

## **RSC Submission to the Comprehensive Spending Review 2010**

The RSC is the UK professional body for chemical scientists and an international Learned Society for advancing the chemical sciences. Supported by a network of over 46,000 members worldwide and an internationally acclaimed publishing business, our activities span education and training, conferences and science policy, and the promotion of the chemical sciences to the public.

### **The case for investment**

The Government should place the highest priority on investing in excellence in science and engineering because a sustained, broadly-based economic recovery depends on the UK's strength in these areas. The RSC is submitting evidence on the past and future contribution of the chemical sciences, which makes an enormous contribution to our economy and enhances the quality of life of our citizens.

#### **Creating sustained wealth**

Chemistry research enables us to generate £258 billion each year, or 21% of our GDP<sup>1</sup>.

#### **Supporting a highly productive workforce**

At £83,500 per employee (2007), workers in the UK chemicals sector have a level of output per head which is more than double the UK average.

#### **Generating a high return on investment for the individual and society**

Chemistry graduates earn an extra £187,000 over their working lifetime and the Exchequer receives an extra £132,000 – one of the highest returns for any subject<sup>2</sup>.

#### **Driving the most promising areas of research**

UK chemistry, which is world class<sup>3</sup>, lies at the heart of the most exciting multi-disciplinary research programmes and holds the key to the industrial success stories of the future.

#### **Satisfying student demand**

Chemistry continues to be a popular choice with students. Since 2004, A-level entries and enrolments on university chemistry courses have increased by 15% and 26% respectively<sup>4</sup>.

### **Sustaining our economy**

The UK can continue to enjoy the economic boost from chemistry by giving top priority to investing £1,25bn per year in the chemical science base from the science and education budgets that are agreed over the next three years. This will secure the future UK knowledge economy by providing a long term, positive contribution from the science and engineering sector. In order to achieve this, the Government should prioritise this area in funding decisions to:

- **Invest in the skills pipeline** to ensure that talented and interested young people are educated and trained. To achieve this, priority should be given to ensuring that we are able to:
  - Maintain and develop a well trained supply of science teachers in secondary schools. £30m should be invested annually in continuing professional development for science teachers and technicians.
  - Ensure that school laboratories are fit-for-purpose and provide a good learning environment that encourages the study of science in preparation both for future citizenship and for further studies/careers in the science and engineering sector. We estimate that £520m per annum, invested over the next three years, would bring all school laboratories up to a good standard<sup>5</sup>.
  - Ensure that schools can provide practical work un-encumbered by a lack of technical support and consumables, for an annual investment of £70m.

- Remove bureaucracy, including unnecessary health & safety procedures and restrictions; stop ill thought-through changes to the curriculum and provide high quality examinations that our pupils, their parents and teachers, and employers can have confidence in.
- **Invest in quality in our university sector** covering both teaching and research. Priority should be given to the following:
  - There should be a cadre of internationally recognised and competitive, research focused chemistry departments in a significant number of universities and the output of post-graduate level research training should be students that are internationally regarded as being of the highest quality. £490m should be invested annually to ensure excellent research<sup>6</sup>.
  - There should be high quality, well-funded, full-time chemistry teaching to graduate level in universities and UK students should be able to access well funded and relevant part-time teaching in the chemical sciences leading to graduate level academic or professional qualifications in all regions/countries of the UK. This should be provided for an annual investment of £140m.
  - Access to the study of chemistry and chemical science based courses should be irrespective of ability to pay. This must include students from poorer backgrounds, who may have to study from home.
- **Invest in the economic environment** to ensure that a thriving economic sector with large, world-leading companies and small and medium enterprises (SMEs) is maintained in the UK. The investment priorities should be to:

- Address key societal and economic challenges facing the UK, EU and globally, including the problems arising from a rapidly growing and increasingly affluent population and climate change. The challenges can be categorised into the following broad areas: energy, food, future cities, human health, lifestyle and recreation, raw materials and water & air.

The RSC has defined the specific technical challenges that investing in the chemical sciences will enable us to tackle over the next 15 years, including drug discovery, more efficient solar cells and sustainable product design. Innovations in these areas will improve our well being and form the basis of our future prosperity<sup>7</sup>.

- Support the pharmaceuticals sector and a broad range of medical research. This sector generates a positive trade balance in excess of £4billion<sup>8</sup> and employs 73,000 highly-skilled workers<sup>9</sup>, who each contribute an average of over £120,000 in added value to the economy<sup>10</sup>. The UK's widely recognised lead in medical science and related disciplines and the quality of our graduates are often cited by business leaders as the main reasons why they invest in the UK.

As the cost of drug discovery continues to increase, organisations will have to collaborate on basic research and academic partnerships will come to the fore, often replacing industrial research. This transition needs to be overseen by the Government and careful investments made to ensure the continued success of UK pharmaceuticals. An increasingly prosperous and ageing population will ensure that the market for treatments continues to grow, providing large potential returns for investing in this area.

- A large proportion of our future growth will be generated by companies that are currently classified as SMEs and technology spin-out companies. They will succeed through continual innovation to develop products and services which are in high demand around the world, and the Government should invest in the capability of the UK economy to support this type of innovation. This requires close relationships between the sources of discovery, mainly found in our universities, and people with insight and experience who can attract funding and open new markets.

## Securing the future

There is an urgent need to address the issues affecting chemistry in the UK, due to the changes in funding that will result from this Comprehensive Spending Review and the Browne Review of Higher Education Funding and Student Finance.

The system of funding that is finally agreed must be able to support, over the long term, a fully funded, world class chemical science base. UK chemistry should consist of centres of research excellence with strong links to industry complemented by support and encouragement for entrepreneurship and innovation. There must also be diversity of provision in chemistry education, with applied courses offering alternative routes into science, securing the supply of technicians into academia and industry. Finally, chemistry education must be available to all students with the ability and desire to study the subject, irrespective of their ability to pay. Whether this means regional provision of chemical science courses, or assured financial support for poorer students, is open to debate.

The natural role of learned societies, like the RSC, is to lead these discussions, and the increasing importance of multi-disciplinary research means that other scientific disciplines should follow a similar, parallel process. This is the only way that we will define a viable model for world-class science in the UK and we would welcome the opportunity to work with you to achieve this goal and to support a broadly-based, sustainable economic recovery.

## References

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