

ROYAL SOCIETY OF CHEMISTRY

CAMPAIGN FOR CHEMICAL SCIENCES

RSC response to the Comprehensive Spending Review outcome, including the Science and Innovation Investment Framework 2004 - 2014

Summary

The Royal Society of Chemistry is pleased with the outcome of the Comprehensive Spending Review (CSR). These spending plans demonstrate that the Government sees science as a key area underpinning the future of the UK economy. The RSC welcomes this sign of support and recognition. In return the Society has offered to work with the Government to ensure that its plans set out in the accompanying "Science and Innovation Investment Framework 2004 - 2014" come to fruition for the benefit of the UK as a whole.

In the CSR and Framework, specific mention was made of the key role played by the chemical sciences in underpinning all aspects of science and innovation. Tremendous support was given for the chemical sciences through long term investment in school laboratories and chemistry teachers, investment in HE facilities, financial support for key chemistry departments regionally and the successful AimHigher grant to promote careers in chemistry.

Increased support for the chemical sciences in the CSR was one key aim of the RSC's Campaign for Chemical Sciences. The RSC's success demonstrates the impact of the RSC submission to the CSR, our meetings with Ministers and other key officials, and other related activities. Our raising of important issues and offering of possible solutions led to increased support for the subject.

We now have a national strategy in place to underpin science and innovation activities over the next ten years on a national and regional basis. Our aim is to work in partnership with Government, Vice-Chancellors and other key bodies to ensure the successful implementation of the plans. The RSC will be vigilant and proactive in ensuring that written commitments in the policy documents are translated into actions, and that additional resources are made available to support the chemical sciences in the UK.

Major highlights from the outcome include:

Working to secure the future of the chemical sciences in Higher Education (HE)

- £70m allocated to enhance [UK] capabilities in areas such as the physical sciences.
- HEFCE to take a more active role in examining regional provision of science. teaching, including setting up of an expert group to review impact on economic development.

Providing the best facilities to train and inspire scientists of the future

- An increase in the overall DfES schools capital budget from £5bn to £7bn.
- Provision of modernised science facilities highlighted as part of the DfES "Building schools for the future" programme for England.

Providing the best chemical sciences education in schools

- Government set target to achieve a step change in the quality of science teachers and lecturers in very school, college and university.
- Increases in the science teacher training bursary to £7k and Golden Hello to £5k from September 2005.
- Expansion of continuous professional development opportunities for science teachers in schools, and,
- A review of SET teaching staff turnover to improve staff planning and retention.

A more detailed analysis of the Science and Innovation Investment Framework is appended.

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RSC response to the Comprehensive Spending Review outcome, including the Science and Innovation Investment Framework 2004 – 2014 – full response¹

Introduction

1. **Background:** published on Monday 12 July, at the same time as the outcome of the Comprehensive Spending Review (CSR) was announced, the framework sets out how the CSR ambitions will be realised.
2. **Government financial commitment:** science funding through DTI and DfES will increase at an average annual rate of 5.8% in real terms, guaranteed until 2007/08 and projected from 2009/10 - 2014. DfES funding for research will rise to £1.7bn, and the DTI Science Budget will rise to £3.3bn in 2007/08 (foreword, paras 1.6, 1.12, 3.8).
3. **Government target:** to increase UK R&D investment as proportion of GDP from 1.9% now to 2.5% by 2014. This will require an annual growth rate across the private and public sector research bases of around 5.75%. The Wellcome Trust will also provide an investment of £1.5bn for UK science in partnership with the Government (foreword, paras 1.4, 1.6 1.8, 1.41, box 1.2, para 4.9).
4. **Overall aim of the framework** is “to enable Britain to be a key knowledge hub in the global economy with a reputation not only for outstanding scientific and technological discovery, but also as a world leader in turning that knowledge into new products and services” (para 1.1).
5. The Government also wishes that the UK should be the partner of choice for global businesses looking to locate R&D or foreign universities seeking to collaborate with the science base or business (para 1.45)
6. R&D activities in both the public and private sectors are seen as core to realising these aims. (paras 1.2, 1.3, 4.3)

Overall RSC comments on CSR/framework: *The continuing Government support of and the increases for science and innovation funding are welcomed as is the intent that investment in the science budget will be adjusted in response to a strategic view of priorities. Through the framework, the CSR has endorsed the RSC priorities set out in its CSR submission, and suggested how they can be addressed via individual Government departments.*

