

CaSE written evidence submitted to the House of Lords Science and Technology Committee inquiry on delivering a UK science and technology strategy

March 2022

About CaSE

The Campaign for Science and Engineering (CaSE) is the UK's leading independent advocate for science and engineering. Our mission is to ensure that the UK has the skills, funding, and policies to enable science and engineering thrive. We represent over 115 scientific organisations including businesses, universities, professional bodies, and research charities as well as individual scientists and engineers. Collectively our members employ over 336,000 people in the UK, and our industry and charity members invest over £32bn a year globally in R&D. We are funded entirely by our members and receive no funding from government.

What would it mean for the UK to be a “science superpower”?

CaSE welcomes the Government’s “science superpower” rhetoric, which has so far included major commitments to double R&D investment to £22bn by 2026/27 and reach an R&D intensity of 2.4% of GDP by 2027. However, beyond economic metrics, the Government is yet to articulate a detailed strategy or vision for what it sees “science superpower” to mean.

New investment is being driven by a recognition within central government that R&D is vital to delivering growth and prosperity across all parts of the UK, including levelling-up and strengthening national security. However, the corresponding policies are currently thin on detail and lack a coherent narrative linking them together.

The Government, therefore, needs to take steps to translate “science superpower” into something that is more tangible, for more people. CaSE recently launched the Discovery Decade project which will focus on forging a stable vision across government, the R&D sector, and broad sections of the public. Without any one of these three, progress is unlikely to be sustained, and yet the importance of public support for R&D investment has often been overlooked. An R&D base doubling in size won’t just need cash, it will need supportive council planning committees, local authorities willing to accommodate new R&D clusters and businesses, businesses stepping up to the plate, devolved parliaments that prioritise the education of the future R&D workforce and new groups of people excited and able to acquire R&D relevant skills. Through this, we can create an environment where ambitious, long-term R&D targets are politically non-controversial, allowing the sector’s energy to be focused on delivering a cross-government strategy that addresses the real challenges of optimising delivery and impact.

Are the right structures in place in Government to implement a science and technology strategy?

In our report, *Improving the use of evidence in UK government policymaking*¹, we recommended that cross-cutting agencies, such as GO-Science, should be located within the Cabinet Office. We therefore welcomed the Government’s plans to establish an Office for Science and Technology Strategy (OSTS) and the National Science and Technology Council (NSTC). Each will provide an opportunity to stimulate and coordinate cross-departmental action, which will be vital in getting the most out of growing departmental research budgets and tackling long-standing problems such as cancer and climate change. These new bodies

¹ <https://www.sciencecampaign.org.uk/static/uploaded/5da82e8c-4344-4c3c-9412bf3b37a67244.pdf>

must also work seamlessly with existing coordinators in the sector, such as GO-Science, UKRI, and business and academic bodies.

CaSE hopes that the new Cabinet committee will also bring greater integration of thought and action to the science and universities briefs. Concerns were raised across the sector when the ministerial briefs for Science and Universities were separated, including by former University and Science Ministers, Lord Willets and Lord Johnson. Universities play a crucial role in the UK's research environment and their involvement will be critical to achieving a research intensity of 2.4% of GDP by 2027.

Does the introduction of a science and technology strategy challenge the Haldane principle and UKRI's commitment to fund outstanding research?

With public R&D investment set to rise to £20bn per year by 2024/25, it's essential the Government introduces a cross-government strategy that delivers the best value for taxpayers.

The most important thing the Government can do to preserve the Haldane principle is ensure that UKRI is well-powered. CaSE therefore welcomed the recent BEIS allocations which will see the agency's funding reach record levels by 2024/25 (£8.9bn). This will help ensure the UK has the right balance of bottom-up, curiosity driven research.

However, with strengthening headwinds from the wider economy, even a UKRI budget rising by around 6% per year is likely to be outpaced by inflation, at least in the immediate term. The erosion of buying power will be felt across all R&D budgets, making it harder to deliver the scale of transformation desired. We are calling on the Chancellor to set out further measures to prevent the Government's R&D ambitions being diluted.

How should state funding for research and development be allocated between different organisations, who should make that decision and by what criteria?

In our report, *Building on Scientific Strength*², we recommended that the UK should continue to foster a breadth and diversity of funders, investment instruments, settings for research and innovation, disciplinary strengths, and people. This includes government departments, public sector research establishments (PSREs) and universities.

CaSE therefore welcomed the Chancellor's commitment to increase departmental R&D budgets, which we hope will shift R&D's centre of gravity across Whitehall and ensure all public services can access the full benefits of the UK being a "science superpower".

