



Department for
**Innovation,
Universities &
Skills**

**The
Allocations of
the Science
Budget**

2008/09 to 2010/11

December 2007

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“The allocation of
effective exploitation of

Foreword



John Denham

Secretary of State
for Innovation,
Universities and Skills



this science budget will further promote our research base by funding knowledge transfer activities to the highest ever level.”

I am delighted to present the allocations of the Science Budget for 2008-9 to 2010-11. By increasing the funding of the Science Budget to almost £4 billion by the end of this spending period we continue to strongly support world-class research, and build a UK economy driven by innovation and enterprise.

The UK continues to perform exceptionally well in research and, increasingly, its exploitation. We remain second only to the US in global scientific excellence (as measured by citations), while collaboration between the research base and business continues to grow ever stronger.

But continued strong performance is essential. Science and innovation are at the heart of the ongoing transformation of the global economy; we face unprecedented competition from other countries.

The Department for Innovation, Universities and Skills (DIUS) was created by the Prime Minister in June 2007 to drive forward delivery of the Government’s long-term goal to make Britain one of the best places in the world for science, research and innovation; and to deliver the ambition of a world-class skills base. My allocation of the Science Budget for 2008 -11 will take us further towards this goal.

The money we distribute through the Science Budget will support world-class research through the Research Councils and our National Academies. The funding will cover the full spectrum of research endeavour - from the discovery of new knowledge through to practical translation of science into tangible benefits for the economy. Ambitious cross-council programmes will focus on the key global challenges we currently face.

We must continue to drive up the economic impact of our world-class research by fostering ever stronger links between the research base and business. The allocation of the science budget will further promote effective exploitation of our research base by funding knowledge transfer activities to the highest ever level. It will enable Research Councils to make a step change in their economic impact.

These ambitions will only succeed if we continue to maintain a financially sustainable research base. I am pleased to introduce a new capital fund to provide a permanent support for long-term investment to maintain and develop a modern research infrastructure in our universities.

We need a society that is both enthused and excited by science, one where the public understands the value of science and its applications in today’s society and can feel confident about how scientists are operating. In allocating this science budget we are supporting activities which will engage with the wider public. It will also fund important work aimed at enthusing young people – the scientists of the future. It is important we effectively communicate how science enriches our lives.



John Denham

**Secretary of State for Innovation,
Universities and Skills**



01

Part One

- 1 Investing in World-Class Science
- 2 What will the Science Budget Deliver?
- 3 Objectives
- 4 Key Highlights of the Allocations

“World-class research
the challenge

01

Investing in World-Class Science



Excellence in Science

World-class research in the UK is crucial to maintaining economic prosperity and responding to the challenges and opportunities of globalisation. In the global knowledge economy the UK's competitive advantage relies on the ingenuity and capabilities of our population and requires an innovative and enterprising culture to capitalise on opportunities.

Science plays a vital part in addressing key global and domestic challenges, such as climate change, energy, ageing, technological change and security. The research base also delivers improvements in public service delivery and contributes to improvements in education, health and culture. Research findings affect each of us, every day.

The Natural Environment Research Council has isolated a new compound from deep-sea bacteria that could counter the spread of MRSA, the hospital superbug.

The Medical Research Council first found high blood pressure increases the risk of heart disease. Aspirin and Warfarin are now regularly prescribed to reduce the chances of heart attacks and strokes.

The Engineering & Physical Sciences Research Council worked with the engineers constructing the Jubilee Line in London to prevent damage to Big Ben.

in the UK is crucial to maintaining economic prosperity and responding to the challenges and opportunities of globalisation.”

The CSR 07 settlement for the Science Budget demonstrates the largest ever commitment to global excellence in research. The Science Budget rises to almost £4 billion by the end of the CSR period, recognising the critical role of the research base.

A Record of Success

UK researchers are amongst the most efficient and productive in the world. Latest reports on the performance of the research base show the UK with an increased share of the most influential research papers and in a number of key disciplines we lead the world.

The fourth independent annual report on the performance of the UK research base – PSA Target Metrics for the UK Research Base (March 2007)¹ - revealed continued improvement from an already strong position. The UK has increased its share of highly cited papers to 13.3%, and the proportion of uncited papers produced by the UK continues to fall.

The UK has also sustained a more consistent performance across the range of scientific disciplines than most other countries and retains its lead in the G8 on productivity measures. China is making unprecedented levels of investment in science and is rapidly increasing its global share of publications and citations, but this study shows that the UK continues to maintain its world share in the face of intensifying competition.² Our excellent research continues to have great impact across the world.

¹ PSA target metrics for the UK research base, DTI, March 2007
<http://www.berr.gov.uk/files/file38817.pdf>

² Science and Innovation Investment Framework 2004-2014, HM Treasury, July 2004. http://www.hm-treasury.gov.uk/spending_review/spend_sr04/associated_documents/spending_sr04_science.cfm

Animal Health

The BBSRC-sponsored Institute for Animal health leads the world on monitoring the spread of bluetongue. It was the first to link the recent extensions in the spread of the virus in Europe with climate change.

The DIUS Opportunity

In creating DIUS, the Prime Minister brought together three important agendas – science & innovation, higher education and skills. The Department now has a unique opportunity to bind these different areas together in an overarching strategy.

DIUS has been set a new challenge by the Prime Minister to promote world-class science and innovation. This is underpinned by the Department’s Strategic Objectives. Details of these new objectives, along with the objectives of the Science & Innovation Investment Framework can be found in annex four to this publication.

Education research funding make up the two streams of public research funding for Universities in England. This will enable DIUS to take a coordinated view on this key driver of the knowledge economy and will bring about a real step change in the impact of research.

“As a country, we
our quality of life, environ
challenge

02

What does the Science Budget Deliver?

Cross-Council Programmes

As a country, we are facing unprecedented challenges to our quality of life, environment and security. Meeting these challenges requires new, innovative ways of thinking.

Novel, multidisciplinary approaches are needed to help solve the global challenges of the next 10 to 20 years. In response, the Research Councils are embarking on an exciting range of thematic programmes, bringing together partners from inside and outside the research community in an unprecedented effort to tackle these issues.



are facing unprecedented challenges to environment and security. Meeting these challenges requires new, innovative ways of thinking.”

Energy

The Research Councils’ Energy Programme brings together energy-related research and training across the Councils to address the vital international issues of climate change and security of energy supply.



Living With Environmental Change (LWEC)

LWEC is an interdisciplinary research and policy partnership programme to increase resilience to - and reduce costs of - environmental change, addressing the associated pressures on natural resources, ecosystem services, economic growth and social progress.



Global Threats to Security

The Global Threats to Security programme will integrate research in crime, terrorism, environmental stress and global poverty, to address causes of threats to security, their detection, and possible interventions to prevent harm.



Ageing: Life Long Health and Wellbeing

This initiative will establish new interdisciplinary research centres targeting the major determinants of health and wellbeing at every stage of life reducing dependency in later life.



The Research Councils are also working on two further multi-disciplinary programmes covering:

Digital economy

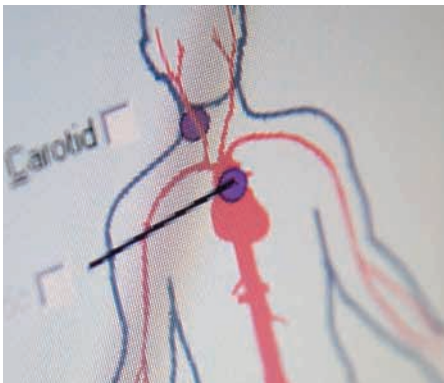
Early adoption of Information and Communications Technology (ICT) tools, supported by research capacity and skilled people, will better position the country to reap the economic and social benefits of technological change.

NanoScience through Engineering to Application

Nanotechnologies can transform society, they offer the potential of disruptive step changes in electronic materials, optics, computing, and in the application of physical and chemical understanding (in combination with biology) to generate novel and innovative self-assembled systems.

Advances in Medical Research

Medical science will receive almost £2 billion from the Science Budget over the CSR period to help keep the UK at the forefront of research. This represents a significant rise in funding over the next three years - a major boost to research on the nation's health.



Preventing Heart Disease

Medical Research Council research spanning four decades has contributed to a vast reduction in the number of people dying each year from heart disease and strokes. Mortality rates today are almost 40% lower than in the 1970s due to drug and surgical treatments, and reductions in risk factors such as smoking.

The increased budget will fund both basic and translational research, in line with the recommendations in Sir David Cooksey's report on health research³. Over the last twenty years there have been rapid advances in fundamental biomedical sciences. This has created a vast body of knowledge and technologies which can be applied to health problems. The creation of the new Office for the Strategic Co-ordination of Health Research (OSCHR), jointly funded by DIUS and the Department of Health, will help speed up the translation of this knowledge into clinical practice.



Cancer Screening

The MRC Cancer Cell Unit in Cambridge studies fundamental cell biology and its links to the understanding of cancer. The team has found a marker that identifies the presence of cancer in its very early stage. This could uncover oral cancer, cervical cancer and cancer of the larynx, in a simple smear test that is non-invasive, accurate, quick and cheap.

³ A Review of UK Health Research Funding, David Cooksey, December 2006.
http://www.hm-treasury.gov.uk/media/4/A/pbr06_cooksey_final_report_636.pdf.

Economic Impact

The world is changing and the UK must make vigorous responses to the challenges of globalisation. We must continue to strengthen our knowledge-based economy by developing a highly skilled workforce, encouraging enterprise and nurturing world-class research.

The UK has an excellent research base⁴; but we must continue to improve our performance. Many countries, including, China and India, are spending heavily on research and are becoming increasingly attractive to globally mobile R&D investors. These countries are already in a position to deliver world-class research and exploitation.

Lord Sainsbury commented in his recent review⁵:

"In today's global economy, investment in science and innovation is not an intellectual luxury for a developed country, but an economic and social necessity, and a key part of any strategy for economic success."

To keep the UK in the premier league, we must sustain our research excellence and we must find and extract every possible economic benefit from that research. Some observers have already noted significant advances in the UK's performance in this area.

Carl Schramm, CEO of the Kauffman Foundation in the US, highlights that the UK has maintained its reputation as a place to conduct international research⁶:

"IBM, Hewlett-Packard, Baker Hughes, Intel, Texas Instruments, and Microsoft, to name just a few major firms on a growing list, are now shifting research funding to universities in England, India, Russia, and China, where they have access to top scientists and often face fewer intellectual property hurdles."

The FT has commented⁷:

"Policymakers and commentators love to draw unflattering comparisons between enterprising US universities churning out commercially exploitable inventions and UK ivory towers that are content to leave research mouldering on library shelves. But the days when critics could bemoan the country's failure to cash in on its world-class research base may be drawing to a close"

According to an independent report by Library House⁸:

"UK universities are now producing spin-out companies of equivalent number and quality to some of the US's top institutions."

