

Technology Strategy Board

Driving Innovation

CATAPULT PROGRAMME Progress update 2012-13

Catapult is a Technology Strategy Board programme
August 2013

CATAPULT

“CATAPULT CENTRES
EXIST TO HELP
TURN **GREAT IDEAS**
INTO COMMERCIAL
REALITIES”



Introduction

Catapult centres exist to help turn great ideas into commercial realities by bridging the gap between universities, research institutions and business. They represent a strategic long-term investment in the UK’s innovation capability. Germany, through its Fraunhofers has such a system and I want the UK to have a competitive one.

All seven of the ‘first wave’ of Catapults now have strong leadership teams in place and are open for business – albeit at different stages. The further advanced have started work on a range of exciting projects and are forging useful international links to broaden the impact of the overall network.

Confirmation in the Spending Review that we will create an additional two catapults covering energy systems and diagnostics for stratified medicine is a clear signal of intent. I would like to see the network expanding steadily over the coming years to exploit further areas where the UK has clear potential to become a market leader in new technologies.

The Rt Hon Dr Vince Cable MP

Secretary of State for Business,
Innovation and Skills

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AN INTRODUCTION TO CATAPULTS

Catapult is the name for a network of new elite technology and innovation centres, designed to transform great research rapidly into commercial success. This is a long-term investment that will open up global opportunities for the UK and also generate economic growth for the future.

“IN THE YEAR SINCE WE PUBLISHED OUR LAST UPDATE, THE **PROGRESS** MADE IN SETTING UP THE CATAPULTS NETWORK HAS BEEN **SUBSTANTIAL** AND **EXCITING**”

IAIN GRAY, CHIEF EXECUTIVE OFFICER



Foreword

In the year since we published our last update, the progress made in setting up the Catapults network has been substantial and exciting.

We are now well past the early stages of the process and the pace is accelerating all the time: many of the centres are open, all of the management teams have been appointed and, by the end of 2013, all of the 'first wave' Catapult centres will be fully up and running.

Catapult centres exist to help turn great ideas into commercial realities. They bridge the gap between universities, research institutions and innovative businesses, and they're going to help ensure that the best new ideas and innovation in the UK can be translated into a competitive advantage for UK businesses. The Catapults are a strategic long-term investment in the UK's innovation capability and, by building a bridge between our world-leading research

base and businesses, will drive economic activity for years to come.

In this document we explain the progress made in the past year, and our plans for the next stages of the process.

A crucial step has been the appointment of senior management to oversee and run the programme and individual centres. This year six new Catapult centre chief executives and six new chairmen have joined the network completing the senior leadership positions across all Catapult centres. There has been substantive progress made in the appointment of board members for each centre. These senior teams represent enormous amounts of expertise and bring the energy and focus needed to take each Catapult to full operation and success. You can read more about who's who in the network on the central pages of this booklet. I am very pleased

to see such enormous expertise come into the network's independent governance structure.

The past year has seen impressive progress more broadly across the network, too. Staff numbers have more than doubled, rising from five hundred to just over a thousand. The High Value Manufacturing Catapult is now approaching its second year of full operation, and the Cell Therapy, Offshore Renewable Energy and Satellite Applications Catapults have all become operational, working to agreed five-year business plans.

The Connected Digital Economy Catapult has presented its five year plan for approval by the Government. Future Cities and Transport Systems Catapults' five year business plans are currently being drafted. The Transport Systems Catapult has announced Milton Keynes as the location for the new centre, with a comprehensive premises search underway.

A major boost in recent weeks came in the form of the Chancellor's Comprehensive Spending Review announcing that an additional £185m will be put aside for the Technology Strategy Board in 2015-16 to support its efforts to drive innovation and economic growth including expanding the number of Catapult Centres to areas including energy systems and diagnostics for stratified medicine.

The Catapult centres have been set up to make real changes to the way innovation happens in the UK – to make things faster, less risky and more successful. We're proud of what has been achieved so far, and excited by the very real prospects that the Catapults offer for the future.

Whilst the centres operate in seven distinct challenge areas, there are often innovative ideas which span

these boundaries and we are looking to foster cross-Catapult collaborative working wherever possible. This will provide a richer solution to the challenges faced, with greater opportunities for knowledge sharing in both academic and industrial fields to speed up the positive economic impact. This collaborative working has been evidenced in the wider railway network (transport systems), using satellites (satellite applications) to accurately determine the safety of railway embankments and proactively address the risk of unforeseen landslip and the disruption that would result from sections of high traffic railway line being compromised.

It's great to see the Catapults delivering for businesses already, from some of the largest to some of the smallest. HVM have helped new start-ups like Plaxica through to global leaders like Rolls Royce. Cell

Therapy have announced significant collaborations with ReNeuron a leading SME through to GSK. Right at the other end of the scale, it's also great to see companies like WeatherSafe emerging from the Satellite Applications Hackathon events.

This early stage of the Catapult Programme has also seen the development of our on-line presence with the delivery of our first phase website; please don't hesitate to use this resource as a way to keep in touch with the programme and the individual centres.

We look forward to bringing you up to date with our progress in another year's time – and in the meantime, please visit: www.catapult.org.uk

Iain Gray,
Chief Executive Officer

Technology Strategy Board

“THE CATAPULTS EACH
FOCUS ON A SPECIFIC
AREA OF **TECHNOLOGY**
AND **EXPERTISE** WITH
GREAT **POTENTIAL**”

What are Catapults?

Catapult is the name for a network of new elite technology and innovation centres, designed to transform great research rapidly into commercial success.

This is a long-term investment that will open up global opportunities for the UK and generate economic growth for the future.

The Catapults each focus on a specific area of technology and expertise with great potential. Bringing together the best people in their fields, they will pull together all the UK's know-how to create innovation and develop new products and services. The momentum they generate will grow entire markets.

Catapults will be challenge-led; they will help businesses to innovate by developing new solutions and

products to meet current and future market needs, not by developing technology for technology's sake.

