

**THE ALLOCATION OF SCIENCE AND  
RESEARCH FUNDING**

**2011/12 TO 2014/15**

**INVESTING IN WORLD-CLASS SCIENCE  
AND RESEARCH**

DECEMBER 2010

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## Foreword: Funding World-Class Science and Research in the UK

Our world-class science and research base is inherently valuable, as well as critical to promoting economic growth. Investment in science and research creates new businesses and improves existing ones; brings highly skilled people into the job market; attracts international investment and improves public policy and services. The UK's world-class research base will be a key driver in promoting economic growth.

Despite enormous pressure on public spending, funding for science and research programmes has been protected in cash terms demonstrating the Government's commitment to rebalancing the economy and promoting economic growth. For the first time Higher Education research funding in England has been included within this ring-fence, providing stability and certainty to both parts of the dual support system of research funding. Across the country, we have excellent research capabilities with the critical mass to compete globally and the expertise to work closely with business, charities and public services. The £4.6 billion per annum resource settlement for science and research will allow us to continue to support them. We will protect the vital components of research infrastructure and maintain membership of international facilities, providing researchers with access to key large scale research infrastructure, both here and abroad.

It is right to maximise the benefits of excellent research of all kinds. We welcome the impact that research has on society, public policy, culture, the quality of life and of course the economy. We can be proud of our excellent research capacity across the natural sciences, engineering, social sciences and the arts and humanities paid for by the public.

We will achieve efficiencies of £324m by 2014-15. All these savings will be reinvested in science and research, within the ring-fence. The Higher Education Funding Council for England will reform Quality Related research funding and the Higher Education Innovation Fund with a greater focus on research excellence and performance.

A theme of collaboration runs throughout these allocations of science and research funding. In a period of constrained public finances, we will put increased emphasis on bringing people together to develop creative solutions. Researchers will have access to a wider range of facilities and equipment through a pooling of resources and expertise. This larger pool of capability will be crucial in building the reputation of UK science and research and attracting international investment and talent.

These allocations and reforms will provide strong incentives and rewards for universities to improve further their relationships with business, charities and government, and to deliver even more impact on the economy and society.

The Research Councils and the Technology Strategy Board have identified a number of strategic priority areas within the broad themes of high-value manufacturing; healthcare; digital; low carbon; energy and resource efficiency. The research base has a number of clusters of excellent science which have strong relationships with industrial 'hotspots' of innovation and growth. We value the arts and humanities and the social sciences and are maintaining their broad share of Research Council funding.

We shall be providing funding to put the new UK Space Agency on a firm initial footing in meeting key national challenges. The UK

Space Agency programme will mean that the UK remains at the forefront of global scientific excellence in space, as well as in the exploitation of space infrastructure, products and services.

Across the allocations we shall provide funding for outstanding researchers to pursue curiosity driven work, allowing them to define their own areas of work. We shall continue to fund three of the UK's National Academies, principally to allow a cadre of the most capable researchers to work full-time in their chosen areas of research. These allocations will also provide funding for the British Academy to extend research in quantitative social sciences and modern languages.



David Willetts

David Willetts  
Minister for Universities and Science

Engaging people with science and engineering and providing an effective and diverse Science, Technology, Engineering and Mathematics (STEM) education pipeline has never been more important. In an increasingly technological world, everyone needs to understand the benefits and potential concerns around new developments which may affect us all. It is also vital that we develop and maintain a STEM workforce capable of meeting global challenges. Our Science and Society Programme provides a framework of support to help us to achieve this.



Vince Cable

Vince Cable  
Secretary of State

Department for Business, Innovation and Skills

# PART 1: Investing in World-Class Science

Maintaining the ring-fence around science and research programme funding, and including within it block grant funding for research in England, is clear evidence of the Government's commitment to science and research. The ring-fence provides stability and certainty to the research base.

Research Councils and Funding Councils will be able to focus their contribution on **promoting impact through excellent research, supporting the growth agenda**. They will provide strong incentives and rewards for universities to improve further their relationships with business and deliver even more impact in relation to the economy and society.

The Science and Research funding allocations will support the very best research, **by further concentrating resources on research centres of proven excellence and with the critical mass and multi-disciplinary capacity** to address national challenges and compete internationally. The vital components of research infrastructure will be protected and membership of international facilities will be maintained, providing researchers with access to key large scale research infrastructure, both here and abroad.

These allocations will maintain the UK national capability to respond to emergencies in areas such as human and animal health, flooding and pollution.

Funding will be provided for **outstanding researchers to define their own areas of work**. Funding from Research Councils, HEFCE QR and National Academies will all contribute to this.

Significant funding will be directed to **cross-Council programmes**, which are long-term commitments to research of key national importance, such as the ageing population, environmental change, global security, energy and the digital economy. In addition the Research Councils are establishing a **new programme on Global Food Security**, to help meet the challenge of providing a growing world population with a sustainable food supply a limited resource of land.

Funding is being provided to put the new **UK Space Agency** on a firm initial footing to meet key national challenges. The UK Space Agency programme will allow the UK to remain at the forefront of global scientific excellence in space as well as in the exploitation of space infrastructure, products and services. The Agency will actively promote interaction between academia and industry to translate research skills into engineering capability - both areas in which the UK excels.

The Department will fund two projects (UKCMRI, see page 10 and Diamond Phase III, see page 39) that were announced in the Spending Review.

## Highlights

### *Diamond Light Source synchrotron*

The Diamond Light Source is a valuable facility for UK business as well as academics. Recent collaborations include working with pharmaceutical giants Pfizer and GlaxoSmithKline on drug discovery and development; high-tech manufacturers including Rolls Royce on aerospace and energy applications and Johnson Matthey on nano-electronic components and emissions control catalysts.

Recently, a team from Imperial College London used Diamond to understand how HIV and other retroviruses infect human or animal cells, helping with the design of better drugs for fighting AIDS.

### *UK scientists win three Nobel Prizes in 2010*

Nobel Prize Physics duo Professors Andre Geim FRS and Konstantin Novoselov at Manchester produced sheets of carbon just a single atom thick, which could herald a new generation of electronic devices. The research was funded by EPSRC and the Royal Society.

Professor Robert Edwards (University of Cambridge) won the prize in Physiology or Medicine for pioneering work on in vitro fertilisation (IVF).

Professor Christopher Pissarides (London School of Economics) shared the prize in Economic Sciences.

### *Volcanic ash cloud*

UK air space was reopened using advice and data from NERC-funded scientists.



The Natural Environment Research Council's (NERC) Airborne Research and Survey Facility flew its Dornier 228 research aircraft in April 2010 to the edge of the volcanic plume over Britain caused by the Icelandic volcano Eyjafjallajökull, recording data relating to the height, density and position of the plume.

Their findings contributed greatly to the agreement with the aviation industry which allowed UK airspace to reopen. NERC scientists were also appointed to scientific and operational advisory groups set up by the Government to deal with this and future environmental emergencies. Many other scientists funded by NERC, including

volcanologists at the British Geological Survey (a NERC- funded centre of geological and earth science expertise), also played important parts during the crisis.

### *Red sludge disaster*

In the wake of the red sludge disaster the people of Hungary has been aided by ideas, technology and extra capacity from NERC- funded scientists.

In October 2010 alkaline waste from aluminium production, escaped near Ajka in Hungary when a dam collapsed. This killed nine people and seriously affected nearby villages, rivers and 40 square kilometres of land.



The UK Government Chief Scientific Adviser, Sir John Beddington facilitated the involvement of the British Geological Survey and Newcastle University in the clean up and in measures designed to limit the impact of the spillage.

Working with the Hungarian environment ministry, the British Geological Survey team offered a range of modelling techniques, developed in the UK, in order to assess the local geology, the likely environmental health impact of the sludge and the most effective form of dam construction for containing the substance.

### *The Large Hadron Collider (LHC)*

The UK is a major partner in CERN (the European Particle Physics Research Organisation) which has built and operates the LHC. UK scientists, with funding from STFC, have contributed vital hardware, computing and expertise to the LHC, and are now using it to understand some of the major unsolved puzzles of our Universe.



## **Cross-Council Programmes**

Novel, multidisciplinary approaches will be needed to solve many, if not all, of the big research challenges over the next 10 to 20 years. To achieve this, the Research Councils will deliver multidisciplinary research programmes in six priority areas addressing major societal and economic challenges.

Each programme is important in terms of the knowledge and skilled people generated, and all have significant potential for delivering economic impact. Effective coordination of the programmes through Research Councils UK (RCUK) will accelerate the delivery of benefits and economic impact.

The six RCUK priority areas are:

### ***Global uncertainties: security for all in a changing world***

In a time of increased uncertainty this programme will help governments, businesses and societies to predict, detect, prevent and mitigate threats to security. Economic security depends on effective national security. The programme focuses on six core areas: cyber-security; ideologies and beliefs; proliferation of chemical, biological, radiological, nuclear and explosive weapons and technologies; terrorism; threats to infrastructures; and transnational organised crime.

### ***Living with environmental change***

Human activity has caused the acceleration of environmental change. This programme aims to optimise the coherence and effectiveness of UK environmental research funding, so that government, business and society have the foresight, knowledge and tools needed to mitigate, adapt to and capitalise on

environmental change. It is a partnership of 22 major UK public sector funders and users of environmental research, including the Research Councils, central government departments and devolved administrations.

### ***Digital economy***

ICT and Digital technology can transform important areas of our lives including improved health and a more inclusive society. This programme is aimed at building a base of people and expertise to put the UK at the forefront of the digital economy. It is bringing together the UK's world-class ICT research base with the other disciplines needed to deliver its benefits and match those with a strong user pull to deliver multidisciplinary, user focused research.

### ***Ageing: Lifelong health and wellbeing***

Improvements in healthcare, diet and sanitation have resulted in a dramatic increase in life expectancy over the past century. In 20 years time almost a quarter of the UK population will be over 65. This initiative will target major factors over the life course that influence health and wellbeing in later life; develop effective interventions that lead to improved health and quality of life in older age; inform policy and practice including the development of services and technologies to support independent living; and increase capacity and capability in ageing-relevant research.

### ***Energy***

We need secure, affordable and sustainable energy supplies to facilitate our economy and way of life. This programme aims to position the UK to meet its energy and environmental targets and policy goals through world-class



research and training. The programme will work in partnership to contribute to the research and postgraduate training needs of energy-related businesses and other key stakeholders; increase the international visibility and level of international collaboration within the UK energy research portfolio and expand UK research capacity in energy-related areas.

### *Global food security*

The UN Food and Agriculture Organization predicts that demand for food will grow by almost 50% by 2030 and 70% by 2050 (based on 2005/07 average data). Meeting this scale of growth in demand, in ways that are environmentally, socially and economically

sustainable, and in the face of global climate change, presents huge challenges. The world will need to produce and supply more food using less land, water, fertiliser, energy and other inputs and reduce waste and greenhouse gas emissions throughout the food supply chain, from production to consumption. The global food security programme was launched in March 2010 and brings together the research interests of the Research Councils, the Department for International Development, the Department for Environment Food and Rural Affairs, the Food Standards Agency, Technology Strategy Board and the Scottish Government.

