ABOUT US

The Engineering and Physical Sciences Research Council (EPSRC) is at the heart of discovery and innovation. We invest in long-term, fundamental engineering and physical sciences research and training in the UK.

Committed to excellence and impact, we support the talented scientists, engineers and postgraduate research students who through their research, discover new knowledge, explore new ways of thinking and drive innovation.

Our research provides underpinning knowledge that informs other fields such as the life and medical sciences.

Our research places the UK as a leading global research nation. It saves lives, creates prosperity, protects the environment and inspires future generations.

KEY FACTS

£2.5bn
RESEARCH PORTFOLIO

£838m
CONTRIBUTED BY INDUSTRIES, CHARITIES AND PUBLIC SECTOR ORGANISATIONS

42%
OF OUR PORTFOLIO IS MULTIDISCIPLINARY

8,500
STUDENTS SUPPORTED

OVER

2,800
ORGANISATIONS INVOLVED IN COLLABORATIVE GRANTS
THE CHANGING LANDSCAPE

Over the last five years the national and international research landscape, and the context in which EPSRC operates, have changed and continue to develop. We have updated our Strategic Plan to take account of this new environment.

We need to consider how internationally excellent, discovery-driven research can be integrated with the often regional delivery of innovation and exploitation of ideas.

The UK now has an Industrial Strategy that has a sector focus with many elements which align, directly or indirectly, to EPSRC’s research portfolio. Likewise, the identification of eight great technologies as areas of UK strength and promise indicates an increased governmental focus in science and technology and a greater willingness to identify specific priorities.

We must also recognise that the shifting and uncertain global economic climate has resulted in the UK having to face greater competition in research and innovation while research budgets have also been stretched. At the same time, the shift towards open access to the results of research means that the internationalisation of research and cross-border collaboration continue to grow.

The Strategic Plan sets out the direction of EPSRC policy for at least the next five years. How we implement this strategy will be set out in our Delivery Plan which will be drawn up in 2014/15 in collaboration with the research community and our partners.

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Science and engineering drive the global economy in the 21st century, and EPSRC is at the heart of the research, discovery and innovation that will support them.

Science and engineering are key to tackling challenges such as attaining energy security, developing a low carbon future, advancing regenerative medicine, designing and building future cities, maintaining cyber security, growing manufacturing and exploiting quantum technologies.

EPSRC provides the national leadership needed to realise new opportunities for the UK and to guide the UK research community in responding to global challenges and government-led initiatives. We invest to generate the fundamental knowledge and skilled people essential to business, government and other research organisations.

Our strategy is to encourage world-leading research, discovery and innovation, focusing support on talented scientists and engineers who can deliver excellent research with economic and social impact that addresses the needs of the nation.

We are building on strong foundations. EPSRC has fostered a UK research base that is continuing to hold a leading international position based on highly cited research over the last five years.

We work with our partners in the research community, universities, industry, government, other Research Councils and other agencies to ensure we effectively bring through academic-led research to business-led development and demonstration. In particular, we work together and jointly fund research projects, programmes and centres with Innovate UK (previously known as the Technology Strategy Board) and other organisations involved in exploitation of research.

These partnerships are critical if we are to accelerate the impact of our research and ensure, for example, the commercialisation of our research outcomes.

We ensure that the country can make the most of its talent, progressing ideas and encouraging open innovation that can bring benefits to all, while meeting national priorities.

The challenges we must tackle do not respect geographical, political or scientific boundaries – and our strategy will allow the UK research base to take a multidisciplinary and international approach to solving them. EPSRC supports the research base, helping it engage with and benefit from international funding like the European Commission’s Horizon 2020 programme. We work with overseas funding agencies to make the most of worldwide funding opportunities and to maximise the flow of the best people, driving global excellence across the research landscape.

We need to sustain a balanced programme of investment in science and engineering to ensure research supports, influences and informs UK policies such as the Government’s Industrial Strategy. Within our portfolio
we provide over £1.65 billion for research and doctoral training that is directly relevant to the priority sectors identified in the Industrial Strategy. EPSRC develops the technologies, materials, advanced data management, statistical analyses and advanced instrumentation that enable cutting-edge breakthroughs across sectors including the health and life sciences.