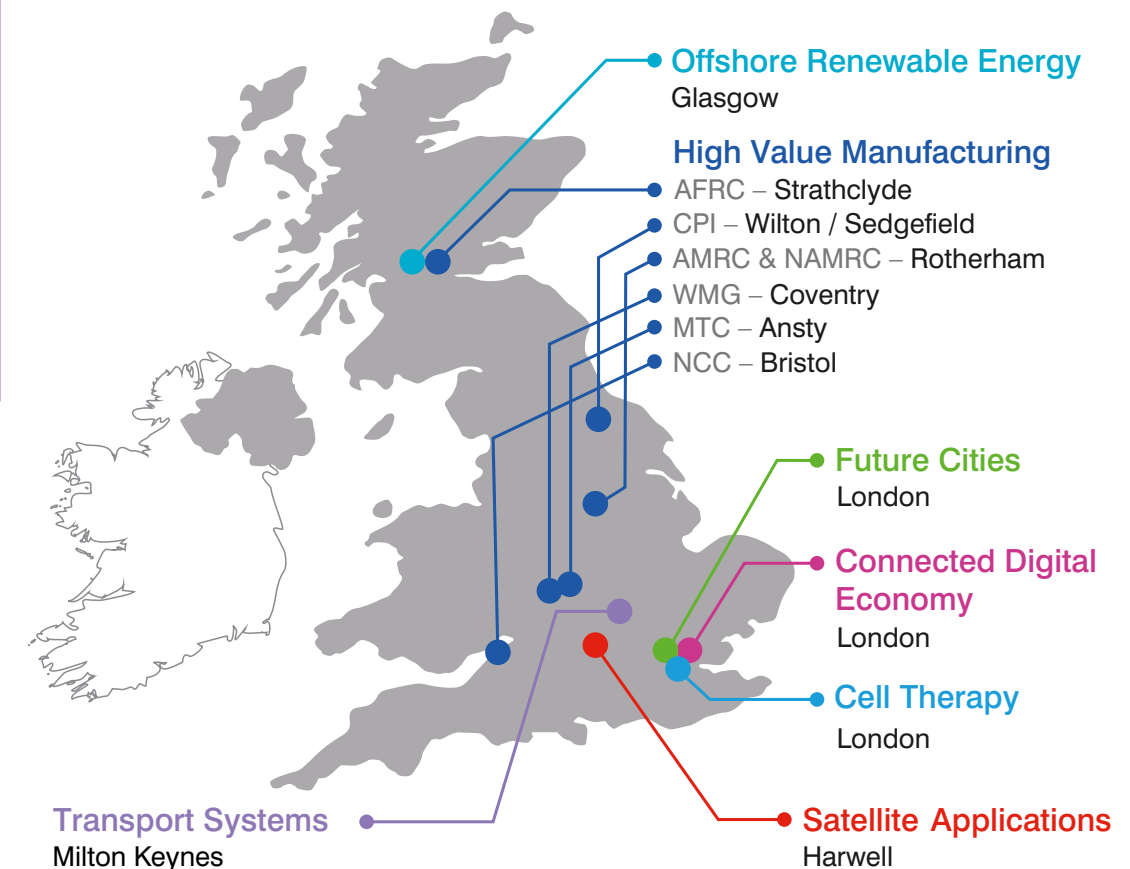
To set up the Catapult centres, the Technology Strategy Board is focusing on technology areas where the need, the opportunity and the capability come together to make a Catapult the right answer at the right time – creating a long-term strategic resource that does not currently exist. We are working closely with the business and research communities to focus efforts and ensure we create successful centres.

Once fully established, and over time, the Catapult centres will receive broadly equal funding from the core Technology Strategy Board grant, from research and development grants won by the Catapult in

collaboration with business, and from contract research funded fully by business– the self-styled third, third, third model. Under this model centres would be required, when fully established, to generate their funding broadly equally from three sources:

- business-funded R&D contracts, won competitively
- collaborative R&D projects, funded jointly by the public and private sectors, also won competitively
- core public funding for long-term investment in infrastructure, expertise and skills development.

Catapult locations



“WE HAVE COME
A LONG WAY IN THE
THREE YEARS SINCE THE
ENTREPRENEUR HERMANN
HAUSER PRODUCED HIS
INFLUENTIAL REPORT”

From Hauser to Catapult

We have come a long way in the three years since the entrepreneur Hermann Hauser produced his influential report¹ proposing a national network of technology and innovation centres, a concept Sir James Dyson reinforced.

The project began in October 2010, when Prime Minister David Cameron announced that, as part of its strategy to stimulate innovation and growth, the Government would invest in a network of such centres to be created and overseen by the UK's innovation agency, the Technology Strategy Board.

In early 2011, we published a prospectus outlining the key principles behind what the centres should do, the broad areas of work that should be covered and how they should be run. There were more than 500 overwhelmingly positive responses, and many valuable suggestions were made that helped in drawing up a strategy. At the same time, we identified that the first technology and innovation centre would focus on high-value manufacturing. The High Value Manufacturing Catapult centre opened for business in October 2011, bringing together a network of seven existing technology centres.

In March 2012 we announced that the second Catapult would be in cell therapy.

The review of the potential for Catapults across a range of areas, working closely with industry and research, has now concluded with five further Catapults decided upon and progressed, in:

- satellite applications,
- the connected digital economy,
- offshore renewable energy,
- future cities
- and transport systems.