**Table of Research Council spend on priority programmes**

£m	AHRC	BBSRC	EPSRC	ESRC	MRC	NERC	STFC	TOTAL
Digital Economy	12		106	11				129
Energy		51	439	13		20	17	540
Global Food Security		416		8	10	15		440
Global Uncertainties	10	4	64	35	15	4	3	120
Lifelong Health and Wellbeing	2	48	23	40	83			196
Living with Environmental Change	7	54	54	39	100	305	3	562

## Relations with the Technology Strategy Board (TSB)

The Research Council-TSB partnership is now stronger and more diverse than before – evolving from traditional (e.g. aerospace) and technology push areas to addressing key challenges (e.g. agri-food) and new sectors of the economy that are important to the UK (e.g. creative industries). The partnership enables investments in research to be closely informed by business, so that businesses will more readily adopt innovations that stem from excellent research.

Going forward the Research Councils and the TSB have identified a number of strategic priority areas within the broad themes of high-value manufacturing; healthcare; digital; low carbon; energy and resource efficiency. The Research Councils will also work with the Technology Strategy Board to help deliver Technology and Innovation Centres.

## Medical Research and UKCMRI

The Medical Research Council resource funding has been set in order to maintain its expenditure in real terms over the period of the Spending Review. This is to complement the real terms increase in the Department of Health's research budget, within which additional funding will be made available to support the translation of research into practical applications, including the development of new medicines and therapies. The Office for Strategic Coordination of Health Research (OSCHR) will continue to play an important role in oversight of the coordination of funding for translational medical research, in order to maximise the impact of funding streams and minimise gaps in translational research.

The Department of Health will provide £220 million of capital funding in the 4 years to 2014-15 as part of the Spending Review settlement so that the UK Centre for Medical Research and Innovation (UKCMRI) can proceed swiftly. UKCMRI will be one of the most significant developments in UK biomedical science for a generation. Its goal will be to understand the biology underlying human health, and thereby finding ways to prevent and treat the most significant diseases affecting people today.

## Other funding

In addition to the £4.6 billion per annum of programme funding for science and research, £1.9 billion of capital over the 4 years of SR10 has been allocated to science and research. The first year of that capital allocation is firm but the remaining years are indicative only at this stage. These allocations also cover the budgetary provision for depreciation and impairments.

In addition, the Research Councils will be allocated a separate budget to cover their administrative costs. Those administration budgets are not covered in this publication.

The creation of the Department for Business Innovation and Skills brought together responsibility for both elements of the dual support system of science and research funding. These allocations are the first to be made on that unified basis. The funding covered by this publication also encompasses the whole of space expenditure supported by the Department. Previously funding had been divided between two Research Councils and the TSB.

## How these benefits will be delivered

### International excellence

The UK has an excellent track record in science and research. Despite growing international competition, the UK research base is second in the world for excellence and the UK is the most productive country for research in the G8. The UK remains first or second in the world at research in most disciplines overall.

### Campuses

Campuses provide:

- thriving environments for businesses, industry and universities in areas including biomedical research, energy, security, climate and the environment;
- access to advanced world-leading facilities and scientific services;
- a culture of collaboration and innovation to support the creation and growth of new business;
- access to a unique training environment and world-leading expertise

The National Science and Innovation Campuses at Harwell, Oxfordshire, and Daresbury, Cheshire, are key foci of public investment in science and innovation. In addition, Research Councils are pursuing other campus developments in Cambridge and Norwich to maximise existing investment in existing research facilities there.

### Harwell Science and Innovation Campus (HSIC)

HSIC is a joint venture between STFC, the United Kingdom Atomic Energy Authority and the property developer Goodman International. It has a track record of developing long-term partnerships with the organisations using its buildings and facilities.

More than 145 organisations are already located on the Harwell Campus, including the European Space Agency's new UK centre, specialising in space robotics and climate change research.

### Daresbury Science and Innovation Campus (DSIC)

On 19 November 2010 the Government announced the formation of a public-private joint venture to establish DSIC as a leading location for scientific research, innovative technology development and entrepreneurial collaboration. This partnership comprises STFC, Halton Borough Council, the North West Development Agency (NWDA) and private sector property investment development company, Langtree. This joint venture will attract further domestic and international inward investment in world-class scientific research and innovation.

### Cambridge and Norwich

BBSRC will develop its campuses in Norwich and Cambridge as part of the innovation system driving the UK economy: At Cambridge BBSRC will continue to develop the Babraham Research Campus (BRC) beyond the 30 companies already on site, as

part of the Cambridge science and innovation cluster.

The Norwich Research Park (NRP) consists of BBSRC's Institutes, the John Innes Centre, the Institute of Food Research and the Genome Analysis Centre, which sit alongside the Sainsbury Laboratory, the University of East Anglia and the Norfolk and Norwich University Hospital and 30 science related businesses. The NRP provides a unique concentration of research resources, plants and microbes, food and interdisciplinary environmental science. This combination of strengths is central to the cross-Council programmes including Living with Environmental Change, Bioenergy, Global Food Security and Healthy Ageing.

### **Impact on critical mass and clusters**

Across the country, the UK has excellent university research capabilities with the critical mass to compete globally and the expertise to collaborate with businesses and other organisations. Our policy is to concentrate funding further on research centres of proven excellence, so these centres have the critical mass to address national challenges and compete internationally.

The priority is to retain investment in these clusters, to strengthen engagement between the research base and industry, and complement the existing portfolio of joint activity between the research base, TSB and local and regional innovation bodies.

## How the budget was allocated

### The Haldane Principle

The Haldane Principle means that decisions on individual research proposals are best taken by researchers themselves through peer review. The Coalition Government supports this principle as vital for the protection of academic independence and excellence.

Over the years there has been some uncertainty over the interpretation of the Haldane Principle. After consulting senior figures in the science and research community, the Government has now offered a further clarification. The full text of the Government statement can be found in Annex A of this document.

The decisions leading to the allocation of science and research funding as set out in this document have been made in accordance with the Haldane Principle and the Government statement.

### BIS strategic priorities for science and research funding

In order to protect national capability and international competitiveness and to maximise the economic and social benefits of research, the following criteria were developed for the prioritisation of science and research funding – covering the project-based Research Council funding, the block-grant HEFCE funding, and individual researcher support provided by the Research Councils and National Academies.

- Further concentrating funding on research centres of proven excellence and with appropriate critical mass and multi-disciplinary capacity to address national challenges and compete internationally.
- Providing relative protection to funding in areas attracting leveraged funding from collaboration with charities, business and other private sector funders of research.
- Maintaining a substantial flow of new researchers
- Maintaining national capability to support other Government departments that deal with crises such as foot and mouth disease and extreme weather events.
- Providing researchers with access to key large scale research infrastructure, both here and abroad.
- Supporting cross-Council research into strategic national challenges identified by Government, such as Energy and Climate Change.
- Pursuing a research cluster strategy to support economic growth in strong and emerging industrial sectors, and encouraging close working between Research Councils and TSB.
- Maintaining stability of funding over the medium-to-long term to achieve best Value for Money, provide institutional stability and enable recruitment and retention of research staff (through continuation of a ring-fenced budget).
- Promoting financial sustainability in the UK research base through maintenance of the full economic cost

policy of research funded by Research Councils.

### Consultation

Advice was sought from the following bodies, all of whom have high-level overviews of science and research:

- The Royal Society
- The Royal Academy of Engineering
- The British Academy
- The Council for Science and Technology
- The Chief Scientific Advisers' Committee
- The Confederation for British Industry
- The Academy of Medical Sciences

The Director General for Science and Research met the leaders of each of these bodies, and written advice was provided which helped to shape the priorities listed above.

### Allocation process

Following the confirmation of the overall resource funding for science and research in the Chancellor of the Exchequer's Spending Review announcement in October 2010, the Research Councils, HEFCE, the UK Space Agency and the National Academies were asked to set out delivery plans for the period 2011-2015, taking account of the priorities set out above. Ministers' decisions on the allocations of science and research funding took account of the extent to which those Delivery Plans met the priorities set out

above and also took account of the views expressed in the consultation process.

During the consultation the strong advice was that the current balance between Research Councils, National Academies and HE Research Funding should be broadly maintained and Ministers have accepted and followed that advice. Within the resource allocation which overall has been maintained level in cash terms we have made a number of adjustments, including: (a) to meet financial pressures mainly arising from additional costs of international subscription owing to exchange rate movements since the previous allocations in October 2007; (b) in accordance with the terms of the Spending Review, to increase the allocation to MRC to a level which maintains expenditure at real terms, taking account also of increased funding from income; and (c) to provide for the increased running costs of the national facilities operated by STFC at the level agreed by Research Councils collectively.

Against a background of a reduction in capital funding across Government a careful judgment has been made over the funding available, after taking account of existing commitments. This has balanced the desirability for some further investment in new facilities to keep the UK at the forefront of science and research whilst maintaining at a reduced level continuing investment to maintain the UK's existing research infrastructure and facilities - both those owned and operated by Research Councils and those directly within the HE sector.



## Efficiency

The Wakeham Review of Financial Sustainability and Efficiency in Full Economic Costing of Research in UK Higher Education Institutions was commissioned by the Research Councils and Universities UK to make practical proposals on the implementation of efficiency drivers within a more robust regime for monitoring HEI sustainability.

The Review, published in June 2010 recommended that the best way to constrain the indirect costs within the Full Economic Costing regime for Research Council funding was to place efficiency targets on HEIs, applying tighter constraints to those institutions with relatively high overhead rates. The principles of the Wakeham recommendations will be applied across the spectrum of research funding, as the core of the driver for efficiency savings in SR10. This - together with pay restraint - will deliver £324m of efficiency savings in 2014-15 (7% of the £4.6 billion resource funding). These savings will be reinvested in science and research within the ring-fence.

The Research Councils will publish a plan by March 2011 specifying how they will deliver their share of these savings. HEFCE will also look to HEIs to deliver these savings in respect of their QR funding.

An equivalent level of savings is also expected to be achieved by applying this approach to the other areas of research funded (Research Council institutes, National Academies' programmes and international

subscriptions). Research Councils will bear down on the indirect and estate costs of their institutes and achieve savings from the public sector pay restraint that will apply to researchers working in their institutes.

Although the Government does not have direct control over the costs of international science organisations (such as CERN), it has been pressing them to reduce their costs and budgets to reflect the pressure on public finances that the UK and other countries face. Good progress has already made on this.

The Research Councils have actively driven efficiency in their own operations in recent years, most notably through the creation of a Shared Services Centre which will generate "back office" efficiencies, including procurement; the consolidation of their administrative headquarters in Swindon (with AHRC and MRC having moved there during 2010); the rationalisation of their peer review process; and a sustained programme of review leading to the merger or transfer to the private sector of some of their research institutes.

