CaSE Campaign for Science and Engineering

Mission Critical R&D

How R&D can support delivery of the UK Government's priorities

February 2025

Report Authors

Dr Camilla d'Angelo

Camilla is Policy Manager at CaSE. She works with the policy team to shape and deliver CaSE's policy agenda. Previously, Camilla worked as a senior analyst at RAND Europe, focusing on innovation, science and technology policy. Camilla holds a PhD in Experimental Psychology from the University of Cambridge.

Dr Florence Young

In her role as Public Opinion and Policy Officer, Florence works across both the public opinion and policy teams with a focus on analysing CaSE's landmark public attitudes research, delivering CaSE's policy agenda and integrating public opinion insights into policy projects. Prior to joining CaSE, Florence worked as a senior scientist at a biotech start-up. She holds a PhD in Molecular Biology from the University of Cambridge.

Contents

Executive summary

Research and development (R&D) has a vital role to play in tackling some of our most pressing global and national issues and will be instrumental in helping the UK Government meet its objectives across all its missions - a set of strategic, long-term challenges for the UK that the Government seeks to address.

A majority of the public think it is important for the Government to invest in R&D. People across the UK believe R&D is vital to tackling climate change, the quality of the NHS and the cost of living – and they want to see politicians pay more attention to it.

However, these benefits aren't inevitable – they depend on action from Government.

This report sets out evidence on the integral role of R&D in driving progress on the UK Government's missions. We propose a series of measures that the UK Government should take to support the R&D sector to deliver this role. We also highlight actions that the R&D sector itself should take to better communicate to policymakers and the public the value of R&D to the missions.

Why is R&D important to the missions?

R&D drives economic growth and delivers wide ranging benefits to society.

R&D generates new knowledge and technologies. R&D can help the UK Government meet its objectives across its missions by producing new knowledge, discoveries and ideas that underpin innovation and technological advancement. Synthesis of existing R&D knowledge can support rapid progress towards mission objectives. The R&D sector can also increase the efficiency of policy processes underlying mission agendas.

Uptake and adoption of innovation from R&D improves public services. Supporting and incentivising the adoption of both existing and upcoming R&D-based innovations into UK public services has the potential to catalyse rapid progress on mission objectives.

R&D and innovation generates high-skill jobs. R&D and innovation are crucial in generating high pay and high skill jobs that drive economic growth and better opportunities across the UK.

Recommendations for Government

Despite the strength and promise of UK R&D to deliver the missions, the R&D sector faces challenges. We propose a range of solutions that will help to address these.

1 Commit to a long-term plan for R&D

A predictable policy environment is vital to enable effective long-term planning and investment in R&D by businesses, universities and others in the sector.

- There needs to be cross-Government coordination on long-term plans and high level goals to ensure coherence and consistency, with leadership from the very top of Government. This can be done through the Science and Technology Cabinet Committee and Mission Boards.
- The UK Government should work with the R&D sector to develop 10-year budgets for key R&D activities as part of a wider strategic framework for R&D. These should:
    - Strike the right balance between stability versus flexibility
    - Introduce an exit point and strategy
    - Consider the added value and benefit when directing long-term funding
    - Consider the realistic timeframe on returns
    - Ensure transparency and clear communication around parameters

2 Maintain a broad and balanced R&D base

The interdisciplinary nature of the complex societal challenges that the missions hope to address means they will need to be informed by a range of R&D disciplines. In addition to applied R&D, it is important not to lose sight of the vital role of broad, discovery research in supporting the missions.

- The UK Government must continue to support a breadth and diversity of disciplinary strengths in R&D. This should include ensuring a diversity of funding sources and types, both within UKRI and from other parts of Government.
- The UK Government should address the decline in the value of QR funding in England and ensure that QR funding is uplifted in line with new R&D commitments. The Scottish and Welsh Governments should also ensure that Scottish and Welsh universities have access to the flexible funding they need to support discovery research.

3 Fix the fundamentals of the R&D system

The sustainability of the R&D system is vital to the future success of R&D in the UK. This includes financial sustainability, as well as the people and skills that underpin it.

- Take short-term action to support universities while longer-term reform is carried out. A holistic review of the funding mechanisms for university-led R&D (and universities more broadly) is needed to increase 'end-to-end' coverage of the costs of research activity and protect the UK's world leading research sector.
- The UK Government should immediately reduce upfront visa costs for researchers and associated roles. Any changes to visa routes need to make them simpler for individuals and businesses to navigate and should consider how to attract talent across all of R&D.

