



House of Commons
Innovation, Universities,
Science and Skills Committee

Science Budget Allocations

Fourth Report of Session 2007–08

Volume I

EMBARGOED ADVANCE COPY

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in full, or in part, in any form before

00.01hrs on Wednesday 30 April 2008



House of Commons
Innovation, Universities,
Science and Skills Committee

Science Budget Allocations

Fourth Report of Session 2007–08

Volume I

Report, together with formal minutes

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The Innovation, Universities, Science & Skills Committee

The Innovation, Universities, Science & Skills Committee is appointed by the House of Commons to examine the expenditure, administration and policy of the Department for Innovation, Universities and Skills.

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Dr Roberta Blackman-Woods (*Labour, City of Durham*)
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The Reports and evidence of the Committee are published by The Stationery Office by Order of the House. All publications of the Committee (including press notices) are on the Internet at www.parliament.uk/ius
A list of reports from the Committee in this Parliament is included at the back of this volume.

Committee staff

The current staff of the Committee are: Dr Lynn Gardner (Clerk); Glenn McKee (Second Clerk); Dr Edward Waller (Second Clerk); Dr Christopher Tyler (Committee Specialist); Dr Joanna Dally (Committee Specialist); Ana Ferreira (Committee Assistant); Camilla Brace (Committee Secretary); and Jonathan Olivier Wright (Senior Office Clerk).

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Summary

In the Comprehensive Spending Review (CSR) 2007 the Science Budget has increased to £11.24 billion; the increase from 2007/08 to 2010/11 is 17.5%. We welcome the Government's decision to maintain its commitment to increase the science budget by 2.5% per annum in real terms; but the first Science Budget Allocations of the new Department for Innovation, Universities and Skills has been marred by a few poor decisions, which have turned the Government's PR fanfare into a PR disaster.

The Science Budget increases do not fully cover Government-determined spending commitments, such as the requirement for Research Councils to cover 80% of the full economic costs of research (FEC), and expenditure on new bodies like the Technology Strategy Board. Additionally, large parts of the budget are tied to cross-council programmes that largely follow a Government agenda. Consequently, we are concerned that the Government has failed to protect the existing and planned research base, and we have reservations about the influence Government appears to have on the use of the budget and the extent to which the Haldane Principle has been upheld.

Regarding the Science and Technology Facilities Council (STFC), we conclude that its formation was untimely and poorly conceived. First, the Government's expectation that STFC, having been formed in April 2007, would be ready for the 2007 CSR was overly ambitious. Second, in merging two Research Councils, one research community has been saddled with the debt of another, despite assurances from the Government that STFC would be formed without any legacy issues.

In STFC itself, we found weaknesses in its peer review system, its communications and its management. We are concerned about some of the decisions made in its Delivery Plan and how those decisions were made. We recommend that STFC wait for the results of the Wakeham review of physics before implementing the cuts proposed in the Delivery Plan and that it use this time to consult with its stakeholders. Further, we conclude that substantial and urgent changes need to be made to the way in which the Council is run in order to restore confidence and to give the Council the leadership it desperately needs.

DIUS has a difficult job to do: it has to ensure the Research Councils are effective without interfering in how they spend their money. The evidence suggests that the Department's performance has been below par in both these areas and we look to the Department to demonstrate greater effectiveness in the future.

1 Introduction

Background

1. The Government funds much of the science that takes place in the UK. In addition to expenditure by individual departments, central funding for research is channelled through the Department for Innovation, Universities and Skills (DIUS) in the form of the Science Budget. This budget has increased since 2004 in line with the commitment in the Science & Innovation Investment Framework that the Science Budget should increase by an annual average of 2.5% in real terms.¹ In 2010/11 the annual budget will amount to nearly £4 billion.² Over 85% of the budget goes to the Research Councils, which direct and fund research across the UK university sector and in research institutes. The remaining money is directed to the National Academies, capital funding and various programmes including knowledge transfer initiatives and science and society projects.

2. The most recent Comprehensive Spending Review (CSR), which was published in October 2007,³ set the Science Budget for the period from 2008/09 to 2010/11 at £11.24 billion. In December 2007, DIUS announced its decisions on how this total would be divided between the various bodies and programmes.

The inquiry

3. The Innovation, Universities, Science and Skills Committee is charged with scrutinising the expenditure, administration and policy of the Department for Innovation, Universities and Skills. Approximately half of DIUS's expenditure is through the Science Budget. We therefore decided to conduct an inquiry into the Science Budget Allocations.

4. Our initial intention was for a short inquiry into the allocations as a whole. However, upon announcement of the inquiry, we received a substantial volume of correspondence from within the particle physics and astronomy community, which raised concern about the funding and delivery plan of the Science and Technology Facilities Council (STFC). Therefore, we decided to explore the allocation to STFC more closely than we had originally planned.

5. The inquiry consisted of three oral evidence sessions. In the course of these sessions we heard from representatives of the physics and astronomy community, Professor Ian Diamond, Chair of Research Councils UK, Dr Ian Pearson MP, Minister for Science and Innovation, and Professor Sir Keith O'Nions, Director General of Science and Innovation. We also took evidence twice from the Chief Executive of STFC, Professor Keith Mason, and once from the Chairman, Peter Warry.

1 *Science & Innovation Investment Framework 2004–2014*, HM Treasury, July 2004, www.hm-treasury.gov.uk/spending_review/spend_sr04/associated_documents/spending_sr04_science.cfm

2 *The Allocations of the Science Budget 2008/09 to 2010/11*, Department for Innovation, Universities and Skills, December 2007, p 29, www.dius.gov.uk/publications/URN07114.pdf

3 *2007 Pre-Budget Report and Comprehensive Spending Review*, HM Treasury, October 2007, www.hm-treasury.gov.uk/pbr_csr/report/pbr_csr07_repindex.cfm

6. In view of the concerns over the STFC Delivery Plan, we also decided to visit the sites most affected: the Rutherford Appleton Laboratory, Didcot, the UK Astronomy Technology Centre, Edinburgh, and the Daresbury Laboratory, Warrington. We are grateful to STFC for organising these visits at short notice and for their prompt cooperation with our requests for further written evidence and additional material following the evidence sessions.

7. In this report, we look first at the overall Science Budget. We then look at the allocations to three Research Councils: the Science and Technology Facilities Council, the Arts and Humanities Research Council and the Medical Research Council.

2 The Science Budget

Funding landscape

8. The largest slice of the Science Budget goes to the seven Research Councils. These are the Arts and Humanities Research Council (AHRC), the Biotechnology and Biosciences Research Council (BBSRC), the Economics and Social Research Council (ESRC), the Engineering and Physical Sciences Research Council (EPSRC), the Medical Research Council (MRC), the Natural Environment Research Council (NERC), and the newly formed Science and Technology Facilities Council (STFC).⁴ Research Councils fund and coordinate research and researchers so as to, in the words of the Government, “deliver a world-class research base and through this create a higher level of economic impact and a better quality of life people in the UK”.⁵

9. The next largest portion goes to the three National Academies, which bring together field leaders to promote excellence in their respective disciplines. The Royal Society promotes excellence in science, the Royal Academy of Engineering in engineering and the British Academy in the arts, humanities and social sciences.

10. The remaining elements of the allocation are:

- the Large Facilities Capital Fund, which provides a source of capital funds for new or existing large facilities in which Research Councils have invested; and the University Research Capital Investment, which does the same for universities;⁶
- the Higher Education Innovation Fund, which is joint-funded by the Science Budget and the Higher Education Council for England (HEFCE) to help universities with knowledge transfer; and the Public Sector Research Exploitation Fund (PSRE), which does the same for the Research Councils, NHS, Government Laboratories and museums and galleries;⁷ and
- various science & society and other programmes.⁸

11. Given the range of programmes and disciplines covered by the Science Budget, the name is somewhat misleading, especially since the transfer of AHRC into the budget in 2005. We recommend that DIUS change the name of the Science Budget to the Science and Research Budget to reflect the inclusion of arts, humanities and knowledge transfer, which we note matches the welcome change in title of the DIUS official in charge of the budget to the Director General for Science and Research (DGSR).

4 STFC was formed following the merger of the Particle Physics and Astronomy Research Council (PPARC) and the Council for the Central Laboratory of the Research Councils (CCLRC).

5 *The Allocations of the Science Budget 2008/09 to 2010/11*, Department for Innovation, Universities and Skills, December 2007, p 31

6 *Ibid*, pp 51–54

7 *Ibid*, pp 55–57

8 *Ibid*, p 59

CSR07

12. The increase in the Science Budget for CSR07 was first announced in March 2007 when the then Chancellor of the Exchequer stated that:

As part of our plan to double investment in science, I can announce that in the next four years public investment in science will rise from £5 billion this year to £6.3 billion by 2010—a 25 per cent. cash increase in the science budget of our country.⁹

13. This was confirmed in October 2007 with the announcement of the final CSR settlement for all departments.¹⁰ The headline figure is a three-year increase in the Science Budget of 17.4%. This builds on an increase of 26.2% made over the last CSR period (the difference in spend between 2004/05 and 2007/08)¹¹ and meets the Government's ten-year framework commitment to increase the Science Budget by an annual average rate of 2.5% in real terms.¹² It is also significantly higher than the overall increase in DIUS's budget and the average departmental budgetary increases. **We welcome the Government's decision to maintain its commitment in the ten-year framework to increase the Science Budget by 2.5% per annum in real terms.**

14. The Treasury announcement on the Science Budget in CSR07 reflects a strategic shift of focus as a result of two recent reviews by Lord Sainsbury of Turville and by Sir David Cooksey. Sainsbury's *The Race to the Top* reviewed the UK's science and innovation system and the role that it will play in keeping the UK competitive in the global economy.¹³ Cooksey's *A review of UK health research funding* looked specifically at institutional arrangements for health research.¹⁴ These reviews emphasised the importance of innovation and knowledge transfer, and shed light on how the UK's strength in basic science can be more effectively translated into economic benefits for the UK and improvements in quality of life for its population. The Sainsbury and Cooksey vision is manifested in this CSR allocation through the commitment of funds to the new translation-focused institutions, the Office for Strategic Co-ordination of Health Research (OSCHR) and the Technology Strategy Board (TSB), and the knowledge transfer funds.¹⁵ **We welcome the evidence within the Science Budget Allocations of the Government's commitment to the Sainsbury and Cooksey agenda.**

9 The Chancellor of the Exchequer (Mr Gordon Brown), 21 Mar 2007, Hansard Column 819. These figures include science funding channelled through HEFCE.

10 *2007 Pre-Budget Report and Comprehensive Spending Review*, HM Treasury, October 2007

11 Science Budget Allocations 2005–06 to 2007–08, Department of Trade and Industry, May 2005, p 7

12 This commitment was made in the so-called 'ten-year framework': *Science & innovation investment framework 2004–2014*, HM Treasury, July 2004.

13 *The Race to the Top: A Review of Government's Science and Innovation Policies*, Lord Sainsbury of Turville, October 2007, www.hm-treasury.gov.uk/media/5/E/sainsbury_review051007.pdf

14 *A review of UK health research funding*, Sir David Cooksey, December 2006, www.hm-treasury.gov.uk/media/4/A/pbr06_cooksey_final_report_636.pdf

15 See Table 1. We note that there has been a reallocation of the knowledge transfer budget, with HEIF receiving a 32.9% increase and DSRE receiving a 10.7% reduction.

The Science Budget allocations process

15. Once the Treasury agrees on a total budget, it becomes the responsibility of DIUS to allocate the funding between the Research Councils and other headings. Professor Keith Mason, Chief Executive of the Science and Technology Facilities Council (STFC), described the procedure from the perspective of the Research Councils:

Late in 2006 each council was invited to set out priorities in the broadest sense for the then Office of Science and Innovation. These were discussed in a set of bilaterals in late 2006 and early 2007. In May or June of 2007 each research council received a formal letter with a template for a draft delivery plan and as part of that each council was invited by DIUS (or it may still have been DTI) to provide four scenarios, each of them after full economic costing: one, how you would manage a 5% cut after full economic costing; secondly, how you would manage flat cash; thirdly, what you would do with an increase of 5%; fourthly, what you would do with an increase of 10%. Each council provided those scenarios by early July. The allocations were then announced, as you know, in October and we were invited by the end of October to submit the final draft delivery plan on the basis of those allocations.¹⁶

16. The Delivery Plan for each Research Council set out how the funding would be spent in their area of responsibility. The final allocations were made by the Director General for Science and Innovation, Professor Sir Keith O’Nions, following representations by the Research Councils and bilateral discussions between the Research Councils and DIUS. The Royal Society has suggested that:

a new structure is needed to ensure that Ministers and their officials know the likely effects of [Research Council] allocations or any funding rearrangements. We believe the [Director General of Science and Innovation] should be advised by an independent group of experts from all disciplines and from a range of institutions, who can identify any potential negative consequences of decisions and ensure they are drawn to the attention of all concerned.¹⁷

17. However, when we put this suggestion to Professor Ian Diamond, Chairman of Research Councils UK, he was unconvinced: “that is a return to the position in the late 1980s and early 1990s. I have to say that my own sense is that this allocation has been undertaken extremely professionally and [...] used the budget in a reasonable way”.¹⁸ Professor Keith Mason, Chief Executive of STFC added: “I do not see evidence that the outcome would have been any different [under such a system]”.¹⁹ The Minister was equally unsure regarding this suggestion:

we are in a situation where, once this overall science budget is decided upon, we reach a stage of negotiations with the individual research councils and there are lots of vested interests out there. I suppose the question I put back to you is, if we did have a committee of the great and the good advising the Government, would it

16 Q 106

17 Ev 76

18 Q 112

19 *Ibid.*

produce a different decision overall or would it just produce a decision where the people who were not inside the room giving advice to Government were critical of those who were inside the room giving advice to Government?²⁰

18. We are concerned that a structure of independent expertise such as suggested by the Royal Society may be too bureaucratic. However, it is clear that more and better information needs to be passed from the Research Councils to the DGSR on the potential implications of projected allocations from the Science Budget in order that Ministers can be made fully aware of the consequences of those decisions. We note that the documents prepared by STFC for use in the bilaterals with DIUS have been made available through the Freedom of Information process and we recommend that the Director General of Science and Research and the Research Councils publish such documents as a matter of course to increase transparency and accountability.