Efficiency saving per annum in 2014/15	Delivery
£131m	Research Council funding for HEIs
£104m	Block grant funding for universities (QR)
£89m	Research Council Institutes, facilities and subscriptions, and other programmes

## Reform

### Universities

HEFCE will further reform QR funding both for research and for support for the next generation of researchers by selectively funding on the basis of internationally excellent research, while maintaining support for institutions leveraging funding from external sources.

### Supporting business competitiveness

Collaboration will be strengthened between Research Councils and business, working with the TSB, including the proposed new Technology Innovation Centres, and through more strategic partnerships with major companies.

HEFCE will take forward reform of Higher Education Innovation Funding rapidly. Reforms, based on the current formulaic approach, will provide greater incentives to HEIs to increase interaction with business and other users, through a focus on

performance rather than capacity, incentivising the highest performing institutions further and supporting only the most effective performers.

### Further reforms:

Other elements of the reform agenda include:

- Greater prioritisation of research funding to high quality people (scholarships, fellowships, link with academies) situated in best research groups linked to growth.
- Prioritising Research Council postgraduate support on pathways to research doctorates.
- Fewer, larger Research Council grant rounds with more active management of demand (to reduce nugatory effort).

# PART 2: The Allocations

## Resource

	Baseline 2010-11 £'000	2011-12 £'000	2012-13 £'000	2013-14 £'000	2014-15 £'000	TOTALS £'000	Final Year to Baseline
<b>Research Councils</b>	<b>2,549,353</b>	<b>2,596,196</b>	<b>2,573,678</b>	<b>2,586,641</b>	<b>2,599,812</b>	<b>10,356,327</b>	<b>101.98%</b>
AHRC	100,717	99,881	98,370	98,370	98,370	394,993	97.67%
BBSRC	362,341	370,306	359,471	351,471	351,471	1,432,718	97.00%
EPSRC	771,289	759,720	748,150	748,150	748,150	3,004,171	97.00%
ESRC	158,061	155,690	153,319	153,319	153,319	615,648	97.00%
MRC	545,585	536,172	546,243	559,894	574,641	2,216,950	105.33%
NERC	298,071	298,600	297,129	300,129	289,129	1,184,987	97.00%
STFC - Core Programme	177,519	190,060	172,200	172,200	172,190	706,650	97.00%
STFC - Cross-Council facilities <sup>1</sup>	66,800	77,170	79,280	81,410	89,470	327,330	133.94%
STFC - International Subscriptions <sup>2</sup>	68,970	108,598	119,515	121,697	123,071	472,881	178.44%
<b>HEFCE</b>	<b>1,731,300</b>	<b>1,662,112</b>	<b>1,699,578</b>	<b>1,685,689</b>	<b>1,686,321</b>	<b>6,733,700</b>	<b>97.40%</b>
QR Research	1,618,300	1,549,112	1,586,578	1,572,689	1,573,321	6,281,700	97.22%
HEIF <sup>3</sup>	113,000	113,000	113,000	113,000	113,000	452,000	100.00%
<b>National Academies</b>	<b>87,832</b>	<b>87,465</b>	<b>86,547</b>	<b>86,547</b>	<b>86,547</b>	<b>347,106</b>	<b>98.54%</b>
Royal Society	48,558	47,830	47,101	47,101	47,101	189,133	97.00%
British Academy	26,448	27,001	27,005	27,005	27,005	108,015	102.10%
Royal Academy of Engineering	12,826	12,634	12,441	12,441	12,441	49,957	97.00%
<b>Other Programmes</b>	<b>43,616</b>	<b>24,496</b>	<b>24,140</b>	<b>24,165</b>	<b>24,005</b>	<b>96,805</b>	<b>55.04%</b>
Science & Society	15,441	13,000	13,000	13,000	13,000	52,000	84.19%
International	5,104	5,095	4,740	4,765	4,605	19,205	90.22%
Foresight	2,800	2,800	2,800	2,800	2,800	11,200	100.00%
Evidence & Evaluation	20,271	3,600	3,600	3,600	3,600	14,400	17.76%
UK Space Agency	163,805	205,637	191,963	192,864	179,221	769,685	109.41%
<b>Total S&amp;R Resource</b>	<b>4,575,906</b>	<b>4,575,906</b>	<b>4,575,906</b>	<b>4,575,906</b>	<b>4,575,906</b>	<b>18,303,622</b>	<b>100.00%</b>

<sup>1</sup> Operated by STFC on behalf of all Research Councils.

<sup>2</sup> Managed by STFC on behalf of all Research Councils. Total resource expenditure on international subscriptions in 2010-11, including the additional exchange rate costs was £103m. The SR10 allocations are at the exchange rates prevailing in early December 2010 and reflect a shift in funding from capital to resource as explained on page 20.

<sup>3</sup> HEIF will also include £37 m pa from HEFCE, taking the total for each year to £150m.

## Depreciation and impairment

Council	Baseline 2010-11 £'000	2011-12 £'000	2012-13 £'000	2013-14 £'000	2014-15 £'000	Total £'000	Final Year to Baseline
AHRC	-	170	165	152	151	638	
BBSRC	6,916	7,500	7,900	10,100	10,100	35,600	146.04%
EPSRC	8,756	11,000	11,000	8,000	7,000	37,000	79.95%
ESRC	387	247	316	167	167	897	43.15%
MRC	22,127	46,295	48,849	48,751	43,729	187,624	197.63%
NERC	23,196	38,000	38,000	39,000	41,000	156,000	176.75%
STFC	69,324	75,260	74,210	76,090	78,210	303,770	112.82%
<b>TOTAL</b>	<b>130,706</b>	<b>178,472</b>	<b>180,440</b>	<b>182,260</b>	<b>180,357</b>	<b>721,529</b>	<b>137.99%</b>

## Capital

Note these figures are indicative for the three years from 2012-13 to 2014-15

Council	Baseline 2010-11 £'000	2011-12 £'000	2012-13 £'000	2013-14 £'000	2014-15 £'000	Total £'000	Final Year to Baseline
Research Councils	393,438	239,821	199,393	181,430	180,967	801,611	46.00%
AHRC	3,150	0	0	0	0	0	0.0%
BBSRC	66,480	38,000	29,700	29,700	29,700	127,100	44.68%
EPSRC	49,261	31,000	35,000	25,000	25,000	116,000	50.75%
ESRC	20,600	18,700	13,700	12,700	12,700	57,800	61.65%
MRC	134,517	33,000	29,000	31,000	31,000	124,000	23.05%
NERC	34,183	32,200	17,800	17,800	17,800	85,600	52.07%
STFC—Core Programme		19,630	21,981	14,237	14,169	70,017	
STFC—Cross-Council Facilities	85,247	21,070	21,919	22,463	22,931	88,383	75.98%
STFC - International Subscriptions <sup>4</sup>		46,221	30,293	28,530	27,667	132,711	
Large Facilities Capital Fund	103,380	115,279	61,307	47,769	128,132	352,487	123.94%
UK Space Agency	19,000	19,000	19,000	19,000	19,000	76,000	100.00%
HEI Capital HEFCE	166,952	75,170	90,970	90,160	101,500	357,800	60.80%
HEI Research Capital England	158,420	53,199	64,377	63,810	71,831	253,217	45.34%
HEI Research Capital Scotland <sup>5</sup>	23,622	8,620	10,431	10,339	11,639	41,029	49.27%
HEI Research Capital Wales <sup>5</sup>	6,031	2,113	2,557	2,535	2,854	10,059	47.32%
HEI Research Capital N. Ireland <sup>5</sup>	1,778	798	965	957	1,077	3,797	60.57%
<b>TOTAL</b>	<b>872,621</b>	<b>514,000</b>	<b>449,000</b>	<b>416,000</b>	<b>517,000</b>	<b>1,896,000</b>	<b>59.25%</b>

<sup>4</sup> This figure reflects a shift from capital to resource that is outlined on page 20.

<sup>5</sup> These funds are allocated on the basis that they will be supplemented by further funding from each of the devolved HE funding bodies.

## Research Councils

The seven Research Councils will collectively provide public investment in science and research covering the complete range of academic disciplines from arts and humanities, astronomy, physics, chemistry and engineering to medical and biological sciences, social sciences, economics and environmental sciences.

The Research Councils are non-departmental public bodies. They are independent legal bodies outside of government, accountable to Parliament and established by Royal Charter under the 1965 Science and Technology Act (or in the case of AHRC, the Higher Education Act, 2004).

### Role of the Research Councils

The Research Councils seek to provide a world-class science and research base and through this to make a major contribution to a productive economy, healthy society and a sustainable world. Their focus is on excellence with impact. To this end they fund research, provide research facilities and support postgraduate training.

### Economic and social impact of research

Excellent research pushes back the frontiers of knowledge but this is not the only benefit. It supports growth in the economy by improving the performance of existing business, creating new businesses, delivering highly skilled people to the labour market, improving public services and policy making and by attracting R&D investment from global business. Contributing to the economic competitiveness of the UK is a

prominent part of the Research Councils' individual strategies.

### Key challenges

Research Councils work together to develop research programmes that address key challenges such as Living with Environmental Change; Energy; Global threats to security, Ageing: Life Long Health and Wellbeing, Digital Economy; and Food security. These programmes bring together the research community with key users of research from business and the public sector.

### International Subscriptions

The UK faces significant foreign exchange pressures which are reflected in the resource allocation for international subscriptions. Negotiations on the cost of the international subscriptions have offset some of these effects. The overall cost of international subscriptions will decline by about 9% by the end of SR10 following negotiations with each of the partner bodies.

Over the next Spending Review the nature of the international subscriptions expenditure changes from the last Spending Review. The completion of the construction of the CERN accelerator and major ESO projects means that a greater proportion of the subscriptions will be used on operating costs and less on capital. This means that the Resource costs increase and Capital costs decrease sharply within an overall fall in subscriptions cost.



## Research Council Facilities

Lord Drayson, whilst Science and Innovation Minister, reviewed the role and funding of the STFC in 2010. He recommended “better management of pressures arising from international subscriptions (such as CERN), and longer-term planning and budgeting for large domestic facilities (such as Diamond)”<sup>6</sup>. That approach has been adopted in these allocations.

## Research Councils UK

Research Councils UK (RCUK) is the strategic partnership of the UK Research Councils. It facilitates and enables the Research Councils to work together to maximise their impact, effectiveness and efficiency by providing a single focus of advice, information and policy development for the Research Councils, as well as international representation and contributing to the delivery of the Government’s objectives for science and innovation.

Each Research Council is an equal partner in RCUK. Leadership for the partnership is provided by the Research Councils’ Chief Executives working together through RCUK Executive Group (RCUKEG).

The RCUK Strategic Vision reflects the Research Councils’ opportunities for joint working. It complements the Research Councils’ individual delivery plans and should be read in conjunction with these. The Strategic Vision can be found at [www.rcuk.ac.uk](http://www.rcuk.ac.uk).

