Parliamentary briefing: Science and innovation in the UK

Science is important to the UK’s economic growth and job creation. We punch above our weight internationally, but are in danger of falling behind. This briefing sets out some key facts about the success of science in the UK and how parliamentarians can support science and innovation.

A strong track record in science
The UK represents 0.9% of the global population, but accounts for 15.9% of the world’s most highly-cited scientific research articles. In terms of quality and impact we are often ranked highest in the world and over the last century we hold claim to 78 Nobel Prize winners – 12 of those since 2004.

We are not just good at basic research, but have built a strong reputation for converting invention into economic gain. Innovation drove 63% of UK growth between 2000 and 2008, and the Technology Strategy Board estimates that for every £1 invested in collaborative Research & Development (R&D) £7 is returned to the economy.

Chemistry has made a large contribution to this success and the UK manufacturing sector relies on chemistry to generate £600 billion of annual aggregate sales. The chemical sector itself has an annual turnover of £60 billion, and sustains 500,000 jobs throughout the country.

In danger of falling behind
However, the UK is not currently investing sufficiently in this successful science base and as a result we are in danger of falling behind our competitors. The UK’s total investment in R&D as a function of GDP has dropped significantly since the mid-1980s. We used to invest at the level of the OECD average but have fallen well below and are now also towards the bottom of the G8.

For the last decade or so the UK has managed to hold investment (government and industry combined) in R&D fairly constant at 1.7% of GDP, but over that period the rest of the world has worked to increase theirs. In 2012 China surpassed the UK to now invest 1.9% of GDP, the USA and Germany invest 2.8% & 2.9% respectively and other nations invest even more (such as Korea at 4.4%).

There is evidence to suggest that our science base is at the limit of its efficiency. A recent government report investigating the levels of R&D spend stated: "This overall level is unlikely to allow the UK to maintain or develop its leadership in science and innovation".
Government expenditure in this area is a key driver for increasing overall investment.\textsuperscript{viii} Looking purely at government expenditure on R&D we are also far behind, investing only 0.6% of GDP, behind the EU average of 0.7% and a G8 average of 0.8%.\textsuperscript{ix}

Government funding for research through the research and funding councils is formally split into capital and non-capital:

- Capital – restored to 2010 levels in real terms and protected in real terms until 2020-21
- Non-capital – the ‘Science Budget’, which has been held at a flat £4.6bn since 2010

The cash freeze of the science budget equates to a real terms cut of over £11bn to the end of 2015/16, and puts us at severe risk of losing talent. A recent survey saw 58% of researchers identify the UK’s funding climate as a factor to thoughts of leaving the UK.\textsuperscript{x}

The return of funding for capital was especially welcome, but the distribution of this money is still of concern. There has been a tendency for capital funding to be given to ‘announceable’ projects, rather than to upgrade current equipment or for researchers to openly apply for. This limits the types of science being performed in the UK, and risks damaging the breadth of our science base.

The separation of capital and non-capital provides its own problems, as it means that funding for infrastructure or equipment is not always met with the money for personnel and operational costs. As the non-capital budget reduces alongside a constant capital budget this problem will only increase.

The future for science in the UK
To secure and maximise economic growth through science and innovation, we need a long-term commitment to our knowledge economy to keep the UK competitive.

Parliamentarians need to ensure that:

1. Both government and business increase their investment in research and development
   - Public funding encourages private; international comparisons and economic studies show that public and private funding are linked and complementary
   - The UK is not in a position to be truly internationally competitive whilst R&D funding is at a level significantly lower than that of its competitors; long-term investment in science will ensure that the UK is not left behind and will provide a secure research ecosystem to attract business investment and top-class researchers
   - To support our knowledge economy the UK should set a target to raise our government investment to the EU average (0.7% of GDP from 0.6%) by the end of the next Parliament

2. Capital funding is made available based upon excellence
   - Funding for science capital has been reinstated to 2010 levels, a bold and welcome investment
   - Strategic, large investment in new facilities is important, but ‘bread and butter’ investment in maintaining current capacity, upgrading old equipment, or for open application across the sciences should not be neglected either.

3. Capital and non-capital budgets are both protected in real terms
   - Both capital and non-capital are essential for scientific progress
   - Funding for facilities or equipment should be met with resource for operational costs and personnel
   - Combining both capital and non-capital budgets within a ring-fence formally protected against inflation would ensure that the UK’s research base can operate at maximum efficiency
Action MPs and peers can take
To help support UK science there are three actions parliamentarians can take now:

- Ask the Chancellor and all political parties to **commit to raising government expenditure on R&D to the EU average of 0.7%** by the end of the next Parliament
- **Publicly support UK science** by contributing to debates in Parliament, by making your support clear in the media and by visiting local businesses and academic institutions

About the Royal Society of Chemistry
The Royal Society of Chemistry is the world’s leading chemistry community, advancing excellence in the chemical sciences. With over 49,000 members and a knowledge business that spans the globe, we are the UK’s professional body for chemical scientists; a not-for-profit organisation with 170 years of history and an international vision for the future.

For further information about this briefing, please contact

Matt Davies  
Government Affairs Manager  
daviesm@rsc.org / 020 7440 3392

Dr Richard Walker  
Programme Manager – Physical Science  
waller@rsc.org / 01223 432234

April 2014

---

i International comparative performance of the UK research base, Elsevier (2013)

ii Plan I, Nesta (2012)

iii https://www.innovateuk.org/-/collaborative-r-d


v Economic survey of the United Kingdom, OECD (2013)

vi Main science and technology indicators, OECD (2013)

vii Insights from international benchmarking of the UK science and innovation system, BIS (2014)


ix Main science and technology indicators, OECD (2013)

x Legacy of the 2010 science budget cash freeze, Science is Vital (2013)