4 Invest in regional capacity building for R&D

For a region to benefit from R&D investment it needs to have capacity to carry out R&D.

- Conduct a comprehensive mapping of the R&D infrastructure landscape to identify any gaps and encourage and assist wider access to research and innovation infrastructure. This should include UKRI keeping infrastructure databases up to date across specific sectors.
- Design large scale inter-regional collaboration into national strategic planning and funding calls.
- Funding agencies should work with local government and mayoral authorities to provide continuous stewardship of regional R&D programmes and innovation initiatives, even once a programme ends.

5 Drive adoption and uptake of innovation

For R&D to contribute to the missions, it is necessary to support translation and commercialisation into innovation as well as uptake and diffusion across public services.

- Consider how access to scale-up infrastructure could be subsidised or develop ways of bringing in joint funding with industry to reduce the upfront cost for R&D intensive scale-ups.
- Support non-traditional routes into R&D jobs alongside PhD training, including for example apprenticeships and bootcamp style training opportunities. The Entrepreneurs in Residence programme is an example of a programme of learning by teaching that has been helpful in bringing in role models and is highly replicable across sectors.

Recommendations for the R&D sector

Although a majority of the public think the Government should use R&D as a tool to achieve its missions, it is not completely clear to people how investing in R&D can help achieve these goals. The following actions should be taken by the R&D sector to better communicate to policymakers and the public how R&D can help tackle society's problems and help the Government achieve its ambitions.

1 Emphasise both the short-term and long-term benefits of R&D to policymakers

Impact from R&D can involve small, incremental improvements over a long period. This can lead to unrealistic expectations from government about the time taken between specific R&D investment announcements and seeing a return on that investment.

- The R&D sector should clearly communicate any immediate benefits, as well as the longer-term benefits, of R&D to demonstrate the value of sustained investment. This could include the use of mission-aligned case studies, framed in ways which emphasise and quantify the investment that led to the stated impact.

2 Articulate to policymakers how existing, interdisciplinary R&D supports the missions

In addition to funding new research in support of the missions, the UK's existing R&D knowledge base is a valuable resource that, if supported, can be readily deployed by the UK Government to achieve rapid mission progress.

- R&D institutions across the UK should coordinate with government Chief Scientific Advisers and collaborate both internally and externally to synthesise and translate their research in a way that is accessible to political audiences.

3 Highlight the diversity of R&D that supports the missions at a local level

The diversity of mission-applicable R&D taking place across the UK must be made more visible to different audiences, both public and political.

- Those seeking to raise the profile of R&D should highlight the breadth of research activity being conducted in their local area, by opening up their establishment's doors and going out into local communities.

- R&D advocates from all disciplines should foreground the place and purpose of their work, as effective ways to convey the value of R&D to both political and public audiences.

4 Champion diverse voices and messengers from the R&D sector

There is a need to highlight the diversity of roles and people working in R&D, and to champion these voices as advocates for the value of R&D to society and to the UK Government's missions.

- R&D institutions, universities, funders and local organisations should champion excellence and diversity in R&D when engaging with the public. This must include establishing mechanisms to ensure that those who act as local R&D messengers or advocates are adequately incentivised and recognised for their valuable engagement work.

5 Embed and innovate ways of involving and engaging the public with mission-led R&D

R&D stakeholders should explore creative ways to involve and engage with the public on R&D, including in underserved communities who may mistrust R&D activities.

- R&D organisations should consider how they could adopt the People's Principles for Involvement in R&D into their own work, as a step towards meaningfully and purposefully involving the public in R&D.

Introduction

Missions

The UK Government will focus its efforts across five national 'missions' (1) and stated that economic growth is its central mission (Box 1) (2). The missions have been set out in the Government's recently published Plan for Change, along with milestones for how it will deliver on them (1).

Box 1: The UK Government's five missions and milestones as outlined in the 'Plan for Change'

1 Kickstart economic growth

Raising living standards in every part of the United Kingdom, so working people have more money in their pocket as we aim to deliver the highest sustained growth in the G7.

Building 1.5 million homes in England and fast-tracking planning decisions on at least 150 major economic infrastructure projects – more than were decided in the last 14 years combined.

2 Build an NHS fit for the future

Ending hospital backlogs to meet the NHS standard of 92% of patients in England waiting no longer than 18 weeks for elective treatment.