1 The Current and Future Role of Technology and Innovation Centres in the UK, 2010 <http://www.bis.gov.uk/assets/BISCore/innovation/docs/10-843-role-of-technology-innovation-centres-hauser-review.pdf>

22 MAR 2012	27 APR 2012	2 MAY 2012	10 JUL 2012	8 AUG 2012	31 AUG 2012
Two new Catapult centres announced: Future Cities & Transport Systems	Keith Thompson appointed as Cell Therapy Catapult Chief Executive	Bob Gilbert appointed as High Value Manufacturing Catapult Chairman	David Willetts announces that the Satellite Applications Catapult will be located at Harwell	Colin Hood appointed as Offshore Renewable Energy Catapult Chairman	Dick Elsy appointed as High Value Manufacturing Catapult Chief Executive
12 SEP 2012	12 SEP 2012	3 DEC 2012	6 DEC 2012	22 FEB 2013	12 MAR 2013
John Brown appointed as Cell Therapy Catapult Chairman	Andrew Jamieson appointed as Offshore Renewable Energy Catapult Chief Executive	Chairman Tim Sherwood and Chief Executive Stuart Martin of Satellite Applications Catapult are announced	Neil Crockett appointed as Connected Digital Economy Catapult Chief Executive	Will Whitehorn appointed as Transport Systems Catapult Chairman	Sir David King appointed as Future Cities Catapult Chairman
12 MAR 2013	11 APR 2013	18 APR 2013	14 MAY 2013	14 JUN 2013	9 JUL 2013
Vince Cable announces that Future Cities Catapult will be located in London	Peter Madden appointed as Future Cities Catapult Chief Executive	Steve Yianni appointed as Transport Systems Catapult Chief Executive	Duke of York officially opens Satellite Applications Catapult	Andy Green appointed as Connected Digital Economy Catapult Chairman	Transport Systems Catapult announce Milton Keynes location



THE CATAPULTS

This year six new Catapult centre chief executives and six new chairmen have joined the network completing the senior leadership positions across all Catapult centres.



“THE FACT THAT PRIVATE SECTOR SUPPORT HAS **EXCEEDED OUR AMBITIOUS FIRST YEAR TARGET** SPEAKS VOLUMES FOR THE APPETITE FOR THE CATAPULT PROGRAMME. WE ARE WORKING WITH INDUSTRY ON SOME QUITE **EXTRAORDINARY TECHNOLOGIES** WHICH WILL SHAPE THE UK’S MANUFACTURING LANDSCAPE FOR THE FUTURE.”

DICK ELSY, CHIEF EXECUTIVE OFFICER
HIGH VALUE MANUFACTURING CATAPULT

High Value Manufacturing Catapult

The HVM Catapult is the catalyst for the future growth and success of manufacturing in the UK. We help accelerate new concepts to commercial reality and thereby create a sustainable high value manufacturing future for this country.

The HVM Catapult combines seven world class centres of industrial innovation into one cohesive force. We:

- Have capability which spans basic raw materials through to high integrity product assembly processes.
- Provide companies with access to world-class facilities and skills to scale-up and prove-out high value manufacturing processes
- Develop a network of leading suppliers who contribute to key UK industry supply chains
- Unite industry, government and research in a shared goal to make the UK an attractive place to invest in manufacturing

Our ultimate aim is to more than double the contribution of the manufacturing sector to the UK economy.

ABOUT THE CATAPULT

The High Value Manufacturing Catapult combines the strengths of seven existing centres across key manufacturing processes, with more than £140m of Government investment planned over a six-year period, with investment matched by private industry.

The centres that make up the Catapult include:

- the Advanced Forming Research Centre (AFRC) in Glasgow,
- the Advanced Manufacturing Research Centre (AMRC) in Sheffield,
- the Centre for Process Innovation (CPI) in Wilton,
- the Manufacturing Technology Centre (MTC) in Ansty,
- the National Composite Centre (NCC) in Bristol,
- the Nuclear Advanced Manufacturing Research Centre (NAMRC) in Sheffield, and
- the Warwick Manufacturing Group (WMG) in Coventry.

The Catapult brings these centres together to develop manufacturing technologies, which can span from raw materials to finished assembly

processes. It also enables innovation to cut across sectors by bringing together businesses from diverse industries and giving access to a pool of world-class expertise, equipment and processes invested and supported by UK Government.

PROGRESS IN 2012-13

The High Value Manufacturing Catapult has made substantial and rapid progress in the last year:

In its first full financial year, the centre had 571 businesses directly involved in programmes, participated in 830 projects with private sector clients and had over 1800 engagements with SMEs.

This year 35 per cent of the centre’s £134m of innovation activity came from industry – beating the target of 33 per cent.

In October Dick Elsy joined the Catapult as chief executive from his previous role as CEO of FTSE technology firm Torotrak plc. Torotrak is one of the few UK listed companies involved in innovative automotive engineering. Dick brings extensive experience in the process of innovation management and the introduction of new technologies to market.

The High Value Manufacturing Catapult has secured commitment to substantial sources of additional funding totalling £214m across the various constituent centres. This new funding is from a number of sources, both direct and competitive and is reflective of strong industry appetite for the programme and also a need to grow capacity to meet this demand.

In the Chancellor’s 2012 Autumn Statement Speech the Catapult received £28m of funding towards increasing the capacity of the National Composites Centre. In the same month, the Government announced that the Centre for Process Innovation would establish and manage the new £38m National Biologics Industrial Innovation Centre to drive the development of UK healthcare solutions. The centre, part of the Government’s ‘Strategy for UK Life Sciences’, will be a large open-access facility to enable firms to scale up the manufacturing of antibodies,

vaccines and other new biologic medicines. After a detailed review the location for the centre will be Darlington. In September 2012, Warwick Manufacturing Group (WMG), opened the new £13m UK Energy Storage R&D Centre. The centre will work on the advancement of electric and hybrid vehicle batteries.

In October 2012, the Advanced Manufacturing Research Centre, based in Sheffield, announced the creation of a new Training Centre to provide the practical and academic skills that manufacturing companies need to compete globally. The Training Centre will be based in a new 5,000sq m building and will open in autumn 2013.

Over the course of the past year the Catapult and its various centres have collaborated closely with an array of high-profile organisations, from bioplastics production company Plaxica to leading power systems firm Rolls-Royce.