The Science Budget Allocations

19. The headline figure of a 17.4% increase in the Science Budget disguises a great deal of variation (see Table 1). For example, the Research Councils received an 18% increase, but within that, AHRC received only a 12.4% increase, while MRC received a 30.1% increase. We discuss both of these examples in later chapters. The Academies had a particularly good settlement: a 21.6% increase overall, with the Royal Academy of Engineering seeing the biggest budgetary increase. The Large Facilities Capital Fund, which will be used by Research Councils to invest in new and replacement large-scale scientific research facilities both in the UK and internationally, has received a particularly large increase.²¹

20 Q 157

21 *The Allocations of the Science Budget 2008/09 to 2010/11*, Department for Innovation, Universities and Skills, December 2007, pp 51–52

Table 1: Science Budget Allocations²²

£'000	CSR07				CSR07Total	End CSR07 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 *	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%

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

Within the allocations as given in Table 1, are a series of smaller allocations. These include a commitment to covering around 90% of the full economic costs of research, three new institutions and a number of cross-council research programmes. Details of the funding allocated in these areas are given in the next section.

The Haldane Principle and financial flexibility

20. The cornerstone of science funding in the UK is the Haldane Principle, which asserts that detailed decisions on how to spend the Science Budget should be made by scientists rather than politicians.²³ But in the 2007 allocations process the Government has had a significant influence on how this Science Budget will be spent. There are three strands to this. First, there is the continuing drive towards Research Councils funding their university-based research at full economic cost (FEC).²⁴ Previously, universities had to subsidise a greater proportion of Research Council-funded research, which was a significant financial burden. FEC is a Government-led agenda that has received broad support from the Research Councils, universities, the wider scientific community and this Committee. The Research Councils are able to commit to FEC because DIUS has provided commensurate additional funding to cover around 90% of FEC. Of the approximately £1 billion increase in funding over the CSR period compared with the 2007/08 baseline figure, £748 million has been allocated to FEC uplift.²⁵ **In view of the importance of attaining sustainability and transparency for ongoing and future research in the UK, we welcome the Government's commitment to FEC.**

21. Second, there are a number of new bodies that have been set up to meet Government objectives in the fields of innovation, knowledge transfer and energy. These are:

- a) the Technology Strategy Board (TSB), which was created as an executive non-departmental public body in July 2007 to promote, through funding and relationship brokering, technology-based innovation across the UK;²⁶
- b) the Energy Technologies Institute (ETI), which was created in December 2007 to promote industrial collaboration and focus on the development of new and sustainable energy technologies;²⁷ and
- c) the Office for Strategic Co-ordination of Health Research (OSCHR), which will coordinate funding of health research between the Medical Research Council (MRC) and the National Institute for Health Research (NIHR) and promote the translation of this research into health and economic benefits for the UK.²⁸

23 The Haldane Principle is named after Richard Burdon Haldane, the 1st Viscount of Haldane, who chaired a committee in 1918 which produced a report (known as the Haldane Report) that recommended that non-departmental-specific research should be managed by scientists through 'Research Councils'. Haldane RB, (1918) Ministry of Reconstruction, *Report of the Machinery of Government Committee*, Cd 9230 <http://ia340927.us.archive.org/0/items/reportofmachiner00greaiala/reportofmachiner00greaiala.pdf>

24 *The Allocations of the Science Budget 2008/09 to 2010/11*, Department for Innovation, Universities and Skills, December 2007, p 13

25 Ev 118

26 www.innovateuk.org

27 www.energytechnologies.co.uk

28 www.nihr.ac.uk/about_oschr.aspx

22. The Research Councils have committed £120 million to TSB over the CSR period, EPSRC has earmarked £60 million for ETI (although its projected expenditure is £21 million), and MRC has committed £132 million to OSCHR.

23. It is noteworthy that when the budgets set aside for FEC and the new institutions are combined (£1,060 million), the sum is higher than the total increase in near cash (that is, money that can be spent²⁹) over the CSR period (£945 million).

24. Third, the Research Councils have come together to commit to six cross-council programmes, which are:

- energy: to address international issues of climate change and security of energy supply (£319 million over the CSR period);
- living with environmental change: to address the associated pressures on natural resources, ecosystem services, economic growth and social progress (£363 million);
- global threats to security: to address causes of threats to security, their detection, and possible interventions to prevent harm (£113 million);
- ageing: to address life long health and wellbeing in an ageing population (£485 million);
- digital economy: to get the most out of information and communications technology (£58 million); and
- nanoscience through engineering to application: to get the most out of nanoscience technologies (£50 million).³⁰

Table 2. Funding for cross-council research programmes³¹

£ million	AHRC	BBSRC	ESRC	EPSRC	MRC	NERC	STFC	Total
Energy	–	23	240	20	–	22	14	319
Environ. change	5	16	26	20	57	237	2	363
Security	21	5	17	23	45	1	2	114
Ageing	1	41	31	30	370	1	12	486
Digital economy	5	–	39	3	11	–	–	58
Nanoscience	–	15	16	1	9	2	8	51
Totals	32	100	369	97	492	263	38	1391

29 “Near-Cash is defined as accruals measures of transactions that normally turn into cash flows soon. So the main components of near-cash in resource budgets are: pay, current procurement, grants and subsidies to the private sector and subsidies to public corporations. Near-cash also covers amounts paid out that are covered in accounting terms—and at the level of the Resource Budget—by the release of provisions.” Quote from *Consolidated budgeting guidance from 2007–08*, HM Treasury, 1 February 2008, Section 5.7

30 *The Allocations of the Science Budget 2008/09 to 2010/11*, Department for Innovation, Universities and Skills, December 2007, pp 17–23

31 *The Allocations of the Science Budget 2008/09 to 2010/11*, Department for Innovation, Universities and Skills, December 2007, pp 17–23; and *RCUK Delivery Plan 2008/09 to 2010/11*, Research Councils UK, December 2007, pp 4–6

25. We note that these six areas of research are very similar to a list of policy challenges produced by HM Treasury in July 2005:

- 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;
- 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.³²

26. The combined effect of these expenditures—FEC, the new bodies, and the cross-council programmes—will lead to a reduction in the volume of research that the Research Councils can fund and a shift in their priorities. For example, the Engineering and Physical Sciences Research Council (EPSRC) has announced that the amount of research it funds will drop by between 3% and 5% because of FEC,³³ and that its investigator-led funding will reduce by 12–15%³⁴ with much of this money instead being “channelled into funding research in specific government-defined areas”.³⁵

27. The increase in the Science Budget does not fully cover increased expenditure on FEC and the new bodies (OSCHR, ETI and TSB), which means that Research Councils will have to redirect money previously earmarked for research grants. Additionally, large parts of the budget are tied to cross-council programmes that largely follow a Government agenda. It is of course acceptable for the Government to set priorities for UK research but not for it to micromanage individual Research Council budgets. We recommend that the Government make a statement on its application of the Haldane Principle.

Impact of the Science Budget Allocations

28. The headline figure for the Science Budget was welcomed; our witnesses agreed that 17.4% is a good settlement for science.³⁶ However, problems emerged immediately because a large proportion of the Research Councils’ expenditure had been predetermined. Once

32 Written ministerial statements, Tuesday 19 July 2005, Column 55WS

33 www.epsrc.ac.uk/Content/News/FundingPrioritiesAndPlans.htm

34 *Ibid.*

35 ‘£130-million cut to grants hits UK physical scientists’, *Nature*, vol 454, pp 393–393

36 Qq 1–3, 100, 152–153,

commitments to FEC and the new bodies are taken into account, the settlement is essentially flat cash and therefore a reduction in real terms. MRC is the exception: it has received sufficient money to cover FEC and the new body for which it is responsible (OSCHR). This means that the existing and planned programmes of research for the other six Research Councils are being carried out on a reduced and eroding budget. This is especially problematic when one considers that inflation for scientific research is typically higher than for the rest of the economy.³⁷ Consequently, it is likely that “across all research councils [we] will see reductions in success rates and reductions in volume [of research grants]”.³⁸

29. We are concerned that the Government has failed to protect both the existing and planned research base by allocating insufficient funds to cover FEC and the new bodies. The large increase in MRC’s budget means that the effect of this near cash deficit is concentrated on the other Research Councils.

30. We turn now to the specific difficulties faced by three of the Research Councils.

37 Qq 101–102

38 Q 102 [Professor Ian Diamond]; Qq 156, 231

3 Science & Technology Facilities Council

Background

31. There has been considerable concern about the impact of the Science Budget Allocation on one Research Council in particular. It has been widely reported that the Science and Technology Facilities Council (STFC) has been left with an £80 million shortfall in its finances, which will lead to job losses, the closure of research facilities and cessation of programmes.³⁹ Additionally, we have received a great deal of correspondence from some members of the particle physics and astronomy community, who are concerned about the funding situation of STFC and the way STFC has handled its budget.

32. STFC is a new Research Council, which was formed on 1 April 2007. It is the result of a merger between the Council for the Central Laboratory of the Research Councils (CCLRC), which managed national facilities, and the Particle Physics and Astronomy Research Council (PPARC), which managed the particle physics and astronomy research funding. The rationale behind the merger was to “create a more integrated approach to large scientific research facilities”.⁴⁰ Its role is to promote and to support:

- high-quality scientific and engineering research by developing and providing facilities and technical expertise in support of basic strategic and applied research programmes;
- high-quality basic, strategic and applied research and related post-graduate training in astronomy, particle physics, space science and nuclear physics and research in any other field which makes use of STFC-managed facilities; and
- advancement of knowledge and technology (including the promotion and support of the exploitation of research outcomes) and to provide trained scientists and engineers.⁴¹

Structure of STFC

33. STFC has two functions that were historically carried out by its two predecessor Councils, CCLRC and PPARC. The first function is to manage the UK’s large science facilities (see Box 1) on a number of sites (see Box 2). The second is a grant-giving function: STFC funds research in the fields of astronomy and space science, computational science, materials, nuclear physics, particle physics, and technology; it is involved in all but one of the cross-council research programmes in CSR07.

39 See, for example: ‘Scientists wait to see where axe will fall’, *The Guardian*, 8 January 2008; ‘10,500 sign petition to reverse cuts to science’, *Times Higher Education*, 10 January 2008; ‘Ministers review physics funding’, *BBC News Online*, 11 December 2007

40 Third Delegated Legislation Committee, Draft Science and Technology Facilities Council Order 2007 and Draft Technology Strategy Board Order 2007, 11 December 2006, col 5

41 www.scitech.ac.uk/About/Miss/Contents.aspx

Box 1. Facilities

STFC manages many national science facilities.⁴² The following are of particular relevance.

Synchrotron Radiation Source (SRS) is a second generation light source based at the Daresbury Laboratory in Cheshire (see Box 2). It has been producing synchrotron light for a range of experimental uses since 1981: it was used to determine the structure of the foot and mouth virus in 1988 and in 1997 Dr John Walker was awarded the Nobel Prize for his work on ATPase, which was based on data collected at SRS.⁴³ SRS is due to close on 31 December 2008 and is being replaced by:

Diamond Light Source is a third generation light source, which has been built at the Harwell site in Oxfordshire (see Box 2) in a joint venture between STFC and the Wellcome Trust. Diamond is the largest UK-funded scientific facility to be built for more than 40 years. It covers an area the size of four football pitches and will house 40 beamlines.⁴⁴

ISIS is the world's leading neutron and muon source, based at the Rutherford Appleton Laboratory on the Harwell campus. It is currently completing its £120 million second target station (ISIS TS2), which houses facilities complementary to those at TS1.