4 PSA target metrics for the UK research base, DTI, March 2007
<http://www.berr.gov.uk/files/file38817.pdf>

5 The Race to the Top: A Review of Government's Science and Innovation Policies, David Sainsbury, October 2007.
http://www.hm-treasury.gov.uk/independent_reviews/sainsbury_review/sainsbury_index.cfm

6 http://www.city-journal.org/html/17_4_sndgs03.html

7 NATIONAL NEWS BUSINESS AND ECONOMY: Universities switch on to business. By Jon Boone, Education Correspondent, Financial Times. Published: Jul 27, 2006

8 Spinning out quality: University spin-out companies in the UK, March 2007. Library House

University Spin Outs

Universities are becoming increasingly sophisticated in the way they create spinout companies and in recent years have forged strong links with the investment community. Since 2003, there have been 30 companies floated on stock exchanges at a valuation of £1.5 billion.

Microchip Technology

Wolfson Microelectronics Plc - a spin out of Edinburgh University – is now a global leader in the supply of high performance microchips. Wolfson's chips are found in PDAs and digital music players, most notably the Apple iPod.

Holograms

Smart Holograms Ltd., a spinout company from the University of Cambridge, can engineer holograms to alter their wavelength, brightness, image or position in response to a wide range of physical, biological and chemical stimuli. There are numerous applications for this technology, including providing a quick and non-invasive way to monitor and detect diseases.

Talented People

Major businesses from around the globe make R&D investments in the UK to gain access to our research base and its extraordinarily talented people. Highly skilled people from the research base are in high demand in the business community across every sector from pharmaceuticals to finance.

Boeing, for example, has R&D partnerships with Cambridge, Cranfield and Sheffield Universities. Pfizer has also developed a number of long-term relationships with the UK science base. These include partnerships with the Natural History Museum and the £500,000 sponsorship of the School of Pharmacy at the University of Greenwich.

Driving up the Economic Impact of the Research Base

This allocation makes resources available to drive forward the economic impact agenda in the face of global challenges. The Research Councils have each set out explicit strategies for delivering a step change in their economic impact. For example, the 2008 -11 allocations commit the Research Councils and the Technology Strategy Board (TSB) to significant new collaborations. The TSB and the Councils have already seized this opportunity with considerable enthusiasm. Research Councils are also working with UK Trade and Investment to promote the UK research base as a magnet for inward investment in R&D. These are important steps forward and they provide a good foundation from which Research Councils can further raise their emphasis on economic impact during the CSR spending period.

In addition, the Higher Education Innovation Fund will rise to £150m pa by 2010/11, providing more resources than ever before to support knowledge transfer between universities and business. The PSRE Fund will continue to nurture the exploitation of research from publicly funded laboratories and will in future attract co-funding from other sources so that even more support can be made available to public sector laboratories as they commercialise their research.

Financial Sustainability

World-class research requires a world-class research infrastructure. The Science and Innovation Investment Framework highlighted the need for investment to improve the infrastructure and sustainability of the research base; and we have made great progress in achieving this aim.

During this CSR period, DIUS is introducing a new Capital Investment Fund for universities carrying out Research Council funded projects. This permanent funding stream replaces the temporary Science Research Investment Fund (SRIF) programme which has successfully completed its task of making good the backlog in investment in research infrastructure. The new fund will help Universities maintain their research infrastructure and avoid the backlog problem reoccurring.

A further step forward is the completion of the move to Research Councils' funding research at 80% of full economic cost (FEC). Together with the new capital fund, this will bring funding of research at universities to around 90% of FEC. This will help to put the research base on a sustainable financial footing.

Science and Society

The Sainsbury Review reinforced the important point that success in ensuring that there is a well-educated and enthused supply of scientists, engineers and technicians is critical to our future economic growth.

Such activities will continue to be supported by DIUS, but the formation of the new Department also provides an opportunity to develop a refreshed approach to encouraging and enriching science within our society.

Science and Engineering Ambassadors Programme

The Science and Engineering Ambassadors (SEAs) Programme, funded by DIUS, is STEMNET's flagship programme. It provides role models from a wide variety of STEM backgrounds to offer their time, enthusiasm, and expertise to support schools and inspire young people.

The SEAs Programme is on target to reach 18,000 registered SEAs by the end of March 2008. Since it began hundreds of thousands of students have been able to benefit from the expertise of the Ambassadors.

"The Ambassador provided me with support and encouragement which contributed significantly to my personal and professional development."

Alisa Galbraith, Teacher,
Park Mains High School, Renfrewshire.

"The SEAs have provided an invaluable insight and complemented the work we do in inspiring young people to reach their full potential."

Ellie Boorer, Work Related Learning
Manager, Wandsworth BEST

Launching a dialogue in November 2007 on the science and society strategy, Ian Pearson, Minister of State for Science & Innovation commented⁹:

"I believe we need a society that is both enthused and excited by science, one where the public understands the value of science and its applications in today's society and can feel confident about how scientists are operating... Scientists cannot operate in a vacuum. They are part of the society in which they, and the outcomes of their research, operate."

International Collaboration

Research is an international activity, and it is important UK researchers continue to interface with leading researchers from across the globe. International collaboration exposes UK researchers to new ideas and fresh approaches, ensuring they are full participants in the global knowledge economy. Much world-class research can only be achieved through global collaboration.

The Science Budget allocations promote further international collaboration. For example, the successful Science Bridges scheme is to be expanded; the National Academies and RCUK are together launching a new International Fellowships' scheme; and RCUK are developing existing and initiating new, international partnerships. RCUK has already opened new offices in China and the United States, and will shortly do the same in India.

⁹ Speech given by Ian Pearson, First Sir Gareth Roberts Science Policy Lecture, The Science Council. 6 November 2007.



03

Objectives

The Policy Framework

In allocating the Science Budget, the DIUS aim is to support the overarching Government policy to promote world-class science. In addition, DIUS Departmental Strategic Objectives (DSOs) provide a clear direction for policy in support of the long-term aspirations set out by the Science & Innovation Investment Framework. Further information on the DSOs and 10 Year Framework can be found in the annex to this document.

In allocating the Science Budget DIUS is also addressing the long term public policy challenges outlined by the Treasury at the announcement of the Comprehensive Spending Review¹⁰. These were:

- a rapid increase in the old age dependency ratio as the 'baby boom' generation reaches retirement age;
- the intensification of cross-border economic competition as the balance of international economic activity shifts toward rapidly growing emerging markets such as China and India;

¹⁰ Long Term Opportunities and Challenges in the UK: an analysis for the Comprehensive Spending Review 2007, HM Treasury, November 2006. http://www.hm-treasury.gov.uk/media/6/F/csr_longterm271106.pdf

- an acceleration in the pace of innovation and technological diffusion and a continued increase in the knowledge-intensity of goods and services;
- continued global uncertainty with ongoing threats of international terrorism and global conflict; and
- increasing pressures on our natural resources and global climate from rapid economic and population growth in the developing world and sustained demand for fossil fuels in advanced economies.

It is also important that all resources are used to best possible effect, supporting the capability and sustainability of the research base. Further information on efficiency savings from the Research Councils is presented in the annex to this publication.

The Allocation Process

Previous UK investment in research has proven excellent value for money. Across the board, publicly funded research in the UK has performed very well against international competition; compared with other countries, our Research Council spending is exceptionally effective.

Before allocating the budget, DIUS collected evidence on the activities and performance of all funding lines. All the Research Councils and the Academies provided detailed delivery plans, which set out what future investment would deliver against the overarching objectives (outlined in the previous section). Other key programmes, such as the Higher Education Innovation Fund and the Science Research Investment Fund, were subject to independent evaluation.

The following factors were taken into account in determining the Science Budget Allocations to individual Research Councils and Academies:

- a thorough assessment of draft Research Council and Academy Delivery Plans for CSR07;
- the strength of the case for increasing the investment in any particular area of research in CSR07; and
- a full evaluation of the performance of each of the Research Councils and Academies through the SR04 period (see the annex for more detail on the performance measurement of the Research Councils).

04

Key Highlights of the Allocations

Cross-Council Programmes

DIUS has taken into account the key public policy challenges currently facing the UK when allocating the budget. The research base has the potential to have a great impact on these issues.

The Science Budget will fund a number of ambitious cross-council programmes co-ordinated by RCUK. These programmes will involve new ways of multi-disciplinary working, combining resources from a range of bodies, to address the key challenges.

The following table outlines the projected funding for each programme:

Table 1.1: Funding for the Cross-Council Research Programmes¹¹

| | AHRC | BBSRC | EPSRC | ESRC | MRC | NERC | STFC | Total |
|----------------------------|------|-------|-------|------|-----|------|------|-------|
| Energy | | 23 | 240 | 20 | | 22 | 14 | 319 |
| LWEC | 5 | 16 | 26 | 20 | 57 | 237 | 2 | 363 |
| Global threats to security | 21 | 5 | 17 | 23 | 45 | 1 | 2 | 113 |
| Ageing | 1 | 41 | 31 | 30 | 370 | 1 | 12 | 485 |

¹¹ Figures represent planned expenditure (£M) over CSR period. Figures are rounded to the nearest million. For further information please refer to the RCUK Delivery Plan. www.rcuk.ac.uk

Energy

The Research Councils' Energy Programme brings together energy-related research and training across the Councils to address the vital international issues of climate change and security of energy supply.

Energy is at the top of our national and international policy agenda. We need secure and sustainable energy supplies to facilitate our economy and way of life. However, energy provision is the major contributor to greenhouse gas emissions. The Stern Review emphasises the need for an urgent global response to climate change including energy demand reduction and new technology in power generation, transport, and energy use.

The Research Councils' Energy Programme (EPSRC, BBSRC, ESRC, NERC, and STFC) brings together research and training across the Councils to address climate change and security of energy supply. The programme aims to sustain the research portfolio in power generation and supply, and grow the portfolio in demand reduction, alternative energy vectors, transport, security of supply, research capacity building, and international engagement. Collaborative development of the portfolio with business, government, Regional Development Agencies, and other funders and non-governmental organisations is a priority. The programme will work closely with the Technology Strategy Board, Department for Business, Enterprise and Regulatory Reform (BERR), DIUS, and the Energy Technologies Institute (ETI). This will help realise the enormous potential of ETI to bring a step change in applied energy research and development. The Councils will seek to ensure that ETI work is focused in appropriate technology areas, addresses relevant environmental, social and economic issues, and pulls through the most promising work from the research base.



Carbon-Free Cars

A new breakthrough in hydrogen storage technology achieved by researchers from the UK Sustainable Hydrogen Energy Consortium could remove a key barrier to widespread uptake of non-polluting cars that produce no carbon dioxide emissions.