RSC comment on Government target: *the RSC is pleased to note the ambition of increasing UK R&D investment, but we are disappointed that 3% is not the target. We also note that the target of increasing R&D investment to 2.5% by 2014 still requires an increase in the [financial] commitment from the private sector from 1.25% towards 1.7% (box 1.1), and wonders whether there are sufficient incentives in the framework to achieve this.*

7. The Government remains committed to developing the **dual support system** (para 1.13, 3.2, 3.3, 3.5, 3.5) and UK research funds from the Research Councils (RCs) and HE bodies continue to be driven by **excellence wherever that may be found** (para 1.14).
8. Research Councils (RCs) will be funded through to 2007/08 to increase the share of full economic costs which they provide to the universities for the projects they sponsor (para 1.15, 3.7, 3.17, 3.18, 3.19, 3.20, 3.21, 3.22, 3.23).
9. Universities should charge and commissioners of such work should assume that they will pay full economic cost (FEC) prices for research sufficient to

¹ Unless specified otherwise, the paragraphs and boxes referred to throughout the text directly cross-link to the relevant text in the Science and innovation investment framework 2004 – 2014.

cover at least full economic cost of work. Government departments should also be prepared to pay full economic cost (para 3.28, 3.29).

10. Charities also play a significant role in UK research. In recognition of their important role, the Government has worked with the WellcomeTrust and the Association of Medical Charities (AMRC) to develop a partnership agreement which will provide the basis for working towards FEC. The Government will also invest £90m through HEFCE QR. (paras 1.16, 3.32 – 3.7)

RSC comment: *the RSC notes the Government's commitment to the dual support system and welcomes the RCs' intention to meet full economic costs in Universities, but believes that a first tranche payment of £80m in 07/08 and a target of "close to economic costs" in the early years of the next decade is far too slow. Further erosion of the UK science base in the intervening period remains a significant concern.*

Science and Innovation Framework responses to RSC CSR submission

11. **Introduction:** other than £70m to significantly enhance [UK] capabilities in areas such as physical sciences (which will be channeled through the Research Councils), neither the CSR, nor the framework identify specific sums of money to address the RSC priorities. However, both Department for Education and Skills (DfES) and the Department for Trade and Industry (DTI) budgets have been increased.

RSC comment: *although £70m has been allocated through the Research Councils to enhance capabilities, it will not be enough to address the scale of the issue. In our submission to the CSR, we calculated that £300m across all the countries of the UK was needed to secure the future of physical sciences in the HEIs.*

RSC action: *we await the outcome of the Scottish CSR for more information on how Scotland takes this issue forward. We also look to the Welsh Assembly for its views on how it will address the issue in Wales.*

It is now essential that the RSC, through its Campaign for Chemical Sciences, maintains and increases its profile, and focuses its lobbying activities to ensure that the Government Departments, particularly DfES and HEFCE, respond effectively.

RSC CSR submission

Priority 1: securing the future of the Chemical Sciences in the Higher Education Institutions (HEIs)

12. The framework states that the UK's present strengths must be maintained and enhanced. Action should be taken to significantly enhance capabilities in weaker areas such as physical sciences. The CSR has provided £70m for this purpose (para 2.6, 9.58).
13. The framework notes that the Higher Education Funding Council for England (HEFCE) is committed to take a more active role in examining the implications that falling science provision may have for student access at the regional level. HEFCE will also consider providing additional funding to university departments if there is a powerful case that falling provision in a particular region would hinder student access to disciplines that are important to national and regional development (para 1.32, second bullet).
14. As part of the review process, the Government expects HEFCE to explore with the HEIs and bodies representing HEIs' interests the possibility of making a

notice period of 12 months before the closure of any department a condition of grant (paras 6.48, 6.49).

15. HEFCE will set up an expert group to include business and scientific leaders to review how falling Science, Engineering and Technology (SET) provision will affect long-term economic development. (Para 1.32, third bullet, 6.51).

RSC comments: *the RSC is pleased that the Government has recognised its concerns about national science provision and notes that HEFCE has been tasked to review the situation and provide additional support where necessary. We presume that the review process will have an underpinning national strategic vision which is also linked to regional needs and wants.*

The RSC also welcomes the concept of English HEIs being required to give a 12 month notice period to HEFCE as a condition of grant as we believe that this will introduce the necessary time to consider the impact of potential closures on a regional and national strategic basis.

We note that Treasury has allocated a budget of £70m which will be channelled through the Research Councils to enhance areas of provision which is substantially below the RSC estimate of £300m.