ALICE (Accelerators and Lasers In Combined Experiments) is a technology demonstrator for accelerator and laser science, based at Daresbury. ALICE was formerly called ERLP (Energy Recovery Linac Prototype), so to distinguish it from an experimental programme at the Large Hadron Collider, CERN, also called ALICE (A Large Ion Collider Experiment), we refer to it as ERLP/ALICE. Related to ERLP/ALICE, is **EMMA** (Electron Model for Many Applications), which is a model electron accelerator that uses ERLP/ALICE as its particle source. Also relevant in this context is **4GLS** (4th Generation Light Source), which was originally planned for construction at Daresbury; this project has been put on hold for two years.

Box 2. STFC-owned sites

There are three particularly relevant STFC-owned sites:

The Daresbury Laboratory, near Warrington in Cheshire, is home to a scientific library, SRS and ERLP/ALICE (see Box 1), the Medium Energy Ion Scattering Facility (MEIS), the National Centre for Electron Spectroscopy and Surface Analysis (NCESS) and the Cockcroft Institute.⁴⁵ The latter is the UK's national centre for accelerator science and technology; it is a joint venture between the Universities of Lancaster, Liverpool and Manchester, the NorthWest Development Agency (NWDA) and STFC.

42 For a full list visit www.scitech.ac.uk/ResFac/LargeFac/contents.aspx.

43 For a timeline of SRS, see www.srs.ac.uk/srum05/srum_timeline2.htm.

44 More information on Diamond can be found at www.diamond.ac.uk.

45 For links to each of these facilities and centres, use www.stfc.ac.uk/About/Struc/Locs/DL/facs.aspx.

The Rutherford Appleton Laboratory (RAL), which is on the Harwell Campus near Didcot in Oxfordshire, is home to the Central Laser Facility (CLF), Diamond and ISIS (see Box 1), the Molecular Spectroscopy Facility and Space Test Facilities. The Space Science and Technology Department (SSTD) at RAL is the largest space department in Europe comprising of 230 staff and 186 instruments (larger than the rest of the UK put together). It hosts 3,600 users and has a £20 million turnover annually. Customers of SSTD include the Government, NASA, ESA, intelligence agencies, industry and universities.

The Astronomy Technology Centre (ATC), based at the Royal Observatory, Edinburgh. It is the UK's national centre of astronomical technology, which designs and builds instruments for many of the world's major telescopes.

The remaining STFC sites are the Chilbolton Observatory (near Stockbridge in Hampshire), the Isaac Newton Group of Telescopes (in La Palma, Spain) and the Joint Astronomy Centre (in Hawaii).

Funding

34. STFC's CSR07 allocation is given in Table 3. The increase from the baseline year, 2007/08, to the end of CSR07, 2010/11, is 13.6%. This is the second smallest increase of all the Research Councils (behind AHRC, see Chapter 4), and amounts to an additional £185 million over the CSR period. Professor Sir Keith O'Nions, Director General of Science and Innovation, told us that "STFC had the best increase percentage settlement of any of the other six research councils: it got a 3.2 per cent increase over flat cash plus FEC".⁴⁶ This is true, although Sir Keith presumably meant 'the largest increase apart from MRC', and it further underlines the depth of the problems faced by STFC. However, equally pertinent to percentage increases is the 'shape' of the allocation: a comparison of near cash allocations (that is, money that can be spent) over the course of CSR04 and CSR07 between STFC and the other science-based Research Councils shows that all the other Research Councils have marked increases in near cash over CSR07 while STFC does not (Figure 1).⁴⁷ In other words, STFC has received a flat near cash allocation that will erode against inflation.

46 Q 193. He was specifically talking about near cash, so as to be able to include AHRC, which has very little non cash, in the comparison.

47 *The Allocations of the Science Budget 2008/09 to 2010/11*, Department for Innovation, Universities and Skills, December 2007, p 62; *Science Budget Allocations 2005–06 to 2007–08*, Department of Trade and Industry, May 2005, pp 20–34

Table 3. 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	631,337	651,635

* DEL = Departmental Expenditure Limit

The Allocations of the Science Budget 2008/09 to 2010/11, Department for Innovation, Universities and Skills, December 2007, p 44

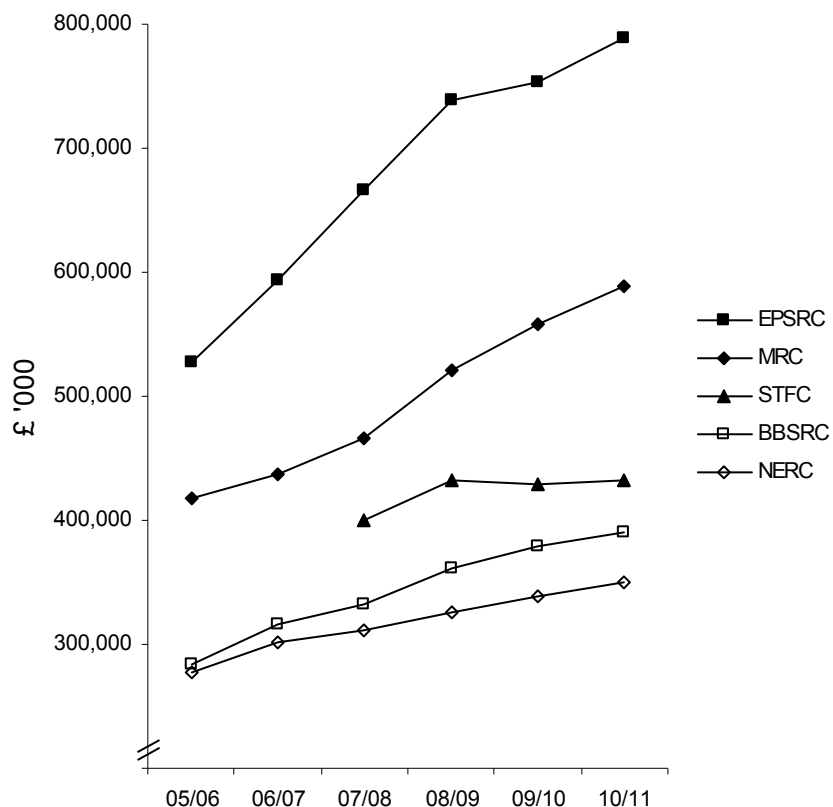


Figure 1. A comparison of near cash allocations over CSR04 and CSR07. STFC is missing the first two data points because it only came into existence in 2007.

Legacy issues

35. There are other factors that have led to STFC's financial difficulties, and these are largely related to legacy issues derived from the merger of PPARC and CCLRC. These predecessor Councils differed greatly in their functions: PPARC funded particle physics and astronomy research in same way as the other Research Councils fund research for their respective communities, whereas CCLRC funded facilities for the whole science research community. Despite assurances from Professor Sir Keith O'Nions that "there were no deficits in either council upon merger",⁴⁸ it is clear that CCLRC in Sir Keith's words was "carrying difficulties".⁴⁹

36. The key difficulty has to do with the operational costs of Diamond and ISIS. Although CCLRC did not carry a deficit at the point of merger, it did not have money in its budget to cover the future operating costs at ISIS and Diamond. The National Audit Office has commented on these operating costs and the future of CCLRC:

The anticipated total increase in its operating costs is in the region of £25 million per annum at 2006–07 prices [...] If the Council does not secure additional resources, this degree of cost growth could exacerbate existing constraints.⁵⁰

37. Professor Keith Mason confirmed this when he told us that: "It is true to say that the base line budget allocation to the ex-CCLRC (the predecessor organisation) was not fully raised to compensate for the running costs of Diamond and ISIS Target Station II".⁵¹ He also told us that "The budget I received to run STFC was the sum of the budgets that were previously in PPARC and CCLRC".⁵² Therefore, it follows that STFC has been left with a bill for the operating costs of Diamond and ISIS that is £75 million (across the CSR period at 2006/07 prices) above the sum that was allocated in its budget following the merger.

38. This has placed the STFC Executive in a position where it has had to cut planned programmes in order to pay for ISIS and Diamond. As STFC's Chief Executive put it: "Diamond is a great thing, ISIS Target Station is a great thing but they do require more running costs which means that we have to restructure the programme in order to pay for them".⁵³ As we will discuss later, it is the former PPARC programmes that have been cut rather than the former CCLRC programmes. In other words, the former PPARC community is being penalised by the merger with CCLRC. This is a situation that the Government had promised would not come about. Sir Keith O'Nions told the Science and Technology Committee on 17 January 2007, in reference to the CCLRC and PPARC merger, that:

the budgets of those two councils have to be left without any legacy difficulties at the time the new council starts in April [...] What I am saying is that if there are any

48 Q 190

49 Q 191

50 *Big Science: Public investment in large scientific facilities*, National Audit Office, HC 153 Session 2006–2007, 24 January 2007, p 21

51 Q 83

52 Q 95

53 Q 83

holes in the road that need to be filled in we will have to make sure they are filled in. We do not want to start a new Council with legacy issues.⁵⁴

39. We remain concerned that the former PPARC community has been saddled with a £75 million (at 2006/07 prices) funding deficit derived from CCLRC to meet the additional running costs of Diamond and ISIS TS2, despite assurances from the Government that STFC would be formed without any legacy issues. We conclude that the combined budget of PPARC and CCLRC was never going to be sufficient for STFC to manage Diamond, ISIS TS2, the other large facilities and all the PPARC research programmes. This was noted by the National Audit Office in January 2007, and therefore the Government should have known and should have acted upon it. The fact that it did not has had unfortunate consequences. We believe that the Government should ensure that its original commitment to leave no legacy funding issues from the previous Councils is honoured.

40. A further legacy issue has to do with timing rather than funding. STFC began life as a new Research Council on 1 April 2007, which means that not only did the merger take place during the CSR allocation process, but that STFC was asked to provide a draft delivery plan only three months after its formation.

41. The timing of the formation of STFC was not propitious. It takes time to set up a new organisation, especially one as large and complex as STFC. The Government's expectation that STFC would be ready for a new CSR was overly ambitious.

Delivery Plan

42. The Delivery Plan sets out STFC's strategy for meeting its mission following the allocation. This strategy is focused around two key factors. First, a number of major new facilities in which STFC (and its predecessor Councils) have invested heavily are coming online during CSR07: Diamond, ISIS TS2 and the Large Hadron Collider (LHC) at CERN, Geneva, Switzerland. Exploiting these facilities is STFC's highest priority.⁵⁵ Having said that, we note that in the consultation on STFC's Programmatic Review (see para 89), it is made clear that while the two largest experiments on LHC, ATLAS and CMS, are high priority, the two smaller ones, LHCb and ALICE, are medium-low and low priority, respectively. This low priority for LHC experiments is surprising given that they are about to come on stream this year. In Diamond and ISIS, STFC has two world leading facilities which are used to "probe the structure of matter and materials, for applications in biosciences and medicine, the environment, nanoscience and nanotechnology, materials processing energy, and engineering as well as fundamental physics and chemistry".⁵⁶ CERN's LHC is the largest accelerator ever built. Scientists are not certain what they will see when experimentation begins this year, but: "at the very least, we hope to find the Higgs Boson, which is postulated to give particles their mass; theoretical models suggest we will

54 Science & Technology Committee, Sixth Report of Session 2006–07, *Office of Science and Innovation: Scrutiny Report 2005 and 2006*, Qq 333–334

55 *Delivery Plan 2008/9–2011/12*, Science and Technology Facilities Council, December 2007, p 4

56 *Ibid*, p 7

likely observe new symmetries of nature, new particles and forces beyond those known”.⁵⁷ One of the two major experiments at LHC is UK-led.

43. Second, STFC is planning a “step change in knowledge exchange and economic impact” by developing Daresbury and Harwell as Science and Innovation Campuses.⁵⁸ The vision is to use these campuses to act as focal points for bringing together industry and academic researchers. This will be achieved by creating “internationally-competitive critical mass”.⁵⁹ STFC’s vision for each campus differs. The plan for Daresbury is “to focus on creating a national technological capability in the areas of computational science and accelerator and detector R&D for next generation facilities”.⁶⁰ The plan for Harwell is based around STFC’s major facilities: Diamond, ISIS and the Central Laser Facility, as well as facilities in space systems, imaging and sensors.

Key decisions

44. STFC has made a number of decisions that have caused concern in the physics and astronomy community. These are discussed below under the broad headings of projects, sites, and grants.

Projects

45. One of the most important decisions that STFC has made, as mentioned above, is to follow through on its investment in the major large facilities: LHC, Diamond and ISIS TS2. Work relating to these projects is of the highest priority and the rest of STFC’s programme is tailored accordingly.⁶¹ Given the level of investment in these projects, approximately £600 million in the last three years, STFC had little choice but to follow this path. However, the size of the allocation has meant that other programmes have to be cut to make the books balance. These programmes, as reported in the Delivery Plan, are the UK’s participation in two international projects—the International Linear Collider and the Gemini telescopes—and ground-based solar-terrestrial physics facilities. By way of comparison, investment in these projects over the last three years is approximately £16 million.