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<sup>6</sup> STFC Press Release - Ministerial Review of STFC

## Arts and Humanities Research Council (AHRC)

### Breakdown of the allocation

£000	2011-12	2012-13	2013-14	2014-15	Total
Resource	99,881	98,370	98,370	98,370	394,993
Depreciation and impairments	170	165	152	151	638
Capital	0	0	0	0	0

### Strategic Direction

AHRC funds research, training and knowledge exchange in the arts and humanities. Its strategic goal is to deliver world-leading research that:

- furthers understanding of human society, culture and creativity;
- analyses historical and social context, and the interpretation of experiences, identities and cultural assumptions; and
- creates social and economic benefits directly and indirectly through improvement in social and intellectual capital, social networking, community identity, learning and skills and quality of life.

### Research Priorities

AHRC will direct a significant part of its funding into six strategic research areas so that the highest priorities in arts and humanities are tackled: communities and big society; civic values and active citizenship, including ethics in public life; creative and digital economy; cultural heritage; language-

based disciplines; and interdisciplinary collaborations with a range of STEM subjects.

A major thread of activity will be focused on communities, including leading the cross-Council 'Connected Communities' programme. AHRC will systematically address issues relating to social cohesion, community engagement and cultural renewal contributing to the 'Big Society' initiative.

To underpin capacity in its high priority areas the Council will further develop postgraduate training support provision in line with the principles established in the Block Grant Partnership, which concentrated research and training in fewer HEIs. It will focus support on centres of excellence and high-quality institutional consortia.

### Economic Impact

AHRC research contributes to the economic prosperity and social fabric of the UK – including many of the fastest growing parts of the UK economy such as new media, computer games, music, textiles and fashion, design, film and television.

AHRC will focus the main thrust of its impact strategy on the creative economy. It aims to bring the universities, the research sector in other public bodies and the creative economy

into more direct and active alignment, building partnerships and translating into significant social and economic impact.

## Biotechnology and Biological Sciences Research Council (BBSRC)

### Breakdown of the allocation

£000	2011-12	2012-13	2013-14	2014-15	Total
Resource	370,306	359,471	351,471	351,471	1,432,718
Depreciation and impairments	7,500	7,900	10,100	10,100	35,600
Capital	38,000	29,700	29,700	29,700	127,100
IAH Pirbright – LFCF	30,000	7,000	0	0	37,000

### Strategic Direction

BBSRC funds research across the life sciences to improve the fundamental understanding of the biological systems upon which all life depends. The research supported by BBSRC spans the microbial, plant and animal kingdoms (including humans) from molecules to cells to whole organisms and populations.

BBSRC's goal, as set out in its Strategic Plan for 2010-15 'The Age of Bioscience', is to deliver world-class research and training with a strategic emphasis on :-

- Food security – Bioscience for a sustainable supply of sufficient, affordable, nutritious and safe food in a rapidly changing world. •
- Bioenergy and industrial biotechnology - Energy and industrial materials from novel biological sources, reducing dependency on petrochemicals and helping the UK to become a low carbon economy.
- Basic bioscience underpinning health - Driving advances in fundamental

bioscience for better health and improved quality of life reducing the need for medical and social intervention.

### Research Priorities

BBSRC will continue to drive excellence in bioscience. Building on current strength, BBSRC will:

- Improve coordination of UK food research by leading the new Global Food Security (GFS) partnership between five Research Councils, the TSB and Government including Defra, DfID and the Scottish Government.
- Support the development of the next generation of cutting-edge tools and technologies, for example in bioimaging, phenomics and biomolecular characterisation, to accelerate the pace of discovery in bioscience.
- Increase the UK's economic resilience to livestock diseases such as foot and mouth, bluetongue and African swine fever, particularly through the Institute for Animal Health (IAH).

- Position the UK as a global leader in wheat research and breeding for food and other products to increase yields and adapt to climate change.
- Fund research that will reduce greenhouse gas emissions from agriculture, improve carbon sequestration in soils and enhance biomass photosynthesis in plants.
- Drive innovation, growth and jobs through Industrial Biotechnology including advances in enzymology, biocatalysis and the design of biological systems for more efficient bioenergy, new biopharmaceuticals and renewable 'green' industrial feedstocks and building on the work of the BBSRC Sustainable Bioenergy Centre (BSBEC).
- Drive innovation in our high-value chemicals industry, building on excellence in genomics and bioinformatics to exploit microbes and plants for novel bioactive compounds and pathways of high-value.
- Prepare for an ageing population and to maintain wellbeing through improved understanding of the basic biological mechanisms underlying healthy physiology. BBSRC are positioned uniquely to generate early stage knowledge of bioscience to underpin innovation in healthcare.
- Generate knowledge to protect the UK against infectious diseases, boost the impact of animal health research by linking veterinary and human medicine with other science disciplines, better

coordinate UK ageing research, build on the success of the existing industry/users club in diet and health and support research to generate new and better biopharmaceuticals.

### Economic Impact

BBSRC will prioritise actions to aid economic recovery, drive growth, and influence public policy.

Bioscience will provide new opportunities for growth and green jobs. Bioscience (plants, bacteria, algae and fungi) offers the only viable alternative sources of renewable liquid transport fuels, lubricants, solvents, raw materials for polymers such as plastics and synthetic fibres and high-value chemicals to replace those currently derived from the fossil carbon. BBSRC's research will make the UK well placed to exploit bioscience for renewable energy and chemicals in the new global knowledge based bio-economy.

In addition to investing for growth in the new bio-based businesses of tomorrow, BBSRC will focus on extracting economic benefit from existing research through its Follow-on Fund, strengthen pathways to the application of research, implement BBSRC's Campus strategy and work with the TSB, industry and others to accelerate research into practice and economic benefit.

BBSRC will provide people with the right skills through high-quality PhD training to boost business critical R&D and innovation skills.

## Engineering and Physical Sciences Research Council (EPSRC)

### Breakdown of the allocation

£000	2011-12	2012-13	2013-14	2014-15	Total
Resource	759,720	748,150	748,150	748,150	3,004,171
Depreciation and impairments	11,000	11,000	8,000	7,000	37,000
Capital	31,000	35,000	25,000	25,000	116,000
HECTOR - LFCF	15,000	0	0	0	15,000

### Strategic Direction

EPSRC funds research, and related post graduate training, in the engineering and physical sciences. EPSRC investments aim to maintain and develop a strong research base, promote future economic growth, and improve quality of life in the UK.

EPSRC plans will generate the new knowledge from skilled people needed for innovation in the modern economy, whilst galvanising the research community around key global and national challenges.

In its Delivery Plan, EPSRC will deliver a programme of transformative change in which it partners with researchers to move from being a funder to a sponsor of research, and where their investments act as a national resource focused on outcomes for the UK good. It will do this by:

**Delivering Impact**, creating the environment that enables impact to arise from the research

and training EPSRC sponsors and making it accessible to those who can exploit it.

**Shaping Capability**, ensuring EPSRC has the right people with the right resources in the right places, doing so through a full understanding of its research portfolio and talent base, and by using evidence from key stakeholders and its advisory bodies.

**Developing Leaders**, supporting and nurturing both the visionary leaders who set research agendas and act as role models, and inspirational team leaders who manage complex, multidisciplinary programmes of research.

### Research Priorities

EPSRC is committed to supporting long-term core and multidisciplinary research in engineering and physical sciences. EPSRC will focus its research and training on helping rebuild the UK economy and solving some of the biggest long-term challenges facing the UK,



including sustainable low-carbon energy, healthcare and climate change. In order to support this, EPSRC has identified the following priority themes for research and essential skills:

- Core National Capability – EPSRC will continue to invest in research and skills which build resilience and the ability to meet unforeseen and possibly disruptive challenges, drive economic growth and are essential to other disciplines. EPSRC will protect a set of priority capabilities which are internationally excellent and strategically important to the UK, and will generate new knowledge and essential skills by nurturing discovery-led research in emergent research topics and new application domains.
- Manufacturing the Future - EPSRC will build on existing investments to deliver research in the supporting science, simulation and design, production, fabrication, systems and services to underpin the development of high value manufacturing both where market opportunity is well developed (nano-applications, regenerative medicine, plastic electronics, advanced composites and low carbon technologies), and in frontier manufacturing e.g. graphene, synthetic biology and flow chemistry. EPSRC will increase the number of Centres for Innovative Manufacturing to provide national leadership in upstream manufacturing research.
- Energy – EPSRC will lead and will commit a further £439m over the CSR period to the cross-Council Programme, supporting a range of research including renewable energy generation, demand-reduction, fuels cells and energy storage, carbon capture and storage, transport and

nuclear research. EPSRC will also provide public funding, along with the Technology Strategy Board, for the Energy Technologies Institute (ETI) and will work with DECC and the Low Carbon Innovation Group on a low carbon roadmap to target technologies with the potential to meet the UK's CO2 reduction targets and to be exploited by UK industry.

- Digital Economy – EPSRC will lead the cross-Council programme to transform lives through the novel design and use of digital technologies and ICT, improving health, delivering a more inclusive society, creating economic value and saving public money via on-line services. EPSRC will commit over £106m to delivering a focused research portfolio connecting technology with social science.
- Healthcare technologies – EPSRC will invest £23m and work with MRC, TSB, NIHR and other funding bodies on challenges that will create transformative healthcare technologies to enable earlier and better diagnosis, treatment and management of health conditions and to future healthcare systems that will deliver more efficient personalised and localised care.

To promote the long term sustainability of research in engineering and physical sciences EPSRC will:

- Invest in the next generation of world-class researchers and research leaders, including support of skills and pioneering research investing in Industrial Doctorate Centres, Centres for Innovative Manufacturing and Centres for Doctoral Training.

## Economic Impact

During 2011-15 EPSRC will deliver increased impact by engaging more strongly with business, targeting those sectors where research has the strongest potential to boost economic growth and where user needs and pull through are paramount. EPSRC will continue to strengthen its relationship with business, the TSB and other user-led collaborations. It will:

- Build on its existing strategic investments in Centres for Innovative Manufacturing, Innovation and Knowledge Centres and Centres for Doctoral Training, joint investments with strategic partners and, in addition, support underpinning research in technology areas being considered for Technology Innovation Centres.
- Develop more sophisticated sector-based partnerships with business and accelerate the exploitation of research outputs in key technologies for economic benefit through appropriate organisations such as Knowledge Transfer Networks.
- Continue to work in partnership with the ETI to accelerate the deployment of energy technologies.
- Accelerate the exploitation of research outputs in key technologies for economic benefit through strategic partnership with the Technology Strategy Board.
- Act to improve further the quality of PhDs it funds, via a cohort approach and closer alignment with industry so that the skills base generated is most valuable to industry.