Plaxica approached the Centre for Process Innovation to help develop and scale up the production process for its sustainable plastic products, conducting trials on a larger scale to confirm the scalability of the process. The company also wanted to use CPI’s laboratory facilities and extensive technical and analytical support. The trials have been successfully taken from bench to pilot scale. And Plaxica now runs two laboratories with a multi-disciplinary team of around 30 staff, as well as launching its own pilot plant on site.

Rolls-Royce works closely with the Manufacturing Technology Centre to develop and optimise enabling technologies to support the new Advanced Blade Casting Facility, which will deliver single crystal turbine blades castings for one of its engine families. An integrated Rolls-Royce/ MTC team has established a pre-production cell to prove the effectiveness of the technologies involved and a production facility, using the technology developed with the Catapult is now under construction, with plans to employ 150 staff and deliver 100,000 castings a year.

“OUR TASK IS TO BREAK THROUGH THE VARIOUS BARRIERS TO COMMERCIALISATION OF CELL THERAPIES - BE THEY CLINICAL, REGULATORY, OR MANUFACTURING - SO WE CAN **HELP TO GROW A VIBRANT UK INDUSTRY**. THE CELL THERAPY CATAPULT IS PLEASED WITH THE PROGRESS IT HAS MADE ON THESE FRONTS SINCE INCEPTION JUST OVER A YEAR AGO, AND LOOKS FORWARD TO ANNOUNCING **FURTHER DEVELOPMENTS** IN THE YEAR TO COME.”

KEITH THOMPSON, CHIEF EXECUTIVE OFFICER
CELL THERAPY CATAPULT

Cell Therapy Catapult

The Cell Therapy Catapult's vision is for the UK to be a global leader in the development, delivery and commercialisation of cell therapies - a place where businesses can start, and confidently grow. It was established in recognition of the need for concerted long-term translational activities in order to realise the full value of cell therapies, building on the high-quality early stage research being carried out by academic and commercial groups in the UK.

ABOUT THE CATAPULT

As part of the Cell Therapy Catapult a wide range of industry experts will help businesses to create investible therapies, build clinical data, generate manufacturing processes and regulatory pathways. As well as providing access to state of the art equipment and industry expertise the Catapult is also able to provide robust advice around viable business models, intellectual property, standards and quality systems. The Catapult can also provide extensive regulatory expertise.

The Catapult is specifically engaged in taking products into the clinic, de-risking them for further investment, providing clinical expertise and access to NHS clinical partners. In addition providing technical expertise and infrastructure to ensure products can be made to good manufacturing practice (GMP) and providing access through its network to business expertise, grants and investment finance.

PROGRESS IN 2012-13

In 2012 and early 2013, the Cell Therapy Catapult finalised the appointment of its senior team and Board. Dr John Brown CBE FRSE was recruited as Chairman of the Catapult, while Dr Natalie Mount, previously at Pfizer, joined as Chief Clinical Officer. Dr Stephen Ward, previously at Stabillitech Ltd, joined as Chief Operating Officer, and Chief Business Officer Matthew Durdy joined from Aqix Ltd. They joined Chief Executive Officer Keith Thompson, who had been appointed early in 2012, and, in May 2013 the team was bolstered by the arrival of Chief Scientific Officer Professor

Johan Hyllner from French company Cellectis SA. Four non-executive directors with wide academic, clinical and commercial expertise have been appointed to the Catapult's board.

Recruitment is also ongoing across the Cell Therapy Catapult's financial, business development, clinical, regulatory and process development groups. A strong team of experienced professionals is developing, making the organisation a real centre of excellence.

The Cell Therapy Catapult has also been busy executing its strategy. In January 2013, it published its database of ongoing UK clinical trials in the cell therapy field, which is being used to identify potential programmes for development or partnership and to provide a benchmark for progress. It was updated in May to include 34 trials, when the Catapult also published its complementary UK Pre-Clinical Trials Database, which numbers 37 projects. Combined, these databases give the Catapult and the UK cell therapy sector a measure of current activity, and a tool with which to predict the future direction of developments.

Engaging with the cell therapy community in the UK and globally is vital to the success of the Catapult, and since inception it has linked up with the commercial, academic and not-for-profit sectors. AIM-listed SME ReNeuron Group plc and the Cell Therapy Catapult signed an agreement in March 2013 to work together on new cell therapy manufacturing technologies and assays. The collaboration will focus on the development and optimisation of the processes required to scale up manufacture of the CTXcell line, including rapid cell culture techniques, cryopreservation methodologies and the development of protocols for automated manufacturing processes. The Cell Therapy Catapult was pleased to note that in July 2013 ReNeuron secured a £33m round of equity and grant funding from major investors and the Welsh Government.

In April 2013, the Cell Therapy Catapult and the UK Stem Cell Foundation charity signed a memorandum of understanding to cover planned collaborative work. The joint work will aim to build a pipeline of projects that meet the two organisations criteria for support and funding on the route to commercialisation. Also in April, the Catapult centre and Loughborough University agreed to work together on innovative manufacturing, working in partnership to remove the barriers associated with turning cell-based therapies into products.

Following this, the Cell Therapy Catapult announced a collaboration with GlaxoSmithKline plc in May 2013. The two organisations will work together in a range of areas relevant to the development of cell therapies, from research projects to technical and regulatory strategy. The Catapult's partnering has an international flavour as well, in May they established a link with the Canadian Centre for the Commercialisation of Regenerative Medicine.

Located in London within the NIHR Biomedical Research Centre at St Guy's and St Thomas' NHS Foundation Trust and King's College London, the Cell Therapy Catapult is looking forward to the opening of its new facilities in early 2014. The £7.5m state-of-the-art facilities will be located on the 12th floor of the Tower Wing, Guy's Hospital, at the heart of a cluster of hospitals, clinical research centres and universities. Current project work is being undertaken at its interim laboratories on Guy's Campus.