46. We welcome STFC’s decision to support its major facilities to the extent set out in its Delivery Plan and recognise the valuable role that these facilities currently play, and will play in the future, in maintaining the excellence and continuing the growth of UK science. However, we are concerned that the decision to support the large facilities has come at the expense of research in fields where the UK excels and in which STFC and its predecessor Research Councils have made significant investments.

57 *Ibid*, p 5

58 *Delivery Plan 2008/9–2011/12*, Science and Technology Facilities Council, December 2007, p 9

59 *Ibid*.

60 *Ibid*.

61 Q 83

International Linear Collider

47. The International Linear Collider (ILC) is a proposed electron-positron collider, which would complement the Large Hadron Collider at CERN. It is the result of a decision made in 2004 to merge three linear collider projects (the Next Linear Collider, the Global Linear Collider and the Teraelectronvolt Energy Superconducting Linear Accelerator). Draft designs for ILC propose a 30 km to 40 km collider, which would be an order of magnitude larger than the Stanford Linear Collider (the longest existing linear particle accelerator).

48. STFC has decided to withdraw UK funding for this project on the grounds that: “We do not see a practicable path towards the realisation of this facility as currently conceived on a reasonable timescale.”⁶² The Minister has supported STFC’s decision by arguing that it is sensible to delay ILC until the results come in from LHC.⁶³ He also noted that the United States has withdrawn from ILC.⁶⁴

49. We will not comment on the scientific justification for withdrawal, since this falls within the remit of experts in the area; however, we are concerned by the manner in which this decision was taken. When we asked Professor Swapan Chattopadhyay, Director of the Cockcroft Institute, whether there was adequate peer review prior to the decision to withdraw from ILC, he said:

In the case of International Linear Collider, as far as I know there has been no consultation or review with the community about their decisions and no consultation with the international community that we know of. It came out of the blue.⁶⁵

50. This was supported by Professor Peter Main of the Institute of Physics:

I think the biggest criticism we would put forward there is that the decision was made with very, very little consultation with the people involved. The people who have been involved—Brian Foster at Oxford is the European leader of the ILC programme—were not given any opportunity to present their case before the project was terminated. It is not useful at this sort of meeting to get involved in the ins and outs of whether it is a good thing; they are very complicated issues. It is really a question of the time available for the decision and the lack of consultation.⁶⁶

51. A further problem is one of international reputation. Concern for international reputation has been raised in the context of “reneging on existing commitments without prior consultation” by the Institute of Physics and the Royal Astronomical Society.⁶⁷ We return to this issue later.

62 *Delivery Plan 2008/9–2011/12*, Science and Technology Facilities Council, December 2007, p 5

63 Q 200

64 *Ibid.*

65 Q 280

66 Q 65

67 Ev 68

Gemini

52. The Gemini Observatory consists of two 8-metre telescopes: one atop Cerro Pachon in the Chilean Andes, and the other atop Mauna Kea in Hawaii. By placing twin telescopes in the southern and northern hemisphere, astronomers have access to the entire sky. Gemini was built and is operated by seven countries—Argentina, Australia, Brazil, Canada, Chile, the UK and the US—and has been in operation since 2000.⁶⁸

53. STFC first announced its intentions to withdraw from Gemini to the Gemini Board in November 2007.⁶⁹ This decision was confirmed in its Delivery Plan (11 December 2007): “We plan to withdraw from future investment in the twin 8-metre Gemini telescopes and we will work with our international partners to retain access to Gemini North.”⁷⁰ The reason for wanting to retain access to Gemini North is that it is the only 8-metre telescope in the northern hemisphere to which UK astronomers have access. STFC attempted to negotiate reduced on-going participation, but this was refused by the Gemini Board and taken as notice of withdrawal from the partnership.⁷¹ This meant that the UK would be liable for a penalty payment of approximately £7 million. STFC argued that: “While we sincerely regret the need to withdraw from Gemini, the current circumstances leave us no choice.”⁷² However, on 9 February 2008 the Gemini Board announced that STFC would continue operations payments through 2008.⁷³ On 3 March 2008, STFC announced that: “The UK remains a partner in Gemini until at least 2012, but the intention is to sell 50% of our time on the two telescopes from 2009.”⁷⁴ As Professor Richard Holdaway put it: “Are we in or not? The answer is, we are in. We were in and out and in and out and now we are back in again.”⁷⁵

54. The ongoing saga over Gemini raises questions about the competence of STFC’s communications. As with the decision taken over the International Linear Collider, there was no consultation with the astronomy community before decisions over Gemini were taken. Professor Michael Rowan-Robinson, President of the Royal Astronomical Society, told us, in relation to the decisions taken in the Delivery Plan, that: “it was a complete bolt out of the blue. The first hint of it was the leaked announcement about the withdrawal from Gemini.”⁷⁶ Further, the Gemini saga is damaging to the UK’s international reputation. Professor Rowan-Robinson explained that: “In the Royal Astronomical Society we have many overseas fellows and I get e-mails all the time from them wondering what on earth is going on.”⁷⁷ We return to communication and international reputation later.

68 www.gemini.edu

69 ‘Shock as UK withdraws from Gemini Observatory’ *Astronomy Now Online*, 16 November 2007

70 *Delivery Plan 2008/9–2011/12*, Science and Technology Facilities Council, December 2007, p 6

71 www.gemini.edu/index.php?option=content&task=view&id=270

72 www.scitech.ac.uk/PMC/Prel/STFC/Gemini-Update.aspx

73 www.aura-astronomy.org/nv/nuresult.asp?nuid=166

74 *Consultation on STFC’s Programmatic Review 2007–8*, Science and Technology Facilities Council, 3 March 2008, p 5

75 Q 300

76 Q 6

77 Q 28

Ground-based solar-terrestrial physics

55. Solar-terrestrial physics (STP) is the study of the impact of solar activity (solar wind, flares and storms) on the Earth and near-Earth space. This work is relevant to the use of satellites (for example, for communications and navigation), aircraft, electricity and oil supply networks, and climate change. STP is studied from two perspectives using both space-based and ground-based instrumentation. The UK is recognised as a world-leader in this field,⁷⁸ yet one of the key decisions in STFC's Delivery Plan was to "cease all support for ground-based solar-terrestrial physics facilities".⁷⁹

56. Professor Keith Mason characterised this decision as a "half-decision" on the basis that it was "actually a decision that we made at the last spending review but we are confirming this time".⁸⁰ However, the decision that PPARC made in the last spending review was "to maintain a capacity in ground-based STP, [... but] to close some of the current facilities".⁸¹

57. One of the reasons for PPARC's maintaining a capacity in ground-based solar-terrestrial physics was that the UK is committed to a 5-year involvement (from 2006) with the EISCAT project, which is an international research organisation operating three incoherent scatter radar systems in Northern Scandinavia.⁸² Professor Mason explained:

The thing is, we could not withdraw from EISCAT because we had just recently entered into a five-year commitment, as has been indicated earlier. So essentially the PPARC statement was meant to reflect the fact we would withdraw when we could without breaking international agreements.⁸³

58. We do not accept this explanation, which does not accord with the explicit desire stated in the PPARC Programmatic Review to 'maintain a capacity in ground-based STP'. Further, we agree with Professor van Eyken, Director of EISCAT, when he says:

The prospect of the UK belonging, for several more years, to an international association, namely EISCAT, which it does not then exploit, is very damaging to its credibility as a competent research nation.⁸⁴

59. We find Professor Mason's explanation for the withdrawal of funding from ground-based solar-terrestrial physics (STP) facilities to be inaccurate, unconvincing and unacceptable. PPARC did not decide to cut funding to all ground-based STP facilities, but intended to maintain a reduced capacity in this field. We urge STFC to suspend its decision on ground-based STP so that the issue can be revisited with proper peer review and in full consultation with the community, including NERC.

78 Ev 105; Ev 87

79 *Delivery Plan 2008/9–2011/12*, Science and Technology Facilities Council, December 2007, p 6

80 Q 124

81 *Outcome of the Programmatic Review*, PPARC, 10 April 2006, STPNFC(06)03

82 EISCAT (European Incoherent Scatter) is funded and operated by the research councils of Norway, Sweden, Finland, Japan, China, the United Kingdom and Germany. EISCAT studies the interaction between the Sun and the Earth as revealed by disturbances in the magnetosphere and the ionised parts of the atmosphere (these interactions also give rise to the aurora, or Northern Lights).

83 Q 384

84 Ev 105

Implications for the STFC-owned sites

The Astronomy Technology Centre

60. The Delivery Plan also has implications for STFC's laboratories. Job losses across STFC will be particularly damaging at the Astronomy Technology Centre (ATC) in Edinburgh, since it is a relatively small centre. Of the current 100 staff, 40 are expected to lose their jobs in the next few months.⁸⁵ Part of the expected job losses at ATC are connected to the UK's withdrawal from Gemini, which would mean the loss of contracts building instrumentation for those telescopes. Now that the UK is back in the Gemini programme there is a possibility that those contracts can be won.⁸⁶ However, ATC's chances of winning that work must be reduced following the poor handling of the Gemini issue and future uncertainty of UK's involvement in the project.

The Rutherford Appleton Laboratory

61. STFC's plans call for a staff cut at RAL of approximately 150 out of 1,500 staff. This is a significantly lower percentage of the staff to be lost compared with ATC or Daresbury (see below).

The Daresbury Laboratory

62. Of all STFC's sites, most concern has been raised about the future of Daresbury. Reports of 350 job losses (out of a total staff of 500) were circulating soon after the Delivery Plan was published,⁸⁷ although the actual numbers are not yet decided. 80 jobs are set to be lost this year with the closure of SRS,⁸⁸ and a further 30 will be lost next year following decommissioning. Additionally, funding for ERLP/ALICE⁸⁹ has been placed on the 'low priority' list in STFC's Programmatic Review,⁹⁰ a decision that threatens not only jobs on that project, but the accelerator skills base at Daresbury. This could potentially damage work on a range of projects, including EMMA, which uses ERLP/ALICE as a particle source and has already secured funding, and undermine the position of the Cockcroft Institute.⁹¹

63. STFC and the Government, however, foresee a bright future for Daresbury. Professor Mason told us:

The other point I would make in relation to our campuses and to correct a statement [...] that the redundancies that we are talking about will affect the viability of the Daresbury campus in particular, again I do not accept that. We are pursuing a new

85 Q 51

86 Q 389

87 'Future at risk as Daresbury sacrifices hundreds of jobs', *Liverpool Daily Post*, 4 January 2008

88 see Box 1

89 *Ibid.*

90 *Consultation on STFC's Programmatic Review 2007–8*, Science and Technology Facilities Council, 3 March 2008, p 4. As an aside, another project placed on the 'low priority' list is the e-Merlin project. As a result, the future of Jodrell Bank, which is owned by the University of Manchester, is uncertain.

91 Q 286

model for doing science in this country which involves partnership with the private sector and local authorities in order to get more science done. Daresbury is a shining example of this and we are planning huge additional investments from all these sectors into Daresbury; I think Daresbury has an absolutely shining future.⁹²

64. This sentiment was echoed by the Minister for Science and Innovation who assured us that the Government is committed to developing Daresbury as a science and innovation campus.⁹³ He also warned: "I hope that the Committee is very careful in terms of its conclusions in this matter because the last thing that I think we ought to be doing is talking down the prospects of Daresbury as a science and innovation campus."⁹⁴

65. When we visited Daresbury we found a demoralised workforce concerned that without a major facility the site was not viable. Professor Chattopadhyay summed up the concerns we heard at Daresbury:

What I see as the fundamental flaw in the vision of the Daresbury site is, as I heard the chief executive particularly say, the fact all operational facilities are supposed to be concentrated in one site and Daresbury would be comprised of major technological development centres, and the way it is evolving it is going to be a business park with a call centre for technologists to solve a particular problem. If you look at major scientific break-throughs in countries like the United States, all those parts have evolved around some core scientific unit either university-driven or a lab-driven, like Stanford or Berkeley. Cockcroft by itself, having experts there without any operational scientific facility around and technical expertise around from STFC, is not going to be attractive to stay on the site.⁹⁵

66. This concern for the future of Daresbury has not sufficiently been addressed by STFC. Professor Chattopadhyay highlighted an example that demonstrates a way that the uncertainty at Daresbury could have been handled:

I will give you one example. In the Human Genome Centre at the University of California there are three stakeholders, government, Genotech and the industry and the university. When there was significant instability in one of the stakeholders, the Department of Energy, that agency sat down around the table with the Director of the Human Genome Centre and discussed how they could mitigate the loss of skills for genetic science engineering. [...] That process never took place [at Daresbury]. In the case of STFC, there were only inward looking and secretive discussions within STFC without bringing in the university and other stakeholders.⁹⁶

67. We share the concern of members of the staff that in the absence of a major facility at Daresbury, like a fourth generation light source⁹⁷ or ERLP/ALICE, it will lose the scientific

92 Q 123

93 Qq 160, 163, 172, 179

94 Q 179

95 Q 289

96 Q 287

97 see Box 1

critical mass that STFC is so keen to foster⁹⁸ and it will cease to be a science campus. The announcement of the Hartree Centre for computing and a detector centre,⁹⁹ and the Minister's preference for the fourth generation light source to be based at Daresbury,¹⁰⁰ are probably insufficient to prevent Daresbury, under the current strategic plan, from becoming merely a technology/business park. These concerns are reinforced by the recent announcement of £25m private sector funding for building with no clear plan about who or what is to occupy the buildings.