## Economic and Social Research Council (ESRC)

### Breakdown of the allocation

£000	2011-12	2012-13	2013-14	2014-15	Total
Resource	155,690	153,319	153,319	153,319	615,648
Depreciation and impairments	247	316	167	167	897
Capital	18,700	13,700	12,700	12,700	57,800

### Strategic Direction

ESRC funds strategic research in the social sciences. ESRC identifies and addresses key societal challenges, generating a highly skilled workforce for the wider economy, and coordinating the national social science research infrastructure. As set out in its 2009 to 2014 Strategic Plan 'Delivering Impact through Social Science', ESRC addresses a range of challenges for social science including: Global Economic Performance, Policy and management; Health and Wellbeing: Understanding Individual Behaviour; New Technology, Innovation and Skills; Environment, Energy and Resilience; Security, Conflict and justice; and Social Diversity and Population Dynamics.

ESRC has developed a focused investment strategy for the coming period, which will centre its investment around three newly defined national priority areas which are critical to the UK economy and society. They are:

- Economic Performance and Sustainable Growth

- Influencing Behaviour and Informing Interventions
- A Vibrant and Fair Society.

### Research Priorities

ESRC's research priorities will be to:

- Continue to deliver a critical contribution to the RCUK interdisciplinary research programmes. ESRC is one of two Research Councils participating in all six themes.
- Channel its resources into longer, larger grants that deliver ambitious social science.
- Concentrate its PhD training in the most excellent centres. This will include targeting some students towards key strategic areas.
- Protect its essential investments in the national data infrastructure, though it will make efficiency savings across its portfolio of data resources. ESRC will give continued priority to the development of key longitudinal datasets which provide a critical underpinning for high-quality social science research and policy analysis.

- Continue to prioritise the generation of economic and societal impact from its investments through further embedding impact as an integral part of funding schemes.
- Expand collaborative activities with the private sector by applying its expertise in developing strong partnerships with the public sector and civil society, to generate research which will impact directly on business.
- Continue to encourage and promote international collaboration through embedding international perspectives across the range of ESRC activities.

### Economic Impact

Delivering the benefits of its investment in social science is central to ESRC's Strategic Plan 2009-14, which measures success through five objectives. ESRC will deliver impact through: world-class research; skilled people; infrastructure; partnerships and international leadership. Creating, assessing and communicating impact is not a separate strand of ESRC's strategy; rather it provides

the linchpin around which its activities are organised.

ESRC will achieve impact by means of:

- Embedding impact as an integral part of its funding and assessment mechanisms from postgraduate training through to large-scale investments. ESRC will specifically be looking at increasing the impact from its current large investments in each of its three priority areas.
- A commitment to innovative approaches and efficiency. As the ESRC continues to extend its collaborations with policy, business and civil society it will innovative its funding mechanisms for knowledge exchange and impact.
- The assessment and communication of impact. ESRC will continue to evaluate ESRC investments through its expert Evaluation Committee, extending its methodologies and programme of impact evaluations, including the impact of people and data investments, so that the results are widely disseminated.

## Medical Research Council (MRC)

### Breakdown of the allocation

£000	2011-12	2012-13	2013-14	2014-15	Total
Resource	536,172	546,243	559,894	574,641	2,216,950
Depreciation and impairments	46,295	48,849	48,751	43,729	187,624
Capital	33,000	29,000	31,000	31,000	124,000
LMB - LFCF	31,100	0	0	0	31,100

### Strategic Direction

The MRC's Strategic Plan sets out the key aims and research themes over the CSR period and how MRC will develop and sustain leading edge research programmes that will accelerate the transition of fundamental research into measurable positive impact on health, innovation and wealth creation.

Fundamental to this delivery plan is a transformative translation agenda to drive innovation and speed up the exploitation of the best ideas in medical science, to deliver new preventive and therapeutic interventions and demonstrable improvements in the return on investment in the science base.

### Research Priorities

'Research Changes Lives' the MRC Strategic Plan, sets out key aims and objectives for the next 4 years. The MRC delivery plan highlights some major examples of activity that will rapidly deliver gains in health and wellbeing, together with increased economic impact.

Understanding more about the mechanisms of resilience, repair and replacement will channel discoveries towards disease prevention and treatment. Addressing the complex interplay between genetics, development and life events or lifestyles will improve the chances of living a longer, healthier and productive life.

New or developing programmes include:

- £60m new commitments in Stratified Medicine;
- spend in the region of £130m in regenerative medicine;
- £10m to support new initiatives in addiction research;
- £150m across a range of activities in neurodegeneration and;
- increased spending on experimental and translational medicine, likely to reach £250m over the CSR period.

MRC will continue to develop the UK Centre for Medical Research and Innovation (UKCMRI) as a key element of strategy to increase the impact of science on health, now and for decades to come.

In addition, MRC remains committed to reduction, refinement and replacement of animal use in scientific research. To help deliver on this commitment, as well as the Coalition Government pledge to reduce animal usage, MRC will continue supporting National Centre for the Replacement, Refinement and Reduction of Animals in Research (NC3Rs), working with BBSRC to maintain their joint contribution at the current level in real terms (rising to £5.6m pa by 2014/5).

### **Economic Impact**

Worldwide the pharmaceutical and medical technology sectors have been less affected by the global recession and are forecast to continue to grow. Richer nations spend more on health, so that future growth will be accompanied by a corresponding expansion in demand for healthcare, presenting enormous potential markets for countries that choose to make biomedical science a centre piece of their economies.

MRC will aim to deliver the strong academic research base and highly skilled researchers, which are both so important in attracting and retaining these companies in the UK.

## Natural Environment Research Council (NERC)

### Breakdown of the allocation

£000	2011-12	2012-13	2013-14	2014-15	Total
Resource	298,600	297,129	300,129	289,129	1,184,987
Depreciation and impairments	38,000	38,000	39,000	41,000	156,000
Capital	32,200	17,800	17,800	17,800	85,600
Discovery Replacement -LFCF	20,000	12,000	6,000	0	38,000

### Strategic Direction

NERC funds research, training and knowledge exchange in the environmental sciences. Its goal for the CSR period is to secure competitive advantage for the UK in the race to a global green economy, and to help make the nation resilient to environmental crisis, by:

- Delivering strategic environmental knowledge with the strongest potential for the nation;
- Creating vibrant business and policy partnerships to co-design research and maximise its benefits; and
- Transforming the delivery of NERC science to provide the most effective and efficient support.

During 2011-15 NERC will: increase focus on strategic research; increase economic impact and societal benefit; attract and retain top talent for the UK; transform delivery of national capability; and shift resources into frontline science.

### Research Priorities

NERC will direct a growing share of its funding through seven strategic science themes to ensure the most critical issues in environmental science are tackled: climate system; biodiversity; sustainable use of natural resources; earth system science; natural hazards; environment, pollution and human health; and technologies.

NERC will design this strategic research to deliver shared RCUK priorities in the following cross-Council programmes: Living With Environmental Change (LWEC); Energy; Global Food Security; Global Uncertainties. It will invest £344m in cross-Council programmes over the CSR period.

On behalf of RCUK and other partners NERC will continue to drive LWEC, a transformative cross-Government partnership that accelerates the translation of research into environmental policy, business and societal

outcomes with greater impact and cost-efficiency.

### **Economic Impact**

NERC research and innovation enables a successful greener economy by providing UK competitive advantage, informing policy leadership, improving business performance and transforming public services. During 2011-15 NERC will deliver increased impact by engaging more strongly with business, targeting those sectors where research has

the strongest potential to boost economic growth.

By engaging with business, Government policymakers, local authorities and society - most notably through the LWEC business and partners' boards - NERC is able to identify and prioritise the environmental sectors and new markets with most potential research to unlock for green economic growth. It will also develop and sustain the capability of NERC researchers and users to evidence and demonstrate the impacts of research.



## Science and Technology Facilities Council (STFC)

### Breakdown of the allocation

£000	2011-12	2012-13	2013-14	2014-15	Total
<b>RESOURCE</b>					
International Subscriptions	108,598	119,515	121,697	123,071	472,881
Facilities	77,170	79,280	81,410	89,470	327,330
STFC Core Programme	190,060	172,200	172,200	172,190	706,650
Depreciation and impairments	75,260	74,210	76,090	78,210	303,770
<b>CAPITAL</b>					
International Subscriptions	46,221	30,293	28,530	27,667	132,711
Facilities	21,070	21,919	22,463	22,931	88,383
STFC Core Programme	19,630	21,981	14,237	14,169	70,017
Diamond I & II VAT – LFCF	4,600	3,300	3,300	3,300	14,500
Diamond III – LFCF	8,900	16,700	19,900	19,200	64,700

### Strategic Direction

STFC promotes and delivers world-class research, innovation and skills to generate knowledge, solutions and skilled people, thus underpinning the UK's future competitiveness and the rebalancing of the economy. STFC's strategy is to maximise the economic and societal impact of their programme.

STFC covers three distinct but interrelated functions: sponsoring university-based research, innovation and skills in particle physics, astronomy and nuclear physics;

ensuring access to world-leading, large-scale facilities for the physical and life sciences and enabling research, innovation and skills training in these areas; STFC also leads on the development of the UK's Science and Innovation Campuses at Harwell and Daresbury to promote academic and industry collaboration.

## Research Priorities

STFC's research priorities include:

- Maintain resource spending on research grants to support a world-class research programme in astronomy, particle and nuclear physics following the priorities established a year ago;
- Focus university research programmes in centres of excellence by continuing to place a premium on critical mass in research groups and encouraging research groups to self-manage demand;
- Streamline grant administration by moving all researchers from rolling grants to a single consolidated grant mechanism providing support for up to four years;
- Protect national capability in strategically vulnerable areas by brokering consortia or setting up university hosted institutes;
- Foster a complementary partnership between STFC and universities by focusing the capabilities of STFC's in-house researchers on technology, instrumentation and detector construction, leaving university scientists to concentrate on research.

STFC's innovation priorities include:

- Increase shared investment, pooling of activities and strategic outcomes with the TSB to improve innovation outcomes, spending £5.5m over four years and aligning £39m of activities to shared projects;
- Realign STFC's activities with TSB's restructured Knowledge Transfer Networks to optimise support of these

initiatives, spending will provide innovation-rich hosting venues;

- Ensure that skills and technologies originally developed to address fundamental research questions are harnessed effectively to provide solutions to Global Challenges, spending £6.5m over four years to increase innovation outcomes in these areas.

STFC's priorities for provision of facilities are:

- Implement the levels of access and service required at national and international facilities agreed with the other Research Council's science requirements.

STFC priorities for skills include:

- Keep studentship numbers constant i.e. 220 PhD graduates per annum with more than 30% pursuing private sector careers, and 75% of these taking high salaried financial and business services roles. Also providing training to 700 PhD students funded by other Research Councils on STFC facilities;
- Introduce an elite Fellowship scheme aimed at individuals with future leadership potential;
- Introduce a new Studentship Enhancement Programme (STEP) for the 15 brightest post-graduates to help in the first stages of their post doctoral research careers;
- Increase the relevance and breadth of PhD training by developing shared programmes between university departments and their own laboratories;
- Preserve undergraduate training opportunities by working with HEFCE, EPSRC and others to mitigate the

impact of funding reductions on physics departments;

- Establish Technology and Innovation Skills Training Centres on their Campuses to provide targeted high tech skills training.

