



## Value for taxpayer's money invested in science

Response to the House of Commons Science & Technology Committee's Inquiry into knowledge transfer activities by the Research Councils

1. The Campaign for Science & Engineering is pleased to submit this response to the Committee's inquiry into knowledge transfer activities. CaSE is a voluntary organisation campaigning for the health of science and technology throughout UK society, and is supported by over 1,500 individual members, and some 70 institutional members, including universities, learned societies, venture capitalists, financiers, industrial companies and publishers.

2. The science policy community has for years constantly reiterated the mantra that the UK is good at science but bad at turning it into wealth. This may have been true a decade ago, but it is only partially so now. We are certainly good at science, and although the UK may not be as good as the USA at knowledge transfer, it is at least as good as competitor countries, and better than most.

### Terminology

3. Neither the political community nor the science and engineering community can agree on a terminology for the various activities that form the focus of the Committee's inquiry. 'Knowledge transfer,' 'technology transfer' and 'translation' are all popular terms, while some people stress the two-way nature of the process by referring to 'exchange'. Different groups define different sets of activities using various expressions, and this can make it difficult to make useful comparisons.

4. In this response, CaSE takes the words 'knowledge transfer' to be principally concerned with activities such as spinning out companies, collaborative research with industry, and the licensing of publicly-funded technology to the private sector. However, the most effective form of knowledge transfer is the movement of people between different public and private sector laboratories, who carry their accumulated knowledge with them.

5. The Research Councils form only one element of a much larger landscape of research and knowledge transfer activities, and so the Committee's inquiry has a very narrow focus. CaSE's response works from a slightly broader perspective. We believe the important question to be whether or not British taxpayers are getting economic value for money for their considerable investment in British science.

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## Money

6. The Research Councils invest about £70 million a year in knowledge transfer out of £100 million official classed as 'knowledge transfer'<sup>1</sup>. However, overall public support for the process of turning science into wealth is far greater.

Bodies involved include the Higher Education Funding Councils, the Regional Development Agencies, the Department of Trade & Industry and HM Revenue & Customs.

7. For example, public funding for research and development carried out in industry comes from three main sources. The largest comes in the form of tax credits, costing between £700 million and £1 billion a year in lost revenue. The DTI gives grants for research and development amounting to between £200 and £300 million a year, while the Research Councils award a very small proportion of their overall budgets to such research (about £10 million per year)<sup>2</sup>.

8. This investment is not officially classed as 'knowledge transfer' but is clearly part of the same overall picture of using British scientific and engineering expertise to generate new economic growth.

9. Even within the Research Councils, small pots of money appear as a bewildering array of fragmented initiatives. For example, on the website of the Biotechnology and Biological Sciences Research Council is a section on business and innovation, dedicated to 'facilitating the application of knowledge...for the benefit of the UK economy'. A series of links invite the reader to 'Jump to a scheme'. There are 14 different schemes, including Enterprise Fellowships, Faraday Partnerships, Intellectual Property Workshops, Knowledge Transfer Partnerships, and Modular Training for Industry<sup>3</sup>. If the £70 million spent by the Research Councils is distributed among 14 schemes in each of the six main Councils, each scheme within each Council distributes on average less than £1 million per year. (We stress that use the example of the BBSRC not because we believe it to be either typical or unusual, but because this information happens to be presented in an admirably clear way on its website).

10. Some of the schemes funded by the Research Councils are widely praised. Knowledge Transfer Partnerships in particular are highly thought of, and the new Integrated Knowledge Partnerships have been highlighted by CaSE's members as potentially very valuable. But this level of praise does not extend to all of the many individually named initiatives. It may be better in some cases to amalgamate the money into a single pot with a degree of flexibility over how the money might be best used.

11. However, we should stress that, in general, the Research Councils perform well against the other public funding bodies that support innovation. Some of the Regional Development Agencies, for example, have clearly not yet fully understood their role in supporting the process of generating wealth from research. They seem to have two very different areas of focus. First, they are agents for channelling public investment into local regeneration projects. Second, they have an agenda more concerned with the global exploitation of knowledge. Both may be valuable, but while the former can legitimately be organised at a regional level, the latter cannot. There is no reason why a

particular challenge faced by an individual business should be best addressed through the knowledge and expertise in a local research institution.