UK scientists have developed a compound of the element lithium which may make it practical to store enough hydrogen on-board fuel-cell-powered cars to enable them to drive over 300 miles before refuelling. Achieving this driving range is considered essential if a mass market for fuel cell cars is to develop in future years, but has not been possible using current hydrogen storage technologies.

LWEC is an interdisciplinary research and policy partnership programme to increase resilience to – and reduce costs of – environmental change, addressing the associated pressures on natural resources, ecosystem services, economic growth and social progress.

Human activities, most notably worldwide fossil-fuel demand and rapid population and economic growth in the developing world, are accelerating environmental change and increasing pressure on ecosystems and services, challenging our social and economic well-being. HM Treasury has identified this issue as a key challenge that the UK must address in the next decade, a concern supported by the Intergovernmental Panel on Climate Change Fourth Assessment, the Millennium Ecosystem Assessment, and the Stern Review.

Living With Environmental Change (LWEC) is a major interdisciplinary research and policy partnership to tackle environmental change and the societal challenges it poses, and thus provide a firmer basis for people to deal with the unprecedented changes that the world will face over the next century. The Research Councils, working with partners in at least nine Government Departments, Agencies and Devolved Administrations, will design the LWEC programme across the relevant research areas and policy and industrial sectors. Through a 10-year programme, LWEC aims to provide: the knowledge, tools, predictions, solutions and business opportunities needed to increase resilience to, and reduce the economic costs of, environmental changes such as more severe weather and reduced biodiversity; and the best information to enable sustainable management and protection of vital ecosystem services – such as clean air, fresh water, healthy soils, and flood and disease protection – on the time and space scales on which the economy is managed.

Living With Environmental Change (LWEC)



Improving the Urban Environment

LWEC will build on forerunner programmes such as URGENT, which examined urban environmental problems, such as contaminated soils and rivers, improving air quality, and increasing biodiversity in gardens.

The £10m programme brought together universities, research institutions, local authorities, public agencies, government departments and industry. It has been estimated that the programme will deliver benefits to the UK economy of £13-29 million.

Global Threats to Security

The Global Threats to Security programme will integrate research into crime, terrorism, environmental stress and global poverty, to address causes of threats to security, their detection, and possible interventions to prevent harm.

Trans-national global crime such as drugs, people smuggling, money laundering and cyber crime, is increasing in sophistication and scale as criminals exploit today's open and globalised world. Terrorism in pursuit of particular aims is increasing across the globe as many disparate groups see violence as a means to achieve their aims. Environmental stresses will continue to interact with human vulnerabilities to provide a powerful basis for insecurity in many parts of the world. Systemic research is needed to capture the direct and indirect contributions to global security arising from the continuing experience of extreme poverty - the world's poorest people are often those most vulnerable to harm from security threats.

All seven Research Councils will work together to address four inter-related global threats to security - crime, terrorism, environmental stress, and global poverty, each linked in a systematic way to address three themes - causes, detection, and possible interventions to prevent harm. Research will be pursued that seeks to understand how crime, terror, environmental stress, and poverty create vicious circles through positive feedback. A particular challenge is to move debates away from a narrow definition of national interests to one in which national interests are best served by mutual attention to causes, detection, and prevention in the international domain.



Homeland Security

The recent publication on Homeland Security, based on the work of the Economic and Social Research Council, shows how key public and private-sector bodies can prevent, pre-empt, counter and manage terrorist attacks by using a matrix of factors such as types of terrorist networks, tactics and targets. It examines the measures taken since 9/11 to enhance homeland security and considers whether domestic security measures are striking an appropriate balance between homeland security and civil liberties.

This initiative will establish new interdisciplinary research centres targeting the major determinants of health and wellbeing over the whole life course and reducing dependency in later life.

There is an unprecedented demographic change underway in the UK with the proportion of young people declining whilst that of older people is increasing. By 2051, 40 percent of the UK population will be over 50 and one in four over 65. There are considerable benefits to the UK of having an active and healthy older population with potential economic, social, and health gains associated with healthy ageing and reducing dependency in later life.

Ageing research is a long standing priority area for the Research Councils. The Research Councils will develop a new initiative (involving MRC, AHRC, BBSRC, EPSRC, ESRC, NERC, and STFC) which will provide substantial longer term funding for new interdisciplinary centres targeting themes of healthy ageing and factors over the whole life course that may be major determinants of health and well being in later life. Centres will be focussed on specific research themes drawing on the interdisciplinary strengths of the Research Councils, such as “Quality of Life”, “Physical Frailty” and “Ageing Brain”.

Ageing: Life Long Health and Wellbeing



The Ageing Population

Research Council discoveries are improving our understanding of the ageing process and what can be done to keep people healthy as they get older. Recent advances include findings that may lead to better ways to treat aortic aneurysms, Alzheimer’s and Parkinson’s diseases, diabetes and stroke, as well as clues to understanding what happens at a molecular level as we age.

Research into the Digital Economy and Nanoscience

In addition to these major programmes, the Research Councils are working on two multi-disciplinary projects. These multi-disciplinary programmes are part of much larger bodies of work being undertaken by the Research Councils on these areas.

Table 1.2: Projected Funding for Digital Economy and Nanoscience Programmes¹²

| | AHRC | BBSRC | EPSRC | ESRC | MRC | NERC | STFC | Total |
|-----------------|------|-------|-------|------|-----|------|------|-------|
| Digital economy | 5 | | 39 | 3 | 11 | | | 58 |
| Nanoscience | | 15 | 16 | 1 | 9 | 2 | 8 | 50 |

¹² Figures represent planned expenditure (£M) over CSR period. Figures are rounded to the nearest million. For further information please refer to the RCUK Delivery Plan. www.rcuk.ac.uk

Digital Economy

Early adoption of Information and Communications Technology (ICT) tools supported by research capacity and skilled people, better positions the country to reap the economic and social benefits of technological change.

ICT is everywhere. It is embedded in every aspect of our lives. Business, Government, the Health Service, and other users depend on how we capture, manipulate, and share information. ICT has the power to transform the way business operates, the way that government can deliver, and the way science is undertaken to improve life. In an ever-changing world, being able to respond rapidly to new opportunities and challenges is key to the future economic and social prosperity of the UK.

The Digital Economy programme will link the 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 focussed research aimed at building a base of expertise to put the UK at the forefront of the digital technology. Through the Digital Economy programme we will make a step-change in the type of industrial engagement to pursue key research challenges so that the transformational



Combating credit card fraud

Imperial College London, working in collaboration with Capital One, Lloyds TSB, Alliance & Leicester and Abbey, are developing a new computer model to identify credit card fraud more effectively than currently possible, benefiting both banks and their customers

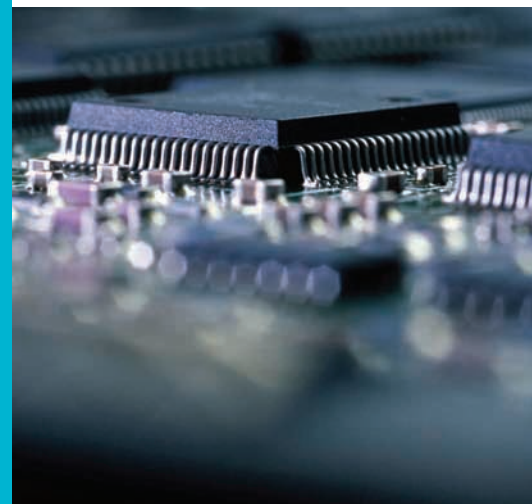
possibilities of ICT are employed to support the innovation cycle. The initiative (involving EPSRC, AHRC, ESRC, MRC, and STFC) will concentrate on areas where the management and presentation of information can have maximum transformational impact: healthcare, transport, and the creative industries.

Nanotechnologies can transform society, they offer the potential of disruptive step changes in electronic materials, optics, computing, and in the application of physical and chemical understanding (in combination with biology) to generate novel and innovative self-assembled systems.

The field is maturing rapidly, with a trend towards ever more complex, integrated nanosystems and structures. It is estimated that by 2015 products incorporating nanotechnology will contribute US\$1 trillion to the global economy, and that the UK has a 10 percent share of the current market.

To focus the UK research effort we will work through a series of Grand Challenges developed in conjunction with researchers and users in areas of societal importance such as energy, environmental remediation, the digital economy, and healthcare. An interdisciplinary, stage-gate approach spanning basic research through to application will be used including studies on risk governance, economics, and social implications. The challenges will be addressed via interdisciplinary consortia supported jointly by the Research Councils and the Technology Strategy Board. The Councils will also work with the cross-Government Nanotechnology Research Coordination Group to respond to the Royal Society/Royal Academy of Engineering report on Nanoscience and Nanotechnologies.

NanoScience through Engineering to Application



Display Technology

Cambridge Display Technology (CDT), a spinout company from the University of Cambridge, develops Polymer Light Emitting Diodes (PLEDs) which provide lightweight, low voltage, robust displays. Clearer, brighter and cheaper than previous technology, they are set to replace Liquid Crystal Displays (LCDs) and Cathode Ray Tubes (CRTs).

Other benefits of the technology include the potential for flexible and wearable displays, and more energy efficient devices.



Other Key Highlights

Medical Research

The allocation of the Science Budget significantly increases the funding available for medical research, training and knowledge transfer. In particular, the allocation will provide additional funding for public health and translational research, in line with the recommendations of the Cooksey Review¹³.

DIUS is part funding the new Office for the Strategic Co-ordination of Health Research (OSCHR). A specific Medical Research Council (MRC) allocation will, together with funding from the Department of Health, form a single research budget for OSCHR. The creation of OSCHR will help speed up the translation of fundamental knowledge into clinical practice.

Energy Research

Securing reliable, sustainable energy is a key Government priority. In order to meet this challenge, further investment in R&D is required to identify the most promising technologies, and to accelerate their deployment.

The Energy Technologies Institute (ETI), announced in the 2006 Budget, is a 50:50 public-private partnership capable of funding research costing up to £110 million p.a. for at least the next 10 years. It brings together some of the world's biggest energy and engineering companies – including BP, Caterpillar, EDF Energy, E.ON UK, Rolls-Royce and Shell. The ETI will help to deliver UK's climate change goals by bringing more focus, ambition and collaboration to the UK's work in energy science and engineering.

¹³ A Review of UK Health Research Funding, David Cooksey, December 2006. http://www.hm-treasury.gov.uk/media/4/A/pbr06_cooksey_final_report_636.pdf.

Sainsbury Review

The Sainsbury Review sets out a vision for science and innovation aimed at ensuring Britain remains a leading nation in the increasingly competitive world. It is a blueprint for dealing with globalisation, providing a clear view on how the UK can best optimise its excellent research base.