3 Safer streets

Putting police back on the beat with a named officer for every neighbourhood, and 13,000 additional officers, Police Community Support Officers and special constables in neighbourhood roles in England and Wales.

4 Break down the barriers to opportunity

Giving children the best start in life, with a record 75% of five-year-olds in England ready to learn when they start school.

5 Make Britain a clean energy superpower

Securing home-grown energy, protecting billpayers and putting us on track to at least 95% clean power by 2030, while accelerating the UK to net zero.

Source: HM Government - Plan for Change: Milestones for mission-led government

Industrial strategy

Central to the economic growth mission is the UK Government's new industrial strategy, Invest 2035, due to be published in June 2025 alongside the multi-year spending review (3). The strategy is framed as a 10-year forward plan with a focus on eight 'growth-driving sectors' within the economy where the UK is globally competitive. These are advanced manufacturing, clean energy industries, creative industries, defence, digital and technologies, financial services, life sciences, and professional and business services. The industrial strategy aims to provide certainty and stability to businesses to promote investment. It seeks to address a series of barriers within the business environment, such as skills, commercialisation, regulation, infrastructure and investment in R&D, amongst others.

R&D investment

R&D will be vital to achieving the missions. There was recognition from the Chancellor in the 2024 UK Autumn Budget that investing in R&D is essential to driving economic growth (4). R&D and innovation are set out in the budget as one of the Government's seven priorities within the growth mission. This was backed by a commitment to protect overall government R&D investment, with £20.4 billion allocated for 2025-26.

Investment in public R&D increases private sector output and productivity, leading to significant rates of economic return (5). The latest estimate, commissioned by the Department for Science, Innovation and Technology (DSIT), suggests an average rate of return to public R&D investment of up to 40% after 6 years, with the possibility of even greater returns over a longer period (6). Sustained public investment in R&D will be an important vehicle to achieve the economic growth that is central to the Government's mission-focused agenda.

In addition to its economic returns, investing in R&D delivers wide ranging benefits to society. Many of these R&D-based societal advancements will be integral to success in the Government's other four missions. CaSE public opinion research shows that people across the UK believe R&D is vital to tackling climate change, the quality of the NHS and the cost of living – and they want to see politicians pay more attention to it (7).

The upcoming multi-year UK spending review in June 2025 is taking place in the context of challenging fiscal conditions. According to the Treasury, these pressures amount to an estimated £21.9 billion over and above what had been budgeted for in spring 2024 (8). This will likely require trade-offs between different priorities for investment across government. However, the spending review also presents an opportunity to invest for the long-term growth and health of the UK economy. Continued investment in R&D will fuel economic growth and boost productivity, enabling researchers and innovators to continue driving the high-skill sectors and cutting-edge technologies that will help shape the UK's future. Crucially, stable public investment will also help leverage the private investment needed to achieve the UK Government's ambitions for growth.

Nationally-representative polling commissioned by CaSE in 2024 found that a majority of people say it is clear how investing in R&D would grow the economy, and more than half think investing in R&D is a better strategy to grow the economy than other typical near-term policy interventions, such as minimum wage increases or building hospitals (9).

And, although a majority of the public think it is important for the Government to invest in R&D, many struggle to see how R&D and innovation impacts their everyday lives. For example, around a third of respondents to CaSE's 2024 poll could think of very few or no ways in which R&D investment improves their lives (10). It is therefore necessary for the sector to work together to develop a compelling and coherent narrative that demonstrates, to both public and political audiences, how and why R&D and innovation can support the missions and, in turn, benefit people's lives and livelihoods.

Approach and scope of the work

In this report we set out the evidence gathered by CaSE on the integral role of R&D in driving progress on the UK Government's missions. We propose a series of measures that the UK Government should take to support the sector to overcome the challenges faced by the R&D sector to deliver this role. We then conclude with actions that the R&D sector itself should take to better communicate to policymakers and the public the value of R&D to the missions.

The report also draws together valuable insights from work done by other stakeholders, including reports published by the R&D sector, and builds on CaSE's previous work, including on visas and immigration (11) and the role of university-led R&D (12). We have considered these perspectives alongside our recent discussions with the sector when integrating key evidence on the role of R&D in the missions, and drawing out cross-cutting recommendations.

