

UK Research & Development Strategy

February 2021

The UK research and development system has been highly agile and responsive to the emerging social, health and economic needs of the UK as we respond to the Covid-19 pandemic. The crisis has highlighted successes but also exposed vulnerabilities in the UK research and innovation funding system. Research and development make substantial returns to the UK economy, hence long-term, transparent public investment in research and development will be central to recovering from the social, health and economic consequences of the pandemic and ensuring the UK is equipped to meet future challenges including moving to a more environmentally sustainable economy.

We call on the UK government to:

1. **Set out the pathway to the government's target for increased public investment in R&D**
2. **Use evidence from researchers to deliver fit-for-purpose R&D funding that brings solutions to global challenges and economic and social prosperity.**
3. **Work across departments to retain the people with the knowledge and skills that will enable a green economic recovery**

1. Set out the pathway to the government's target for increased public investment in R&D

The UK government needs to show how its commitment to increase public investment in R&D will translate into transparent, long-term R&D funding mechanisms

Planning for stability and long-term recovery

The UK government must set out a pathway showing how increased R&D investment will translate into future funding streams.

Covid-19 has led to government making unprecedented economic decisions disrupting its ability to lay out multiyear funding commitments. Clarity on longer term R&D investment plans can demonstrate confidence to private and public sector partners, including international investors making their own long-term R&D investment decisions. Funding streams that visibly enable the drivers of science – curiosity, collaboration (between sectors, nations and disciplines), and leadership can help to attract private investment that will enable economic recovery.¹

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.

Increased public investment commitments are welcome, but researchers, innovators and private investors must be able to understand the 'UK offer'. Delivering an easy-to-use, one-stop, digital shop window outlining all public R&D funding will help researchers and innovators identify relevant streams quickly as well as present a clear point of engagement for international investors and global leaders in science.

2. Use evidence from researchers to deliver fit-for-purpose R&D funding that brings solutions to global challenges and economic and social prosperity.

Evidence on and the experience of chemists across the UK underpins our work. This can inform effective design of funding approaches to deliver breakthroughs, innovations and economic and social prosperity.

The government's Research & Development roadmap is *'the start of a big conversation on what actions need to be taken and how'*.² Our community has already been providing the evidence and insights on what actions need to be taken to deliver R&D funding that will foster breakthroughs, create productive international partnerships and ensure that R&D can be part of the government's ambition to 'level up' across the UK.

Initiate new funding streams using evidence and expertise from the community

Channel the collective expertise of the research community to define 'UK ARPA's' programmes.

We heard from researchers in that US that the research community is involved extensively in setting the direction of research early in the development process for ARPA-E calls, involving different sectors and fields focussed towards a specific challenge. They also shared that complementary funding for basic research is part of the wider system that enables the success of the ARPA-E and DARPA models. A key question for government to answer is where and how UK ARPA will 'fit' in the wider R&D system, including in the context of the ambitions set out in the R&D Roadmap. The government needs to consider a more thorough mapping of the UK research funding landscape to inform plans for the new agency.³

'So we collect all these people, we talk a lot, to a lot of people, we hold a workshop and then people brainstorm and they provide a lot of the detail, the input in shape, helping to shape the content of the program.' **Former ARPA-E programme manager.** ⁴

Improve monitoring to inform place-based understanding of sector capacity

To deliver on its levelling up agenda, UK government needs to implement monitoring strategies to examine place-based sector capacity, informing place-based approaches to R&D funding.

Our work shows that chemistry-using professionals contribute an average of £83bn per year, through their skills and innovation, to the UK economy.⁶ We also found different trends in the number of chemistry-using professionals in the UK by region. The chemical sciences sector is vital to the present and future prosperity of the UK and its regions. Consistent monitoring of sector capacity at regional level is vital in supporting the government's ambition to 'level up' the country.

Position the UK as the global partner of choice in R&D

Ensure timely completion of the next steps for Horizon Europe participation.

We welcome the government's announcement that the UK will participate in all the pillars of Horizon Europe including the European Research Council and Marie Skłodowska-Curie Actions subject to ratification of the overall deal and finalisation of the Horizon Europe Programme regulations. Once finalised the reality for UK researchers and innovators wishing to apply for EU funding is unchanged. Government must ensure a timely completion of the necessary processes to complete the final steps required for participation whilst working with professional and sector bodies to communicate with research and innovation communities to support engagement.