## Economic Impact

STFC will deliver the following outcomes:

- The Science and Innovation Campuses hosting over 200 hi-tech companies with over 5,500 employees to grow to 20,000 within a decade;
  - Increased commercial use of STFC's UK large facilities, doubling since 2006/07, that, for example, have aided new aircraft development, improved drug discovery and development, developed new medical diagnostic tools and helped reduce oil pipeline blockages;
  - Facilitate inward investment into the UK high tech industry. For example
- £282m international investment and £180m from national sources to UK high tech firms over the last three years;
  - Increase innovation output by translating technical and science ideas into new spin outs, technology patents and proof of concept projects each year – in 2008/09 6 spinouts, 23 technology prospects and 31 proof of concept projects were delivered;
  - 1,000 physics and astronomer graduates trained by STFC-funded researchers;
  - Attract 2,500 undergraduates to study physics, inspired by STFC research areas;
  - Educate and support teaching staff from 80 UK universities and research institutes who train the majority of UK microelectronics design engineers.

## Large Facilities Capital Funding

The Large Facilities Capital Fund (LFCF) is part of the overall science and research funding and supports Research Councils' investments in large research facilities with capital funding where that could not be sensibly accommodated within individual Council budgets. The LFCF provides a funding contribution to the capital costs of:

- The construction of new facilities either nationally or internationally;
- The expansion or enhancement of existing facilities;
- The upgrading or replacement of existing facilities.

RCUK provides advice to Government on the prioritisation of projects for funding from the LFCF. Normally, eligible projects should:

- Be included on the current RCUK Large Facilities Roadmap, which helps the UK to take a strategic view as to the best way to maintain access for researchers to large facilities. The Roadmap includes national and international projects. It concentrates on those identified by RCUK as being of the highest strategic importance and that require significant investment for the Council concerned;
- Represent a large scale investment in research infrastructure. 'Large scale' means having total capital costs greater than £25 million or representing more than 10% of the annual budget of the lead Council;
- Serve a significant community of researchers, often spanning the research communities of more than one Research Council.

### The breakdown of the allocation

£000	2011-12	2012-13	2013-14	2014-15	Total
Capital	115,279	61,307	47,770	128,133	352,489

## Current projects

Since the publication of 2008 RCUK Roadmap, LFCF funding has been allocated to the following projects:

- MRC Laboratory for Molecular Biology to maintain the UK at the forefront of understanding biological processes at the molecular level and improving our understanding of the molecular basis of such common diseases as Parkinson's and Alzheimer's;
  - Institute for Animal Health – Pirbright, an internationally recognised centre of research on research on bacterial, parasitic and viral infections of farm animals;
  - provision for High Performance Computing to support targeted systems
- for HPC enabled research in particle physics and astronomy;
  - replacement for RRS Discovery to maintain the UK's strong international leadership in seagoing science, an essential element of Earth system science;
  - Diamond Phase III – 10 additional beamlines to extend the user base to new communities in applied areas including archaeology, cultural heritage, food sciences, industrial processing, engineering materials, forensics and environmental and medical science.

The Government intends to announce during 2011 the allocation of funding to a small number of further projects on the 2010 Large Facilities Roadmap.

## HEI Capital Funding

Over the past decade, HEIs have benefited greatly from investment in capital facilities. Research capital funding for HEIs is set out on page 19.

Historically HEFCE received two streams of research capital funding, one from the UK-wide Science and Research Budget and one from the Higher Education budget in England. For clarity, therefore, page 19 shows the BIS science and research funding contribution to HEI research capital for each of the four countries of the UK as well as the funding to HEFCE for HEIs in England.

Scottish, Welsh and Northern Irish HE funding bodies propose to allocate the BIS contribution by reference to the research income HEIs receive from Research Councils. This BIS capital is allocated on the basis that the funding bodies will supplement the BIS capital with further funding for HEIs in their administrations, which will be allocated by reference to research income from sources other than Research Councils.

HEFCE propose to allocate its capital allocations partly by reference to income from Research Councils and partly by reference to research income from other sources.

## Higher Education Funding Council for England (HEFCE)

### Breakdown of the allocation

£000	2011-12	2012-13	2013-14	2014-15	Total
Quality-Related (QR) Research	1,549,112	1,586,578	1,572,689	1,573,321	6,281,700
HEIF <sup>7</sup>	113,000	113,000	113,000	113,000	452,000
Research Capital England	75,170	90,970	90,160	101,500	357,800
HEI Research Capital England	53,199	64,377	63,810	71,831	253,217

**To support long term growth the Government will prioritise support for world-class science and research and will also take measures to increase the focus on excellence.**

The UK research base has excellent capabilities in higher education institutions with the critical mass to compete globally and the expertise to work closely with business, charities and public services. HEFCE research funding is particularly significant in sustaining capability in the arts and humanities and in the social sciences. The ring-fenced settlement for science and research means that arts and humanities and social sciences will continue to be supported in the next Spending Review period.

HEFCE is responsible for distributing Quality Related (QR) research funding to English Higher Education Institutions (HEIs). QR is

allocated as a block grant to individual institutions distributed by formula, primarily on the basis of the outcomes of 2008 Research Assessment Exercise (RAE). QR research funding is already focused strongly on internationally excellent research (3\* & 4\* - research of internationally excellent and world-leading quality respectively), and incentivises institutions to work with businesses and charities and to supervise postgraduate researchers. It is highly concentrated, with one-third of QR allocated to the 5 largest recipients and nearly 70% to the 20 largest.

QR funding supports institutional research capability and infrastructure. It enables institutions to invest strategically in their research capacity, to plan ahead to develop and support excellent researchers between

<sup>7</sup> Total funding for HEIF will continue at £150m p.a. of which £113m p.a. is from science and research funding

project funding, and to explore novel fields and respond to emerging priorities. QR also enables HEIs to lever funding and commissioned research from other sources, and provides the capacity to pursue projects where funders, notably charities, do not meet full economic costs.

HEFCE will further reform QR funding both for research and for support for the next generation of researchers to selectively fund internationally excellent research, while maintaining support for institutions leveraging funding from external sources.

### **Economic Impact**

The Government is committed to encouraging universities and business to work more closely together, through the provision of incentives which enhance the economic and social impact of research.

HEFCE is committed to continue Higher Education Innovation Funding (HEIF) at £150m p.a. of which £113m is science and research funding.

HEFCE will take forward reform of Higher Education Innovation Funding rapidly. Reforms, based on the current formulaic approach, will provide greater incentives to HEIs to increase interaction with business and

other users, through a focus on performance rather than capacity, incentivising the highest performing institutions further and supporting only the most effective performers.

HEFCE will continue to develop an assessment framework that combines recognition of the highest levels of research excellence with reward for the impact it has on the economy and society. HEFCE is making good progress with developing the Research Excellence Framework, in partnership with many academics from across the spectrum of disciplines. Results from the Pilot Impact Assessment exercise show how it is possible to make this approach work across a range of disciplines, while preserving academic integrity.

HEFCE will continue to implement the REF over the next four years to recognise impact only from excellent research.

### **Research Capital**

Over the past decade, the sector has benefited greatly from public investment. HEFCE will focus future research capital funding on maintaining excellent departments with the critical mass to compete globally and the expertise to work closely with business, charities and public services.



## Maximising the benefits of research: collaborations and translation

Science and research contribute to technological progress and innovation as well as the supply of high-skilled labour for business. Research institutes and HEIs are sources of new knowledge and discovery which give the UK global advantage. The Spending Review explicitly recognised the contribution of the research base to the economy and the Government's desire to maximise the economic impact of the research base.

HEFCE and the Research Councils will work together so that support and incentives to bring universities and business closer together are delivered coherently across the research and knowledge exchange lifecycle:

- Research Councils' Pathways to Impact encourage researchers to consider potential beneficiaries and the future pathways towards impact from their research from inception. This helps speed these impacts by encouraging researchers to think about the value of their research to the economy and society;<sup>8</sup>
- Research Councils provide support such as collaborative research and training. Higher Education Innovation Funding and the Business Research element of QR support universities' current capacity to work with business and provide strong incentives for high performance;
- The Research Excellence Framework will recognise universities

achievements in terms of impacts from excellent research.

Over the Spending Review period HEFCE will:

- take forward reform of Higher Education Innovation Funding rapidly. Reforms, based on the current formulaic approach, will provide greater incentives to HEIs to increase interaction with business and other users, through a focus on performance rather than capacity, incentivising further the highest performing institutions and supporting the most effective performers;
- reform QR funding for research while funding that incentivises universities to leverage income from external sources, such as the charitable and business sectors;
- continue to implement the REF over the next four years to recognise impact only from excellent research.

The Research Councils continue to work hard to encourage researchers to exploit their research, including through high profile competitions and awards that celebrate and recognise the achievements of academics. Recent examples include the RCUK Business Plan Competition (Nov 2010) and the upcoming BBSRC Innovator of the Year Award (March 2011). The launch of a 'Knowledge Transfer Portal' in 2010 also makes it easier for academics to access the range of activities, such as collaborative research and follow-on funding, supported by the Research Councils.<sup>9</sup>

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<sup>8</sup> Additional information on 'Pathways to Impact' can be found at <http://impacts.rcuk.ac.uk/default.htm>

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<sup>9</sup> The Knowledge Transfer Portal can be found at: <http://www.rcuk.ac.uk/innovation/ktportal/default.htm>

Over the Spending Review period the Research Councils will:

- through 'Pathways to Impact' give academics the support that they will need to engage in activities relevant to their research, that will help them form closer ties to business, industry, policy makers, charities and civil society organisations;
- invest in high quality research and training which has a significant impact across a range of areas of crucial importance to the UK economy including;
  - increase leveraged funding into the research base from collaborators;
  - increase strategic partnerships with major companies (and develop coordinated strategies for working with industries e.g. energy, water, creative);
  - make research findings more accessible to all users (business, charities, government etc);
  - strengthen collaboration between Research Councils and Technology Strategy Board, including working together to deliver effective Technology Innovation Centres.

## NATIONAL ACADEMIES

### Role

BIS is responsible for Government funding of key programmes at three of the UK's independent National Academies: the Royal Society (the UK's national academy of science), the British Academy (which promotes and champions the humanities and social sciences) and the Royal Academy of Engineering. The Academies:

- receive government funding for specific projects and programmes, principally to allow a cadre of the most capable academics to work full-time on research. This helps to maintain excellence in the UK's research base, and secures future economic returns from our investment in science and research;
- help to develop research links and collaborations with the best researchers overseas, particularly in regions of strategic importance to the UK;
- are an important source of authoritative, impartial advice. Their independent policy studies make an important contribution to the evidence base for public policy making;
- are increasingly working in collaboration, e.g. on cross-disciplinary policy advice. On engineering issues, the Royal Academy of Engineering is working in collaboration with other leading engineering institutions;
- are working with Government and other partner organisations to promote STEM careers and to support public engagement with science, engineering and research.