The conclusions and recommendations are based on views gathered from the breadth of CaSE's membership. They are based on a series of roundtable discussions held across the devolved nations and regions of the UK with 49 senior representatives from academia, industry, charities and local and national government to discuss the importance of R&D to the UK Government's priorities. We explored the following questions:

- What is the role and contribution of R&D to the missions?
- How does the R&D sector make the case for R&D as an integral part of achieving the missions?
- What's needed from Government for R&D to be able to perform these roles?

The report also includes insights from a nationally representative poll of public attitudes to the UK Government's missions and R&D's role in them (CaSE Public Attitudes to R&D and the UK Government's missions, September 2024; 3,258 UK adults) (13). This research, along with CaSE's wider work on public attitudes to R&D, formed an integral part of our discussions with R&D stakeholders on the missions.

The expertise and perspectives of CaSE's members have been crucial in building a representative view across the R&D sector and throughout the UK, allowing us to identify challenges and solutions.

The role of R&D in the missions

R&D has a vital role to play in tackling some of our most pressing global and national issues and will be instrumental in helping the UK Government meet its objectives across all its missions.

The mission-based approach of the UK Government presents a clear, and rare, opportunity for the R&D sector to demonstrate afresh the many and diverse ways that UK R&D can help bring about ambitious improvements to the UK economy and society, in line with this agenda.

Knowledge and technologies

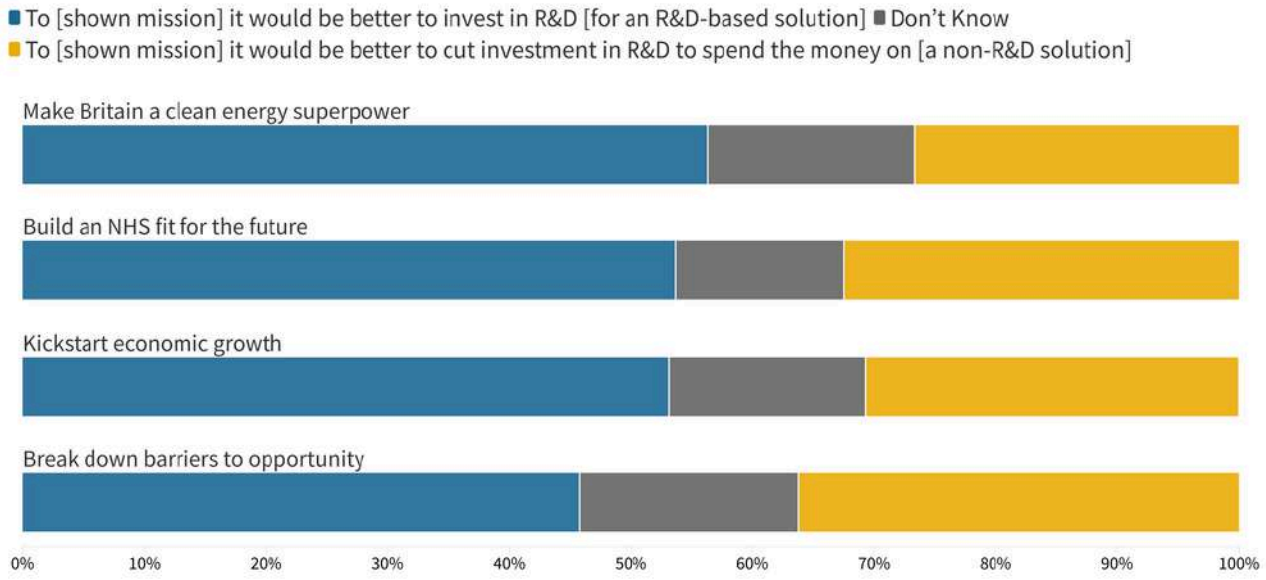
R&D generates new knowledge and technologies that support delivery of the missions

R&D can help the UK Government meet its objectives across its missions by producing new knowledge, discoveries and ideas that underpin innovation and technological advancement.
From mission-specific research innovations such as developing new diagnostic tools that can reduce NHS waiting times, or efficiency improvements to renewable energy infrastructure in the UK, to the broader economic benefits that public investment in R&D provides, R&D will be a vital component in achieving the UK Government's missions.

R&D's role in achieving the missions is also recognised by the public. CaSE's public attitudes research showed that a majority (72%) think the Government should use R&D as a tool to achieve its missions. In addition, for each mission tested, more people support investing in an R&D-based approach to achieve its ambitions than would support cutting R&D investment to spend the money on a non-R&D solution (13).

