment, bringing academic rigour to industrial and organisational practice.

Today we are one of the world’s leading research and education groups, with over 450 people working across five buildings on the Warwick campus plus collaborative centres in seven countries. We have an annual programme of £40m which includes industrial and in-kind support.

An academic department of the University of Warwick, we are an international role model for how universities and business can successfully work together.

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About WMG

WMG Energy Innovation Centre – a unique UK facility

This centre comprises a recently commissioned battery characterisation laboratory and an established electric/hybrid drives test facility. A 3D fly-through of the centre and facilities can be viewed on our website: www.wmghvmcatapult.org.uk

The Centre will soon include a £13m Battery Materials R&D Scale-Up Line which will be the only one of its kind in the UK. Construction for this commences in November 2013. Funding for the new facility is provided by UK Department of Business, Innovation and Skills and the TSB.

These facilities will provide a one-stop-shop for the development of new battery chemistries from concept to fully proven traction batteries, available in sufficient quantities for industrial scale testing. The post-test facilities will help researchers understand the changes that occur in materials as a battery ages from use.

The Centre will focus on the immediate priority of batteries for low carbon automobiles, but will over time extend to other transport applications including commercial and off road vehicles, rail and marine, and to other technologies such as fuel cells, ultra-capacitors and inductive charging.

WMG will be working closely with industry and other universities on joint research projects that will have real impact for the companies as well as the sector as a whole.

We lead major multi-partner projects, and through innovative technology create and develop exciting new processes and products that can lead to major breakthroughs and be of huge benefit to organisations. These are across a range of sectors including automotive, aerospace and defence, digital, energy and utilities and healthcare.

We are a leading centre for world class management studies, offering unrivalled innovative postgraduate and professional education programmes that meet business and industry needs and attract high calibre students and executives.

WMG centre HVM Catapult is home to two UK centres of excellence in Lightweight Technologies and Energy Storage and Management.

Our key capabilities in these areas include:

**Lightweight Product / Systems Optimisation**
- Detailed material modelling and validation
- The development, assessment and characterisation of components and structures fabricated with novel alloys and composites in conjunction with existing and novel joining technologies
- Simulation of performance of advanced multi-material structures
- Digital fatigue prediction in advanced materials and structures
- The development of multifunctional components incorporating electronics, sensors and transducers
- Enhanced functionality, performance and durability of materials through Additive Manufacturing techniques
- State-of-the-art metrology and visualisation laboratory for the analysis of materials and structures and the visualisation of new solutions

**Energy Storage and Management**
- Full lithium battery technology characterisation including abuse testing and ageing over a full range of charge, discharge and climatic conditions
- Modelling and verification of all-electric and complex hybrid drive systems
- Full dynamic testing of drive systems on a state-of-the-art twin dynamometer rig
- Climatic chamber dynamometer cell capable of testing systems over -40°C to +80°C
- Complex electrical systems test, diagnostics and validation using hardware-in-the-loop systems

**Global Challenge – Low Carbon Mobility**

Whilst WMG centre HVM Catapult covers all Technology Readiness Levels (TRLs) our main focus is on TRLs four to six. These levels are sometimes called the ‘valley of death’ reflecting the difficulty of getting a good research idea or new technology through to higher production levels into business.

Many Innovations Fail Here: HVM Catapult is Addressing This
WMG is one of seven centres that together comprise the High Value Manufacturing Catapult. The other centres are: Advanced Forming Research Centre (Strathclyde); Advanced Manufacturing Research Centre (Rotherham); Nuclear AMRC (Rotherham); Centre for Process Innovation (Wilton & Sedgefield); Manufacturing Technology Centre (Coventry); National Composites Centre (Bristol).

Excellent transport and road links

- 1 hour to London by train
- Nearest airport – Birmingham International – 20 minutes
- Nearest train station – Coventry 10 minutes

**Contact Details**

For more information about our research, equipment and facilities please visit our website: [www.wmghvmcatapult.org.uk](http://www.wmghvmcatapult.org.uk)

If you are interested in working with WMG centre HVM Catapult please contact us. We would be happy to meet with you and/or give you a tour of our facilities.

Telephone: +44 (0)24 7615 1667

Email: wmghvmcatapult@warwick.ac.uk

**WMG centre HVM Catapult**

International Digital Laboratory

University of Warwick

Coventry

CV4 7AL