86% of the total Horizon 2020 funding for the UK Chemical Sciences comes through the European Research Council (ERC) and Marie Skłodowska-Curie actions (MSCA) funding streams.⁵

3. Work across departments to retain the people with the knowledge and skills that will enable a green economic recovery

People are the cornerstone of delivering the UK's R&D ambitions. Supporting people through joined-up policy levers enables effective diffusion of their knowledge and skills, benefitting individuals and society.

The top three factors that inform location of R&D by industry are the quality of researchers, the availability of researchers and skilled staff and access to specialised R&D knowledge and skills.⁷ Policy levers affecting the R&D workforce fall across different government departments. The proposed R&D People and Culture strategy needs to be developed with thorough engagement across relevant government departments, funders, employers and sector and professional bodies.

Creating a diverse and inclusive workforce

The UK Government and funders need to drive equality of opportunity in science and research.

Government should work with leaders in diversity and inclusion and organisations in the research landscape, including employers (universities, institutions and companies), funders, learned societies, academies and publishers, to ensure that policy levers and organisational practice make a step change in diversity in research and innovation environments.⁸ A key near-term action for government is to implement robust mechanisms to gather evidence and record and analyse the effects of Covid-19 on the practice of R&D, including disaggregating these effects to understand specific impacts on those with protected characteristics (e.g. gender, race, disability) and differences by discipline.

Retain chemistry knowledge and skills to enable environmental and economic recovery.

Government needs to work with professional and sector bodies to draw on the strengths of key actors like SMEs so they can drive a green economic recovery.

Our chemical sciences community already makes substantial contributions to the green economy developing new products and processes for [sustainable plastics](#), developing [new battery chemistries](#)⁹ and [scaling up production of the latest technology](#)¹⁰, and monitoring and testing approaches for chemicals in the natural environment¹¹. Retaining professionals with these skills and knowledge in the workforce is crucial to achieving a green economic recovery. Support for settings like research intensive SMEs that host this talent and essential innovations are vital to enable a long-term knowledge-based economic recovery.

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 effectively attract leading scientists and innovators to the UK this requires welcoming messaging, streamlined rules and manageable costs. The UK Government implemented a [new immigration system for EEA and non-EEA citizens wanting to work or study in the UK](#) from 1 January 2021. Concerns remain over the potential complexity and high costs associated with the revised system. Employers and employees, especially those in innovative SMEs, often do not have the resources to manage high visa costs and complex regulation.¹²

Recognise the multifaceted impact of Covid-19 on the current and future research and innovation workforce

The UK Government and funders need to ensure that their policies and processes recognise the impact of increased demand on researchers and innovators taking account of sector and domestic disruption.

Our chemical science community have made substantial contributions in the fight against the Covid-19 pandemic and will be critical to delivering green in the UK's economic recovery. This critical work has placed substantial pressure on researchers and innovators in the public and private sectors. Where feasible funders need to extend deadlines for competitive funding and regulatory returns to support institutions and businesses to manage substantially increased workloads. This will also help mitigate the impacts of reduced productivity on researchers and innovators who have been affected by substantial increases in caring responsibilities.

Training and development of future researchers and innovators has been substantially disrupted across the talent pipeline. The chemical science workforce makes substantial contributions to professions providing critical services. Government must ensure that as the pandemic continues the higher education sector is supported to provide essential Covid-19 safe practical training and development at undergraduate, postgraduate and doctoral level in the chemical sciences.

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 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.

¹ [Science Horizons](#), Royal Society of Chemistry, September 2019

² [UK Research and Development Roadmap](#), HM Government, July 2020

³ [RSC evidence submission to the House of Commons Science and Technology Committee inquiry into 'A new research funding agency'](#), Royal Society of Chemistry, September 2020

⁴ *ibid*

⁵ [UK Chemistry funding needs post EU exit](#), Royal Society of Chemistry, July 2020

⁶ [Chemistry's contribution. Workforce trends and economic impact](#), September 2020

⁷ [The 2019 EU Survey on Industrial R&D Investment Trends](#), EU Joint Research Centre, May 2020

⁸ [Research culture -improving diversity in the chemical sciences](#), Royal Society of Chemistry, February 2020

⁹ <https://faraday.ac.uk/>

¹⁰ <https://britishvolt.com/news/britishvolt-appoints-world-leading-lithium-ion-battery-expert-chief-technical-officer/>

¹¹ <https://www.nature.com/articles/s41586-019-1193-4>

¹² [Mobility in the chemical sciences](#), Royal Society of Chemistry, April 2020