Competing priorities on investing in R&D solutions

Overall, we see greater support for investing in R&D solutions to achieve the tested missions than for cutting R&D investment to spend the money on non-R&D solutions



Source: Public First polling for CaSE • Sept 2024
Which of the following comes closest to your view? n=3,258

For the full solutions given, see: https://www.sciencecampaign.org.uk/what-we-do/public-opinion/research/case-public-attitudes-to-rd-and-the-governments-missions-2024/#competing-priorities

Case study: SPECIFIC, Swansea University

Type of R&D: Materials science

Working with Tata Steel UK, SPECIFIC leads a revolution in renewable energy technologies, particularly solar electricity and heat generation and storage. The project is developing functional coated steel and glass products, for roofs and walls that generate, store and release renewable energy - turning buildings into power stations and delivering significant environmental and economic benefits. This work is transforming the construction industry, building resilience into the steel and metals industry, and tackling fuel poverty in the UK and internationally. The work received a Queen's Anniversary Prize for Higher Education in 2021 (14).

For the full examples given, see: https://www.sciencecampaign.org.uk/analysis-and-publications/detail/mp-welcome-pack/

The R&D ecosystem is made up of a wide range of institutions that fund and conduct R&D, from fundamental discovery research to translational, applied or commercialised R&D. The UK Government will need to invest in and draw from all types of research across this pathway to drive progress towards achieving its mission agenda. While it may be tempting to focus exclusively on the applied end of the research pipeline, where R&D outputs' applicability to the missions may be more immediately apparent, our evidence from across the R&D sector emphasised that it is often the serendipitous discoveries arising from non-targeted discovery research that form the foundation of the most economically and socially-beneficial advances and innovations.

Moreover, the UK needs to retain a strong foundation of basic research to be ready for unanticipated global challenges, as we saw in the vaccine response needed for the COVID-19 pandemic. The capacity of the UK to nurture and retain broad, world-class R&D capability is crucial not only in delivering on today's missions, but also in maintaining the UK's sovereign capabilities and readiness to respond to future challenges.

Case study: British Heart Foundation, University of Edinburgh

Type of R&D: Cardiovascular disease research

The University of Edinburgh has received nearly £14m of funding through the British Heart Foundation's Research Excellence Awards, which supports cutting-edge projects that will lay the foundations for future breakthroughs, such as the development of an artificial intelligence tool that can improve diagnosis of acute heart failure.

For the full examples given, see: https://www.sciencecampaign.org.uk/analysis-and-publications/detail/mp-welcome-pack/

Synthesis of existing R&D knowledge can support rapid progress towards mission objectives

In addition to funding new research in support of the missions, the UK's existing R&D knowledge base is a valuable resource that, if supported, can be readily deployed by the UK Government to achieve rapid mission progress. The UK's universities are home to a vast and interdisciplinary base of knowledge and expertise as well as being a disseminator of research skills and best practice into the workforce. There are existing UK research outputs that can immediately support the UK Government's ambitions. This is particularly the case in areas requiring preventative action. For example, the Scottish Prevention Hub, a collaboration supported by the University of Edinburgh, brings together research, policy, evidence and practice to inform a whole-system, public sector approach focused on prevention, to drive the reduction of health and wellbeing inequalities in Scotland (15).

Case study: The Scottish Prevention Hub, Edinburgh Futures Institute

Type of R&D: Public service innovation incubator

The Scottish Prevention Hub

The Scottish Prevention Hub is a co-directed national partnership between Public Health Scotland (PHS), Police Scotland, and Edinburgh Futures Institute at the University of Edinburgh. The Hub aims to revolutionise public sector reform approaches in Scotland through the lens of primary prevention for children and young people. The Hub fosters system-wide partnerships, leveraging research and data insights, and building capacity for collaborative working. The Hub has recently contributed to the UK Government's Open Innovation Research programme as an innovative approach in public service reform. A further example of the Hub's ongoing activities is its Policing Mental Health Distress research project, a first-of-its-kind project in Scotland where police, PHS and academia are collaborating to unlock health and justice data for research purposes (15).

