

Enhancing UK prosperity by increasing R&D investment

February 2020

The UK government must plan for and deliver on its commitment to increase UK R&D investment from 1.7 to 2.4% of GDP by 2027 in order to drive national prosperity, regain the UK's position as an innovation leader and catch up with its economic competitors' investment levels.

We call on the UK government to:

1. Plan for and deliver increased public sector investment in R&D to bring the UK's investment in line with the best in the OECD with a transparent, long-term investment plan to 2027 and beyond.
2. Safeguard the UK's diverse R&D funding landscape by investing in the entire innovation pipeline from core capacity to commercialisation, and creating an attractive environment for private sector investment.
3. Work across departments to deliver the skilled workforce the UK needs to support future economic growth and attract R&D investment to the UK.

1. Plan for and deliver increased public sector investment in R&D

The UK government must bring the UK's R&D investment in line with the best in the OECD with a transparent, long-term public sector investment plan to 2027 and beyond.

When it comes to economic growth, the UK is lagging behind its biggest economic competitors.¹ Since the mid-80s the UK's investment in R&D has fallen behind² and we risk losing our competitive advantage. The European Innovation Scoreboard 2019³ shows the UK already losing its status as an innovation leader.⁴

Public sector investment will be crucial to boost private sector investment and reach the 2.4% target.⁵

There is a complementary relationship between public and private investment in R&D: public investment crowds in private investment, attracts overseas investment and raises productivity.⁶ In addition, the UK's public sector spending needs to foster an environment that attracts private sector investment. The top three factors known to achieve this are the quality of researchers, the availability of researchers and access to specialised R&D knowledge.⁷

Planning for stability and prosperity

The UK government should set out a long-term, cross-sectoral roadmap for public sector investment to provide the stability needed to attract talent and R&D investment to the UK.

Ambition will not be enough to reach the UK government's 2.4% target. Real commitment and a transparent, long-term roadmap to 2027 and beyond will be essential to give confidence to the private sector, including international investors, for long-term R&D investment decisions.

Creating trust through transparency

The UK government should create a 'digital shop window' for R&D investment that guides domestic and international researchers, innovators and investors to the UK's offering.

R&D funding announcements currently don't refer to their source budgets, making it challenging to navigate the system. Creating a digital shop window for R&D investment will help attract the international talent and investment that is vital to the UK's R&D landscape.⁸

2. Safeguard the UK's diverse R&D funding landscape

The UK government must reverse the long-term erosion of core research budgets to protect our national research capacity and capability.

Core research budgets are at the heart of the UK's national research capacity, supporting postgraduate training, infrastructure, early-stage research and core research activities.^{9,10} Quality related (QR) funding has seen a real-terms fall in its value of 13% over the last 7 years¹¹ and whilst the uplift in QR funding announced in the summer is welcome,¹² the longer-term erosion of core budgets¹³ risks damaging our national research capacity.

Investing in university teaching

The UK government must balance any reduction in undergraduate tuition fees recommended by the Augar Review¹⁴ with increased public sector investment in university teaching.

Failing to do so will leave universities' core budgets stretched even further. This could be particularly damaging for strategically important subjects like chemistry that are more expensive to teach.¹⁵

Investing in infrastructure

The UK government must deliver long-term, sustained investment in the different types and scales of infrastructure critical to advancing scientific endeavour.

Investment should range from world-class UK university labs to world-leading national facilities like Diamond Light Source, regional hubs like the Daresbury Laboratory, and e-infrastructure that enables advancements in digital technologies.

Supporting regional growth

The Shared Prosperity Fund (UKSPF) must flexibly support the growth of R&D across the UK at a scale at least equivalent to that of the European Structural Investment (ESI) Funds.

Funding to support regional growth is vital. Funding to support R&D from the ESI Funds, such as the European Regional Development Fund (ERDF), which has a track record of supporting businesses to grow, invest and create jobs in regions across the UK. Domestic replacements, such as the UKSPF must flexibly support R&D to secure sustainable regional growth.

*The UK has been allocated €17.2bn in ESI Funds for 2014-2020, of which **€5.8bn is via the ERDF.**¹⁶*

Supporting all stages of the innovation pipeline, including discovery research

The UK government and UKRI must ensure the balance of investment recognises the importance of curiosity-driven, discovery research as a vital element of a diverse R&D funding landscape.

Discovery research underpins current and future research and innovation activities, leading to ground-breaking discoveries, new technologies or completely new avenues of research.^{17,18} Public sector investment must support all stages of research or we risk drying out the innovation pipeline,¹⁹ but there is a perceived domestic provision gap for discovery research, with much of the UK's funding coming *via* EU framework programmes like European Research Council (ERC) grants.²⁰

*Chemists see **funding for discovery research** as a vital aspect of public sector R&D investment.²¹*

*The UK has received **€1.84bn** in ERC funds from Horizon 2020 so far.²²*

Setting the UK's research and innovation on the global stage

The UK government must secure association to Horizon Europe, as well as seeking collaboration in excellent science with the rest of the world.

When it comes to maintaining the UK's status as a global R&D leader, we must embrace links with the whole world, including securing full association to EU framework programmes. The collaborations these programmes enable are vital in tackling global challenges and advancing discovery research, where we can only achieve progress by bringing together the best people, equipment and facilities in the world.²³

*Chemists see **access to international collaborative networks, knowledge and expertise** as some of the most important factors of public sector R&D funding.²⁰*

3. Work across departments to deliver the skilled workforce the UK needs

The UK government should develop a cross-departmental strategy to deliver the skilled workforce the UK needs to support future economic growth and attract R&D investment to the UK.