RSC action: *we will establish a dialogue, and work, with HEFCE to ensure that the necessary capacity and capability in chemical sciences to underpin the framework is maintained across the UK. As the premier organisation for chemical sciences in Europe, we will also seek to play an active role in the expert group.*

Priority 2: providing the best facilities to train and inspire scientists of the future

16. The Government will continue to improve the quality of school buildings, including science provision, through its Department for Education and Skills (DfES) Building Schools for the Future programme, which aims to renew all secondary schools in England. We also note from the Comprehensive Spending Review that the DfES capital budget has increased from £5bn to £7bn (para 6.19, chapter 7 CSR)

RSC comment: *the RSC is pleased to see that the Government has accepted the RSC-identified need to improve provision of schools laboratories, where 65% are rated as being below a good standard.*

RSC action: *we will now work with DfES to ensure that the programme under which this refurbishment will take place delivers to time.*

Priority 3: providing the best chemical sciences education in schools

17. The Government's overall ambitions are to achieve a step change in: the quality of science teachers and lecturers in every school, college and university; the results for students studying science at GCSE level; the numbers choosing SET subjects post-16 education and in higher education; and, the proportion of better qualified students pursuing R&D careers (para 6.8).
18. The framework recognises the need to enthuse and inspire young people (para 6.12) and acknowledges that an increase in the supply of good science teachers is crucial (para 6.20). Measures include increasing the value of the science teacher training bursary from £6k - £7k and the Golden Hello from £4k to £5k with effect from Sept 2005, and expanding continuous professional development (CPD) opportunities as well as immediate research to understand why and when teachers join and leave the sector to inform long term strategy

to reduce shortages, including Science, Engineering and Technology (SET). (paras 1.28, 1.30, 1.33, 6.7, 6.25, 6.39, 6.40, 6.63, boxes 6.1, 6.2).

19. The Science Learning Centres will play an important role in disseminating best practice in science teaching (para 6.18). The HEIs and other stakeholders will also have a crucial role to play in better informing students about the choices they have on entering higher education and in delivering high quality courses (para 1.32, 6.45, 6.46)

RSC comment: *the RSC is pleased to see that the Government accepted its advice on Golden Hellos, and recognised the need for CPD for those already teaching science. We would note that the RSC is the largest non-governmental provider of CPD.*

The 2004 CSR delivers significant additional resources to DfES so that total spending on education in England will be £12bn higher in 2007/08, an average growth rate of 4.4%.

RSC actions: *the RSC looks forward to learning more about how much of this increase will be allocated to CPD activities in the chemical sciences, and working with DfES.*

The RSC has already carried out a study looking at teacher shortages in physical sciences and there will be further research undertaken in the autumn. We are therefore well-placed to provide accurate, robust information concerning chemical sciences. We look forward to playing an active role in working with DfES to help Government meet its full set of ambitions concerning provision of qualified science teachers.

The RSC also looks forward to learning more about Government plans to disseminate best practice in science teaching (para 6.18) and about HEFCE plans for increased outreach activities (1.32, 6.54)

Other Science and Innovation Investment Framework Ambitions

Role of the Devolved Administrations and Regional Development Agencies (RDAs)

20. The framework addresses science and innovation in the devolved administrations (boxes 9.4 – 9.6) and at the regional level. It is clear that the RDAs in particular will play an increasing role in funding and supporting science and innovation activities across the business and education sectors. The RDAs will continue to build their capacity to promote science and innovation, and develop their active role in making links between business and universities (para 1.24, 5.16).
21. The Government will support the RDAs in developing the right level of capacity to deliver their Knowledge Transfer (KT) role effectively (box 5.1)
22. The RDAs have identified three modes of partnership: regional delivery with national advice and direction, for example grants to small and medium enterprises (SMEs), improving the capacity of HEIs to work productively with business, national delivery which relies on regional advice and input, for example, HEIF, HEFCE regional advisors, and, inter-regional partnerships. (para 9.41 – 9.42)
23. Additionally, the RDAs will work more closely with HEFCE and the Research Councils (RCs). The RCs will enhance the scale of their support for developing the RDAs' professional capabilities particularly through representation on the newly-established Science and Industry Councils. (para 9.45)

RSC comment: *the RSC will monitor progress for the chemical sciences, both nationally and regionally. We welcome the establishment of Science and Industry Councils in all regions and will continue to develop good links with the RDAs.*

We note that the CSR has allocated more support to the RDAs and look forward to learning how they will deploy this support towards improving their professional capabilities. We will also continue to build on our strong links with the Funding Bodies and Research Councils.