A one-site solution?

68. The position of the Government (that it is committed to the development of Daresbury and RAL) and the concerns of the science community (that Daresbury will become a technology/business park) may not be mutually exclusive. When STFC and the Government speak of enthusiasm for the future of Daresbury, the emphasis is very much on the opening of the Hartree Centre for computing, the detection centre and the influx of business to the campus.¹⁰¹ There is an acceptance that there is a “structural imbalance between Daresbury and RAL in terms of facilities”,¹⁰² which STFC inherited. However, there have also been recent decisions, for example to postpone funding for 4GLS and put ERLP/ALICE on the low priority list, that will add to this imbalance between the two sites. Consequently, the future for Daresbury looks to be based on technology rather than science.

69. Prior to the final allocations of the science budget, STFC's Science Board recommended that: “to minimise overheads and maximise synergies, Science Board felt that there is no alternative to closing the Daresbury Laboratory in the current budgetary climate”.¹⁰³ This suggestion was, at the time, supported by the Executive, whose proposal was:

To concentrate most if not all core in-house capability on the Harwell campus and plan for all future national large facilities to be located there. This would mean [...] working with the private sector and the NWDA to develop the Daresbury campus primarily as a private sector venture with some core scientific and/or technology expertise retained either within the STFC or transferred into a university or private sector company.¹⁰⁴

70. According to Mr Peter Warry, Chairman of STFC, these suggestions were made during the decision-making process and were rejected by the STFC Council.¹⁰⁵ However, the Executive's description of developing Daresbury “primarily as a private sector venture with some core scientific and/or technology expertise retained” is an apt description of STFC's vision for the site. Peter Warry and Professor Mason, respectively, summarised this vision:

98 *Delivery Plan 2008/9–2011/12*, Science and Technology Facilities Council, December 2007, p 9

99 Q 362

100 Q 178

101 Qq 167, 176, 361, 362, 377

102 Q 377

103 Q 353

104 Q 356

105 Q 358

In our delivery plan we mention one of the things we want to do is to set up a Hartree Centre for world class computer modelling and simulation, and we have now got the first leg of that signed off [...] We also [...] are in very serious discussions for two world class science based businesses to come on to the campus.¹⁰⁶

Daresbury is a place that is growing. We have an innovation centre at Daresbury which is overflowing; we need more buildings for new companies coming in. What you see happening is a change in the model where instead of having a research staff solely funded by the research council we are moving to a mixed economy.¹⁰⁷

71. We do not see a major distinction between Keith Mason's proposal of 2 November 2007 to move major facilities from Daresbury to RAL and the situation in which Daresbury currently finds itself. SRS is closing, 4GLS has been postponed and the future of ERLP/ALICE is uncertain; the establishment of a computational science centre—important and welcome as this development is—and the influx of industry R&D teams do not amount to the presence of a national facility.

72. Many of the current users and key partners at Daresbury are under no illusions about the nature of the future of the site. The Director of the Cockcroft Centre has been very clear in correspondence with the Government that on the basis of current plans, the Centre has no good reason to stay on the site.¹⁰⁸

73. It is clear that Daresbury's future under the current vision is as a technology and business park. This cuts across previous Government assurances and pronouncements about the importance of Daresbury in Britain's overall strategy of scientific excellence. We urge STFC either to commit fully to science at Daresbury, which would include confirmation of at least one large national facility and a concrete programme of future activity and scientific excellence at Daresbury, which can then be the subject of proper scrutiny and review, or to make an honest assessment of, and statement on, the future of Daresbury as a technology and business park.

74. We have no doubt of the desire of the Government to see a thriving Daresbury campus and we note from previous announcements that this would include major science facilities. However, the Government must make clear, in line with previous commitments, how it intends to deliver future large-scale science facilities on the Daresbury campus.

The Haldane Principle and regional policy

75. The Minister told us that “We want to develop Daresbury as a world-class centre for science and innovation”,¹⁰⁹ but went on to say that the Government does not want to “get to a situation where [we are] dictating to research councils that a certain percentage of their budget has to be spent in a certain region”.¹¹⁰ However, the Minister has subsequently said

106 Q 361

107 Q 137

108 Ev 107

109 Q 160

110 Q 162

that “individual delivery plans [of Research Councils] should be in accordance with the strategic priorities of the government, which includes a clear regional element, because we want to see Daresbury developed as a world-class centre for science and innovation”.¹¹¹

76. We understand the competing demands on Government and are aware that investment in a major facility will attract its own scientific community, and therefore has economic implications for the region in which it is built. This factor could justifiably be considered in decisions on where large facilities are sited, rather than automatically awarding new projects to locations within the Golden Triangle.

77. The Government's message is confused about whether it has a regional policy for science, and specifically whether it should influence or dictate where STFC should spend its money, be it on the Daresbury Laboratory or elsewhere. This current confusion over the Government's regional policy is unacceptable given that so little is spent on research and development outside the south and the south-east, in particular. If the Government has a regional policy, this percentage spend represents a failure of that policy. **We recommend that the Government make clear its role in regional science policy and how this fits with the Haldane Principle. We also recommend that the Government clarify whether it regards its regional policy as a relevant criterion when the STFC or other Research Councils make decisions about capital projects or programmatic funding. We further recommend that the Government publish a White Paper on Regional Science Policy as a basis for discussion as a matter of urgency.** We will return to this matter in the future.

Site management

78. We were surprised to learn that ATC, with a staff of approximately 100 people has a director, while RAL and Daresbury do not. Professor Mason told us:

We do not have a director at Daresbury, we do not have a director at RAL, because we do not want to be in a situation where Daresbury and RAL are competing with one another which is what has happened in the past.¹¹²

79. However, the current situation, with a single director of the two campuses, has left the staff at each site feeling that they are not properly represented in STFC management; and the communication between the STFC Executive and its staff at Daresbury and RAL is inadequate. We dispute the idea that having site directors should negate the ability of the two sites to work together. Elsewhere it is the norm to have national laboratories with their own directors working together to deliver Government's strategic goals.¹¹³ **We recommend that STFC install a Campus Director at Daresbury and at RAL.**

Cuts to the grant line

80. Following the release of the Delivery Plan, Professor Mason held a number of ‘town meetings’ with the community to explain the background to the decisions and their

111 Ian Pearson MP, Westminster Hall debate, 1 April 2008, 211WH

112 Q 362

113 Q 315

impact. During these meetings, he said that there would be a 25% cut in the grant line.¹¹⁴ Professor Mason has since explained that this figure is set against a rising profile of work that STFC aspired to do.¹¹⁵ The reduction on a flat profile trajectory would be lower.

81. Irrespective of the actual cut for each physics and astronomy sub-discipline or research group in the UK, we have three concerns. The first is to do with FEC. As Professor Rowan-Robinson put it: “The problem is that [...] the FEC increases are entirely negated by the 25% grants cut.”¹¹⁶ In other words, in the case of physics and astronomy, the Director General’s assurance that more money will go into universities because of FEC,¹¹⁷ may not hold, even if universities allow departments to retain the whole FEC increment, rather than remove it to cover central overheads.

82. Second, we are concerned about the nature of the cuts themselves. Professor Mason told us that STFC was planning a 25% cut on what it had “aspired to fund”.¹¹⁸ However, this can be sub-divided into two categories: (a) the money that STFC told DIUS it wanted to spend on grants over the course of CSR07; and (b) the money that STFC promised in agreed research grants that had not been issued by the time of the allocation. The 25% cut applies to both of these categories,¹¹⁹ yet the practical impact is not the same on both.

83. Given the anxiety that grant cuts are causing to the physics and astronomy community, we are dismayed that STFC has been attempting to play down the effects of the cuts on the grounds that reductions in future grants are not problematic. We consider cuts to grants that had already been promised a major problem. We urge STFC to take immediate steps to communicate clearly and comprehensively to its research community the impact of its grant cuts.

International subscriptions and exchange rates

84. Rule changes regarding Research Councils’ subscriptions to international projects are due to take effect this year. Councils used to be compensated by the Office of Science and Innovation in the Department of Trade and Industry for international subscriptions that were affected by movement in exchange rates or GDP-related changes. As of 31 March 2008, this arrangement with DIUS will be lost. The STFC, which will be most severely affected by this change, explains in its Delivery Plan that:

[...] any significant increases in international subscriptions resulting from adverse movements in exchange rates and/or NNI [net national income] rates will be dealt with in the same way as uninsured risks i.e. STFC will be expected to absorb the increase up to £6m, with increases over and above this amount to be subject to discussion with DIUS.¹²⁰

114 Q 340

115 Q 126, 341

116 Q 4

117 Q 193

118 Q 341

119 STFC has not cut the number of grants by 25%, but decreased the money it is giving in each grant.

120 *Delivery Plan 2008/9–2011/12*, Science and Technology Facilities Council, December 2007, p 3

85. Professor Keith Mason told us that this was a better situation since previously the risk was carried by the Research Councils as a whole, which was unfair on, for example, AHRC.¹²¹ However, he also noted that this situation “does contribute some £10 million over the three years to the so-called £80 million [deficit]”.¹²²

Overall considerations and conclusions

Communication

86. The common theme that links the problems outlined above—from cuts in grant lines and specific projects to the impact on STFC sites—is poor communication. We discovered that those with a clear interest in the outcome of funding decisions and with evident expertise to contribute to debate were not consulted over decisions to withdraw funding from the International Linear Collider, from Gemini and from ground-based solar-terrestrial physics facilities. Aside from the damage done to the UK’s international reputation (which we discuss further below), a lack of consultation leads to poor decisions, as the fiasco over Gemini has demonstrated. Similarly, the communication with the staff at ATC, Daresbury and RAL has been woeful, with many staff finding out that their jobs are in jeopardy via the publication of the delivery plan. Communication of the cuts in the grant line has also been poor, since the initial claims of 25% cuts were misunderstood and it is not entirely clear why a figure of 25% was used in the first place: it would have been less sensational and more useful to separate out estimates of cuts to sub-disciplines in physics and astronomy against funding aspirations *and* existing projects.

87. We deplore STFC’s failure to consult on ILC, Gemini and STP, a failure that has cost it the trust of the scientific community. We conclude that STFC’s communications are inadequate, particularly its internal communications, which are deficient both in terms of top down communication (for example, alerting staff to proposed changes) and bottom up communication (for example, engaging the community over decisions). We recommend that STFC pursue urgently the appointment of a permanent Communications Director with appropriate skills and experience.

Peer review

88. Related but separate from the issue of communication are the peer review systems within STFC. The STFC Council is advised by a Science Council, which in turn is advised by two peer review committees: the Particle Physics, Astronomy and Nuclear Physics Science Committee (PPAN) and the Physical and Life Sciences Committee (PALS). These Committees have a difficult job to do considering the broad remit of STFC,¹²³ and we do not doubt the integrity of the individuals who make up those Committees.