Delivering the skilled workforce the UK needs will require investment in STEM education, improving the retention and progression of women and an immigration system that attracts, not deters, scientists and innovators.

Access to a skilled and talented workforce, particularly the availability and quality of researchers, is among the top three factors in attractiveness for private investment.²⁴ It is also a key determinant for UK-based companies to decide whether to invest in the UK or elsewhere and a key barrier to growth for UK scale-up businesses.²⁵

Investing in skills for the future workforce

The UK government must improve recruitment and retention of chemistry teachers, and provide more high-quality apprenticeships, more support for technical skills, and sustainable long-term funding for further education.

For chemistry, strengthening the foundations of excellent STEM education in the UK requires increasing the number of high-quality chemistry teachers by improving retention and progression and improving the quality of and access to technical and further education routes, for example by investing in more high-quality apprenticeships and providing sustained, long-term funding for further education.^{26 27}

Creating an inclusive workforce

The UK government must improve the retention and progression of women in chemistry and science.

Increasing retention and progression of women in STEM will increase workforce participation as well as innovation and productivity. Female chemists in academia experience considerable barriers for progression and are often lost from the STEM workforce^{28 29}

Enabling an internationally mobile workforce

The UK government must deliver an immigration system that ensures easy movement of scientists and their families.

For investments in international R&D collaboration to deliver their potential, the UK immigration system needs to do more to attract scientists and innovators to the UK – this means both welcoming messaging and streamlined rules.³⁰

Contact

The Royal Society of Chemistry would be happy to discuss any of the issues raised in our statement in more detail. Any questions should be directed to Kathy Page or Mindy Dulai at policy@rsc.org.

About us

With about 50,000 members in 120 countries and a knowledge business that spans the globe, the Royal Society of Chemistry is the UK's professional body for chemical scientists, supporting and representing our members and bringing together chemical scientists from all over the world. Our members include those working in large multinational companies and small to medium enterprises, researchers and students in universities, teachers and regulators.

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 - ² [Gross domestic spending on R&D \(indicator\)](#), OECD, 2019, doi: 10.1787/d8b068b4-en (Accessed on 21 March 2019)
 - ³ [European Innovation Scoreboard 2019, European Commission](#), June 2019
 - ⁴ [International comparative performance of the UK research base](#) – 2016, Elsevier and Department for Business, Energy and Industrial Strategy (BEIS), October 2017
 - ⁵ [From ring-fence to 2.4%](#), Campaign for Science and Engineering (CaSE), February 2019
 - ⁶ [CaSE Briefing - The Economic Significance of the UK Science Base](#), CaSE, May 2014
 - ⁷ [The 2018 EU Survey on Industrial R&D Investment Trends](#), Joint Research Centre, European Union 2018
 - ⁸ [Intramural R&D expenditure \(GERD\) by source of funds](#), Eurostat, March 2019
 - ⁹ [Balance and Effectiveness of Research and Innovation Spending](#), Royal Society of Chemistry, September 2018
 - ¹⁰ [Empowering UK universities: how strategic institutional support helps research thrive](#), Wellcome Trust
 - ¹¹ [The invisible hand that supports quality research](#), WonkHE, June 2019
 - ¹² [University research to receive major funding boost](#), Department for Business, Energy and Industrial Strategy, July 2019
 - ¹³ [Challenge funds and flat-cash cores](#), CaSE, March 2019
 - ¹⁴ [Independent panel report to the Review of Post-18 Education and Funding](#), May 2019
 - ¹⁵ [Under-funded and under pressure: the finances of UK university chemistry and physics departments](#), Royal Society of Chemistry and Institute of Physics, April 2015
 - ¹⁶ [UK funding from the EU](#), House of Commons Library, November 2018
 - ¹⁷ [Science Budget and Industrial Strategy](#), Royal Society of Chemistry, October 2017
 - ¹⁸ [Inspirational Chemistry for a Modern Economy](#), Royal Society of Chemistry, June 2015
 - ¹⁹ [UNESCO Science Report: towards 2030](#), UNESCO, November 2015
 - ²⁰ [UK participation in horizon 2020](#), BEIS, May 2018
 - ²¹ Survey of chemical sciences community on their views of European framework programmes, mobility, chemicals regulation and Brexit, Royal Society of Chemistry, February 2019
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 - ²³ [Benefits of UK association to Horizon Europe](#), Royal Society of Chemistry, April 2019
 - ²⁴ [The 2017 EU Survey on Industrial R&D Investment Trends](#), EU Joint Research Centre, 2017
 - ²⁵ [Annual Scaleup Review 2018](#), Scaleup Institute, November 2018
 - ²⁶ [Public Accounts Committee: Delivering STEM skills for the economy](#), Royal Society of Chemistry, 2018
 - ²⁷ [Royal Society of Chemistry's response to the consultation on provider funding for the delivery of T-levels](#), Royal Society of Chemistry, February 2019
 - ²⁸ [Economic benefits of gender equality in the EU](#). How gender equality in STEM education leads to economic growth, EIGE
 - ²⁹ [Breaking the barriers, Women's retention and progression in the chemical sciences](#), Royal Society of Chemistry, November 2018
 - ³⁰ [Mobility in UK chemical sciences](#), Royal Society of Chemistry, May 2019