We also support leading research that develops our fundamental understanding of the world, the talents of our people and identifies new technologies to inform future strategies. It is vital that EPSRC continues to sustain support for discovery-led, or curiosity-led research, driven ‘bottom-up’ by individual investigators in the research community. We remain committed to funding excellence wherever and whenever it arises in the UK’s universities and research institutes and will continue to support the best people and ideas through both discovery-led and challenge-led research.

This balanced approach helps ensure the country is equipped to deal with today’s challenges and has the research capability and quantitative skills for those it may face in the future.

Our past investments are having impact today and have directly led to the identification and emergence of new technologies. New advanced materials, improved medical diagnostics, faster and pervasive communications, and the use of Big Data in multiple academic fields are just some of the impacts resulting from our research. Further investments are vital to sustain this track record.

In addition to these direct benefits, EPSRC research sustains discovery and innovation across the entire research landscape. Our approach and developments provide the vital foundations that will encourage new ways of thinking, develop new tools and stimulate further investigation in bio-science, medicine and environmental sciences within UK industry and other parts of government such as the NHS and Defence.

The UK has the brilliant minds that can change the world. We also have an environment and reputation for research that serves to attract some of the best people from around the globe. EPSRC fosters the ambition, invention and adventure of all those it supports to help disrupt accepted wisdom and technologies and transform how we live.

EPSRC actively engages with the public to ensure informed debate on issues and increase understanding of the value and importance of research. As a publicly funded organisation it is right that we not only inform the public about how we are investing their money but that we also listen to their views on the issues that they feel are important.
OUR VISION
Our vision is for the UK to be the best place in the world to research, discover and innovate.

OUR GOALS
Our vision is supported by two goals which emanate from our Charter:

Research and Discover
For the UK to be positioned as an international research leader, where discovery thrives and our support generates the highest quality research in engineering and the physical sciences.

Research and Innovate
For the UK’s excellent research base and talented researchers to work with us to accelerate innovation for the benefit of society and the economy.

OUR STRATEGIES
To achieve our goals we will use three strategies:

- Balancing Capability
- Building Leadership
- Accelerating Impact
Balancing Capability

EPSRC will champion excellence across the engineering and scientific disciplines while ensuring best value for the taxpayer. We will only invest in research, training and infrastructure that are judged as excellent by our proven peer review processes.

By prioritising investment decisions we will continue to support a balanced portfolio that reflects the developing strategic needs of the nation. This will include supporting the UK’s capability in both discovery-led and challenge-led research to tackle future challenges and capitalise on new opportunities.

We will actively develop our investments to meet our priorities and, working with our university partners and other research funders in the UK and internationally, we will create, develop and sustain new and emerging areas of research.

Research does not exist in a vacuum, we need to be able to respond and adapt to a changing research landscape. We recognise the critical role we have in working with its community to understand and influence that landscape. We will continue to build the relationships that enable that to happen.

We will work in partnership with our research community to ensure that we exploit opportunities at the interfaces between disciplines. We will also build relationships with selected overseas funding agencies to ensure that we exploit opportunities for international collaboration in research for the benefit of the UK.

Building Leadership

Recognising the need for inspirational scientists and engineers to lead excellent research, we will invest in people with leadership potential at all career stages so they can make the maximum contribution, whether that be to universities, business, government or other research organisations.

We will focus support on the best postgraduate research students and the talented individuals who are delivering the highest quality research to meet UK and global priorities. We will work with universities to create an environment that supports them and allows others to benefit from their ability. We will foster ambition and adventure and ensure connections are maintained with the best, whoever they are and wherever they are in the world.

We are committed to diversity and equity in the research base. We will work with our university partners to ensure that the UK’s research base remains world class, attracts and retains the brightest and best researchers, and provides equal opportunities to as wide a pool of talent as possible.

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We will invest in longer-term projects and support the training of students to equip them to deal with the complex, real-world problems and research challenges that require new, more networked approaches to carrying out research.

Accelerating Impact

We are seeking to maximise both academic excellence and the economic and social impact arising from our research and training portfolio. By academic excellence, we mean the contribution that excellent research makes to academic advances, across and within disciplines. Economic and social impacts are the contributions that excellent research makes to society and the economy.