However, knowledge from existing R&D can often be widely distributed across individuals and organisations in the UK research community and is not always communicated effectively or accessibly to political audiences. Incentivising and supporting the synthesis and communication of this existing, mission-applicable knowledge, will be crucial in achieving rapid progress towards the Government's targets, particularly knowledge from social science research that can inform effective implementation of interventions. The UK Government's Chief Scientific Advisers have a central role to play in facilitating the communication of this existing mission-related R&D to appropriate decision makers.

The R&D sector can increase the efficiency of the policy processes underlying mission agendas

Beyond producing mission-relevant innovations, investing in R&D also offers efficiency gains in the policy processes that drive the missions in several ways.

Widespread adoption and diffusion of the insights and technologies arising from the UK research base have historically and can continue to improve workplace productivity across all sectors and industries, including the civil and public services. Whether by evidencing the most effective allocations of public resources to achieve maximum societal benefit, or by producing the latest digital technologies and productivity tools, R&D is a vehicle for increased government efficiency. The R&D sector is also uniquely placed to provide the Government with access to data that may be too expensive or time-consuming for government departments to collect in house, particularly experimental and qualitative data.

Coordination with the R&D sector can also speed up and de-risk government interventions by providing governments with access to established cross-sector and interdisciplinary networks (12). Trusted and existing networks can support collaboration across sectors which can streamline processes by ensuring the right range of stakeholders are being consulted, including aligning industry partners to meet unmet mission-relevant innovation needs. These networks also include access to sector-specific expertise that can support government resourcing. As set out in CaSE's report Backing Business R&D (16), such networks are well placed to support regulatory capacity within Government.

Capitalising on the R&D sector's capabilities in these ways will accelerate UK Government progress towards achieving its missions, while strengthening trust and buy-in from the sector.

Case study: City St George's, University of London

Type of R&D: Sociology, criminology and public policy research

Do Business Crime Reduction Partnerships (BCRP) work? The project is a collaboration between Islington Council, Safer Business Network CIC, the Metropolitan Police Service, and City St George's, University of London. Researchers at City St George's, University of London will review the project's impact, providing, for the first time, clear and robust evidence of the effectiveness of a BCRP in reducing business crime. This evidence will be instrumental in garnering support for BCRPs and other initiatives that promote collaboration among the police, local government, and the community in combating local crime.

For the full examples given, see: https://www.sciencecampaign.org.uk/analysis-and-publications/detail/mp-welcome-pack/

Adoption and implementation

Dissemination and adoption of R&D into public services will drive progress on all five missions

Uptake and adoption of innovation from R&D will be vital to bring about improvements to the UK's public services that will be needed to achieve the Government's missions.

For example, delivering the NHS mission will require harnessing the latest developments in life sciences and technology. Adopting healthcare innovations improves patient outcomes, with lower mortality rates reported in research active hospitals (17). Beyond advancements in medical and pharmaceutical research, innovations arising from data science and artificial intelligence (AI), biotechnology, and advanced materials manufacturing, to name a few examples, will all be instrumental in building an NHS fit for the future. Similarly, in addition to adopting technological innovations such as advances in cyber security, research findings from social science studies can also be instrumental in reducing crime levels, such as testing evidence-based policing strategies to target local crime "hot spots" (18).

Focus groups held as part of CaSE's research into public attitudes to R&D and the Government's missions demonstrated that the relevance of R&D is also appreciated by the public:

> *"[R&D] is important. We've got to equip our children to work in a world that's changing. It's not just the technology delivering lessons. The children that are coming into our foundation stages, the jobs that will be available to them when they leave school probably don't even exist at the minute. So, it's the technology and the research into that which will be important, from an education point of view."*
>
> **Female, 59, Business Manager, Kingston upon Hull East**

Supporting and incentivising the adoption of both existing and upcoming R&D-based innovations into UK public services has the potential to catalyse rapid progress on mission objectives and, for certain missions, may positively influence public attitudes towards the missions.

Case study: Greater Manchester Digital Security Hub and Lancaster Environment for New Security – linking the Northwest Cyber Corridor

Type of R&D: Cyber security research

The North West Partnership for Security and Trust is a partnership between GCHQ, the National Cyber Force and the universities of Lancaster, Manchester, Manchester Metropolitan and Salford. It is a vehicle for collaboration between disciplines, institutions, and sectors, focused on the most difficult technology and security problems. Projects draw on Lancaster's cyber security expertise to enable business and national security organisations to embrace innovations in digital and cyber.