“OUR GOAL IS TO INCUBATE NASCENT TECHNOLOGIES AND DE-RISK RENEWABLE INNOVATIONS, TO TURN THEM INTO INVESTABLE MARKET **OPPORTUNITIES**. THE TYPES OF TECHNOLOGY AND THEIR DEPLOYMENT IN RENEWABLE OFFSHORE ENERGY OFFER **TREMENDOUS VALUE** FOR UK BUSINESSES. THE OFFSHORE RENEWABLE ENERGY CATAPULT IS POISED TO PLAY A LEADING ROLE IN DELIVERING THAT VALUE AND THAT IS A VERY **EXCITING** PLACE TO BE.”

ANDREW JAMIESON, CHIEF EXECUTIVE OFFICER
OFFSHORE RENEWABLE ENERGY CATAPULT



Offshore Renewable Energy Catapult

The ORE Catapult will be a leading international centre recognised for the identification, development and rapid commercialisation of innovative technology solutions, maintaining the UK's position at the forefront of a vibrant and growing offshore renewable energy sector.

The Catapult will be the recognised “go to” institution for the delivery of interconnected technology innovation services. The Catapult will provide access for new technologies while driving greater efficiency and will draw upon the strengths of the UK's innovation services to create sustainable offshore wind and wave and tidal industries.

ABOUT THE CATAPULT

The Catapult's innovation leadership role will leverage the existing innovation systems available, providing clarity and easier access to industry. The Catapult will be of significant scale, employing 100-150 people providing engineering, commercialisation and specialist knowledge services to support technology innovation in businesses both large and small.

It will apply deep sector knowledge to bring together appropriate research, test and demonstration assets and skills to tackle key problems, activities and projects. A key theme for the Catapult, in addition to providing access to our own services, is to work collaboratively with others in the public, private and academic sectors. This will ensure the UK maximises its strengths to develop thriving and valuable offshore wind, wave and tidal industries that add value not only in the UK but also have skills that can be exported worldwide.

The Glasgow-based Catapult will receive up to £10m a year over five years from the Technology Strategy Board and has opened with four pilot projects which will seek to drive cost reduction and innovation in the sector.

PROGRESS IN 2012-13

In August and September 2012, the Offshore Renewable Energy Catapult announced two key senior hires. Colin Hood was appointed Chairman, bringing with him over 35 years' experience in the energy sector. Four non-executive directors complete the Catapult board. Chief Executive Officer Andrew Jamieson joined the Catapult from ScottishPower Renewables, where he was Policy and Innovation Director.

Four major pilots are underway: the development of a Marine Farm Accelerator; Standardisation; Offshore Cables; and Performance & Reliability. They will explore the roles each of these areas play in fuelling innovation, promoting competition, lowering technology costs and accelerating market growth. The first two projects will be led by the Carbon Trust with Narec leading on the remaining two.

Looking at existing systems both within the sector as well as in other industries, these projects look to develop and roll out a form of Standards; exploit current sector efforts to develop a more efficient system of collecting and sharing offshore renewable device performance data; and create and work with a consortium of project developers to drive accelerated innovation of the technology required to de-risk delivery of early wave and tidal farms and reduce the lifetime cost of offshore renewable energy.

The projects adopt a collaborative approach with others across industry and the academic and public sectors. Each project was identified, prioritised and appraised on its impact on cost of energy production, materiality, UK benefit and risk, and, along with other projects in the pipeline, will eventually lead to full programmes of activity and services for the Catapult.