We know that by supporting the highest quality research and people, impact will follow. We also understand that social and economic impact is often not delivered by researchers or Research Councils, but by business, policymakers, charities, healthcare professionals and others. Our role is to help make it more likely that impact will arise, that it will arise more quickly and that it will bring benefit to the UK.

When appropriate we will always encourage and seek co-investment from industry and business that helps accelerate impact and we will support and promote the exploitation of research outcomes.

We will think early on about how research and postgraduate training may develop, who may be interested in the possible outputs and how the outputs might be used, embedding this in our portfolio planning and development. We will encourage all of our researchers to do the same in their proposals. In all of this, we will promote a responsible innovation approach, building on our framework for responsible innovation.

In addition, we will build wider and stronger partnerships in the national and international innovation system, with universities, Innovate UK, charities, businesses and other organisations that can capitalise on our research, benefit from employing talented people, inspire new research challenges and help inform our direction.

We will make the outcomes of our research and postgraduate training accessible to all through open access and online tools, helping accelerate exploitation and commercialisation and generating public awareness, engagement and dialogue.
EPSRC’s vision, goals and strategies are aspirational and ambitious. They look to a future in which the UK maintains its position as a world-leading location for high quality research and where it is equally renowned for its innovation.

However, we must recognise that with rising international research competition and expertise, the UK must perform ever more effectively in order to maintain its research standing let alone further improve it.

Over the past two decades EPSRC has been directly responsible for transformative research that has changed how we live, how we pursue science and how industries work. Our research continues to deliver significant benefits today, in areas such as regenerative medicine, cleaner energy, low carbon technologies, manufacturing and communications. Our peer review processes have been proven effective. We are confident that our recent refinements will mean they will continue to set the highest standards of excellence for research and our reviewers will be well versed in the significance of proposals, in their field and in the broader national context.

We will continue to monitor the proportion of our budget spent on administration and look to make efficiencies where they do not adversely impact on our ability to deliver our strategic goals effectively. We will seek opportunities to work with partners to co-fund research and attract additional funding in cash or in-kind.

But the world is continually changing, economically, demographically, technologically and socially. The strategies we have outlined here ensure we will not only remain responsive to such changes but will enable the UK to take a lead in the research landscape.
WORKING IN PARTNERSHIP

As a significant investor in engineering and physical sciences research and training, we recognise the need to provide national and international leadership while continuing to work in close partnership with UK universities, industry, other Research Councils and funding agencies including European Union bodies and funds.

By working with these partners we can leverage funding to maximise the resources available and, importantly, align and connect strategies, priorities and investment decisions to ensure we use our assets and capabilities to maximum effect for the UK.

Furthermore, our partnerships readily demonstrate to government and the public the outstanding benefits that come from funding high quality research. By demonstrating those benefits, we are most likely to secure the public funds we need to deliver the UK’s research and innovation potential.

Universities are critical to the success of our strategy and we will continue to build on the strong relationships we have developed in the sector. Specifically, we will work closely with those that receive most of our support while still ensuring that our investments are made based on excellence, wherever it occurs.

We already collaborate with over 2,800 industry, charitable and public sector organisations within our research portfolio and recognise the need to build on this foundation if we are to progress our strategy to accelerate impact. Through our 28 Strategic Partners across major corporations we are both leveraging additional investment for the research base and ensuring that our research is meeting the needs of global businesses. We will continue to foster our strong relationship with the users of research and will further encourage participation in our peer review and strategic advice processes.

EPSRC is acknowledged as a major investor in world-leading research. Working with Innovate UK we connect the high quality research and people we fund to business-led development and demonstration. Early collaboration and alignment of priorities enables us to identify new technologies and directly influence and support the work of the Catapults. We will continue to work alongside Innovate UK to accelerate the impact of our investments.

As one of seven Research Councils, EPSRC recognises that the boundaries between us must be porous to enable us collectively to fund the best research and deliver the most impact. This shared objective means it is natural for Research Councils to work together. We do this through cross-council programmes, such as the RCUK Energy programme, but also through more dynamic and less formal routes, for example working with BBSRC on synthetic biology investments. We will continue to work together for the benefit of the UK research base and society.