DIUS is tailor-made to help drive forward Lord Sainsbury's vision through linking universities and skills with research, science and innovation. Through the allocation of the Science Budget, DIUS has already started to take forward a number of the key recommendations from the report, including:

- Research Council – Technology Strategy Board Collaboration. The Research Councils have committed £120m over this CSR period to support the work of the Technology Strategy Board. The Technology Strategy Board will take on a new leadership role, bringing together innovation activity across Government, Research Councils, Regional Development Agencies and business.
- Knowledge transfer - the Budget provides the highest ever level of support for knowledge transfer activities, with HEIF funding rising to £150m p.a. by 2011.
- International Collaboration - there is continued support for international collaboration through an extension of the Science Bridges scheme which will be delivered through the new RCUK offices in Washington, Delhi and Beijing.

Financial Sustainability

The research base requires secure and stable funding, with the capacity to respond to present and future demands. World-class science and innovation is based on a well-funded research infrastructure.

In SR04 a programme was initiated to ensure the financial sustainability of the university research base. Good progress has been made on this agenda, and the CSR07 settlement provides resource to complete the policy of Research Councils' funding research at 80% of full economic cost (FEC). With the additional capital component from the new Capital Investment Fund this will rise to 90% FEC.¹⁴

Furthermore, the Science Research Investment Fund (SRIF) has now largely addressed the backlog of under investment in the research base. As such, a more strategic approach to capital investment in the research base is now required. During this CSR period, the funding will therefore undergo a transition from SRIF to a new capital fund, providing stable and predictable capital funding to support university research infrastructure.

¹⁴ Please see Chapter 8 for further information on the Capital Investment Fund.



02

Part Two

- 5 The Science Budget Allocations
- 6 Research Councils
- 7 The National Academies
- 8 Capital Funding
- 9 Knowledge Transfer
- 10 Science and Society and Other Programmes

05

**The Science
Budget
Allocations**



Table 2.1: Science Budget Allocations¹⁵

| £'000 | CSRO7 | | | | CSRO7 Total | End CSRO7 Increase |
|--|------------------|------------------|------------------|------------------|-------------------|--------------------|
| | 2007-08 | 2008-09 | 2009-10 | 2010-11 | | |
| Research Councils | | | | | | |
| Arts & Humanities Research Council | 96,792 | 103,492 | 104,397 | 108,827 | 316,716 | 12.4% |
| Biotechnology & Biosciences Research Council | 386,854 | 427,000 | 452,563 | 471,057 | 1,350,620 | 21.8% |
| Economics & Social Research Council | 149,881 | 164,924 | 170,614 | 177,574 | 513,112 | 18.5% |
| Engineering & Physical Sciences Research Council | 711,112 | 795,057 | 814,528 | 843,465 | 2,453,050 | 18.6% |
| Medical Research Council | 543,399 | 605,538 | 658,472 | 707,025 | 1,971,035 | 30.1% |
| Natural Environment Research Council | 372,398 | 392,150 | 408,162 | 436,000 | 1,236,312 | 17.1% |
| Science & Technology Facilities Council | 573,464 | 623,641 | 630,337 | 651,636 | 1,905,614 | 13.6% |
| Sub Total Research Councils | 2,833,900 | 3,111,802 | 3,239,073 | 3,395,584 | 9,746,459 | 19.8% |
| Less Depreciation & Impairments | -85,748 | -124,748 | -141,748 | -153,748 | -420,244 | 79.3% |
| Total Research Councils - Note 1 | 2,748,152 | 2,987,054 | 3,097,325 | 3,241,836 | 9,326,215 | 18.0% |
| National Academies | | | | | | |
| Royal Society | 41,072 | 43,360 | 45,823 | 48,558 | 137,741 | 18.2% |
| Royal Academy of Engineering | 9,752 | 10,279 | 12,138 | 12,826 | 35,243 | 31.5% |
| British Academy | 21,385 | 22,540 | 25,062 | 26,448 | 74,050 | 23.7% |
| Total Academies | 72,209 | 76,179 | 83,023 | 87,832 | 247,034 | 21.6% |
| Capital Funding | | | | | | |
| Large Facilities Capital Funding | 104,681 | 104,681 | 138,428 | 265,285 | 508,394 | 153.4% |
| University Capital | 300,000 | 266,711 | 258,149 | 214,851 | 739,711 | -28.4% |
| Knowledge Transfer | | | | | | |
| Higher Education Innovation Fund | 85,000 | 85,000 | 99,000 | 113,000 | 297,000 | 32.9% |
| Public Sector Research Establishments | 14,000 | 12,500 | 12,500 | 12,500 | 37,500 | -10.7% |
| Science & Society | | | | | | |
| Science & Society | 11,441 | 13,441 | 15,441 | 17,441 | 46,323 | 52.4% |
| Other Programmes | 46,940 | 8,857 | 11,557 | 17,678 | 38,092 | -62.3% |
| Total Science Budget | 3,382,423 | 3,554,423 | 3,715,423 | 3,970,423 | 11,240,269 | 17.4% |

¹⁵ The Research Council allocations shown are the total budgetary amounts. A deduction for depreciation and impairments is made to eliminate double counting with capital.



“The Research Councils
base and through this
and

06

Research Councils

The Research Councils collectively will invest in research covering the full spectrum of disciplines from the medical and biological sciences to astronomy, physics, chemistry, engineering, social sciences, and the arts and humanities.

Research Councils aim to deliver a world-class research base and through this create a higher level of economic impact and a better quality of life for people in the UK.”

Role of the Research Councils

The Research Councils aim to deliver a world-class research base and through this create a higher level of economic impact and a better quality of life for people in the UK. The integration of three key outputs is vital to achieving this objective.

Skilled People

Discovery and innovation in research happen through the creativity of people. The Research Councils support the current and next generation of world-class researchers so that the UK can increase its research output and global research impact.

Knowledge

Research excellence is at the core of the UK’s knowledge base. It underpins our ability to create, absorb, and deploy new ideas rapidly. It is a core UK brand value when seeking to attract or retain investment from global businesses. The Research Councils deliver world-class research in globally competitive, networked institutions.

Innovation

In today’s world, the UK’s ability to compete and maintain its leading position is dependent on its success at translating the wealth of knowledge and people from the research base into the economy. The Research Councils deliver economic impact from the research base, enabling the UK to compete effectively in an increasingly competitive global environment.

Through the CSR07 period the Government will invest over £9bn in the Research Councils, which represents an 18% increase over the period.



Research Councils UK (RCUK)

RCUK facilitates and enables the Research Councils to work together more effectively to enhance the overall economic impact and efficiency of their activities.

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

The RCUK delivery plan reflects the Research Councils' priorities for joint working for 2008-09 to 2010-11. It complements the Research Councils' individual delivery plans and should be read in conjunction with these. The RCUK delivery plan should also be read in parallel with the RCUK international, research careers and diversity, and science in society strategies. **The delivery plan can be found at: www.rcuk.ac.uk**

Arts and Humanities Research Council

Table 2.2: AHRC Allocation

| £'000 | 2008-09 | 2009-10 | 2010-11 |
|---------------------|----------------|----------------|----------------|
| Near Cash | 103,002 | 103,957 | 108,377 |
| Non Cash | 350 | 300 | 300 |
| Resource DEL | 103,352 | 104,257 | 108,677 |
| Capital Grants | 0 | 0 | 0 |
| Direct Capital | 140 | 140 | 150 |
| Capital DEL | 140 | 140 | 150 |
| Total DEL | 103,492 | 104,397 | 108,827 |

Strategic Direction

The Council promotes and supports the production of world-class research in the arts and humanities. It aims to strengthen the impact of arts and humanities research by encouraging researchers to disseminate and transfer knowledge to business, public services and other users where it adds value.

Priorities for investment over the next 3 years

Research Priorities

The new Block Grant Partnership (BGP) mechanism for funding postgraduates will ensure a strategic approach to longer term planning in the field and lead to a more proactive management of the health of the disciplines covered by AHRC.

Particular programmes include:

- Delivering user-driven models to simulate innovation in the Creative Industries (CIs). AHRC aims to provide a competitive advantage to the Creative Industries through access to excellent research, people and networks;
- a major cross-Council programme on global threats to security. The programme will inform development of public policy through analysis and interpretation of the historical, ideological and theological underpinnings of current global threats; and
- in partnership with EPSRC, and using STFC facilities, AHRC will strengthen the capacity of the fragmented research base to support the UK heritage industry.

Economic Impact

AHRC provides leadership to the academic community by promoting a culture of knowledge transfer. By drawing on existing exemplars of investments the Council demonstrates that arts and humanities research is a driver of innovation.

The Council is also developing a strategic partnership with the Technology Strategy Board to maximize collaborative research and development opportunities that meet the needs of employers. It has committed £3m for work in collaboration with the Technology Strategy Board and is funding a number of Knowledge Transfer Partnerships (KTPs).

Delivery Plan: www.ahrc.ac.uk

Knowledge Exchange Programmes

The AHRC and BBC Future Media & Technology are collaborating on a range of projects including one to understand how older BBC customers could take more advantage of digital services.

Biotechnology and Biological Sciences Research Council

Table 2.3: BBSRC Allocation

| £'000 | 2008-09 | 2009-10 | 2010-11 |
|---------------------|----------------|----------------|----------------|
| Near Cash | 362,077 | 379,641 | 391,089 |
| Non Cash | 17,131 | 19,364 | 20,488 |
| Resource DEL | 379,208 | 399,005 | 411,577 |
| Capital Grants | 28,937 | 34,194 | 39,593 |
| Direct Capital | 18,855 | 19,364 | 19,887 |
| Capital DEL | 47,792 | 53,558 | 59,480 |
| Total DEL | 427,000 | 452,563 | 471,057 |

Strategic direction

BBSRC is the UK's principal funding agency for basic and strategic research across the biosciences – in the microbial, plant and animal kingdoms (including humans). This encompasses strategic areas such as animal health and welfare, agricultural sustainability, pharmaceuticals, and food safety and quality.

BBSRC funds world-class research and provides training and career development in the biosciences. It also promotes economic and social impact through innovation and knowledge transfer for policy and business development, and fosters public engagement in the biological sciences.

Priorities for investment over the next 3 years

Research Priorities

The Council's overarching priorities are to sustain the health and international competitiveness of UK bioscience through: embedding systems/predictive biology capability; increasing investment for investigator-led research; and through collaborative funding with other Research Councils on major strategic challenges in multidisciplinary science.

BBSRC will secure our future national research capability in key strategic areas (i.e. sustainable agriculture and land use). Examples of research programmes include:

- further embedding systems biology and predictive biology in the science base and provide the requisite tools and resources for 21st century bioscience;
- significant additional support for bioenergy research. - around £40M will be provided over the CSR period to build UK research capacity, fund a new Bioenergy Centre and explore the science of artificial 'solar cells' mimicking plant photosynthesis;
- with the MRC, BBSRC is funding the joint Centre for Lifelong Health and Wellbeing. BBSRC funded research on ageing, which will total more than

£46M over the CSR period, will throw light on the developmental origins of good health, investigate ageing as a risk factor in fragility and loss of homeostasis and unravel the impact of diet, exercise and health on ageing; and

- BBSRC funded research will help address global threats to security through research to improve the sustainability of agriculture in developing countries thereby helping to alleviate poverty, enhance food security and improve political stability. Over the CSR period, emphasis will be placed on plant and animal diseases where anticipated outcomes include better control strategies and increased ability to respond to disease threats (deliberate release or naturally occurring).