The Catapult leadership teams

HIGH VALUE MANUFACTURING CATAPULT

Chairman: Bob Gilbert

CEO: Dick Elsy

Non-Executive Director:
Hamid Mughal

Non-Executive Director:
Professor Sir Mike Gregory

Non-Executive Director:
Joe Greenwell CBE

Non-Executive Director:
Graeme Armstrong

Non-Executive Director:
Juergen Maier

TSB Representative
Non Exec-Director:
Will Barton

CELL THERAPY CATAPULT

Chairman: Dr John Brown,
CBE, FRSE

CEO: Keith Thompson

Non-Executive Director:
Tim Edwards

Non-Executive Director:
Nick Higgins

Non-Executive Director:
Professor Marc Turner

Non-Executive Director:
Professor Michael
Whitaker

TSB Representative
Non-Executive Director:
Dr Zahid Latif

OFFSHORE RENEWABLE ENERGY CATAPULT

Chairman: Colin Hood

Chief Executive Officer:
Andrew Jamieson

Non-Executive Director:
Alan Moore

Non-Executive Director:
The Rt Hon. the Baroness
Liddell of Coatdyke

Non-Executive Director:
Professor Sir Jim McDonald

TSB Representative
Non-Executive Director:
Rob Saunders

Non-Executive Director:
Rob Bryan

SATELLITE APPLICATIONS CATAPULT

Chairman: Tim Sherwood

CEO: Stuart Martin

Non-Executive Director:
Catherine Mealing-Jones

Non-Executive Director:
Sue Hunt

Non-Executive Director:
Lynne Patmore

Non-Executive Director:
Ruy Pinto

Non-Executive Director:
Will Hutton

Non-Executive Director:
Rob Bryan

TSB Representative
Non-Executive Director:
Tim Just

CONNECTED DIGITAL ECONOMY CATAPULT

Chairman: Andy Green

CEO: Neil Crockett

Non-Executive Director:
Warren East

Non-Executive Director:
Graham Hutchins

Non-Executive Director:
Rob Bryan

TSB Representative
Non-Executive Director:
Nick Appleyard

FUTURE CITIES CATAPULT

Chairman: Sir David King

CEO: Peter Madden

Non-Executive Director:
Professor Rachel
Cooper

Non-Executive Director:
Mark Spelman

Non-Executive Director:
Gaeten Sieuw

Non-Executive Director:
Rob Bryan

TSB Representative
Non-Executive Director:
Richard Miller

TRANSPORT SYSTEMS CATAPULT

Chairman: Will Whitehorn

CEO: Steve Yianni

Non-Executive Director:
Terry Hill

Non-Executive Director:
Andy Pitt

Non-Executive Director:
Michael Kayser

TSB Representative
Non-Executive Director:
Andrew Everett

Non-Executive Director:
Graham Hutchins

Non-Executive Director:
Rob Bryan

“I’M ABSOLUTELY DELIGHTED TO HAVE BEEN ASKED TO ESTABLISH AND RUN THE SATELLITE APPLICATIONS CATAPULT. THIS IS **A UNIQUE OPPORTUNITY** TO GROW A FAST-MOVING, HIGH-VALUE TECHNOLOGY SECTOR INTO A WORLD-LEADING CAPABILITY, WITH A BROAD IMPACT ON THE UK ECONOMY. THE CATAPULT PROGRAMME HAS QUICKLY ESTABLISHED ITSELF AS A **VITAL ELEMENT OF THE UK’S INNOVATION ENVIRONMENT**, AND I’M CONVINCED IT WILL DELIVER HUGE BENEFITS IN THE YEARS TO COME.”

STUART MARTIN, CHIEF EXECUTIVE OFFICER
SATELLITE APPLICATIONS CATAPULT



Satellite Applications Catapult

Technologies and applications derived from satellite will be a major growth area for the UK economy over the next decade and beyond. The Satellite Applications Catapult will help UK businesses, across many market sectors, develop new satellite-based products and services, and stimulate growth across the UK. The UK space market is currently worth £9.1bn, a 6% share of the global market. The Catapult will help the UK achieve targets set out in the UK Space Innovation and Growth Strategy to grow the UK market share to 10% by 2030 and create a wealth of new high-value jobs.

ABOUT THE CATAPULT

The Satellite Applications Catapult provides a range of R&D activities from the conception and showcasing of game-changing satellite technologies through to the delivery of everyday services derived from space data.

The Catapult provides technology and service demonstration opportunities to address the difficulties associated with testing technologies and services in space. Satellite programmes – such as TechDemoSat and UKube1 scheduled for launch in 2013/4 – have paved the way in providing UK businesses with an in-orbit platform on which they can test new technologies. The Catapult will be working with these programmes to help smaller companies by providing facilities on the ground that give them access to simulation, data management and visualisation capability.

By providing both the in-orbit facilities and the ground-based data management capability, the Catapult will allow UK businesses to work together to reduce the risk in developing new technologies. It will help innovative organisations to demonstrate new satellite technologies, remove existing prohibitive cost barriers, and shorten the waiting time for first flight demonstrations of new equipment.

PROGRESS IN 2012-13

In developing the Catapult, the Technology Strategy Board worked closely with UK industry and academia, the UK Space Agency, the trade association UKspace, the International Space Innovation Centre (ISIC), and the 1,200-strong Special Interest Group (SIG) of the Knowledge Transfer Network. A document detailing the vision, scope, ways to engage and the next steps for establishing the Catapult was published in February 2012.

In January 2013, Stuart Martin was appointed as Chief Executive Officer, joining Tim Sherwood as Chairman.

In March 2013, the Catapult merged with ISIC, building on its achievements and relationships.

In April 2013, the Catapult completed a series of appointments to its senior executive team. Paul Febvre joined as Chief Technology Officer, Antonia Jenkinson joined as Chief Operating and Chief Financial Officer, and Mark Hampson as

Chief Innovation Officer. Four distinguished non-executive directors also joined the Board.

In May 2013, HRH the Duke of York officially opened the Satellite Applications Catapult on the Oxford Harwell Innovation Campus.

The Satellite Applications Catapult is now establishing programmes in a number of thematic areas. Based upon growth potential, UK capability (including in the research base) and competition, it is focussing on four market-led programmes which, between them, have a global growth potential of more than £60bn over the next decade. These programmes focus on transport; security and civil protection; natural resources management, energy and climate change; and the internet of things. In addition, technology-driven programmes provide support for the development of new satellite, ground and user segment technologies that have the potential to drive application utility, and market acceptance.



“WE ARE EXCITED TO BE AT THE START OF A FASCINATING JOURNEY AND PART OF THE HUGE **VIBRANT INNOVATOR COMMUNITY** IN THE UK. WE ARE LOOKING FORWARD TO OUR ROLE AS A NEUTRAL CONVENOR OF THE DIGITAL ECOSYSTEM WORKING WITH LARGE AND SMALL BUSINESS, INNOVATORS, UNIVERSITIES AND OUR R&D COMMUNITIES TO **BUILD IMPORTANT PLATFORMS** AND CAPABILITIES. THE DIGITAL ECONOMY PLAYS **A VITAL ROLE** IN THE ECONOMIC HEALTH OF THE UK. WE LOOK FORWARD TO HELPING IT **GROW AND PROSPER** IN THE COMING YEARS.”

NEIL CROCKETT, CHIEF EXECUTIVE OFFICER
CONNECTED DIGITAL ECONOMY CATAPULT

Connected Digital Economy Catapult

The UK is one of the world's strongest digital markets. It is valued at more than £100bn in the UK, driven by growth of digital services on the internet, which represented 23% of total UK GDP growth between 2004 and 2009. It is highly vibrant; the growth in new companies during 2011 outstripped any other sector and small companies dominate activity. As well as being a significant sector in its own right, it impacts all other sectors, making CDEC a true 'horizontal' Catapult.

The connected digital economy does not stand still, indeed it seems to speed up with an explosion and convergence of vast amounts of new content and data, combining with new ways for people, businesses and the physical world to connect delivering radically new applications services and experiences across all industry sectors. This convergence will disrupt existing value chains even more than applications such

as e-commerce have transformed retail; it will lead to innovative new business models and create new global markets. It will also transform the way that societies function, and the way people live, impacting for instance how healthcare is delivered, the running of our cities and transport networks, and our environment.

The Connected Digital Economy Catapult's Vision is to help ignite digital innovation to power sustained economic growth in the UK. It will do this by accelerating digital innovators from concept to commercialisation by building platforms and capabilities that address the main challenges they face. It will also work to demonstrate the transformative impact of digital innovation on UK business and public sector organisations.