45% OF OUR RESEARCH PORTFOLIO IS COLLABORATIVE
WHAT OUR STRATEGIC PLAN WILL DELIVER

Our plan is forward looking. We will increase the number of world-leading scientists and engineers working in the UK and will encourage them to be more adventurous than ever before. We will create a research environment that gives UK talent the freedom, flexibility and tools to succeed.

In international benchmarking, EPSRC research is judged to be world-leading. We will maintain, and seek to increase, the UK’s international research standing as judged by the incidence of highly cited papers.

Our plan is also a commitment. We will deliver a research base and a skills portfolio that allows the UK to meet challenges head on, both now and in the future. In a Continuingly uncertain economic climate we will ensure our investments deliver value and accelerate impact.

We will continue to increase the number of leading research groups working on strategic challenges facing the UK and deliver new technological solutions to these issues. We will increase the levels of both multidisciplinary research and international collaboration involving the UK’s leading research groups.

We will continue to encourage an increase in transformative research that breaks the mould.

We will continue to influence the research landscape; monitoring the evolution of our portfolio and effectiveness of our investments, and will be ready to adapt to new conditions.

Government has endorsed our approach to cohort-based research training, allocating additional funds directly for this purpose. Our Centres for Doctoral Training model, delivering the highly-skilled, numerate individuals the UK needs,
£208bn

AN EPSRC-COMMISSIONED INDEPENDENT STUDY SHOWED THAT MATHEMATICAL SCIENCES CONTRIBUTED £208 BILLION (AROUND 16 PER CENT) TO UK GVA

Our Strategic Plan will:

• deliver a portfolio of world-class research by internationally regarded leaders

• support more extensive and rapid exploitation of research outcomes

• maintain the UK’s reputation for excellence and keep it at the heart of global research and innovation

• nurture the next generation of skilled researchers and innovators and provide the knowledge and skills vital to a healthy, sustainable and prosperous society

is being widely adopted by others. We will continue to learn from and evolve this model of training and ensure it complements the flexible support provided through our Doctoral Training Partnerships.

We will deliver a balanced skills portfolio to avoid systemic skills shortages in the UK and increase the satisfaction of both students and their future employers.

We will also support the capital infrastructure needed to ensure the needs of a world-class research base are met and sustained. We will continue to build efficiencies through equipment sharing and strategic investments of capital around centres of excellence to ensure that the research base as a whole benefits from long-term funding.
**MEASURING SUCCESS**

We will evaluate the success of our strategies in relation to both research investments and acceleration of research impact and will use this feedback to target our support.

We will develop and publish a range of metrics that we will use to monitor our progress in delivering our strategic plan goals. These will be presented in our new Delivery Plan.

For example, we will use internationally-recognised measures of bibliographic quality to monitor achievement of research excellence.

We will use data on inward international investment in UK-based research to evidence the level of confidence in the quality of our research base.

We will also provide examples that demonstrate the effective transfer of knowledge from our research to a wide range of users and evidence the impact, either directly or indirectly, on society and the economy.

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**UK RANKED**

3rd in the world by cites/paper in all EPS subjects

39% of EPSRC students employed in business and public services immediately after their PhD

Collaboration fostered through the EPSRC-supported Innovative Manufacturing Research Centres delivered actual gross impacts of around 16 times the EPSRC investment.
Moving Forward

We will develop in cooperation with the research community and our partners a detailed delivery plan in 2014/15.

Since 2007 over 150 new spinout companies have arisen from EPSRC-supported research.

EPSRC’s Strategic Plan 2015 has been developed following input from our partners and communities. It recognises external influences including the international research landscape, global economic situation and government strategies. It will allow us to continue to deliver the world-leading science and engineering research and skills to sustain UK innovation.

Success will not be achieved by EPSRC alone. We will build stronger partnerships with universities, industry and others to work together with a shared sense of purpose to develop priorities.