RSC action: *through our relationships with the RDAs, RCs and the funding bodies, we are well placed to ensure that chemical sciences are fully represented.*

The role of Europe and international science and innovation

24. The framework notes the growing importance of Europe. It notes innovation policies in a number of other EU Member States, and that the EU is working towards an EU Innovation Action Plan. (paras 9.20 – 9.26)

RSC comment: *we are pleased to note that the framework has recognised the growing importance of Europe which reflects the view of the RSC.*

However, the RSC notes that there is no mention of the Bologna declaration with respect to impact on spending.

RSC actions: *we look forward to working with Government and the Commission on behalf of chemical sciences, and providing advice and guidance for the UK presidencies of the EU and G8 in 2005.*

25. The framework outlines the Government current negotiation position for discussion with the Commission on FP7, with particular reference to funding levels, establishment of a European Research Council (ERC), and FEC (paras 3.38 – 3.42, paras 9.32 – 9.37, box 9.1).

RSC comment: *the RSC supports the lines taken by OST thus far, and will provide further details in its response to the OST invitation to consult. However, we do wish to note here that current EU grants are only funded at the 50% level which increases pressures on recipients' finances. This situation should be addressed before FP7 commences (see also comments on FEC in HEIs, also para 9, this document, and 3.39 Science and Innovation)*

26. The framework also notes that the Government has welcomed the EU proposal for an ERC, making clear that research funding must be awarded solely on scientific excellence judged through rigorous international peer review and supporting the EU position that it must be supported through new funds. (box 9.1)

RSC comment: *the RSC agrees that an ERC should be funded with new money and that grants should be made solely on the basis of scientific merit.*

27. The UK can benefit from the 90% global R&D taking place outside the UK through linking into networks and building collaboration. The framework highlights the need for an overarching national strategy for international engagement (paras 9.1 – 9.7).

28. Noting UK expenditure of around £230m pa on large research facilities such as Centre Europeen de Recherche Nucleaire (CERN), it draws attention to the "Large Facilities Road Map" (paras 9.14 – 9.20).

RSC comment: researchers in chemical sciences are already working closely with others nationally and internationally and are keen to continue to build such collaborations and networks. We welcome Government recognition of their importance and Government activity to help promote them.

29. A Global Science and Innovation Forum will be established to develop international strategy (para 1.46).

RSC comment and action: the RSC looks forward to learning more about this proposal and how the RSC may be able to contribute.

Financially secure HEIs

30. The Government's intention is to reach a situation where universities secure sufficient income from all sources to ensure that they can cover full economic cost (FEC) of all the research they undertake. The Research Councils will be funded by an additional £80m to increase the share of full economic costs. Additionally, the government will make additional funds available to help cover the overheads costs incurred by charities. Through HEFCE, the Government will invest up to £90m to support research supported through charitable bodies (para 1.15, 1.41, 1.42, 3.17, 3.23, 3.32 – 3.34).

RSC comments: the RSC is pleased to note the Government's financial commitment to recovering FEC from public funded research, but believes that the time scale is too long and that further erosion of the UK science base will occur in the interim. We retain concerns about the impact on private sector research if FEC are applied.

31. Renewal of the UK's research infrastructure will be supported through dedicated Science Research Infrastructure Fund (SRIF) funds of £500m pa. (para 1.7, 2.26, 3.14, 3.59). The Government is also keen that investment strategies produced for SRIF funding should fit with research priorities of other funders. (para 3.62)

RSC comment: while welcoming the continuation of SRIF, the RSC is concerned about funding provision for support staff. We also believe that longer term strategies for groups applying for SRIF support should also be taken into account when applying for support.

32. Funding for collaborative R&D and knowledge transfer networks will rise to at least £178m by 2007/08, and the DTI Technology Strategy board will provide a framework for setting priorities and improving the effectiveness of business innovation support (para 1.23, 5.10). Higher Education Innovation Funding (HEIF) funding to help HEIs will rise to £110m pa by 2007/08 (para 1.24, 4.34, 5.23).

33. The Government plans to review, with universities and their tax advisers, the impact of new "safe harbour" arrangements on the ability of universities to create spin-out companies (para 4.43).

RSC comments: the RSC looks forward to learning more about these proposals.

Protecting legitimate research

34. The document reiterates the Government's determination to protect legitimate research activities from animal rights extremists and will shortly publish a document fully setting out the Government's approach (para 1.38), 7.16 – 7.20.

RSC comment: *the RSC recognises the necessity of using animal models to ensure full and effective understanding, particularly of new drugs. We will work with Government to make sure that those working in these essential areas of research are not put at risk; we look forward to learning more about the Government's stance on this difficult issue.*

Skills provision in the 21st century

35. The Government also plans to improve the quality and effectiveness of further education (FE) through joint DfES and Learning Skills Councils.