Royal Society and EPSRC-funded Nobel Prize winners Andre Geim (left) and Konstantin Novoselov (right) of the University of Manchester discuss physics during their interview with Nobelprize.org in Stockholm, 6 December 2010.

## Royal Society

### Breakdown of allocation

£000	2011-12	2012-13	2013-14	2014-15	Total
Resource	47,830	47,101	47,101	47,101	189,133

### Strategic direction

The Society's central goal is to promote excellence in the British science base, so that the UK retains its position as one of the most effective scientific nations in the world, in the face of increasing global competition by:

- Investing in future scientific leaders and innovation;
- Influencing policy making with the best scientific advice;
- Invigorating science and mathematics education;
- Inspiring an interest in the joy, wonder and excitement of scientific discovery;
- Increasing access to the best science internationally.
- Deliver a new programme of initiatives to identify and develop innovative ways of raising standards in STEM education at all levels.
- Promote the UK as the partner of choice for international research collaboration by maintaining support for the Newton International Fellowships scheme at current levels, and by amalgamating the International Travel Grants and International Joint Projects schemes to form the International Collaboration programme, retaining the best elements of each at reduced cost.
- Promote public engagement with science through a varied programme of public events and activities, including the annual Summer Science Exhibition.

### Research Priorities

The Society will:

- Attract and retain the very best early-career researchers by focusing resources on the University Research Fellowship (URF) scheme.
- Increase by 30% funding for Industry Fellowships that build valuable long-term relationships between academics and industry, and help translate British science into growth in key areas of the economy.

### Economic impact

The Society supports applications on the basis of excellence, thereby maintaining a strong yet diverse research base. Over two-thirds of URFs are working in strategically important areas, with the rest working in other areas. These can lead to equally important research with potential for significant impact such as the research undertaken by two of the Society's research appointees which led to the Nobel prize winning discovery of graphene with its many potential applications.

## British Academy

### Breakdown of allocation

£000	2011-12	2012-13	2013-14	2014-15	Total
Resource	27,001	27,005	27,005	27,005	108,015

### Strategic direction

The Academy's purpose is to inspire, recognise and support excellence in the humanities and social sciences, in the UK and internationally, and to champion their role and value.

### Research Priorities

The Academy will target resources at:

- Supporting individuals thus complementing the role of the Research Councils. Through its fellowship schemes, the Academy will provide distinctive career opportunities to those who show outstanding potential and achievement at early- and mid-career level. A new mid-career fellowship scheme will focus not only on research excellence but also on the capacity of applicants to communicate their findings to a broad audience.
- Building international collaboration; creating opportunities overseas for UK researchers and attracting outstanding talent to the UK; supporting a British research presence overseas; and facilitating dialogue and understanding across cultural and national boundaries.
- Identifying and promoting excellence; communicating the insights gained by researchers to a wide range of

audiences, to demonstrate the economic, social and cultural value of the humanities and social sciences; and providing independent and authoritative advice to inform government and public policy making.

- Implementing a new programme supporting languages and the use of rigorous, especially quantitative, methods in the humanities and social sciences. This programme reflects the Academy's concerns about deficits in language and quantitative skills in UK education and research. Through a targeted programme of research support, partnerships and interventions the Academy will supply leadership to help strengthen skills in these vital areas, which are necessary to maintain the UK's competitiveness.

### Economic impact

Fellowship applications – both early- and mid-career – that contribute to national priorities, important and vulnerable disciplines (e.g. languages) and skills deficits (e.g. quantitative methods) will be particularly encouraged. The Academy expects a majority of Postdoctoral Fellowship awards to be linked to challenges such as these.

# Royal Academy of Engineering

## Breakdown of allocation

£000	2011-12	2012-13	2013-14	2014-15	Total
Resource	12,634	12,441	12,441	12,441	49,957

### Strategic direction

The Academy will work with government, industry and other partner organisations to build an economy that is resilient and broadly based, with a high proportion of world-leading or world-class businesses in advanced technology, and an education system that provides the skills required at all levels.

### Research Priorities

By focusing resources on the very best early-career researchers and increasing funding for Research Fellowships and Visiting Professors, the Academy will increase the flow of engineering graduates properly equipped to meet the needs of industry, and the flow of new researchers.

In partnership with the engineering institutions, industry and others, the Academy will build a new Leading Diversity in Engineering Programme to widen participation among under-represented groups.

The Academy will communicate the value of engineering, to society and as a rewarding career, through a range of education and public engagement activities, with a particular focus on young people.

The Academy will provide independent and authoritative advice to inform government and public policy making.

### Economic impact

The Academy's delivery plan emphasises engineering as a major delivery vehicle for economic growth, for the low carbon economy and for infrastructure renewal.

Engineering research is generally concerned with addressing an underlying need of industry or society. Examinable assertions of strategic need from industry will be a prime requirement of any submission for a fellowship.

A new Engineering Enterprise Fellowships will enable entrepreneurial young researchers to benefit from a 'year out' during which they will establish a business and receive business training.

## UK Space Agency

### Breakdown of the allocation

£000	2011-12	2012-13	2013-14	2014-15	Total
Resource	207,805	193,405	193,305	179,005	773,520
Capital	19,000	19,000	19,000	19,000	76,000

### Role

The UK Space Agency is responsible for delivering UK civil space activities. This includes initiating and driving policy; working with the scientific community; strengthening the UK's relationship with the European Space Agency (ESA), the EU and other international agencies; and agreeing with UK industry how to maximise economic growth.

### Strategic Direction

The UK Space Agency will deliver an excellent space programme with maximum economic, scientific and policy benefit for the UK. This is through support to research groups and industry to encourage excellent science and increase the UK's high value space activities through innovation. It will work to understand better the origins of the Universe, the make up of our Solar System, and how climate change is affecting our own planet. Through this work, the Agency will be supporting universities, science and research in building a strong and innovative economic area prepared to face the global challenges of the future.

### Priorities

The Agency's priorities are:

- The successful establishment and continuation of the Agency.
- The implementation of the ESA space programmes in line with legal commitments made to ESA programmes.
- Implementation of a national programme of instrument development for ESA programmes.
- To influence the EU in delivering space policy and programmes.
- To define national space policy and deliver associated implementation activities.
- To develop strategic partner relationships which deliver continued growth of the UK space industry.
- To develop strategic partner relationships with other international space agencies
- To establish a programme of education and outreach activities.

### Economic Impact

An independent survey<sup>10</sup> shows that the UK space industry makes a significant economic

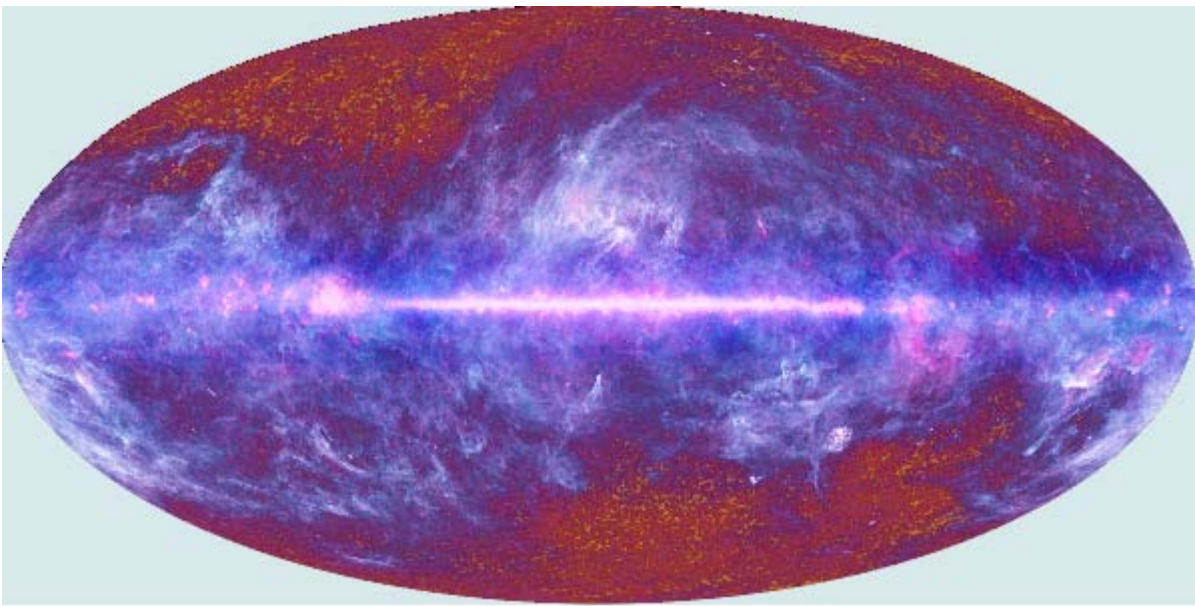
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<sup>10</sup> 'The Size and Health of the UK Space Industry', November 2010



impact. The industry has grown by nearly eight per cent through the recession (compared to the national GDP growth of 0.3 per cent) and is now worth over £7.5 billion to the economy. The primary application for space technology is in broadcasting and telecommunications applications, while

demand for climate and environmental services is growing. All of these applications are underpinned by scientific excellence and innovation, which plays a central role in driving the growth of the UK's knowledge base.



This image is the product of the first 10 months of Planck's mission. The main feature visible is our own Galaxy, as a white line across the middle, but this is showing gas and dust between the stars, rather than stars themselves. The blue wispy material is diffuse dust, while the red glow is gas and electrons. Planck's main objective is to map the Cosmic Microwave Background (CMB), which was emitted in the early Universe. This can be seen in regions where the Galaxy is not emitting strongly, as red and yellow mottled appearance at the top and bottom of the image.

The CMB is actually present over the whole sky, but is swamped by the light from our own Galaxy. Planck's large range of wavelengths measured by its two instruments means it can distinguish the light emitted by the Galaxy from the light from the early Universe.



## Foresight Programme

### Breakdown of allocation

£000	2011-12	2012-13	2013-14	2014-15	Total
Resource	2,800	2,800	2,800	2,800	11,200

### The role of Foresight

Foresight is a strategic futures programme directed by the Government Chief Scientific Adviser (GCSA) in the UK Government Office for Science. It helps Government to develop strategic perspectives about the future by using the latest scientific and other evidence combined with futures analysis to tackle complex policy issues. Foresight has gained a strong reputation within the UK and internationally, not just for high quality analysis which helps Government take important decisions that are robust to future uncertainties, but also in catalysing substantial actions - across Government, the research community, the private sector and civil society.

### Strategic direction

Foresight's mission is to support Government in its strategic aims to ensure economic recovery and govern for the longer term. It also contributes to the promotion of the use of science and other evidence in policy making.

### Priorities

Foresight's main priority over the CSR period is to support policy development through delivery of a high quality programme of projects, horizon scanning, and futures training. It will use the best evidential analysis to bear on

complex policy issues to help provide resilience in the face of future uncertainty. It will complete five major projects including Global Environmental Migration and the Future of Computer Trading in Financial Markets, and initiate three new ones. A strong commitment to follow up recent projects will be pursued to secure impact in government and more widely.