89. PPAN and PALS have been charged with responsibility for STFC’s biennial Programmatic Review, which reviews the projects and facilities in STFC’s research programme in order to inform the STFC Council’s investment decisions. The 2007/08

121 Q 108

122 *Ibid.*

123 Q 319

Programmatic Review was published and opened up for consultation on 3 March 2008. It is essentially a list of priorities. For example, it ranks ATLAS, which is one of the large experiments at the Large Hadron Collider, as a high priority, and e-Merlin, which is an upgrade to the UK's national radio imaging astronomy facility, as a low priority.¹²⁴ The latter has recently received public attention because, if support for e-Merlin is withdrawn, there would be severe ramifications for Jodrell Bank Observatory, the world famous telescope run by the University of Manchester.¹²⁵ Further, as the Programmatic Review points out, the planning assumption is to close e-Merlin in 2009 just as it is starting its surveys,¹²⁶ which would waste an £8 million investment in the project.¹²⁷ **We have grave concerns about the impact of the cuts proposed in the Programmatic Review upon renowned institutions such as Jodrell Bank. This illustrates the extent to which the STFC's decisions affect research and facilities beyond those that it directly funds or owns.**

90. Our main concern, however, is the lack of consultation that appears to have taken place between these Committees and the physics and astronomy community in the run-up to the budget allocations. We have already seen that consultation with the community in relation to the decisions over ILC, Gemini and ground-based STP was inadequate. We have additionally heard claims about the quality of the peer review. For example, Professor Chattopadhyay commented that the reviewers on accelerator science and technology “do not even stand up to the standards of UK scientists who are being reviewed: they are inferior”.¹²⁸ He added that in the case of the light source review, which led to the decision to postpone the 4GLS project, STFC:

picked community members who had interests in the field totally autonomous to what they were reviewing. [...] There was no detailed consultation. Let us say the community gives 25 names, they pick four and that is okay. That process was not there. [...] As an outsider I complained about that the committee was flawed to start with. I had warned the Director of Strategy it was flawed in a letter. The committee went ahead and did the review anyway and I think you got a flawed recommendation.¹²⁹

91. Professor Holdaway's concern with the peer review system is less to do with the make up of the panels and more to do with the way they gather information prior to making decisions. He commented that:

The concern of the community, which I share to a certain extent, is how they get their advice. I think the communications and the advice there has not been what it

124 *Consultation on STFC's Programmatic Review 2007–8*, Science and Technology Facilities Council, March 2008, pp 2–3

125 'Jodrell Bank to close 'because scientists voted for own plans'', *The Times*, 11 March, 2008; also see STFC's reply in Letter, *The Times*, 12 March 2008

126 *Consultation on STFC's Programmatic Review 2007–8*, Science and Technology Facilities Council, March 2008, p 5

127 Figure taken from 'Jodrell Bank to close 'because scientists voted for own plans'', *The Times*, 11 March, 2008

128 Q 281

129 Qq 282–284

should be and I am confident that that will be rectified for the future, but it has not been that way in the past.¹³⁰

92. Professor Holdaway's optimism may be justified since Professor Mason has accepted that the community has not been adequately consulted, and asserts that this is an area in which STFC is working to improve.¹³¹ We are less convinced by Professor Mason's excuse for the current situation:

One of the tasks that the PPAN committee was set at its inception was to derive and devise a better system of community consultation which is an exercise which is not yet completed because, for one reason, its business has been dominated by the delivery plan and the programmatic review so it just has not had the time to put the thought in.¹³²

93. Community consultation is key to peer review. This issue should have been addressed at the outset using models from the previous PPARC and CCLRC structure. We conclude that STFC's peer review system is inadequate and recommend that DIUS review the make up of STFC's peer review committees.

94. We were also told during the course of this inquiry that, upon becoming of Chief Executive of STFC, Professor Mason had commissioned a series of reviews of in-house research to inform him on whether STFC was "doing the right research" and whether it was "world level" or "second rate".¹³³ These reports were not published or shared with the staff, as he explained:

One of the criticisms which had been levelled in the past is that such reviews had involved internal staff and internal managers who had a vested interest to maintain the research of their group. So I deliberately set this up with completely independent panels, with international representation, and we had I think 11 panels covering the whole of the research council, so quite a major exercise, so they are peer review panels in the sense they are independent experts who are not related to the research council. I told them, "You can be as honest with me as you like because this report is coming to me to advise me, it is not going to be shared with my managers or staff, so you can tell me what you really think." I said to them at the outset, "Please tell me exactly what you think so I am informed, so I know how to take this forward, and be honest." So that is the reason for the so-called confidentiality around these reports, they are reports to me and not shared with my managers, so that I can get a really bona fide gold-standard opinion as to whether the research going on in these groups is truly world class which we should continue or whether it is just sucking resources away from things that universities might be able to do better.¹³⁴

130 Q 270

131 Qq 319–320

132 Q 320

133 Q 326

134 *Ibid.*

95. We are at a loss to understand how Professor Mason could think that secretive reviews would have anything other than a divisive effect on the community and undermine confidence in any of his future decisions.

International reputation

96. The final common thread to the issues discussed is international reputation. Science is an international pursuit, but STFC plays a particularly important role internationally since it is responsible for some of the largest subscriptions on behalf of the UK. **In the context of ILC, Gemini and ground-based STP, we do not believe that proper consideration was paid to the impact of the UK's international reputation on two counts. First, DIUS did not allocate enough money to STFC, forcing it to make undesirable cuts. Second, STFC did not handle the cuts well: it failed in its duty to consult with the community prior to making a decision and in the case of Gemini made more than one announcement on which it had to renege.**

97. We are concerned that withdrawal from ILC has made the UK look like an *unreliable* international partner and that indecision over Gemini and the withdrawal of funding for ground-based STP facilities while the UK is engaged in a long term commitment to EISCAT has made the UK look like an *incompetent* international partner.

98. Even at CERN, where the UK is a major and hitherto consistent partner in major international collaborations, the proposal in the programmatic review to de-prioritise the two smaller (ALICE and LHCb) of the four LHC experiments just as they are about to deliver results is a cause of consternation and embarrassment for the UK staff at CERN, especially in the context of the ILC and EISCAT situations described above.

Next steps

99. Several possible solutions have been put forward to the particular problems created by STFC's Delivery Plan. These are: to wait for the forthcoming Wakeham review of physics to be published before implementing aspects of the delivery plan, to move STP from STFC to NERC, to move ATC from STFC ownership to the University of Edinburgh, and to address some managerial shortcomings.

Wait for the Wakeham review to be published

100. The Government has responded to concerns over STFC funding by commissioning a review of physics by Professor Bill Wakeham, Vice Chancellor of Southampton University. Professor Ian Diamond was in the process of organising a series of reviews into the health of key subjects, and the Secretary of State told us on 16 January 2008 he had asked Professor Diamond to conduct a review of physics in the light of funding concerns.¹³⁵ The terms of reference for the Wakeham inquiry include: considering priorities for investment across physics as a whole and examining the provision of physics-based facilities.¹³⁶ There

135 Oral evidence taken before the Innovation, Universities and Skills Committee on 16 January 2008 (2007–08) HC 186-j; Q 75

136 www.rcuk.ac.uk/news/080121press.htm

have been calls from the physics and astronomy community for a moratorium on the STFC Delivery Plan until Professor Wakeham has reported,¹³⁷ which will happen in September 2008. (There has been some confusion over this date, since it had been reported that the review would be published in the summer;¹³⁸ however, this was based on a miscommunication.)

101. The Committee has been told by Professors Ian Diamond and Keith Mason that the Wakeham Review will have no impact on this Delivery Plan:

Chairman: Could you make this absolutely clear to Des and Ian’s point, that the Wakeham Review will have no effect whatsoever on the current plans in the Delivery Plan proposed by STFC? It is totally detached from it; this is looking at something else.

Professor Diamond: It is not the intention that this will impact on the budget of STFC in this spending review.

Chairman: So waiting for it to be concluded and delaying these cuts until that point is not an option.

Professor Mason: No, it is not an option.¹³⁹

102. We are not satisfied with this response, especially in the light of the short time remaining until Wakeham is due to report, and believe that it cuts across the intention signalled by the Department and Secretary of State to reassure the physics and astronomy community when the Wakeham review was announced in the first place. Furthermore, it is unfortunate that the Government did not request a moratorium on the STFC cuts until Wakeham reported. **We recommend that STFC wait for the results of the Wakeham review before implementing the cuts proposed in the Delivery Plan and that it use this time to consult with its stakeholders.**

Is STFC the right Council for solar-terrestrial physics?

103. Funding for solar-terrestrial physics need not solely come from STFC. Ground-based STP fits neatly within the remit of the Natural Environment Research Council (NERC) and the mechanisms for dealing with joint STFC-NERC applications have been in place for a number of years.¹⁴⁰ There may be a possibility that NERC could take a lead responsibility for ground-based STP. Professor Mason told us that: “The onus is on the [STP] community to come forward with a proposal [for funding]”,¹⁴¹ which we believe is happening. **We hope that STFC can liaise with NERC and the STP community to find a favourable solution for all parties.**

137 For example, Q 41–42; Ev 68

138 Ev 68

139 Qq 116–117

140 Q 393

141 *Ibid.*

Consider moving the Astronomy Technology Centre into the University of Edinburgh

104. A possible solution for ATC is to pass ownership of the Centre to the University of Edinburgh. This would not be an unprecedented move, since the University of Edinburgh adopted the Roslin Institute a few years ago. Although this is a very different situation, there are factors that make this an attractive option. First, and most importantly, ATC is based at and works closely with the Royal Observatory Edinburgh. Second, STFC has necessarily limited the amount of entrepreneurial work that ATC takes on, but the University is better suited to handling the risk associated with its centres carrying out contracted work.

105. We welcome news that STFC, ATC and the University of Edinburgh have entered talks about a possible transfer of ATC from STFC ownership to the University. We anticipate that ATC would be able to retain its identity as a world class technology centre and continue to thrive within the University.

Management

106. During the process of this inquiry, STFC altered its management structure. It introduced the role of Chief Operating Officer (Professor Richard Wade), Director of Campus Strategy (Professor Colin Whitehouse) and Director of Communications (Jim Sadlier, who is soon to retire). This was partly in response to an Investors in People report that, as reported in the *Guardian* in March 2008, concluded that changes needed to be made to STFC senior management to ensure “a more robust and transparent management process” since “confidence in senior managers and across senior managers needs to improve”.¹⁴² Professor Mason explained that the structural changes were something that he had intended to do all along:

We started off with a management structure which I frankly was not particularly happy with from the outset—it was too flat and unresponsive—and I had always intended to evolve that as time went on. This is a reflection of that evolution. The motivation behind evolution—this stage of it at least and there will be more, it is not finished—is to provide greater responsiveness in terms of dealing with the challenges we have, to really tackle the issue of culture change within the organisation, to ensure that STFC becomes the vision that we have and not a relic vision from the old research councils, and to ensure that vision is enshrined in the staff and in the community that we are serving.¹⁴³

107. We do not have any confidence that rearranging the responsibilities of the existing staff will solve STFC’s problems. There is, as noted earlier, immediate need for a Communications Director. However, the management failings at STFC go deeper than this. The events of the past few months have exposed serious deficiencies within STFC’s senior management, whose misjudgements could still significantly damage Britain’s research reputation in this area, both at home and abroad.

¹⁴² ‘Astronomers see stars’, *Guardian*, 4 March 2008

¹⁴³ Q 322

Conclusion

108. STFC's problems have their roots in the size of the CSR07 settlement and the legacy of bringing CCLRC and PPARC together, but they have been exacerbated by a poorly conceived delivery plan, lamentable communication and poor leadership, as well as major senior management misjudgements. Substantial and urgent changes are now needed in the way in which the Council is run in order to restore confidence and to give it the leadership it desperately needs and has so far failed properly to receive. This raises serious questions about the role and performance of the Chief Executive, especially his ability to retain the confidence of the scientific community as well as to carry through the necessary changes outlined here.

4 Arts & Humanities Research Council

Background

109. The Arts & Humanities Research Council (AHRC) is the second newest Research Council. It started life as the Arts and Humanities Research Board, which was founded in 1998 in response to the Dearing Report. In 2002, a Government review panel recommended that a full Research Council for the arts and humanities should be created, and AHRC was founded on 1 April 2005. Its strategic aims are:

- to promote and support the production of world-class research in the arts and humanities;
- to promote and support world-class postgraduate training designed to equip graduates for research or other professional careers;
- to strengthen the impact of arts and humanities research by encouraging researchers to disseminate and transfer knowledge to other contexts where it makes a difference; and
- to raise the profile of arts and humanities research and to be an effective advocate for its social, cultural and economic significance.¹⁴⁴

110. The range of subjects that AHRC covers is extremely wide: classics, ancient history, archaeology, visual arts and media, English language and literature, history, languages and linguistics, librarianship and museum studies, music and performing arts, philosophy, law and religious studies.

Delivery Plan

111. AHRC's funding increase of 12.4% over the CRS07 period is the smallest increase of all the Research Councils. We have two concerns in relation to this figure. First, once FEC is taken into account, this equates to a loss of over £3 million.¹⁴⁵ Second, the arts and humanities share of the Science Budget will fall from 2.8% in 2007/08 to 2.6% in 2010/11. Approximately 25% of the academic community is made of arts and humanities researchers.¹⁴⁶

112. We are concerned that AHRC's reduced share in the science budget sends out a negative message to the arts and humanities community.