RSC comment: *the RSC is pleased to note the Government's recognition of this critical sector of the education spectrum. We already work closely with the Chemistry Leadership Council's Skills Network Group and with the Sector Skills Councils (COGENT and SEMTA), and look forward to contributing where we can.*

RSC action: *We are already working closely with DfES and the Learning Skills Councils, particularly through our Aim Higher project. It is vital that post-16 year olds are encouraged into FE to help meet the growing demand for technical skills provision in SET.*

36. The framework recognises the need for more and better information for the post-16 sector on careers. (para 1.31, 1.32, 6.60)

37. The Government will review annually participation in shortage subjects in schools, post-16s, HEIs and the workforce to judge the balance between supply and demand and to recommend any actions (paras 1.35, 6.11)

RSC comment: *the RSC looks forward to learning more about this review process, and will offer what support it can with regard to chemical sciences. The RSC "return on investment in HE" project will provide useful evidence in promoting the value of an education in chemical sciences which will not only be of interest to Government and employers, but also to students.*

38. The framework also states that HEFCE will work to increase significantly the science outreach to schools (para 1.32).

RSC action: *the RSC already has a substantial careers advisory programme and we will work with HEFCE and others to ensure that the chemical sciences outreach activities are effective and points to its recent AimHigher project success which is designed to achieve this objective.*

Representation of women and ethnic minorities

39. The framework identifies considerable under-representation of women and ethnic minorities in SET and the workforce and will invest £2.4m in a new resource centre to help employers make SET a more attractive career for these groups (para 1.34, 6.10, 6.72).

RSC comment and action: *the RSC looks forward to learning more about this initiative and providing advice where appropriate.*

Strategic science and innovation

40. The framework notes the need to enhance a culture of multidisciplinary, and notes centres of excellence and reforms to the Higher Education Funding Councils' Research Assessment Exercise (RAE) as examples of how this aim might be achieved. (para 2.11)

RSC comment: *the RSC welcomes this emphasis on multidisciplinary research and notes that it reflects the RSC's approach to broadening its remit to embrace the full portfolio of chemical sciences. We look forward to helping where we can to take this initiative forward. However, our concerns that regardless of its intentions, the reformed RAE scheduled for 2008 may reinforce rather than remove existing barriers at university research levels.*

41. The framework aims to provide space for fundamental research complemented by strategic priority programmes and incentives to work on projects which focus on application through development of a comprehensive, integrated and efficient performance management system (para 2.17).

RSC comment: *whilst the RSC endorses the need to balance the different demands of the UK R&D community across available funding alongside accountability, it wishes to note the risk of such a system inhibiting rather than enhancing the growth it was intended to promote.*

RSC action: *to ensure that UK research in chemical sciences continues to embrace fundamental curiosity driven research alongside more applied and development work.*

42. The framework states that strategic research decisions must be embedded in and driven by horizon scanning and stakeholder engagement. A single centre of excellence in science and technology horizon scanning will be built up (para 2.19, box 8.17).

RSC comment: *the RSC wishes to learn more about this venture. The RSC has always played an active role in Foresight activities and looks forward to continued involvement.*

43. Information infrastructure is a priority for the framework and it is intended that the government will work with interested funders and stakeholders to deliver an effective system (para 2.25).

RSC comment: *the RSC wishes to learn more about this proposal.*

44. The framework identifies four business responses required to deliver the required growth in business R&D: maintaining or growing R&D in areas such as pharmaceuticals, attracting inward investment, increasing R&D intensity in firms or sectors lagging behind their peers, and, developing new R&D intensive sectors and Small and Medium Enterprises (SMEs) and sets out an Action Plan. (paras 4.3 – 4.34)

RSC comment: *the RSC is pleased that the framework recognises the role of the pharmaceutical industry as one of the major R&D intensive sectors and looks forward to learning more about incentives to encourage other parts of the chemical sciences sectors to invest more in R&D activities.*

Public understanding of science

45. The need to achieve public confidence and engagement in science and technology is also identified as a priority in the framework, particularly with regard to governance, regulation and use. (chapter 7, 7.11 – 7.21).

RSC comment: *the RSC already plays an active role concerning the chemical sciences. We work closely with the BA and RS, and will continue to do so as well as independently seeking to promote chemical sciences across the spectrum. We note the plans to increase OST Science and Society expenditure to over £9m by 2005/06 and look forward to developing closer links to help promote chemical sciences (para 7.21 – 7.22).*

We are actively involved in issues of concern to the chemical sciences, and have been particularly involved in EU REACH activities.