As mentioned, the OSTs provides an important opportunity to coordinate this new investment and support departments to get the most out of their budgets. It's crucial that departmental Chief Scientists are also involved in decision making about their department's R&D budget, and while progress has been made on the publication of Areas of Research Interest, more needs to be done to make the most of these. We strongly support the aim within the R&D roadmap to continue implementing the recommendations of the Science Capability Review.

Universities are also a central part of the UK's research ecosystem, bringing together industry and others to create local partnerships that drive cutting-edge research in world-class facilities. However, the pandemic has shone a harsh light on a shortfall in research funding, with universities having to find large sums of money to cover the full economic costs (fEC) of research grants from Research Councils, industry, UK charities and the EU. UKRI

² <https://www.sciencecampaign.org.uk/static/uploaded/bde3bd5b-4d60-45b6-ae651aeee8fae52e.pdf>

publicly states that it meets 80% fEC for its research grant awards³ but has consistently funded less than 80% recently⁴ with grants only covering 72% fEC in 2016/17⁵.

Universities will often partner with other research organisations to find this additional funding, whether private enterprise or research charities. However, the current economic environment has seen the revenues of research charities drop significantly, leading them to aggressively scale down their research activities⁶. Research is often cross subsidised by student fees, particularly international students, a situation that has also been highlighted as unsustainable.

While the increased envelope for publicly funded research will enable UKRI to run more programmes and fund more research, paying these grants at the current proportion of fEC will only serve to increase the 'research deficit'. UKRI-research should not necessarily be funded at 100% fEC, but this deficit must be taken seriously by the Government who should consider increasing the amount of un-hypothecated QR funding to provide universities with larger settlements to enable institutions to meet matched funding requirements.

The implementation of the Government's proposed changes to student finance and the funding of teaching in universities may also have an impact on research, which the Government should assess and be aware of. Cross-subsidy of research from teaching budgets is common⁷, and shortfalls in funds for teaching provision would very likely affect the amount of money available for research.

However, while important, there is a risk that the UK's path to becoming a "science superpower" focuses only on universities and tech-intensive corporations, overlooking the considerable potential of PSREs to contribute. CaSE recently worked with PSREs across the UK to better understand their contribution, finding that they perform a range of important functions that go well beyond their research output. Despite this, PSREs are often seen as service providers, rather than strategic partners with access to world-leading talent and a vast expertise of the wider system. As such, government departments are currently missing out on opportunities to engage more closely with relevant PSREs. CaSE recommends the Government reviews how it can make its approach to PSREs more strategic.

What more should be done to encourage private-sector investment in research and development in the UK?

About two-thirds of the additional R&D investment required to reach 2.4% of GDP will need to come from private investment, and in particular foreign direct investment (FDI). The Government therefore needs to do everything it can to make the UK an attractive and competitive place for businesses to invest in R&D.

CaSE welcomed the Chancellor's commitment in the Spring Statement to reform the R&D tax credit system, something CaSE has long called for⁸. A supportive and flexible R&D credit system is crucial to inspire greater private sector investment in R&D and power up the entire innovation ecosystem.

In our report, *Building on Scientific Strength*⁹, CaSE also recommended that the Government should make it easier for businesses to find and apply for relevant innovation support and

³ <https://www.ukri.org/files/legacy/documents/fecfaq-pdf/>

⁴ <https://webarchive.nationalarchives.gov.uk/20160702184042/http://www.hefce.ac.uk/data/Type/TRAC/>

⁵ https://www.officeforstudents.org.uk/media/1866c816-2c9f-423f-8f28-fe37a232e477/ofs2018_28.pdf

⁶ <https://www.amrc.org.uk/covid-19-the-risk-to-amrc-charities>

⁷ <https://www.hepi.ac.uk/wp-content/uploads/2017/11/HEPI-How-much-is-too-much-Report-100-FINAL.pdf>

⁸ CaSE | Building on Scientific Strength; The Next Decade of R&D Investment (sciencecampaign.org.uk)

⁹ <https://www.sciencecampaign.org.uk/static/uploaded/bde3bd5b-4d60-45b6-ae651aeee8fae52e.pdf>

funding. CaSE members, including small fast-growing companies, large prime companies, and other funders of innovation told us that there's a lot of good innovation support, infrastructure, and incentives in the UK, but that they're not effectively signposted, either domestically or internationally. The Government should therefore create a digital 'shop window' that showcases in one place the many different incentives, funding, and initiatives for UK research and innovation support.