We will develop in cooperation with the research community and our partners a detailed Delivery Plan in 2014/15. This will set out how our strategy will be delivered across our portfolio, providing a blueprint for continued success.
‘Miracle material’ graphene was first isolated during ‘blue sky’ experiments, by EPSRC-supported University of Manchester scientists Professor Andre Geim and Dr Konstantin Novoselov. Graphene is the lightest, strongest and most conductive material known to mankind.

1995
EPSRC-supported research into renewable energy at Loughborough University resulted in a hybrid battery/fuel cell power source for road vehicles.

1960s
EPSRC has supported research into optical communications at the University of Southampton for over 40 years.

2000
World-leading research in regenerating human tissue using bio-scaffolds has been supported by EPSRC at the University of Leeds for over a decade.
2010
Geim and Novoselov were awarded the 2010 Nobel Prize for Physics for their work with graphene.

2011
Geim and Novoselov showed a 20-fold enhancement in harvesting light using graphene, which could pave the way for advances in high-speed internet.

2001
Spin-out company Intelligent Energy was formed with a core team of EPSRC funded researchers joining the company from its inception to lead its R&D.

1989
The EPSRC-funded Optoelectronics Research Centre (ORC) was set up, led by Professor David Payne, and is now a leading centre for photonics, optic telecommunication and high-power lasers.

2009
The Innovation and Knowledge Centre in Medical Technologies was established at the University of Leeds with funding from EPSRC, BBSRC and Innovate UK and now works alongside the EPSRC Centre for Innovative Manufacturing in Medical Devices launched in 2013.
The UK Government announced a £50 million investment to establish the UK as a global graphene research hub, funded through EPSRC and Innovate UK.

**2012**

*Zero carbon London taxis* used in the 2012 Olympics were powered using Intelligent Energy fuel cell technology.

**2014**

Intelligent Energy employs 350 people worldwide and was valued at £639 million on the London Stock Exchange.

**2005**

Spin-out company SPI lasers created 150 jobs and was floated on AIM with a valuation of £40 million. The ORC has created over 10 successful spin-out companies, over 500 jobs and files at least 20 patents a year.

**2007**

Spin-out company *Tissue Regenix* was formed and now has a market value of over £60 million.

**2013**

Professors *Fisher and Ingham* are collaborating with the NHS Blood & Transplant Tissue Services to develop, optimise and validate biological scaffolds suitable for ligament replacement.
BUILDING LEADERSHIP

2014: Over £950M investment in 115 Centres for Doctoral Training, across 33 universities, with 1,100 partnering companies and supporting over 7,000 students.

“What scientists and engineers are vital to our economy and society. It is their talent and imagination, as well as their knowledge and skills, that inspire innovation and drive growth across a range of sectors from manufacturing to financial services.”

Rt Hon David Willetts, former Minister for Universities and Science

BALANCING CAPABILITY

From 2012: Having indicated Catalysis as a research area to grow EPSRC has:

• established a Catalysis hub, investing £12.9M, with 4 Principal Investigators, 34 Co-Investigators and 21 institutions across Physical Sciences, Engineering, Energy and Manufacturing.
• invested in 3 Early Career Fellowships and 2 Established Career Fellowships.
• included Catalysis as a theme in three of the chemical sciences and engineering Grand Challenges.
• funded 1 Programme grant, 1 Platform grant and 1 Critical Mass grant as well as numerous standard and First grants.

ACCELERATING IMPACT

2012: £60M investment in UK universities through Impact Acceleration Accounts to help scientists and engineers create successful businesses from their research, improve industrial collaboration and foster greater entrepreneurship. Awards ranging from £600,000 to £6M made to 31 universities across the UK.

“The UK’s scientists are some of the most innovative and creative people in the world, but they need support to take their best ideas through to market. This investment will help our leading universities become centres of innovation and entrepreneurship, generating commercial success to fuel growth.”

Vince Cable, Business Secretary
EPSRC’s Delivery Plan is set to be launched in 2015/16.

It will be developed in consultation with the research community and our partners and will set out how EPSRC’s strategy will be implemented across our portfolio.

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EPSRC is the main UK government agency for funding high-quality basic, strategic and applied research and related postgraduate training in engineering and the physical sciences, to help the nation exploit the next generation of technological change. It invests more than £800 million a year in a broad range of subjects – from mathematics to materials science and from information technology to structural engineering.