Economic Impact

BBSRC will drive a step-change in the economic impact of biosciences mainly through a significant increase in collaborative and complementary activities with the new Technology Strategy Board and significant support for training and skills. At least £34m will be invested in collaborative and complementary activity with the new Technology Strategy Board, in particular the establishment, with industry, of Research Technology Clubs in areas such as bioprocessing, diet and health, biorefineries, mitigating impacts of ageing and stem cell bioprocessing.

Delivery Plan: www.bbsrc.ac.uk

Economic and Social Research Council

Table 2.4: ESRC Allocation

| £'000 | 2008-09 | 2009-10 | 2010-11 |
|---------------------|----------------|----------------|----------------|
| Near Cash | 157,988 | 163,501 | 170,280 |
| Non Cash | 400 | 400 | 400 |
| Resource DEL | 158,388 | 163,901 | 170,680 |
| Capital Grants | 3,286 | 3,375 | 3,466 |
| Direct Capital | 3,250 | 3,338 | 3,428 |
| Capital DEL | 6,536 | 6,713 | 6,894 |
| Total DEL | 164,924 | 170,614 | 177,574 |

Strategic Direction

Britain faces many challenges that will determine the future of the country and its role in the world. Many of these challenges are either social scientific in nature or require the deep involvement of social science.

ESRC's mission is to promote and support, high-quality basic, strategic and applied research and related postgraduate training in the social sciences. The Council looks to advance knowledge and provide trained social scientists who meet the needs of users and beneficiaries, thereby contributing to the economic competitiveness of the United Kingdom, the effectiveness of public services and policy, and the quality of life. The Council plays an important role in promoting public understanding of the social sciences.

Priorities for Investment over the Next Three Years

Research Priorities

The Council will lead world-class directed research on: succeeding in the global economy; global poverty; population change and migration; energy and the environment; global security; public health; and individual behaviour. It will fund a range of leading edge basic social science - subjects impacting on all areas of economic, political and social life.

The Council will contribute to a range of cross-Council programmes and support specific research initiatives in ESRC key challenge areas - 'Succeeding in the Global Economy'; migration/population change; and 'Understanding Individual Behaviour'.

ESRC is investing significantly in infrastructure and facilities for the social sciences.

Examples include:

- improved access to and use of a variety of data (international, administrative, business and bio-medical);
- building on the National Centre for Research Methods and National Centre for E-Social Science; and
- creating a "Policy Trials Service".
- The Council will also increase support for school-based events and provide further training in public engagement for social science researchers.

Economic Impact

The Council will undertake a number of Initiatives to ensure that the economic, social and policy impacts of the research funded by the Council are maximised. It will spend £8 million on collaborations with Technology Strategy Board in areas that include network security, the creative industries, transport and financial services.

Delivery Plan: www.esrc.ac.uk

Engineering & Physical Sciences Research Council

Priorities for investment over the next 3 years

Research Priorities

Table 2.5: EPSRC Allocation

| £'000 | 2008-09 | 2009-10 | 2010-11 |
|---------------------|----------------|----------------|----------------|
| Near Cash | 738,699 | 752,631 | 788,305 |
| Non Cash | 9,653 | 13,931 | 5,899 |
| Resource DEL | 748,352 | 766,562 | 794,204 |
| Capital Grants | 33,437 | 34,340 | 35,267 |
| Direct Capital | 13,268 | 13,626 | 13,994 |
| Capital DEL | 46,705 | 47,966 | 49,261 |
| Total DEL | 795,057 | 814,528 | 843,465 |

EPSRC will play a leading role in a number of cross-Council programmes, responding to the challenges facing society and the economy. It will use the concept of the 'Grand Challenges' to build a critical mass of research effort around particular goals, and will encourage 'transformative research' for pursuing mould-breaking activities. Examples include:

- Energy - EPSRC will lead and will commit a further £160m over the CSR period to the cross-Council programme, supporting a full range of basic research including power-generation and supply, demand-reduction, transport, and alternative fuels. EPSRC will also provide public funding, along with Technology Strategy Board, for the Energy Technologies Institute (ETI).
- Nanoscience Through Engineering to Application - EPSRC will lead a focused programme, committing £40m, designed to pull basic research through to application. This will consolidate earlier investments, support goal-driven research programmes and generate critical mass in required skills in this interdisciplinary subject.

Strategic Direction

EPSRC is the main UK Government agency for funding 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 development, and improve the quality of life in the UK. EPSRC plans will generate the new knowledge from research and the skilled people needed for innovation in a modern economy, whilst galvanising the research community around key global challenges.

- Digital Economy - EPSRC will commit over £100m to research which will draw together ICT research outputs and industry across a number of sectors including healthcare, transport, and the creative industries, aiming for rapid take-up of key technologies to support both the economy and to enhance the quality of life of individual citizens.

Support for core engineering and physical sciences research activity ensures a vibrant and healthy research capacity, delivering outputs for all of science and the knowledge-driven economy. To ensure the long term sustainability of research in engineering and physical sciences, EPSRC will:

- maintain investment in the next generation of world-class researchers and research leaders, including increasing the use of Doctoral Training Centres, and ensuring research capacity in areas of need; and
- sustain future people flow into the engineering and physical sciences through our science in society activities alongside RCUK.

Economic Impact

Knowledge transfer is integral to all of EPSRC's research and training activities. EPSRC will seek to reduce the time to exploitation of breakthrough research by:

- accelerating the exploitation of research outputs in key technologies for economic benefit through strategic partnership with the Technology Strategy Board;
- working in partnership with the Energy Technologies Institute (ETI) to realise a step-change in UK energy research, development & demonstration;
- working with key stakeholders to form bridges that pull research through to exploitation more rapidly and efficiently in the areas of energy, digital economy, nanoscience, and next generation healthcare; and
- aligning the skills base more closely to the needs of innovation through more user-focused PhD training.

Delivery Plan: www.epsrc.ac.uk

Medical Research Council

Table 2.6: MRC Allocation

| £'000 | 2008-09 | 2009-10 | 2010-11 |
|---------------------|----------------|----------------|----------------|
| Near Cash | 520,409 | 557,662 | 588,245 |
| Non Cash | 27,689 | 33,686 | 41,763 |
| Resource DEL | 548,098 | 591,348 | 630,008 |
| Capital Grants | 15,492 | 24,043 | 32,774 |
| Direct Capital | 41,948 | 43,081 | 44,243 |
| Capital DEL | 57,440 | 67,124 | 77,017 |
| Total DEL | 605,538 | 658,472 | 707,025 |

Strategic Direction

The MRC's mission is to fund research, training and knowledge transfer to improve human health and quality of life, and contribute to national wealth. To achieve this, the MRC supports research across the biomedical spectrum, from fundamental laboratory-based science to clinical trials, and in all major disease areas.

Priorities for investment over the next 3 years

MRC's main priority over the CSR period will be to maintain the strength and innovation of the fundamental sciences while increasing investment in addressing the translational gaps identified in the Cooksey Report. In the latter context, MRC will be working closely with the National Institute for Health Research (NIHR).

Research Priorities

A key research priority area for the MRC is experimental medicine, including first-in-man studies. Another priority is stem cell research, which has tremendous potential to benefit patients with conditions, which currently have no effective cure, such as Parkinson's disease, juvenile diabetes, Alzheimer's disease, heart disease, stroke and spinal cord injury.

The MRC is leading on the cross-Council programme: 'Ageing, Lifelong Health and Wellbeing'. The aim of the new initiative is to obtain a better understanding of ageing and factors over the whole life-course that may be determinants of health and well-being in later life. New Centres will be established that may have multi-cultural funded programmes or projects funded by others including industry. The first call for proposals was announced early in 2007. The MRC aims to develop a cross-funder partnership of £12m working with a broad range of external agencies and stakeholders (in addition to contributions from other Research Councils) to launch second-stage initiatives.

It is also contributing significantly to the Living with Environmental Change (LWEC) and Digital Economy programmes:

- the MRC has already allocated £1M to support health-related research under the LWEC programme. MRC plan to incorporate other emerging issues (e.g. changes in climate, energy and transport, and food supply) into shaping the portfolio of population and public health research, through calls and highlight notices; and
- it has partnered with other Research Councils in developing the e-science programme, and funds methodological and behavioural research that will underpin new opportunities in health data transfer, data integration, data mining, novel use of ICT in behaviour change and patient self-management.

The MRC plans to increase support for the National Centre for the Replacement, Refinement and Reductions of Animals in Research (NC3Rs). The NC3Rs brings together stakeholders in the 3Rs in academia, industry, government and animal welfare organisations to facilitate the exchange of information and ideas, and the translation of research findings into practice that will benefit both animals and science.

During 2007/08, the MRC has also been reviewing its long term strategy for investment and partnership in Africa. The MRC plans to continue playing a leading role in the UK's investments in global health research, the outcome of the current review will help to determine the level of resource provided.

Economic Impact

In order to increase the economic impact of its research, the MRC will:

- implement the recommendations set out in the Cooksey Review. The MRC expects to invest over £130m (£25m in 2007/08, £44m in 2009/10 and £63m in 2010/11) in priority areas agreed with OSCHR and aligned with the Department of Health's strategies;
- MRC plans a substantial increase in collaboration with the new Technology Strategy Board amounting to collaborative commitments of £30m over the CSR period. This will be linked mainly to strengthened support for translational research; and
- the MRC has a strong programme of doctoral and post-doctoral training and career development, spending over £55m per annum in Universities, medical schools and MRC Research Centres. Over the CSR period, the MRC aims to increase its support above the level of inflation for training and developing people, with particular focus on translational research needs, including those identified by industry.

Delivery Plan: www.mrc.ac.uk

Natural Environment Research Council

Table 2.7: NERC Allocation

| £'000 | 2008-09 | 2009-10 | 2010-11 |
|---------------------|----------------|----------------|----------------|
| Near Cash | 326,129 | 338,197 | 350,225 |
| Non Cash | 27,010 | 25,688 | 36,092 |
| Resource DEL | 353,139 | 363,885 | 386,317 |
| Capital Grants | 15,074 | 19,693 | 24,436 |
| Direct Capital | 23,937 | 24,583 | 25,247 |
| Capital DEL | 39,011 | 44,277 | 49,683 |
| Total DEL | 392,150 | 408,162 | 436,000 |

Strategic Direction

NERC is the main UK Government agency for funding and managing research, training and knowledge transfer in the environmental sciences. NERC's strategic goal is to deliver world-leading environmental research at the frontiers of knowledge:

- enabling society to respond urgently to global climate change and the increasing pressures on natural resources;
- contributing to UK leadership in predicting the regional and local impacts of environmental change from days to decades; and
- creating and supporting vibrant, integrated research communities.