For the full examples given, see: https://www.sciencecampaign.org.uk/analysis-and-publications/detail/mp-welcome-pack/

Our public attitudes research found that when considering the crime-reduction mission, including an R&D approach of "investing in Research & Development of new security technology" led to a slight increase in the proportion of people saying the plan was forward thinking and more likely to be fully achieved by the Government (13).

R&D in social sciences, arts and humanities supports the implementation of mission-focused interventions

Many of the Government's missions seek to bring about ambitious change at the societal level. Research in social sciences, humanities and the arts for people and the economy (SHAPE) will be increasingly important in addressing the complex societal challenges underlying these missions. Evidence from SHAPE research will be vital in understanding how to successfully implement the Government's interventions, including innovations and new technology for the missions. For example, alongside innovation in transport technology, research is also needed into behavioural changes and influencing factors in people's travel choices to fully implement these innovations and maximise the societal and economic benefits.

While it is important to invest in R&D for different innovations and technologies, their benefits should not be considered in isolation from implementation, which is often informed by the social sciences.

Case study: EPIC Futures NI, Belfast

Type of R&D: Labour market analysis

The EPIC Futures NI Local Policy Innovation Partnership hub is a pioneering 'think tank' bringing together stakeholders and providing an evidence base for policy and programmes aimed at targeting the 'hidden unemployed' within the economically inactive population in Northern Ireland. EPIC Futures NI enhances the understanding of the unique cultural and political nuances that influence our skills and labour market challenges.

For the full examples given, see: https://www.sciencecampaign.org.uk/analysis-and-publications/detail/mp-welcome-pack/

Broad benefits across the economy and society

R&D underpins all the inter-related missions, ultimately driving economic growth

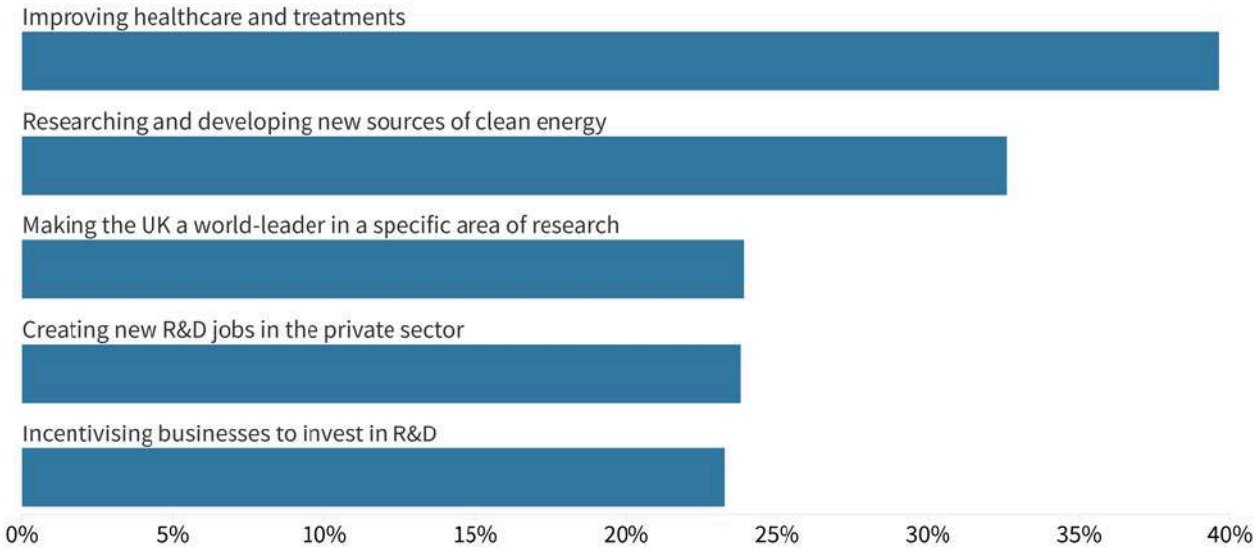
The missions themselves are highly inter-linked, and the benefits of R&D-based solutions for certain missions will indirectly support others, a factor that is recognised by the UK public. CaSE's research into public attitudes to the Government's missions asked which options from a list of R&D-related solutions the public thought would contribute most to the missions. Notably, the top two solutions selected for achieving the economic growth mission related to two of the other Government' missions, namely the NHS and clean energy missions (13). This suggests the public naturally link economic growth with success in the other missions. This is also supported by previous research into public attitudes to R&D and the economy (9). Our qualitative public attitudes research also indicated that the reverse relationship is recognised, with one focus group participant stating (13):