In the digital market, the key differentiator for an innovator is being fast to market.

However, as innovators develop new services, applications and products, they face a number of challenges which they individually cannot address but which substantially slow their ability to innovate:

- The inherent promise of converging the huge variety of new data sources is unrealised because data is often unstructured, complex and poorly integrated,
- They need to be able to experiment with advanced next generation connectivity - in particular mobile and the emerging 'internet of things',
- They need advanced skills to develop commercially successful services which are secure and truly designed around users and have successful new business models,
- They need to be clearly heard in a crowded marketplace.

ABOUT THE CATAPULT

The Catapult will convene academic, research, and business partners to build a series of platforms, capabilities and facilities to accelerate the speed at which the UK's digital economy innovators can address and overcome these four challenges.

It will do this in a way which reflects the rapidly changing nature of the digital marketplace – with an approach that will be open and highly collaborative, to ensure maximal use of what is created.

The initial focus will be on building digital innovation platforms for the creative and media, health sectors and in a city context – all of which are rich with opportunities for digital transformation, and growth.

The cross-cutting nature of digital means that working with other Catapults will be central to the Catapult's success and work has started already

to develop joint projects and initiatives with Future Cities, Satellite Applications and Transport Catapult's.

The Catapult plans to create a new UK Innovator Centre in London in 2014. This 2,000 foot facility will house the administrative functions, studios for technology teams engaged in RD&I projects. The Centre will also have a collaboration and showcasing studio to accelerate understanding amongst business and public sector leaders of the massive transformational impact the digital economy can bring to their organisations. The Centre will be a London base where digital innovators can meet to collaborate and provide a high level platform for them to profile their products and services to UK and International Customers. The Centre will extend its reach physically and virtually to a number of other locations around the UK.

PROGRESS IN 2012-13

Andy Green, the former chief executive of Logica plc and board member of BT, has recently joined as Chairman. Neil Crockett, started as CEO in January 2013. Warren East, former CEO of ARM Holdings plc has become a non-executive director. Further NED appointments representing the diversity of the digital sector will soon be confirmed.

The Catapult also has in place most of its senior team, including Chief Business Officer, Noeline Sanders, Chief Innovation Officer (in residence) Professor Derek McAuley, Human resources Director, Clare Brooke and Partnership Directors, Chris Thompson and Dr Maurizio Pilu. Emer Coleman is working as the Catapults Strategic Communications Consultant. The appointment of a Project Delivery Director and Marketing Director to complete the team is imminent.

“INNOVATING TO **HELP CITIES FUNCTION** EFFECTIVELY IS A MAJOR GLOBAL BUSINESS OPPORTUNITY. WITH OUR STRENGTHS IN ARCHITECTURE, ENGINEERING, FINANCE AND SERVICES, THE UK IS IN A FORMIDABLE POSITION TO MAKE THIS HAPPEN. INITIAL PRIORITIES INCLUDE BUILDING A WORLD-CLASS CLUSTER AND BUSTING THE BARRIERS TO THE MARKET TAKING OFF – FOR EXAMPLE BY DEMONSTRATING THE BUSINESS CASE AND DEVELOPING NEW WAYS TO FINANCE CITY-IMPROVEMENT.”

PETER MADDEN, CHIEF EXECUTIVE OFFICER
FUTURE CITIES CATAPULT



Future Cities Catapult

The Future Cities Catapult is a global centre of excellence on urban innovation. Its goal is to help UK businesses create the products and services to meet the future needs of the world's cities.

ABOUT THE FUTURE CITIES CATAPULT

The Future Cities Catapult will drive economic growth by giving UK businesses access to the emerging technologies that will allow them to develop the products and services required for cities in the future. The market is large and growing. Over £6.5tn will be invested globally in city infrastructure over the next 10-15 years, and the accessible market for integrated city systems is estimated to be £200bn a year by 2030.

The UK has the strength to exploit this market. We have world-leading companies in project management, engineering, architecture, finance, legal and insurance. Our ability to bring together the cluster of companies needed to design, finance, risk manage and execute large infrastructure projects makes the UK a major global centre for such projects. The UK has a world-class science and research base that supports the development of innovative solutions and provides a talent pool for UK and global firms.

The Future Cities Catapult will bring together business, city governments and academia in a unique collaboration to enable businesses to develop products and services for this emerging market. It will help cities deliver improved quality of life, a strong economy and protected environment focus through enabling them to take a more joined-up approach to how they function. It aims to help unlock the market through demonstrating the opportunity, enabling innovation through collaboration and removing the barriers to growth such as lack of financing.

The Catapult will not work on individual city systems in isolation. Instead, it will work on the integration of systems, specifically focusing on the way they combine and interact to create opportunities for better performance and greater value.

The centre will be hosted in London, working in collaboration with a £24m Future Cities demonstrator project in Glasgow, as announced by the Secretary of State for Business Innovation & Skills, Vince Cable, in March 2013. The Catapult will test innovative business solutions in a unique 'City Simulator', combining live data with advanced visualisation and simulation.

PROGRESS IN 2012-2013

The Future Cities Catapult was launched in July 2013. It has in place a Board, chaired by Professor Sir David King, and a start-up team, led by Chief Executive, Peter Madden. It has already held events for business, established collaboration with world leading cities centres in Paris, New York and Singapore, and begun a project on innovative financing mechanisms for city-solutions.

“THE TRANSPORT SYSTEMS CATAPULT WILL BE RECOGNISED FOR MAKING THE WORLD MORE MOBILE. WE WILL SHAPE **A NEW AND SUSTAINABLE MARKET** IN INTEGRATED TRANSPORT SYSTEMS TO THE MUTUAL **BENEFIT** OF BUSINESS, **SOCIETY** AND THE **ENVIRONMENT**.”