12. Government policy had a renewed focus on knowledge transfer from the time of the 1998 Comprehensive Spending Review<sup>4</sup>. In some quarters, it has clearly been seen as a way of generating substantial extra funds for the universities. Since higher education institutes are always underfunded, and will continue to be so because other areas (such as secondary schools) have higher priority, new income streams are important. However, it is unrealistic to believe that knowledge transfer activities will solve the difficulties of financing science and engineering in universities. The best institutions in the world at generating income from their knowledge obtain less than 5% of their research income in this way. This income is welcome, not least because it is unencumbered by strings and caveats attached by Government, but it cannot replace universities' other main sources of income. Knowledge transfer is useful in stimulating extra economic activity in the economy as a whole, not as a way of hiding or resolving the inadequacies of existing funding mechanisms.

13. One particular problem with Research Council funding is concerned with collaborative work with industry. The introduction of 'full economic costs,' while admirable in principle, has only really been worked out in detail for Research Council grants. It has forced up the costs to industry of collaborating with British universities, and is likely to lead to a reduction in such collaborations. Although not necessarily officially classed as 'knowledge transfer,' collaborative projects between industry and academia are an extremely important element of the process by which research funded by the Research Councils is used for the benefit of the economy and society. The recent change has jeopardized the healthy future of such activities.

### **Pull and push**

14. Most knowledge transfer policies in recent years have encouraged the 'push' of knowledge out of the academic base into industry. There has been a culture change in the universities as a result, with key defining moments in 1993, with the publication of the White Paper *Realising Our Potential*<sup>5</sup> and at the time of the 1998 Comprehensive Spending Review<sup>6</sup>. That change has taken over a decade.

15. Policies to encourage 'pull' from industry have been much less prevalent. While some sectors of the economy, such as the pharmaceutical and aerospace industries, engage with, and draw on the academic base in very effective ways, others do not. The fall in industrial research and development in the UK last year was particularly shocking when set against the rise in other mature economies such as that of the USA<sup>7</sup>.

16. Parts of the private sector have not matched the culture change of the universities. The reasons for this are not all entirely clear, but it is plain that policy drivers have not been strong enough. Money is typically channeled into public sector institutions, assuming that the knowledge they have already generated will be of use to a private sector partner if only that partner can be identified. It may well be more effective to channel resources through private sector players who have challenges that need solving, so that they can identify

those people within the research community who may be able to help them. Industrialists are not going to collaborate with universities for the sake of it, unless they can see some actual or potential benefit.

17. Rather than seeing academics as a single element of wider innovation landscape, recent policies have tended to assume that they can work across the whole spectrum of activities from world-class blue-skies research to running successful companies. The skill sets needed at each stage of the process are very different, and there is no reason to assume that any individual will necessarily be good at more than one stage, however brilliant they are at a single element.

### **Overall coordination**

18. Overall, while Government policies on knowledge transfer in recent years have advanced considerably, they remain as a somewhat fragmented collection of relatively small initiatives distributed across various bodies, agencies and Departments, with relatively little coordination. CaSE certainly does not advocate a rigid, monolithic structure, but there is clearly room for much greater harmonization.

19. We would urge caution, however, in focusing too strongly on the Research Councils as the central engines of that coordination. Their primary role is to find and fund the best science and engineering research. Without a strong fundamental research base, there will be no knowledge worth transferring. The mantra that the UK is good at science but less good at turning its research into wealth has been repeated so often that the nation is in danger of forgetting that the first half of this statement is not carved in stone. If we want to continue to be good at science in a competitive world, the Research Councils cannot lose their focus on funding world-class research. Without very substantial new money and a clear protection of their role in funding fundamental research, we should not even consider them as candidates for the role of coordinating knowledge transfer activities.

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### Notes and References

<sup>1</sup> *Hansard* [House of Commons] 26 January 2004 Col 96W.

<sup>2</sup> *Forward Look 2003*, DTI; *Hansard* [House of Commons] 2 March 2004 Col 816W.

<sup>3</sup> [www.bbsrc.ac.uk/business/Welcome.html](http://www.bbsrc.ac.uk/business/Welcome.html) accessed on 20 January 2006.

<sup>4</sup> *Modern Public Services for Britain: Investing in Reform*, HM Treasury, 1998 [Cm 4011]

<sup>5</sup> *Reassembling our Potential: A Strategy for Science Engineering & Technology*, Cabinet Office, 1993 [Cm 2250]

<sup>6</sup> *Modern Public Services for Britain: Investing in Reform*, HM Treasury, 1998 [Cm 4011]

<sup>7</sup> *The 2005 R&D Scoreboard*, DTI, 2005.