

RSC response to the Innovation, Universities, Science and Skills Select Committee Call for Supplementary Evidence on Putting Science and Engineering at the Heart of Government Policy

1. Science has a vital role in contributing solutions to socioeconomic challenges such as climate change and providing evidence to inform policy decisions. Both of these roles must be supported by Government to maximise the societal benefits that science offers.
2. The RSC values the funding received by UK science and believes that this support must continue to reap benefits in the future. It is important to recognise that the nature of science means that investment in fundamental research is unlikely to lead to immediate benefits. The RSC also commends the efforts of the Government in supporting the use of science in policy-making, such as the appointment of Departmental Chief Scientific Advisers, and hopes to see further progress made in this area.

Leading the Debate

3. The IUSS Select Committee is in the best position to lead a debate on science strategy, since they have the powers to gather evidence from important stakeholders, including Ministers, and ensure a response from Government.

A UK and European Science Strategy

4. The UK is too small to be able to develop a sustainable, focussed strategy that also maintains excellence across a wide science base. UK science strategy should be developed in a European context in order to benefit from increased scale and improved collaboration.
5. The Haldane principle, that scientists not politicians should determine how research funds are spent, must be preserved and upheld.
6. The RSC believes that the breadth and quality of the UK fundamental research base should be strengthened. This will ensure that UK science is able to adapt to future changes in priorities and is well-placed to benefit from serendipitous discoveries. The excellent UK science base is an important part of the "innovation ecosystem"¹ but it is difficult to predict where the most significant innovations will come from within the science base. For example, the use of Magnetic Resonance Imaging in diagnostics was a product of decades of fundamental physics and chemistry research into the properties of atomic nuclei.
7. Science should remain a UK-wide activity that fully integrates the devolved authorities in order to capitalise on economies of scale. Directing research priorities within the UK may risk exacerbating tensions within the current devolutionary framework.
8. To prioritise science effectively, whilst minimising impact on the science base, a UK science strategy should be developed in the context of the European Research Area. Developing a Europe-wide science strategy could allow the whole region to direct funds to centres of excellence in specific areas, avoiding inefficient duplication of research and maintaining diversity in science.
9. The RSC does not agree with Lord Drayson's proposed prioritisation criteria and the driver for any selection must be societal need, not economic factors. The Joint

¹ Innovation Nation, DIUS, 2008

Programming initiative in the European Research Area suggests that projects must address a pan-European or global socioeconomic or environmental challenge² and the RSC broadly supports this. Direct economic benefit is only one aspect of societal need and serving society more broadly could have indirect economic benefits, for example, through the mitigation of climate change.

10. The scale and critical mass provided by a Europe-wide science strategy would make the region genuinely competitive with the US and the emerging strengths of China and India. Collaboration within Europe will allow the development of a number of centres of excellence in a broader selection of areas than the UK would be able to do alone. Interdisciplinary work is vital and good collaborative networks of this kind will promote knowledge transfer. For example, the European Molecular Biology Laboratory (EMBL) provides a good model for a European collaboration in the form of a centre of excellence that focuses on a particular strategic area. EMBL has five research facilities spread across the EU and an excellent track-record and reputation in molecular biology research³.
11. Under this model a proportion of the UK science budget would be contributed to the European Research Area in return for European research funds. The rest of the budget would be retained to support UK science. If the UK is able to provide a world-leading environment in which to undertake science it will be able to attract a disproportionately greater share of the European funding and researchers than its counterparts.

Potential Implications of a Science Strategy

12. A science strategy must encompass education, research, innovation and development in order to be effective. Within a wider European strategy the UK should aim to be world-leading in the exploitation of research and the quality of skilled people available to support science in academia and industry. Ensuring excellence in these areas will strengthen UK science and benefit the economy, for example by attracting business investment.
13. The UK must ensure that there is a sufficient supply of well-skilled people to fulfil demand from science industries and academia. An excellent education pipeline is required to ensure this supply. This pipeline requires good quality science education from primary school level through to higher education, through a balance of curriculum and excellent facilities and teaching staff. Vocational and skills-based training that fulfils science industry needs must also be provided in the UK.
14. The UK should aim to attract world-class researchers. Establishing world-leading centres of excellence in the UK, as part of a wider European strategy, is one means of doing this. The UK must have world-class research facilities and working conditions that attract and maintain excellent researchers from around the world.
15. The UK must ensure the effective exploitation of scientific research through innovation and the development of new products and processes. It is also essential to develop a supportive environment that maximises entrepreneurial activity; start-up and SME growth; and ensures that unexpected benefits or applications of research are not overlooked. Areas such as knowledge transfer, intellectual property and the availability of venture capital should be considered. By establishing a world-leading environment for innovation the UK will be well-placed to profit from its excellent science base.

Conclusion

16. How UK research funds should be divided between support of the fundamental science base and support of a European research programme must be carefully considered and decisions must not be taken on the basis of dogma or guesswork. Research should be

² Towards Joint Programming In Research: Working together to tackle common challenges more effectively, 2008, Commission of the European Communities

³ <http://www.embl.org>

undertaken to establish how the division of funding would affect UK science in the short, medium and long-term so that informed decisions can be made.