113. Despite AHRC's tight settlement, its Delivery Plan is positive in tone. In particular, it highlights AHRC's focus on innovation, knowledge transfer and wealth creation, and its commitment to the cross-council programmes. However, on 7 February 2008, AHRC issued a statement to its community to explain that the small increase, combined with FEC

144 www.ahrc.ac.uk/about/Vision_and_Strategic_Aims.asp

145 AHRC will receive a near-cash increase of £25 million over CSR07; the FEC addition is £28.2 million.

146 *Delivery Plan 2008-2011*, Arts and Humanities Research Council, December 2007, p 10

commitments, would mean a reduction in the volume of research it funded. It also outlined two key decisions that it had taken regarding funding priorities:

- success rates in research grants and research leave grants are set to fall from 25% to 15% (the September 2008 round of the research leave scheme¹⁴⁷ has been cancelled entirely¹⁴⁸); and
- new postgraduate awards will be cut from 1,500 to 1,000 in 2008 and to about 1,350 for the following two years.¹⁴⁹

114. While the cuts in research grants are unwelcome, we are more concerned about the impact on the number of postgraduate awards. The age profile of academic staff in the arts and humanities contrasts starkly with the age profile of staff working in the maths, science and engineering: in the arts and humanities around 7% of researchers are aged between 31 and 35 and around 13% are aged between 56 and 65; compared with around 19% and 8% respectively in the biological, mathematical and physical sciences.¹⁵⁰ **We are concerned that reducing the number of postgraduate places will discourage younger researchers from entering academia in the arts and humanities. This is of particular importance at a time when the economic impact of the sector is becoming increasingly recognised as significant.**

Communication with Government

115. When we asked the Minister for Science and Innovation about the cuts that AHRC is making to research grants and postgraduate places, he was surprised:

You are right to say that the Arts and Humanities Research Council received an increase in funding, in actual fact £26.3 million more over the CSR period. I would also point out that the Arts and Humanities Research Council did well in the last Spending Review where its budget increased by 20.5 per cent over the previous three years of CSR04. The situation, as Keith outlined earlier, is that AHRC will have received its full economic costing increase and then its budget is probably minus one per cent, so it is somewhat of a surprise to me to learn that it is planning to see such a major reduction in the first year in terms of its number of research grants. I will want to enquire why that is the case.¹⁵¹

The Director General of Science and Innovation added that he was “similarly perplexed”.¹⁵²

116. We are surprised at the Minister and Director General’s surprise. It was DIUS that indicated to AHRC, in a meeting on 20 November 2007, that it was concerned that the proportion of funding going towards postgraduate awards was high relative to other

147 Research Leave is a scheme that provides salary and associated costs for periods of three to four months, to provide relief from teaching and other duties so as to enable researchers to complete projects.

148 www.ahrc.ac.uk/apply/research/research_leave.asp

149 www.ahrc.ac.uk/news/news_pr/2008/Success_rates.asp

150 *Talent wars: the international market for academic staff*, Universities UK, July 2007, p 4

151 Q 224

152 Q 225

Research Councils and that AHRC should redirect funds into strategic programmes.¹⁵³ **It seems to be a breach of the Haldane Principle that the Government should direct a Research Council to switch funding from postgraduate awards to programme funding merely on the basis of it being out of step with other research councils, or indeed for any other reason.** AHRC acted on this concern by deciding in a Board meeting on 21 November 2007, at which a DIUS official was present, to make the cuts outlined above.¹⁵⁴ On the other hand, it is not clear why these cuts, having been decided in November 2007, did not appear in AHRC's Delivery Plan of December 2007, or why it took until February 2008 for them to be announced.

117. We are concerned that the lines of communication between AHRC and the Government are not clear enough. We recommend that there be an urgent review between DIUS and the AHRC as to whether the scale of the proposed reductions in postgraduate awards should be moderated, in the light of the concerns we have expressed here. While respecting the Haldane Principle, we recommend that DIUS review its working relations and communication strategy with the Research Councils, so that the process of decision-making should be more clearly in line with overall strategy and Government policies.

153 Ev 115

154 *Ibid.*

5 Medical Research Council

Background

118. One of the highlights of the Science Budget Allocation is the Medical Research Council's allocation: a 30.1% increase over the CSR period, which amounts to an extra £341 million (£266 million of which is near cash). £119 million of this is earmarked for FEC and £132 million is set aside for the new Office for Strategic Co-ordination of Health Research (OSCHR), which will focus the efforts of MRC and the National Institute of Health Research (NIHR) on translating medical research into health and economic benefits for the UK. **We welcome the large increase in MRC's budget and a sharpening of its focus on knowledge transfer.**

The commercial fund clawback

119. Our one concern over the MRC allocation relates to a matter that came up some time before the budget allocations. In summer 2007, the Treasury took £92 million (nearly half) of the MRC's commercial fund (the fund which has been built up with profits from its intellectual property).¹⁵⁵ This occurred because the Treasury applied some rules to this fund that had previously not been applied.¹⁵⁶

120. DIUS argued that this had not left the MRC worse off. The Rt Hon John Denham MP, Secretary of State, told us that:

The change in the accounting rules around the MRC research fund was known about within the Whitehall system prior to the CSR settlement, and therefore, having been through this, I am happy that the overall funding that is available to things the MRC would have funded is not different from what it would have been if the accounting treatment had not changed.¹⁵⁷

In other words, the money that was taken away from MRC has been given back in a different form. This is puzzling since the overall science budget was set in March 2007 and the MRC claw-back was decided later, in June 2007.¹⁵⁸ Therefore, the extra money that the Secretary of State said was given to MRC in compensation must have been taken from the (already agreed) Science Budget, leaving less for the other Research Councils. Furthermore, it cannot be said that the claw-back was specifically compensated for in an increased science budget.

121. The funding claw-back additionally causes problems in terms of the message it sends to Research Councils that are being entrepreneurial. We agree with the Minister for

¹⁵⁵ *Nature*, vol 450, 20 December 2007, p 1140

¹⁵⁶ Innovation, Universities and Skills Committee First Report of Session 2007–08, *UK Centre for Research and Innovation*, HC 185; Q 91

¹⁵⁷ Oral evidence taken before the Innovation, Universities and Skills Committee on 16 January 2008 (2007–08) HC 186-i; Q 44

¹⁵⁸ Q 238

Science and Innovation who is keen “to encourage organisations to be entrepreneurial and to raise income where it is appropriate”.¹⁵⁹ The Government has reassured us that this is a good settlement for MRC because “MRC did not have the authority to spend this money [in its commercial fund]” but now “the MRC will be able to spend £106.9m of the accumulated income”.¹⁶⁰ We maintain, however, that, as we have said previously: “Encouraging the MRC to be self-financing to a degree and then appropriating its savings, thus forcing the MRC to come cap in hand for funding, is hardly redolent of good faith.”¹⁶¹ We also note that the rules are such that Research Councils have to bear a much higher “excess” on any shortfall on predicted revenue than they are allowed to enjoy when there is a surplus on predicted revenue. **We ask the Government to justify the Treasury rules on the treatment of excess on shortfalls or surpluses as predicted revenue by Research Councils and in particular the effect it has on higher risk innovation and on the accuracy of revenue predictions.**

122. **We are concerned that the Treasury’s decision to take £92 million from MRC’s commercial fund will act as a disincentive for the Research Councils to be entrepreneurial. This outcome goes against the Government’s aim, which we applaud, to improve the translation of research into wealth. We urge the Treasury to commit to a set of rules that encourages the kind of entrepreneurship that DIUS is attempting to foster.**

159 Q 244

160 Innovation, Universities and Skills Committee, Third Special Report, Session 2007–08, *UK Centre for Medical Research and Innovation: Government Response to the Committee’s First Report of Session 2007–08*, HC 459

161 First Report of Session 2007–08, *UK Centre for Medical Research and Innovation*, HC 185, p 5

6 Conclusions

123. The Science Budget Allocations were announced by the Secretary of State for Innovation, Universities and Skills with great enthusiasm. We agree that there is much in the budget to be celebrated: we have noted in this report the welcome move towards meeting the full economic cost of research and the Government's vision for translating the UK's outstanding basic science base into economic and social benefits. There are other items in this Science Budget Allocation that we could have mentioned with similar support, for example, the new capital fund for supporting long-term investment in universities and research infrastructure. In a tough fiscal climate, the CSR07 Science Budget is a good one.

124. However, the first Science Budget of the new Department for Innovation, Universities and Skills, which was created "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",¹⁶² has been marred by a few poor decisions. Broadly speaking, DIUS left STFC with a large hole in its budget, and STFC managed its allocation poorly. Additionally, the headline increases in the science budget, after commitments to FEC and the new bodies have been taken into account, translate broadly into flat cash for all the Research Councils except MRC, which means fewer grants can be funded. Consequently, the PR fanfare turned into a PR disaster for the Government.

125. Our inquiry has raised questions about management at all levels. We have raised concerns about DIUS's attitude towards the Haldane Principle and its communication with the Research Councils. We have also uncovered in STFC an ineffective and secretive management team, with poor communications. DIUS has a difficult job to do: it has to ensure the Research Councils are effective without interfering in how they spend their money. The evidence suggests that the Department's performance has been below par in both these areas and we look to the Department to demonstrate greater effectiveness in the future.

¹⁶² *The Allocations of the Science Budget 2008/09 to 2010/11*, Department for Innovation, Universities and Skills, December 2007, p 3

Conclusions and recommendations

The Science Budget

1. Given the range of programmes and disciplines covered by the Science Budget, the name is somewhat misleading, especially since the transfer of AHRC into the budget in 2005. We recommend that DIUS change the name of the Science Budget to the Science and Research Budget to reflect the inclusion of arts, humanities and knowledge transfer which we note matches the welcome change in title of the DIUS official in charge of the budget to the Director General for Science and Research (DGSR). (Paragraph 11)
2. We welcome the Government's decision to maintain its commitment in the ten-year framework to increase the science budget by 2.5% per annum in real terms. (Paragraph 13)

Sainsbury and Cooksey agenda

3. We welcome the evidence within the Science Budget Allocations of the Government's commitment to the Sainsbury and Cooksey agenda. (Paragraph 14)

The Science Budget allocations process

4. We are concerned that a structure of independent expertise such as suggested by the Royal Society may be too bureaucratic. However, it is clear that more and better information needs to be passed from the Research Councils to the DGSR on the potential implications of projected allocations from the Science Budget in order that Ministers can be made fully aware of the consequences of those decisions. We note that the documents prepared by STFC for use in the bilaterals with DIUS have been made available through the Freedom of Information process and we recommend that the Director General of Science and Research and the Research Councils publish such documents as a matter of course to increase transparency and accountability. (Paragraph 18)

Full Economic Cost

5. In view of the importance of attaining sustainability and transparency for ongoing and future research in the UK, we welcome the Government's commitment to FEC. (Paragraph 20)

Haldane Principle

6. The increase in the Science Budget does not fully cover increased expenditure on FEC and the new bodies (OSCHR, ETI and TSB), which means that Research Councils will have to redirect money previously earmarked for research grants. Additionally large parts of the budget are tied to cross-council programmes that largely follow a Government agenda. It is of course acceptable for the Government to set priorities for UK research but not for it to micromanage individual Research

Council budgets. We recommend that the Government make a statement on its application of the Haldane Principle. (Paragraph 27)

Impact of the Science Budget allocations

7. We are concerned that the Government has failed to protect both the existing and planned research base by allocating insufficient funds to cover FEC and the new bodies. The large increase in MRC's budget means that the effect of this near cash deficit is concentrated on the other Research Councils. (Paragraph 29)

Science & Technology Facilities Council

Legacy Issues

8. We remain concerned that the former PPARC community has been saddled with a £75 million (at 2006/07 prices) funding deficit derived from CCLRC to meet the additional running costs of Diamond and ISIS TS2, despite assurances from the Government that STFC would be formed without any legacy issues. We conclude that the combined budget of PPARC and CCLRC was never going to be sufficient for STFC to manage Diamond, ISIS TS2, the other large facilities and all the PPARC research programmes. This was noted by the National Audit Office in January 2007, and therefore the Government should have known and should have acted upon it. The fact that it did not has had unfortunate consequences. We believe that the Government should ensure that its original commitment to leave no legacy funding issues from the previous Councils is honoured. (Paragraph 39)
9. The timing of the formation of STFC was not propitious. It takes time to set up a new organisation, especially one as large and complex as STFC. The Government's expectation that STFC would be ready for a new CSR was overly ambitious. (Paragraph 41)

Delivery Plan

10. We welcome STFC's decision to support its major facilities to the extent set out in its Delivery Plan and recognise the valuable role that these facilities currently play, and will play in the future, in maintaining the excellence and continuing the growth of UK science. However, we are concerned that the decision to support the large facilities has come at the expense of research in fields where the UK excels and in which STFC and its predecessor Research Councils have made significant investments. (Paragraph 46)

Ground-based solar-terrestrial physics

11. We find Keith Mason's explanation for the withdrawal of funding from ground-based solar-terrestrial physics (STP) facilities to be inaccurate, unconvincing and unacceptable. PPARC did not decide to cut funding to all ground-based STP facilities, but intended to maintain a reduced capacity in this field. We urge STFC to suspend its decision on ground-based STP so that the issue can be revisited with

proper peer review and in full consultation with the community, including NERC. (Paragraph 59)