Foresight will seek to achieve excellence in a challenging environment through:

- flexibility in how we manage projects
- innovation in developing new methodologies and processes to improve efficiency and effectiveness
- collaboration to develop new and existing partnerships to leverage greater impact with Other Government Departments and other stakeholders

### Economic impact

Foresight has a dedicated follow-up team to ensure that findings of Foresight projects achieve substantial policy and economic impact. For example, Foresight's

new project on the Future of Computer Trading in Financial Markets (sponsored by HM Treasury) will explore how computer generated trading in financial markets might evolve in the next 10 years or more and assess options for addressing the challenges ahead. It will consider how the opportunities offered by advancements in computer technologies could be capitalised upon by the financial sector. Following Foresight's recent publication of a report on Technology and Innovation Futures, Foresight is working with HM Treasury to

inform their national infrastructure plan. Other projects that are due to be launched in the period immediately preceding the CSR and which have potential for a positive impact on policy affecting the economy include: Global Food and Farming Futures and International Dimensions of Climate Change. Besides economic impact, past and present Foresight activities have substantial impact relating to societal wellbeing (Foresight project on Mental Capital and Wellbeing)

## Science and Society Programme

### Breakdown of allocation

£000	2011-12	2012-13	2013-14	2014-15	Total
Resource	13,000	13,000	13,000	13,000	52,000

Advances in science and technology are key to UK economic growth and social prosperity. To achieve long-term progress, the UK relies on a strong base of science and engineering skills at all levels within the population. It is generally accepted that increasing levels of scientific literacy will enable greater citizen engagement in our modern, technologically-driven society.

A mix of quantitative and qualitative evidence shows that there is still low public trust in the outputs of science and its use by Government and businesses, coupled with low confidence in the quality of science education. This often translates into a comparably low interest in science careers, for both young people and adults. More fundamentally, a lack of widespread scientific literacy has led to a low appreciation of why science is a critical component of nearly all aspects of modern society. These are issues that affect the long-term future of science and our ability to exploit value from our considerable investment.

### Role

The Science and Society programme led by BIS is designed to address these issues and maximise benefits to the UK from advances in science and technology. Working in partnership with others it supports the UK in developing the STEM skills required, increasing broad scientific

literacy, and improving public support for science and research. The front-line policy interventions supported by science and research funding are aimed at a broad range of beneficiaries, from schools to business, Government to consumers, and the science and research community. These policies contribute directly to Government's priorities – particularly in relation to the Big Society, and on STEM education, where BIS will continue to work closely with the Department for Education on policy where we have common interests, and maintaining the UK's position as a world-leading science and research nation.

### Strategic direction

Evidence from public attitudes surveys, STEM education statistics and research by our Expert Groups, taken together with Government priorities for growth, commitment to science and engineering and our knowledge of existing initiatives, has led to our decision to concentrate future spend around two key themes:

- Public engagement, communication and confidence in science
- STEM pipeline: skills and diversity

In order to continue to achieve our aims and to increase effectiveness of the Science and Society system, making use of the most up-to-date advice and information, the Government maintains relationships with a wide range of stakeholders and works in partnership with them.

Our partners will be encouraged to simplify their regional delivery infrastructures across the various activities, reducing overheads to maximise value for money, and to consider the ways in which the diversity agenda is most effectively taken forward in each theme. To ensure our evidence base is kept up to date, relevant research studies, surveys and evaluations will be commissioned, to boost the longer-term implementation of the science and society programme by following-up, and supporting with appropriate resources, recommendations and actions from the Expert Groups.

### **Diversity in the STEM Workforce**

This Government is committed to promoting equality in the workplace as our announcements on positive action, transparency, flexible working, and parental leave demonstrate. We are committed to ensuring that the STEM workforce is diverse, reflecting wider society, and makes use of all the talents available to it. Despite positive progress, there are still too many groups under-represented in this sector.

The way forward to tackle this issue is to encourage diversity in the STEM workforce by embedding and mainstreaming it through a number of the programmes we fund, and those of the partners with which we work. This will

build on the wider work of the government to promote inclusive workplaces.

Delivery of this strategic outcome will be taken forward by a number of our delivery partners over the next Spending Review period. A broad mix of STEM activities and wider societal programmes are supported by science and research funding and these have a major impact on diversity in the STEM workforce. These include the work of STEMNET and the STEM Ambassadors to encourage a diverse STEM pipeline; the National Academies' fellowships; Research Councils' PhD and fellowships awards; and the Big Bang Fair, and National Science and Engineering Competition.

In partnership with the engineering institutions, industry and others, the Royal Academy of Engineering will develop a new diversity programme in engineering, and the wider STEM workforce, to widen participation among under-represented groups.

Better value can be realised through these broader activities and through better direction of existing diversity projects. Therefore, from April 2011, funding for the UK Resource Centre for Women in Science, Engineering and Technology (UKRC) will not be renewed.

By embedding good practice on gender issues within our other programmes and partner organisations, and given the right incentives and direction, we expect these to establish a wider reach and greater impact on all areas of diversity and equality in the STEM workforce.

## Priorities

Major activities within the programme include:

- Enabling the public to have their say on science and research issues through the Sciencewise Expert Resource Centre for Public Dialogue
- Providing opportunities for the public to engage with science and research through Festivals and other national events, e.g. National Science and Engineering Week and the British Science Festival
- Supporting key mechanisms for communicating science better such as the Science Media Centre
- Providing opportunities for young people to engage with and celebrate science and engineering and learn more about careers opportunities through STEMNET, The Big Bang: UK Young Scientists and Engineers Fair and the National Science and Engineering Competition and CREST
- Developing a more strategic approach to involving industry and business with STEMNET and related initiatives, so that STEM careers advice and guidance builds on this and is provided to those most in need of it.
- Promoting diversity in science, technology and engineering
- Promoting the opportunities around careers in engineering, including technician skills.
- Supporting regular measurement of key trends through the three yearly Public Attitudes to Science Survey
- Maintaining access to up-to-date information and advice to support policy development through the Science and Society Expert Groups, Research Councils, National Academies and other partners
- Developing and implementing the Science and Society Programme with a wide range of partners from the science, business, policy, education, media and public communities.

## International Programme

### Breakdown of allocation

£000	2011-12	2012-13	2013-14	2014-15	Total
Resource	5,095	4,740	4,765	4,605	19,205

### Role

International Science and Innovation Unit (ISIU) works to promote the UK as the partner of choice for our overseas counterparts. It helps UK researchers, business and Government gain greater benefit from international partnerships, programmes and relationships in science, technology and innovation. It coordinates UK policy on management and delivery of the EU R&D Framework Programme and is responsible for developing the UK position on European research and innovation policy. It also manages the UK's government-level bilateral relationships in science and innovation, facilitated by the UK's Global Science and Innovation Network.

Strong science and innovation policies must be at the heart of any sustainable UK strategy for economic recovery. To be a global hub for business the UK needs also to be networked with the best science and technology. Global challenges such as climate change require the ability to engage other governments with sound science and find more innovative solutions internationally. International collaboration is fundamental to our endeavours in these areas. For these reasons, BIS and the FCO jointly fund the Science and Innovation Network. With knowledge of both the UK and local science and innovation landscapes, this

network of around 90 staff based in British Embassies, High Commissions and Consulates around the world is uniquely placed to identify and deliver on opportunities, influence key players in country and bring insight to UK decision makers. It promotes strategic partnerships between the UK and international science and innovation communities to enhance business, research and policy interests and investments. The network is managed by ISIU.

### Priorities

The bulk of ISIU's programme funding for the next four financial years will go towards running the Science and Innovation Network, including funding for projects that promote strategic partnerships between the UK and international science and innovation communities.

# Annex A: Statement on the Haldane Principle

The Haldane Principle means that decisions on individual research proposals are best taken by researchers themselves through peer review. This involves evaluating the quality, excellence and likely impact of science and research programmes. Prioritisation of an individual Research Council's spending within its allocation is not a decision for Ministers. The Coalition Government supports this principle as vital for the protection of academic independence and excellence. We all benefit from its application in the UK.

Over the years there has been some uncertainty over the interpretation of the Haldane Principle. After consulting senior figures in the science and research community, the Government now offers this further clarification.

This statement on the Haldane Principle applies to science and research which the Government funds through the Research Councils and National Academies. HEFCE has statutory independence<sup>11</sup>. The Haldane Principle does not apply to the research

budgets of government departments, which are used to fund research to support their departmental policies and objectives. That said, departments work closely with the Research Councils to ensure that the research they fund is aligned with that funded by the science and research base and delivers maximum value to the taxpayer. More generally, Research Councils need to ensure that the views of those with an interest in the potential outcomes of the research are sought when setting their overall priorities.

The Government does, however, need to take a view on the overall level of funding to science and research and has decided to protect and to ring-fence the science and research budget for the next four years. This decision is evidence that the Government recognises the strategic importance of science and research to our future growth, prosperity, culture and heritage.

There are areas where Ministers should have no input: Ministers should not decide which individual projects should be funded nor which researchers should receive the money. This has been crucial to the international success of British science.

At the other end of the spectrum there are decisions that ultimately must be for Ministers, albeit informed by external advice; these include the overall size of the funding

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<sup>11</sup> The Further and Higher Education Act 1992 states that the Secretary of State may not attach terms and conditions on grants to HEFCE which are framed by reference to: particular courses of study, programmes of research, the criteria for the selection and appointment of academic staff or the admission of students.

for science and research and its distribution between the Research Councils, the National Academies and Higher Education research funding.

In addition, every Government will have some key national strategic priorities such as addressing the challenges of an ageing population, energy supply or climate change. The research base has an important role to play in addressing such priorities and the Research Councils, with the support of independent advice, have proposed research programmes to tackle them. It is also appropriate for Ministers to ask Research Councils to consider how best they can contribute to these priorities, without crowding out other areas of their missions. But it is for the Research Councils to decide on the specific projects and people to fund within these priorities, free from Ministerial interference.

Similarly, Ministers have a legitimate role in decisions that involve long term and large scale commitments of national significance. These include the construction of large research facilities, where Ministers have to approve business cases, and involvement in international research treaties. Public funding from the Research Councils for both these categories of research spending must be dedicated to supporting excellent

research, irrespective of its geographical location. In many cases the location will be an obvious decision, given clusters of relevant research capability. Ministerial views on such business cases should be formed with the aid of advice from the Research Councils.

It is important that Ministers, where they are involved in making strategic decisions on the funding of research, take account of advice from a wide variety of expert sources including academia and industry, both nationally and internationally.

The Government recognises the contribution to our national life and to the UK economy made by research and teaching in the full range of disciplines including physical sciences, social sciences, life sciences, environmental sciences, engineering and the arts and humanities.

The Government values the multiplicity and variety of sources of funding from the public, private and charitable sectors. These contribute to the provision of a rich and diverse environment supporting the research community across all disciplines.

Overall, excellence is and must remain the driver of funding decisions, and it is only by funding excellent research that the maximum benefits will be secured for the nation.



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