Priorities for investment over the next 3 years

Research Priorities

NERC will direct a significant part 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's contributions to the following cross-Council programmes will be delivered by the outputs from its strategic priorities:

- NERC will invest £237m over the CSR period in the cross-Council programme Living with Environmental Change (LWEC). NERC will take the Research Council lead on this multi-partner activity to provide an interdisciplinary research and policy partnership programme to increase resilience to - and reduce the costs of - environmental change. It will address the associated pressures on natural resources, ecosystem services, economic growth and social progress; and
- NERC will invest £22m over the CSR period in whole-systems approach to energy research, including the UK Energy Research Centre and integrity testing for underground nuclear waste repository.

NERC will provide funding for facilities and infrastructure to enable delivery of science priorities including replacement for RRS Discovery, and key international commitments, including membership of IODP and funding UK Earth Observation science commitments to the European Space Agency (ESA).

Development of NERC's 'National Capability and National Good' activities will be driven by the NERC strategy, maximising synergy between the centres' national capability, research programme and commercial contracts, and by clearly identifying those resources maintained for national good.

Economic Impact

NERC will build up the culture of economic impact and knowledge exchange in its research community, strengthening engagement with stakeholders, enabling full access to its knowledge and data, ensuring full utilisation of NERC-funded research and building collaborations with the Technology Strategy Board.

NERC will fully integrate knowledge exchange (KE) and economic impact within all its activities, and will invest £15m p.a. by 2010/11 in KE support activities. It will also commit £5.5m in collaboration with the Technology Strategy Board in developing technologies for environmental research, information products for the service sector and increasing business interaction with the environmental science community.

Delivery Plan: www.nerc.ac.uk

Science and Technology Facilities Council

Table 2.8: STFC Allocation

| £'000 | 2008-09 | 2009-10 | 2010-11 |
|---------------------|----------------|----------------|----------------|
| Near Cash | 432,250 | 428,932 | 432,741 |
| Non Cash | 92,838 | 100,191 | 114,947 |
| Resource DEL | 525,088 | 529,123 | 547,688 |
| Capital Grants | 45,078 | 46,295 | 47,545 |
| Direct Capital | 53,475 | 54,919 | 56,402 |
| Capital DEL | 98,553 | 101,214 | 103,947 |
| Total DEL | 623,641 | 630,337 | 651,635 |

Strategic Direction

The Council's overall strategy is to support the highest quality science and technology. Maintaining access to world-class experimental facilities is crucial if UK scientists are to remain internationally competitive.

STFC contributes to a healthy and vibrant university research community, increases the UK's international impact and credibility, and contributes to economic impact notably through the development of the Daresbury and Harwell Science and Innovation Campuses.

Priorities for investment over the next 3 years

Research Priorities

The Council will continue to invest in providing access for the UK community to world-leading national and international facilities, giving high priority to exploiting recent investments in new facilities which will tackle some of the most exciting science challenges of the next decade. STFC will also invest in targeted R&D to enable the UK to be a significant partner in selected major new facilities and to host at least one. It will invest in high impact research programmes for the space science, particle physics and nuclear physics communities which will bring substantial scientific and commercial benefits for the UK.

The Government has decided that the Harwell and Daresbury sites should become Science and Innovation Campuses. These campuses are now developing to ensure the facilities are internationally competitive, support world-class science and maximise the opportunities for knowledge transfer.

In delivering both these campuses, STFC will make the necessary investment to establish the joint venture partnerships and deliver the estates infrastructure required on each site. With partners, the Council will invest in key strategic institutes.

The majority of STFC's contribution to the cross-Council programmes comes from the provision of facility access, with some underpinning technology provision. STFC aims to create four new advanced technology institutes contributing to the strategic priorities of the cross-Council Programmes.

With BNSC, STFC aims to develop a national space technology programme which will enable the UK to increase its leadership in space science (and its global market share in space products and services for telecommunications), climate change, global security and resource management.

In implementing this strategy, STFC plans a major programme of restructuring to focus on those activities with highest impact scientifically and economically. This will draw on advice from the Council's science advisory structure.

Economic Impact

The Harwell and Daresbury Campuses, as national hubs of interaction with university groups, the international R&D sector and high added value industries, will be at the heart of STFC's economic impact strategy, developed in close partnership with the RDAs and the Technology Strategy Board.

Delivery Plan: www.stfc.ac.uk

“The national academies
the relative international
by promoting

07

The National Academies



The national academies – the Royal Society, the British Academy and the Royal Academy of Engineering – play a vital role in helping to improve the relative international performance of the UK research base, by promoting excellence and achievement in research.

Much of the academies’ allocation is used to support and develop the best researchers, both in the UK and from abroad, with a particular focus on early and mid-career research. A range of international activities develop research links and collaborations with the best researchers overseas, particularly in regions of strategic importance to the UK.

Communication activities help improve public engagement and understanding of science and engineering issues, and education activities help encourage more young people to follow careers in STEM (science, technology, engineering and mathematics). The academies also influence science and research policy, e.g. by responding to government and parliamentary consultations.

Over the CSR07 period, DIUS will fund £247 million of spending in the academies, an increase over the period of 22%.

The academies are exploring opportunities for sharing systems and services and adapting peer review practices to minimise costs on the academic community, while preserving full academic credibility in decision-making.

s play a vital role in helping to improve
 onal performance of the UK research base,
 ting excellence and achievement in research.”

The Royal Society

Table 2.9: Royal Society Allocation

| £'000 | 2008-09 | 2009-10 | 2010-11 |
|-----------|---------|---------|---------|
| Near Cash | 43,360 | 45,823 | 48,558 |

Strategic direction

As the UK’s national academy of science, the Society’s strategic priorities, taking it up to its 350th anniversary in 2010 and beyond, are:

- invest in scientific excellence to create tomorrow’s leaders;
- influence policy-making with the best scientific advice;
- invigorate science and mathematics education;
- increase access to the best science internationally; and
- inspire an interest in the joy, wonder and excitement of science.

Priorities for investment over the next three years

In order to enable the best scientific talent to realise successful careers in science and engineering in the UK, the Society will continue to offer a portfolio of substantial fellowships at critical career stages, supplemented by tailor-made professional development training. Some key deliverables:

- university Research Fellows (35 new p.a. in 2008/09, rising to 38 new p.a. in 2010/11, maintaining a constant volume of 310)
- Dorothy Hodgkin Fellows (10 new p.a., maintaining a constant volume of 58)

The Society will support innovation and the application of scientific knowledge for wider economic and social benefit through a range of funding tools (e.g. industry fellowships and research grants), and by encouraging top researchers to engage with innovation and business.

The Society will promote the UK as the partner of choice for international scientific collaboration and R&D activities through a variety of funding mechanisms (e.g. travel grants, joint projects, networks), which will allow UK scientists to build relationships and interact with the best research groups overseas, helping to facilitate international collaboration in larger projects.

In partnership with the other academies and Research Councils UK, the Society will introduce a new International Fellowships scheme, with linked alumni management (50 p.a.), as recommended by the Global Science and Innovation Forum (GSIF).

The Society will also support the improvement of school science and maths education through a combination of policy studies, targeted grants and events, and improved public understanding of science through a range of science communication activities.

Delivery Plan: www.royalsociety.org

The British Academy

Table 2.10: British Academy Allocation

| £'000 | 2008-09 | 2009-10 | 2010-11 |
|-----------|---------|---------|---------|
| Near Cash | 22,540 | 25,062 | 26,448 |

Strategic direction

The Academy's strategic priorities for the humanities and social sciences are:

- Providing targeted, often small-scale support, to stimulate innovation and diversity;
- Fostering high-quality research and developing research capacity and researchers through a framework of primarily responsive-mode programmes;
- Promoting international collaboration and cultural interchange through links with overseas partners and institutions; and
- Engaging with the public, to foster debate with policy-makers and others, and to publish and disseminate new knowledge and ideas.

Priorities for investment over the next three years

To support early career research the Academy will increase the number of Postdoctoral Fellowship awards to 45 new awards p.a. It will also implement a new programme of flexible options for mid-career research support, making 50 awards p.a.

The Academy will maintain a programme of research awards – largely responsive mode, small-scale funding – making some 550 awards p.a.

It will develop its international leadership in three areas: policy formulation, research delivery and underpinning investment. It will maintain a programme of Area Panels, policy workshops, partnership agreements, research networks and overseas facilities, enabling UK researchers to undertake strategically important research overseas.

The Academy is a partner with the other academies and RCUK in the new international fellowships scheme.

The Academy is also planning an enhanced programme of communications, outreach and policy development work, including an integrated strategy of conference support to showcase the best UK scholarship, and a programme of activities and publications to raise public awareness of the Academy's work.

Delivery Plan: www.britac.ac.uk

The Royal Academy of Engineering

Table 2.11: Royal Academy of Engineering Allocation

| £'000 | 2008-09 | 2009-10 | 2010-11 |
|-----------|---------|---------|---------|
| Near Cash | 10,279 | 12,138 | 12,826 |

Strategic direction

The Academy brings together the UK's most eminent engineers from all disciplines to promote excellence in the science, art and practice of engineering. Strategic priorities are to enhance the UK's engineering capabilities; to celebrate excellence and inspire the next generation; and to lead debate, guiding informed thinking and influencing public policy.

Priorities for investment over the next three years

Improving innovation in a competitive global environment

The Academy will deliver support across a range of programmes to enhance innovation performance by developing skills in top quality individuals, connecting them with global experts, building relationships with countries of strategic importance, and supporting the interactions between industry and universities in teaching and research.

The Academy is a partner with the other academies and RCUK in the new international fellowships scheme.

Key deliverables include:

- Research Chairs and Senior Research Fellowships (36 rising to 37 in post)
- RAEng/EPSRC Research Fellowships (49 in post)
- Research Chairs in Emerging Technologies (1 in post)
- Global Research Awards (15 p.a.)
- Research Exchanges between UK and China/India (10 p.a.)
- UK International Fellowships (~12 p.a.)

Creating the skills we need for the future

The Academy will deliver support across a range of programmes aimed at encouraging more school-age students to study engineering, helping to make university courses both stimulating and relevant to current and future needs, and enhancing the skills of post-graduate engineers.

Initiatives include:

- BEST Programme of school science curriculum enrichment activities
- Programme for Science Teachers (1,100 teachers assisted p.a.)