Daresbury

12. We do not see a major distinction between Keith Mason's proposal of 2 November 2007 to move major facilities from Daresbury to RAL and the situation in which Daresbury currently finds itself. SRS is closing, 4GLS has been postponed and the future of ERLP/ALICE is uncertain; the establishment of a computational science centre—important and welcome as this development is—and the influx of industry R&D teams do not amount to the presence of a national facility. (Paragraph 71)
13. It is clear that Daresbury's future under the current vision is as a technology and business park. This cuts across previous Government assurances and pronouncements about the importance of Daresbury in Britain's overall strategy of scientific excellence. We urge STFC either to commit fully to science at Daresbury, which would include confirmation of at least one large national facility and a concrete programme of future activity and scientific excellence at Daresbury, which can then be the subject of proper scrutiny and review, or to make an honest assessment of, and statement on, the future of Daresbury as a technology and business park. (Paragraph 73)
14. We have no doubt of the desire of the Government to see a thriving Daresbury campus and we note from previous announcements that this would include major science facilities. However, the Government must make clear, in line with previous commitments, how it intends to deliver future large-scale science facilities on the Daresbury campus. (Paragraph 74)

Government Regional Science Policy

15. We recommend that the Government make clear its role in regional science policy and how this fits with the Haldane Principle. We also recommend that the Government clarify whether it regards its regional policy as a relevant criterion when the STFC or other Research Councils make decisions about capital projects or programmatic funding. We further recommend that the Government publish a White Paper on Regional Science Policy as a basis for discussion as a matter of urgency. (Paragraph 77)

STFC Site Management

16. We recommend that STFC install a Campus Director at Daresbury and at RAL. (Paragraph 79)

Cuts to the grant line

17. Given the anxiety that grant cuts are causing to the physics and astronomy community, we are dismayed that STFC has been attempting to play down the effects of the cuts on the grounds that reductions in future grants are not problematic. We consider cuts to grants that had already been promised a major

problem. We urge STFC to take immediate steps to communicate clearly and comprehensively to its research community the impact of its grant cuts. (Paragraph 83)

Communication

18. We deplore STFC's failure to consult on ILC, Gemini and STP, a failure that has cost it the trust of the scientific community. We conclude that STFC's communications are inadequate, particularly its internal communications, which are deficient both in terms of top down communication (for example, alerting staff to proposed changes) and bottom up communication (for example, engaging the community over decisions). We recommend that STFC pursue urgently the appointment of a permanent Communications Director with appropriate skills and experience. (Paragraph 87)

Impact on non-STFC research facilities

19. We have grave concerns about the impact of the cuts proposed in the Programmatic Review upon renowned institutions such as Jodrell Bank. This illustrates the extent to which the STFC's decisions affect research and facilities beyond those that it directly funds or owns. (Paragraph 89)

Peer Review

20. Community consultation is key to peer review. This issue should have been addressed at the outset using models from the previous PPARC and CCLRC structure. We conclude that STFC's peer review system is inadequate and recommend that DIUS review the make up of STFC's peer review committees. (Paragraph 93)
21. We are at a loss to understand how Professor Mason could think that secretive reviews would have anything other than a divisive effect on the community and undermine confidence in any of his future decisions. (Paragraph 95)

International regulation

22. In the context of ILC, Gemini and ground-based STP, we do not believe that proper consideration was paid to the impact of the UK's international reputation on two counts. First, DIUS did not allocate enough money to STFC, forcing it to make undesirable cuts. Second, STFC did not handle the cuts well: it failed in its duty to consult with the community prior to making a decision and in the case of Gemini made more than one announcement on which it had to renege. (Paragraph 96)
23. We are concerned that withdrawal from ILC has made the UK look like an unreliable international partner and that indecision over Gemini and the withdrawal of funding for ground-based STP facilities while the UK is engaged in a long term commitment to EISCAT has made the UK look like an incompetent international partner. (Paragraph 97)

Wakeham review

24. We recommend that STFC wait for the results of the Wakeham review before implementing the cuts proposed in the Delivery Plan and that it use this time to consult with its stakeholders. (Paragraph 102)

Solar-terrestrial physics

25. We hope that STFC can liaise with NERC and the STP community to find a favourable solution for all parties. (Paragraph 103)

Astronomy Technology Centre

26. We welcome news that STFC, ATC and the University of Edinburgh have entered talks about a possible transfer of ATC from STFC ownership to the University. We anticipate that ATC would be able to retain its identity as a world class technology centre and continue to thrive within the University. (Paragraph 105)

Management

27. We do not have any confidence that rearranging the responsibilities of the existing staff will solve STFC's problems. There is, as noted earlier, immediate need for a Communications Director. However, the management failings at STFC go deeper than this. The events of the past few months have exposed serious deficiencies within STFC's senior management, whose misjudgements could still significantly damage Britain's research reputation in this area, both at home and abroad. (Paragraph 107)
28. STFC's problems have their roots in the size of the CSR07 settlement and the legacy of bringing CCLRC and PPARC together, but they have been exacerbated by a poorly conceived delivery plan, lamentable communication and poor leadership, as well as major senior management misjudgements. Substantial and urgent changes are now needed in the way in which the Council is run in order to restore confidence and to give it the leadership it desperately needs and has so far failed properly to receive. This raises serious questions about the role and performance of the Chief Executive, especially his ability to retain the confidence of the scientific community as well as to carry through the necessary changes outlined here. (Paragraph 108)

Arts & Humanities Research Council

29. We are concerned that AHRC's reduced share in the science budget sends out a negative message to the arts and humanities community. (Paragraph 112)
30. We are concerned that reducing the number of postgraduate places will discourage younger researchers from entering academia in the arts and humanities. This is of particular importance at a time when the economic impact of the sector is becoming increasingly recognised as significant. (Paragraph 114)

Communication with Government

31. It seems to be a breach of the Haldane Principle that the Government should direct a Research Council to switch funding from postgraduate awards to programme funding merely on the basis of it being out of step with other research councils, or indeed for any other reason. (Paragraph 116)
32. We are concerned that the lines of communication between AHRC and the Government are not clear enough. We recommend that there be an urgent review between DIUS and the AHRC as to whether the scale of the proposed reductions in postgraduate awards should be moderated, in the light of the concerns we have expressed here. While respecting the Haldane Principle, we recommend that DIUS review its working relations and communication strategy with the Research Councils, so that the process of decision-making should be more clearly in line with overall strategy and Government policies. (Paragraph 117)

Medical Research Council

33. We welcome the large increase in MRC's budget and a sharpening of its focus on knowledge transfer. (Paragraph 118)
34. We ask the Government to justify the Treasury rules on the treatment of excess on shortfalls or surpluses on predicted revenue by Research Councils and in particular the effect it has on higher risk innovation and on the accuracy of revenue predictions. (Paragraph 121)
35. We are concerned that the Treasury's decision to take £92 million from MRC's commercial fund will act as a disincentive for the Research Councils to be entrepreneurial. This outcome goes against the Government's aim, which we applaud, to improve the translation of research into wealth. We urge the Treasury to commit to a set of rules that encourages the kind of entrepreneurship that DIUS is attempting to foster. (Paragraph 122)

Glossary

4GLS	4th Generation Light Source
AHRC	Arts and Humanities Research Council
ALICE	Accelerators and Lasers In Combined Experiments (at Daresbury)
ALICE	A Large Ion Collider Experiment (at CERN)
ATC	Astronomy Technology Centre
ATLAS	A Toroidal LHC ApparatuS
BBSRC	Biotechnology and Biosciences Research Council
CCLRC	Council for the Central Laboratory of the Research Councils
CLF	Central Laser Facility
CMS	Compact Muon Solenoid
CSR	Comprehensive Spending Review
DGSR	Director General for Science and Research
DIUS	Department for Innovation, Universities and Skills
EISCAT	European Incoherent Scatter Scientific Association
e-Merlin	Multi-Element Radio Linked Interferometer Network
EMMA	Electron Model for Many Applications
EPSRC	Engineering and Physical Sciences Research Council
ERLP	Energy Recovery Linac Prototype
ESRC	Economics and Social Research Council
ETI	Energy Technologies Institute
FEC	Full Economic Cost
GDP	Gross Domestic Product
HEFCE	Higher Education Council for England
ILC	International Linear Collider
LHC	Large Hadron Collider
LHCb	Large Hadron Collider beauty
MRC	Medical Research Council
MEIS	Medium Energy Ion Scattering Facility
NCESS	National Centre for Electron Spectroscopy and Surface Analysis
NERC	Natural Environment Research Council
NIHR	National Institute for Health Research
NNI	Net National Income
NWDA	North West Development Agency
OSCHR	Office for Strategic Co-ordination of Health Research
PALS	Physical and Life Sciences Committee
PPAN	Particle Physics, Astronomy and Nuclear Physics Science Committee
PPARC	Particle Physics and Astronomy Research Council
PSRE	Public Sector Research Exploitation Fund
RAL	Rutherford Appleton Laboratory
SSTD	Space Science and Technology Department
STFC	Science and Technology Facilities Council
STP	Solar-Terrestrial Physics
TS2	Target Station 2
TSB	Technology Strategy Board

Formal Minutes

Wednesday 23 April 2008

Members present:

Mr Phil Willis, in the Chair

Dr Ian Gibson	Ian Stewart
Dr Evan Harris	Graham Stringer
Mr Gordon Marsden	Dr Desmond Turner

The Committee deliberated.

Draft Report (*Science Budget Allocations*), proposed by the Chairman, brought up and read.

Ordered, That the draft Report be read a second time, paragraph by paragraph.

Paragraphs 1 to 125 read and agreed to.

Glossary agreed to.

Summary agreed to.

Resolved, That the Report be the Fourth Report of the Committee to the House.

Ordered, That the Chairman make the Report to the House.

Ordered, That embargoed copies of the Report be made available, in accordance with the provisions of Standing Order No. 134.

Written evidence was ordered to be reported to the House for printing with the Report.

[Adjourned till Monday 28 April at 4.00pm]

Witnesses

Monday 21 January 2008

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Professor Michael Rowan-Robinson, President, Royal Astronomical Society, **Professor Peter Main**, Director of Education and Science, Institute of Physics and **Mr Tony Bell**, National Secretary, Prospect

Ev 1

Professor Ian Diamond, Chair, Research Councils UK and **Professor Keith Mason**, Chief Executive, Science and Technology Facilities Council

Ev 9

Wednesday 20 February 2008

Ian Pearson MP, Minister for Science and Innovation and **Professor Sir Keith O’Nions**, Director General, Science and Innovation, Department for Innovation, Universities and Skills

Ev 20

Wednesday 27 February 2008

Professor Swapan Chattopadhyay, Inaugural Director, Cockcroft Institute, and **Professor Richard Holdaway**, Director of Space Science & Technology, Rutherford Appleton Laboratory

Ev 38

Professor Keith Mason, Chief Executive, and **Mr Peter Warry**, Chairman, Science and Technology Facilities Council

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List of written evidence

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3	British Academy	Ev 64
4	Radio and Space Plasma Physics Research Group, University of Leicester	Ev 65
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19	Professor Alan Rodger, British Antarctic Survey	Ev 90
20	Danny Steeghs, University of Warwick	Ev 91
21	Heads of relevant UK Research Groups	Ev 92
22	Department of Physics, Durham University	Ev 94
23	Magnetosphere, Ionosphere and Solar-Terrestrial Council	Ev 95
24	Johannes Knapp, University of Leeds	Ev 99
25	Dr Sam Nolan, University of Durham	Ev 100
26	Jim Hinton, University of Leeds	Ev 101
27	Dr Brian W J McNeil, University of Strathclyde	Ev 102
28	Science and Technology Facilities Council	Ev 102, 106
29	Dr Mark Thompson, University of Hertfordshire	Ev 104
30	Herbert Carlson, Air Force Office of Scientific Research	Ev 105
31	A P Van Eyken, EISCAT Scientific Association	Ev 105
32	Professor Swapan Chattopadhyay, Cockcroft Institute of Accelerator Science and Technology	Ev 107
33	Professor A D Aylward, University College London	Ev 112
34	Professor Stan Cowley, Professor Mark Lester, Dr Steve Milan, Professor Terry Robinson, Dr Darren Wright and Professor Tim Yeoman, University of Leicester	Ev 113
35	Department for Innovation, Universities and Skills	Ev 116

List of Reports from the Committee during the current Parliament

The reference number of the Government's response to each Report is printed in brackets after the HC printing number.

Session 2007–08

First Report	UK Centre for Medical Research and Innovation	HC 185 (HC 459)
Second Report	The work and operation of the Copyright Tribunal	HC 245
Third Report	Withdrawal of Funding for Equivalent or Lower Qualifications (ELQs)	HC 187-I
First Special Report	The Funding of Science and Discovery Centres: Government Response to the Eleventh Report from the Science and Technology Committee, Session 2006–07	HC 214
Second Special Report	The Last Report: Government Response to the Thirteenth Report from the Science and Technology Committee, Session 2006–07	HC 244