STEVE YIANNI, CHIEF EXECUTIVE OFFICER
TRANSPORT SYSTEMS CATAPULT



Transport Systems Catapult

The Transport Systems Catapult will drive economic growth by enabling business to develop products and services to address the challenges facing the transport system of the future. In developed countries, transportation accounts for between 6% and 12% of gross domestic product, some £2.5tn-£4.7tn pa globally.

The existing transport system is under severe pressure. In order to tackle this, we need a fully integrated and efficient transport system. The key challenge is how to increase mobility, the efficient and cost effective movement of people and goods. By bringing together the transport industries with other sectors to work collaboratively, the Catapult will place UK business in a position of strength to develop innovative products and services to address the challenge.

The global market for novel and cost-effective transport systems is huge, worth up to £900bn pa by 2025. The UK has world-leading academic and industry expertise that can support the development of transport systems innovation. Areas of strength include traffic management systems, vehicle design and manufacture, infrastructure design and delivery, on-vehicle and off-vehicle communications, telematics, logistics provision and testing facilities.

The Transport Systems Catapult will be a global centre of excellence for transport systems' modelling, monitoring, development and demonstration – a place where the latest theories on how transport systems interact and function can be tested against real world demonstrators, and a place where systems can be safely and objectively tested. It will offer a neutral space in which players from different transport sectors and from different points of the supply chain are able to interact with one another to jointly develop wholly new systems and approaches, and influence new behaviours. The Transport Systems

Catapult is developing a national transport systems modelling facility and an integrated test environment where world-class physical testing can be linked to digital models.

In February, Will Whitehorn joined the Catapult as Chair of the board and non executive directors are now in place drawn from across the transport systems sector.

As part of its ongoing journey, the Transport Systems Catapult has appointed former Network Rail director Steve Yianni as chief executive officer, effective from 1 August 2013.

Steve was pivotal in the delivery of Network Rail's 30-year technical strategy and has more than two decades experience in leading manufacturing organisations, contributing to the engineering success of the Ford Motor Company and JCB. He will apply his broad-based innovation and commercial skills to shaping the Catapult.

The Transport Systems Catapult has also recently announced the selection of Milton Keynes as the site for the centre. The choice revolved around a range of factors, from ease of access for the transport community and a strong local talent pool to travel times from locations across the UK and abroad and the availability of property.

Currently the Transport Systems Catapult is developing its five-year business plan.



THE NEXT STEPS FOR CATAPULT

Throughout 2013 the centres will continue to facilitate and create access to expertise within academia, research, industry and government for entrepreneurs, scientists and engineers.

“THE GOVERNMENT PLANS TO **INVEST** AN ADDITIONAL **£185** **MILLION** IN RESOURCE FUNDING TO SUPPORT **INNOVATION”**

Catapults next steps

INVESTING IN BRITAIN'S FUTURE

In the recent HM Treasury report, ‘Investing in Britain’s Future’, it was announced that the Government plans to invest an additional £185 million in resource funding for the Technology Strategy Board (TSB) in 2015-16 to support innovation. The funding is set to include expanding the number of Catapult Centres to including energy systems and stratified medicine.

DIAGNOSTICS FOR STRATIFIED MEDICINE CATAPULT

The Technology Strategy Board will start the process to scope and establish a Catapult with a focus on ‘Diagnostics for Stratification’. The

centre will act as a rallying point to enable the linkages between biopharma, diagnostics and healthcare systems. The Catapult will provide the skills and knowledge which businesses can tap into in a growth area where there is significant potential. Diagnostic development (including sensors and engineering), data handling and management and patient cohorts will all play an important role in supporting diagnostic tool development giving more rapid feedback into the healthcare system and for companies developing new treatments.

ENERGY SYSTEMS CATAPULT

The Technology Strategy Board will scope and develop a new catapult

centre in Energy Systems that will focus on the enabling technologies and controls needed to integrate future energy supplies with future demand patterns and management into resilient and flexible energy systems fit for the 21st century. The global market for integration and control technologies is thought to be worth up to £1.6tn by 2050, according to a recent report by the Low Carbon Innovation Coordination Group. The Catapult Centre will support innovative UK businesses to access these new markets, building on existing UK strengths in systems design and control alongside emerging capabilities in energy storage, electric vehicle integration, demand response,

energy management and big data processing. It will work closely with other centres in the catapult network, especially the offshore renewable energy catapult on integration of renewables, and future cities and transport systems catapults to integrate future demand patterns from the built environment and electrification of transport systems.

CATAPULT DELIVERY PLAN

The next steps for the Catapults will revolve around strategy development and team recruitment for a number of the centres and, for the more established Catapults, ongoing work to accelerate the journey of new concepts to commercial reality.

Throughout 2013 the centres will continue to facilitate and create access to expertise within academia, research, industry and government for entrepreneurs, scientists and engineers.

The seven chief executives and boards, together with the Technology Strategy Board, will continue to support the network of Catapults in their development and their mission to ensure cross-community engagement and innovation.

Each Catapult will keep information and dialogue flowing through its website, _connect groups, workshops and other engagement activities.

The programme will also begin community engagement in order to implement the two newly determined Catapults; Diagnostics for Stratified Medicine Catapult and Energy Systems Catapult.



“THE CATAPULT CENTRES
WHOSE DOORS ARE
ALREADY OPEN **ARE**
WAITING TO HEAR
FROM **YOU**”

Get involved

Together we have achieved a huge amount, thanks to the wide participation and enthusiasm shown by everyone involved.

The Catapult centres whose doors are already open are waiting to hear from you.

Other Catapults continue to develop their business and delivery plans and to engage with the relevant business and academic communities. To get involved with the various centres, please see the details below.

JOIN IN

To join in, please sign up through the _connect collaboration and networking platform at:
<https://connect.innovateuk.org/catapult-networks>
Email: catapult@tsb.gov.uk
Visit: <http://www.catapult.org.uk>
Follow us on Twitter: @Catapult_TSB

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