In this report, we also recommended that the public sector leverages procurement to drive innovation at national and local levels. This would meet the twin goals of saving money whilst also encouraging innovation in service delivery. The Treasury should "demand that disruptive social or technological innovations, which radically improve outcomes and dramatically lower costs, are routinely presented by departments in business cases and Spending Review submissions."¹⁰ The 'Innovation Challenge' proposed in the Spring Statement could be a welcome step in this direction¹¹.

Above all else though, our members across industry consistently tell us that the most effective way to incentivise private investment is to set out a stable and ambitious plan for increased public expenditure on R&D that stands for the long-term. Government analysis shows that each £1 of public R&D eventually stimulates between £1.96 and £2.34 of private R&D¹². This is key not only to supporting the UK's world-class research base which plays a significant role in attracting inward investment and international companies to the UK, but also in breeding confidence among the private sector to invest and build long-term partnerships with universities and the public sector.

It is now time for the UK Government to really show the world that the country continues to be a great place for R&D, especially with ONS estimating that there is £900bn of corporate cash reserves ready to be invested as the economy recovers from the Covid-19 pandemic.

How well does the UK collaborate on research with international partners and what can it learn from other countries?

The UK's ability to collaborate on research with international partners is currently at the mercy of political discussions which have little to do with science. As part of the UK-EU Trade and Cooperation agreement, full association to Horizon Europe was agreed, recognising that strong collaboration would be vital to delivering the Government's "science superpower" ambitions. Among other things, association would allow the UK to retain access to EU funding, attract and retain talent, and improve the quality and scope of research in areas such as medical research.

With UK-based researchers and innovators currently unable to sign Horizon grant agreements, the Government is continuing to signal its desire to get association over the line¹³. However, unless a political agreement is reached soon, the UK will be left in a weaker position to collaborate internationally and address the urgent global challenges we are facing.

Compounding this, the UK's research partnerships with developing countries have also been impacted by cuts to the ODA budget, most notably through the Global Challenges Fund (GCRF). At the end of last year, the Foreign Secretary stressed the importance of ODA in boosting international scientific partnerships, "because these are the building blocks of

¹⁰

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/660408/PU2105_Delivering_better_outcomes_for_citizens_practical_steps_for_unlocking_public_value_web.pdf. p.49

¹¹ Spring Statement 2022 ([publishing.service.gov.uk](https://www.gov.uk/government/speeches/spring-statement-2022)) p.32

¹² https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/897470/relationship-between-public-private-r-and-d-funding.pdf

¹³ <https://www.sciencecampaign.org.uk/news-media/case-comment/case-reviews-the-2022-beis-r-d-allocations.html>

development, and they require a long-term strategic commitment"¹⁴. Unfortunately, the Government is failing to back up this rhetoric as almost 900 projects were affected during the 2021-22 financial year¹⁵, with R&D disproportionately hit by the cuts¹⁶.

Without access to key international collaborations, the UK risks getting left behind by comparator countries. The UK could learn from many of its international peers, including Germany and South Korea, which are setting even more ambitious goals, building long-term strategies to achieve them. For instance, Germany's Pact for Research and Innovation set out an annual increase in research and development budgets of 3% each year from 2005 until 2030¹⁷. This is an example of how a stable, cross-party commitment can be truly transformative.

In contrast, and as the UK has experienced in recent years, short term budgets with near term aims make it difficult to spend public money well. Longer-term budgets are a crucial part of developing a detailed strategy and delivery plan that will facilitate efficient use of funding, minimising wastage and maximising leverage. It enables the Government to consider the appropriate balance of funding and make transparent, evidence-based decisions about how to use public R&D investment and levers most effectively. The sector recently welcomed the UK Government's first multi-year R&D budgets since 2015, but the Government must go further if it truly wants to illustrate that the UK is serious about becoming a more research-intensive nation. The UK should not sit still because while the 2.4% target for research intensity promises to be transformative, both in terms of its economy and culture, the UK will still find itself well behind the ambitions of other countries in the G7 and beyond. If we are not willing to match them with more ambitious public spending commitments, the UK risks losing talented people to those countries.

¹⁴ <https://hansard.parliament.uk/Commons/2020-11-26/debates/A2442925-0DA2-4262-B564-1C6FEE24881A/OfficialDevelopmentAssistance#contribution-7154AD57-CD9A-439F-B473-7BFE2AA12A06>

¹⁵ <https://www.ukri.org/news/ukri-required-to-review-official-development-assistance-funding/>

¹⁶ <https://www.researchprofessionalnews.com/rr-news-uk-research-councils-2021-3-ukri-to-cut-support-for-aid-funded-research-projects/>

¹⁷ <https://www.research-in-germany.org/en/research-landscape/r-and-d-policy-framework/pact-for-research-and-innovation.html>