- Engineering Professional Development Awards (48 awards p.a. assisting 990 engineers, rising to 65 awards p.a. assisting 1,300 engineers)
- Engineering Leadership Scheme (300 leadership places and 30 advanced leadership places p.a., 30% of these to be taken up by women by 2011)

Engaging with the public and the public policy process

Increasing awareness of the range of engineering careers available is a key priority for the Academy. It aims to develop greater public understanding about how engineering can help solve society's problems, and move engineering from the periphery to the centre of society. In order to achieve this, it will increase the number of Public Engagement Awards (30 p.a., rising to 34 p.a.).

The Academy also engages with, and provides advice to, parliamentary committees and government consultations on engineering related matters. It undertakes policy studies and projects of its own on major challenges of the day.

Delivery Plan: www.raeng.org.uk



08

Capital Funding

Large Facilities Capital Fund

Table 2.12: Allocation for the Large Facilities Capital Fund

| £'000 | 2008-09 | 2009-10 | 2010-11 |
|----------------|---------|---------|---------|
| Direct Capital | 104,681 | 138,428 | 265,285 |

The Government is committed to creating an economy based on high value added activities and a highly skilled population. This requires investment in science, technology and innovation. Underpinning leading edge research are large capital facilities which enable researchers to push forward the boundaries of existing scientific knowledge and create a future generation of leading scientists and engineers.

The Science Budget's Large Facilities Capital Fund (LFCF) enables Research Councils to fund investments in new and replacement large-scale scientific research facilities both at home and overseas. To determine which projects should be earmarked for funding from the LFCF, a project selection and prioritisation exercise, led by RCUK (Research Councils UK) takes place every two years.

A large facilities road map, which is maintained and updated by RCUK, highlights the strategically important large facility projects for the short to medium term and forms the basis of this prioritisation exercise.

The budget for the Large Facilities Capital Fund is currently at a level of approximately £105m p.a. This will allow for a number of new large national and international facilities, ensuring the UK maintains its leading role in science and technology development.

Projects currently partly funded from the LFCF include the Diamond Synchrotron, the marine research vessel -RRS James Cross - and the first social science project funded from the LFCF, the UK Household Longitudinal Study - the world's largest longitudinal study of households.



The UK Household Longitudinal Study

UKHLS is a major new household panel study commissioned by ESRC. It will provide valuable new evidence about the people of the UK, their lives, experiences, behaviours and beliefs, and will enable an unprecedented understanding of diversity within the population.

UKHLS will be the largest study of its type in the world. It will assist with understanding the long term effects of social and economic change, as well as policy interventions designed to impact upon the general well-being of the UK population.

University Research Capital Investment

Historically, investment levels in university research infrastructure were below that required to maintain modern facilities. A backlog of infrastructure investment built up over a long period. Through the Science Research Investment Fund (SRIF) (jointly funded by the Science Budget and HE funding) the Government delivered a major programme to address this backlog.

SRIF has been very successful. Universities have risen to the challenge and undertaken major improvement programmes, often supplementing SRIF with other resources.¹⁶ An independent report commissioned in 2006 stated that the backlog has halved since 2001 and is on course to reduce to reach a manageable level (within an ongoing preventative investment programme) by early in the CSR2007 period. The remaining backlog is no longer inhibiting necessary research.

Cardiff University Brain Imaging and Repair Centre

An investment of over £8m from SRIF enabled the establishment of state-of-the-art imaging facilities at the Cardiff University Brain Imaging Centre.



Against this background, a more strategic approach to capital investment in the university research base is now required. A new Capital Investment Fund is being created. This permanent funding stream replaces the contribution from the Science Budget to the temporary Science Research Investment Fund. Together with funding from the Funding Councils, this will help Universities to maintain their research infrastructure in the future and avoid the backlog reoccurring

The Science Budget element of the new Fund will be allocated by reference to the research income an institution receives from Research Councils. The new Fund will start on 1st July 2008. We estimate that the annual allocations will equate to about 10% of the full economic cost (FEC) of Research Council funded research in universities, bringing the total contribution from the Science Budget to around 90% of FEC overall.

The combination of a secure funding basis for research grants and an additional predictable capital stream represents a further significant step toward sustainability. It gives universities the

¹⁶ Future needs for capital funding in higher education. A review of the future of SRIF and learning and teaching capital." Report to HEFCE by JM Consulting Ltd, September 2006

opportunity to plan ahead and to ensure the Research Council-funded research they undertake in the present is not at the expense of their ability to respond to the Councils' needs in the future.

To help smooth the transition from SRIF to the new Capital Investment Fund arrangements, some transition funding will be available over the three years of the CSR period.

This represents the Science Budget contribution to research capital funding on a UK-wide basis. In England, further capital funding will be provided from within the Higher Education capital budget (£266m/ £266m/ £292m over the three years). The two streams of funding will be distributed to institutions and managed as a single funding line. We expect that capital funding will also be made available for HEIs in their respective areas by the devolved administrations in Scotland, Wales and Northern Ireland, as was the case with SRIF.

Table 2.13: Allocation for University Research Capital Investment

| £'000 | 2008-09 | 2009-10 | 2010-11 |
|-----------------------------|----------------|----------------|----------------|
| SRIF ¹⁷ | 131,711 | 73,289 | 25,000 |
| New Capital Investment Fund | 135,000 | 184,860 | 189,851 |
| Total | 266,711 | 258,149 | 214,851 |

¹⁷ The SRIF figures above cover Science Budget funding for the balance of existing commitments, plus transitional funding. This figures exclude contributions from the Higher Education Budgets in the four countries of the UK.



09

Knowledge Transfer

To support our knowledge based economy, we must ensure that our investment in an excellent research base delivers every possible benefit to businesses and the public services. To this end, funds have been allocated to ensure that universities and PSREs can develop the professional capability to undertake top quality knowledge transfer.



Since 2003, 30 university spin-out companies have floated on stock exchanges at a valuation of £1.5 billion.

HEIF

Table 2.14: Allocation for HEIF

| | £'000 | 2008-09 | 2009-10 | 2010-11 |
|-----------|-------|---------|---------|---------|
| Near Cash | | 85,000 | 99,000 | 113,000 |

The Higher Education Innovation Fund is a joint funding stream between the Higher Education Council for England (HEFCE) and the DIUS Science Budget, managed by HEFCE. It supports English Higher Education institutions to: build their capacity to undertake knowledge transfer; commercialise their research and; engage with business, public services and other external organisations.

HEIF has helped drive a culture change across the HE sector, and significantly increase their business interaction, as demonstrated by a rise across a range of indicators in the Higher Education Business and Community Interaction Survey.

In this CSR period, the budget for HEIF will be increased to £150m per year by the final year, in line with the recommendation made by Richard Lambert in his 2003 report on University Business Collaboration. £113m will come from the Science Budget with the remainder from the Higher Education budget in DIUS.

In addition, following the recommendation of the Sainsbury Review, HEIF will move to a fully formulaic allocation. This will provide certainty of funding for higher education institutes. It gives universities the strategic flexibility to

focus on their strengths and enables them to offer career-track positions to knowledge transfer staff, elevating their esteem. In line with the Sainsbury Review, the increased formula funding will be allocated so that the benefits of HEIF are spread widely across the HE sector.

The weighting of the components in the formula have been adjusted since the last round of HEIF to increase emphasis on HEI performance in interacting with business and other organisations (as measured by income). In future rounds of HEIF funding, the weighting for the performance component of the formula can be expected to increase further, with less of the funding allocated according to the size of the organisation.

PSRE

Table 2.15: Allocation for PSRE Fund¹⁸

| | £'000 | 2008-09 | 2009-10 | 2010-11 |
|-----------|-------|---------|---------|---------|
| Near Cash | | 12,500 | 12,500 | 12,500 |

The Public Sector Research Exploitation Fund (PSRE Fund) was set up to realise the economic potential of research carried out by public sector organisations. Since 2002 the fund has provided nearly £50m to support the commercialisation of research from a diverse range of organisations including Research Council Institutes, NHS hospitals, Government Laboratories and major museums and galleries.

¹⁸ A total of £25m was allocated for the PSRE Fund for the last 2 years of SR04, with more funding available in 2007-8 than 2006-7. For CSR07 the annual average funding is unchanged, but it has been spread evenly across the CSR period.

Public Sector Research Establishments are now beginning to generate significant volumes of commercial activity. Their latest annual reports show that Public Sector Research Establishments supported by the fund have:

- allocated proof of concept funding to over 150 projects helping develop them into marketable products; and
- used seed funds to establish at least 12 new companies which themselves have attracted over £14M of 3rd party funds and now employ more than 90 new staff.

Pain Relief Manikin – supporting training in pain relief

During surgery drugs are delivered to patients through hypodermic needles. If needles are not inserted in the right place patients feel pain and distress. To help doctors and students learn how to place needles correctly, the North West NHS Innovation Hub has developed a Pain Relief Manikin. This Manikin gives doctors and students an opportunity to practice placing of needles using an accurate model of the human body.



A further round of the fund was announced in December 2007. In order to maximise the impact of this funding, those Public Sector Research Establishments with a proven track record of commercialisation and which have previously been successful in securing funding from all previous rounds of the Fund will be required to obtain co-funding from other sources.

10

Science and Society and Other Programmes



Table 2.16: Allocation for Science and Society Programmes

| | £'000 | 2008-09 | 2009-10 | 2010-11 |
|-----------|-------|---------|---------|---------|
| Near Cash | | 13,441 | 15,441 | 17,441 |

In its Science and Innovation Investment Framework (2004-2014), the Government set out its science and society agenda as encompassing achieving public confidence and engagement in science, and sustaining the science workforce. It committed to promoting: science for young people, the role of women and ethnic minorities in science, engineering, technology and research careers.

The science and society allocation will enable further delivery in these areas, building on the commitments in the Science and Innovation framework Next Steps, the recommendations of the Sainsbury Review and the revision of the Science & Society strategy in early 2008.

The Science Budget allocation also provides for continued funding of programmes in support of the work of the Government Office for Science.





Annex

- 1** Science Budget
Allocations: Near-Cash,
Non-Cash, Capital
- 2** Research Council
Efficiency & Service
Transformation
- 3** Performance
Management
- 4** DIUS Policy Objectives



A1

Science Budget Allocations:

Near-Cash, Non-Cash, Capital

Table A1: Near-Cash Allocations

| £'000 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | CSR07 Total |
|--|------------------|------------------|------------------|------------------|------------------|
| Research Councils | | | | | |
| Arts & Humanities Research Council | 96,792 | 103,002 | 103,957 | 108,377 | 315,336 |
| Biotechnology & Biosciences Research Council | 331,567 | 362,077 | 379,641 | 391,089 | 1,132,807 |
| Economics & Social Research Council | 142,517 | 157,988 | 163,501 | 170,280 | 491,770 |
| Engineering & Physical Sciences Research Council | 666,126 | 738,699 | 752,631 | 788,305 | 2,279,636 |
| Medical Research Council | 466,705 | 520,409 | 557,662 | 588,245 | 1,666,316 |
| Natural Environment Research Council | 311,975 | 326,129 | 338,197 | 350,225 | 1,014,551 |
| Science & Technology Facilities Council | 400,658 | 432,250 | 428,932 | 432,741 | 1,293,923 |
| Total Research Councils | 2,416,340 | 2,640,554 | 2,724,521 | 2,829,263 | 8,194,337 |
| Royal Society | 41,072 | 43,360 | 45,823 | 48,558 | 137,741 |
| Royal Academy of Engineering | 9,752 | 10,279 | 12,138 | 12,826 | 35,243 |
| British Academy | 21,385 | 22,540 | 25,062 | 26,448 | 74,050 |
| Higher Education Innovation Fund | 85,000 | 85,000 | 99,000 | 113,000 | 297,000 |
| Public Sector Research Establishments | 14,000 | 12,500 | 12,500 | 12,500 | 37,500 |
| Science & Society | 11,441 | 13,441 | 15,441 | 17,441 | 46,323 |
| Other Programmes | 34,541 | 8,857 | 9,046 | 8,495 | 26,398 |
| Total Science Budget | 2,633,531 | 2,836,531 | 2,943,531 | 3,068,531 | 8,848,592 |

Table A2: Non-Cash Allocations

| £'000 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | CSR07 Total |
|--|----------------|----------------|----------------|----------------|----------------|
| Arts & Humanities Research Council | 0 | 350 | 300 | 300 | 950 |
| Biotechnology & Biosciences Research Council | 8,256 | 17,131 | 19,364 | 20,488 | 56,983 |
| Economics & Social Research Council | 914 | 400 | 400 | 400 | 1,200 |
| Engineering & Physical Sciences Research Council | -840 | 9,653 | 13,931 | 5,899 | 29,483 |
| Medical Research Council | 22,096 | 27,689 | 33,686 | 41,763 | 103,138 |
| Natural Environment Research Council | 21,808 | 27,010 | 25,688 | 36,092 | 88,790 |
| Science & Technology Facilities Council | 75,438 | 92,838 | 100,191 | 114,947 | 307,976 |
| Other Programmes | 12,399 | 0 | 2,511 | 9,182 | 11,693 |
| Total Science Budget | 140,071 | 175,071 | 196,071 | 229,071 | 600,213 |

Table A3: Capital Allocations (Capital Grants plus Direct Capital)

| £'000 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | CSR07 Total |
|--|----------------|----------------|----------------|----------------|------------------|
| Arts & Humanities Research Council | 0 | 140 | 140 | 150 | 430 |
| Biotechnology & Biosciences Research Council | 47,031 | 47,792 | 53,558 | 59,480 | 160,830 |
| Economics & Social Research Council | 6,450 | 6,536 | 6,713 | 6,894 | 20,143 |
| Engineering & Physical Sciences Research Council | 45,826 | 46,705 | 47,966 | 49,261 | 143,932 |
| Medical Research Council | 54,598 | 57,440 | 67,124 | 77,017 | 201,581 |
| Natural Environment Research Council | 38,615 | 39,011 | 44,277 | 49,683 | 132,971 |
| Science & Technology Facilities Council | 97,368 | 98,553 | 101,214 | 103,947 | 303,714 |
| Total Research Councils | 289,888 | 296,177 | 320,992 | 346,433 | 963,602 |
| Large Facilities Capital Fund | 104,681 | 104,681 | 138,428 | 265,285 | 508,394 |
| Science Research Investment Fund | 300,000 | 131,711 | 73,289 | 25,000 | 230,000 |
| Capital Investment Fund | 0 | 135,000 | 184,860 | 189,851 | 509,711 |
| Total Science Budget | 694,569 | 667,569 | 717,569 | 826,569 | 2,211,707 |

A2

Research Council Efficiency & Service Transformation



Delivering efficiency savings

RCUK seeks to optimise the way in which the Councils work together to enhance their overall performance and provide better and more efficient services. Improving Councils' operational performance, promoting a culture of efficiency and continuous improvement, and making efficiency gains all release more Science Budget resources for research and contribute to the central Treasury targets for value for money savings.

To deliver these efficiency savings RCUK are running a new cross-Council efficiency delivery programme to collectively deliver 3.65% (across the whole science budget) per annum net cashable value for money gains. The RCUK efficiency programme will focus on increasing the efficiency of Research Council Institutes, growing the level of co-funding of research/postgraduate training with business, and re-prioritisation of research programmes to continue to deliver agreed programme efficiency gains over the period. The programme will also realise a reduction in the percentage of administrative costs to total programme expenditure to 2.92 percent in 2010/11. RCUK will also monitor delivery of Research Councils' asset disposal targets.

Ensuring peer review remains efficient and effective and excellent value for money

The UK's peer review system is regarded as an international benchmark of excellence in research funding and provides a guarantee

of the quality of UK research. The Research Councils will maintain a competitive, project-based peer review system to support the UK research endeavour whilst enabling efficiency across the research sector as a whole. Alongside the continuation of the RCUK Assurance Unit and continued improvements to the Joint Electronic Submission (Je-S) system this will contribute to the wider service transformation government agenda.

To achieve this RCUK will run a cross-Council programme to deliver overall improvements in the efficiency and effectiveness of the peer review system. RCUK will drive forward the implementation of agreed opportunities for improving the efficiency and effectiveness of their peer review via a coordinated cross-Council programme addressing the final reporting process, greater use of outlines, controlling re-submissions, and consolidation. This will deliver £30m of efficiency gains over the period, mainly through the reduction of costs for universities, whilst maintaining the quality and effectiveness of peer review.

Delivering the majority of support services on a shared basis

RCUK aims to improve Research Councils' operational performance, delivering services on a cross-Council basis where it is cost effective to do so. Delivery of support services on a shared basis will provide efficiencies, ensuring the maximum possible funds are directed to research, training and knowledge transfer.

To achieve this RCUK will deliver financial, HR, procurement, administrative IT and IS services collectively to all of the Councils by March 2009 and research grants administration by December 2009. A new RCUK Shared Services Centre (RCUK SSC Ltd) has been established to provide processing services in human resources, finance, procurement, information technology, information systems and grants processing. A separate legal entity jointly owned by the Research Councils, and governed by a Board of Directors, the SSC will be organised and run on the following principles: use of common processes and systems; use of technology to improve service, productivity and controls; customer focused culture with continuous improvement; and use of service level agreements and performance indicators.

The reduced number of systems and processes, together with increased use of technology will improve efficiency and deliver more effective services. The SSC will also include a strategic procurement team to work with the Councils and their suppliers. Over ten years of operation the SSC is estimated to save the Councils £627m (net present value). Due to the scale and complexity of the project, there will be a phased migration of services and Councils to the SSC. The SSC will begin to operate during 2008 and be fully operational in all service functions by the end of 2009.



A3

Performance Management

The Performance Management System (PMS) for Research Councils was introduced in 2005 and has been operating successfully for two years. The PMS has three elements:

- Delivery Plan
- Scorecard
- Output frameworks

Each Delivery Plan sets out the key deliverables for the next 3 years. The scorecard details the targets and milestones by quarter. The Delivery Plans and Scorecards were refreshed in 2006 and 2007. Each Council and RCUK has submitted quarterly returns and published two Annual Delivery Plan reports. The output framework, indicating the metrics and the data from both the first year and second year, has been submitted to DIUS. The first Annual Report of the Output frameworks was published in September 2006 (<http://www.berr.gov.uk/science/research-councils/index.html>).

The performance management data underpins the Performance Management System with rigour and quantitative evidence. Therefore the metrics are a key source of information in demonstrating the delivery of the science budget, and are an important part of DIUS's evidence collection to inform policy developments.

The second annual report highlights the ways in which Research Councils contribute to the overall science and innovation system which delivers economic impacts. The annual report can be found at: <http://www.berr.gov.uk/files/file42023.doc>. The report contains comparative

tables for each Research Council in the following areas:

- Overall economic impacts: details have been given on a wide range of work commissioned to look at the economic impact of Research Councils, including a study commissioned by RCUK;
- Investment in the research base and innovation: data on expenditure outturns has been reported;
- Knowledge generation, stock of publicly available knowledge: Research Councils have provided information on the number of publications arising from their funding and institutes;
- Knowledge generation, human capital: data on the number of PhDs funded by each Research Council has been reported, and PhD submission rates;
- Framework conditions, public engagement: indicators demonstrating the scale and quality of the Research Councils' activities in engaging with the public have been reported;
- Framework conditions, financial sustainability: Research Councils have reported on the quality of their facilities and amount of investment; and
- Knowledge exchange efficiency: indicators on collaborative research and commercialisation, and the movements of PhD students into various sectors have been given.

The academies are subject to a similar Performance Management System (PMS) as the Research Councils, also introduced in 2005. Again, the PMS has three elements:

- Delivery Plan, which sets out key deliverables for the next three years;
- Scorecard, which details in-year targets and milestones; and
- Output Framework, which further quantifies the impact of the academies' work.

Performance metrics for each programme and work activity funded through the Science Budget are formally reviewed every six months, and reports are posted on the academies' websites:

www.royalsociety.org

www.britac.ac.uk

www.raeng.org.uk

Operating costs reflect the year-on-year administrative efficiency savings required by the Treasury.



A4

DIUS Policy Objectives

Departmental Strategic Objectives

For CSR07 the strategic objectives for DIUS are:

- Accelerate the commercial exploitation of creativity and knowledge, through innovation and research, to create wealth, grow the economy, build successful businesses and improve quality of life.
- Improve the skills of the population throughout their working lives to create a workforce capable of sustaining economic competitiveness, and enable individuals to thrive in the global economy.
- Build social and community cohesion through improved social justice, civic participation and economic opportunity by raising aspirations and broadening participation, progression and achievement in learning and skills.
- Pursue global excellence in research and knowledge, promote the benefits of science in society, and deliver science, technology, engineering and mathematics skills in line with employer demand.
- Strengthen the capacity, quality and reputation of the Further and Higher Education systems and institutions to support national economic and social needs.

- Encourage better use of science in Government, foster public service innovation, and support other Government objectives which depend on the DIUS expertise and remit.

The first and fourth of these objectives underpin the delivery of PSA 4 – the promotion of world class science and innovation.

The Ten Year Framework

The Government published its Science and Innovation Framework¹⁹ in July 2004. The Framework sets out a ten-year strategy for UK Science, and highlighted the following aspirations:

- Continuing to improve the sustainability and infrastructure of the research base;
- Improving knowledge transfer and exploitation;
- Improving the health of key disciplines, particularly in areas where the UK is relatively weak;
- Continuing efforts to increase the supply of scientists and engineers;
- Improving public engagement with, and confidence in, science and emerging technologies;
- Contributing to the promotion of a diverse science workforce that is representative of society.

¹⁹ Science and Innovation Investment Framework 2004-2014, July 2004. www.hm-treasury.gov.uk



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