> *"Economic growth is really important, because once you have growth, then you solve a lot of the other issues."*
>
> **Male, 31, Technical Support, Hendon**

While it is easiest to, for example, identify the health benefits from R&D applied to improving the NHS, these benefits will also drive objectives in the other missions, such as economic growth through a healthier workforce. Similarly, R&D investment that drives the economic growth mission will, by reducing the cost of living and improving job opportunities in the UK, indirectly support the crime-reduction mission. The societal benefits of R&D should not be overlooked and should be viewed as part of a broad set of impacts across all missions.

Which R&D solutions contribute most to the economic growth mission?

The top two solutions for the mission to "kickstart economic growth" relate to two of the other Government's missions, namely the NHS and clean energy missions



Source: Public First polling for CaSE · Sept 2024

Which of the following R&D solutions do you think would contribute most to "kickstart economic growth"? Select up to three of the following. The top five most-selected solutions are shown, for all solutions see source. n=3,258

R&D and innovation generates high skill jobs that benefit society and the economy across the UK

CaSE's public opinion research found that, among under 44s, 'raising wages and the quality of existing jobs' and 'generating economic growth' were two of the top five issues that younger people thought the new Government of the UK should prioritise, at the time of polling in September 2024 (13).

R&D and innovation are crucial in generating high pay and high skill jobs that drive economic growth and better opportunities across the UK. Our wider research has shown that almost half of the public think that greater R&D investment would create jobs that make the UK more competitive on the global stage; jobs for young people at the start of their careers; jobs that provide a long-lasting stable career; and jobs that benefit society more broadly (10).

There is extensive evidence that public investment in R&D provides significant economic returns at both regional and national level (5). With economic growth cited as the top priority for the Government (2), investing in R&D will be a vital component in delivering on this ambition, supporting the creation of good jobs, higher living standards, and productivity growth in every part of the United Kingdom.

> *"I would like more investment in the North, to have wind turbines here. They can be an eyesore, but it's brought so much to the area. It's reduced unemployment a lot... people are earning more, which in turn, they spend in the area."*
>
> **Female, 52, Shop Assistant, Kingston upon Hull East**

Case study: Alderley Park, Macclesfield

Type of R&D: Biotech and health research

Alderley Park, a world leading science and innovation campus, is home to over 250 companies with 4000+ employees including the UK Government's Medicines Discovery Catapult. Having seen £247m investment in the past 10 years, the Park offers over 1 million sq ft of laboratory and office space alongside specialist scientific services and support. Businesses based at the Park secured £50m in R&D-linked funding in areas including biomolecular medicine and oncology in 2023.

For the full examples given, see: https://www.sciencecampaign.org.uk/analysis-and-publications/detail/mp-welcome-pack/

What support the R&D sector needs

For R&D to perform the roles set out above and deliver on the UK Government's missions, there are a series of challenges that need to be addressed. Support from government is crucial to enable R&D to progress the missions. Below we outline recommendations across five overarching themes.

Commit to a long-term plan for R&D

Ensure predictability through the strategic setting of priorities

A predictable policy environment is vital to enable effective long-term planning and investment in R&D by businesses. This was one of the recommendations in CaSE's 2024 report Backing Business R&D (16). High-level goals set by Government also influence how universities strategically position their R&D investments. The clarity of end goals and the knowledge that there will be an end user can also help to accelerate R&D and the pull through of innovation towards application. It is therefore welcome that the Government seeks to provide stability and long-term certainty through the Science and Technology Framework, 10-year budgets for R&D activities and in its industrial strategy.

CaSE heard from our members that the clear signalling of priorities set out in the industrial strategy green paper is helpful. For high level goals to be useful to the sector, the aligning of the different government strategies will be important. This will require greater join up between departments, with the five designated Mission Boards and the Science and Technology Cabinet Committee offering a good opportunity to address this.

There needs to be cross-Government coordination on long-term plans and high level goals to ensure coherence and consistency, with leadership from the very top of Government. This can be done through the Science and Technology Cabinet Committee and Mission Boards.

Design 10-year budgets in close consultation with the R&D sector

The UK Government has committed to providing long-term certainty for key R&D activities through 10-year budgets (4). Longer-term R&D funding settlements can provide many benefits for R&D. They can help to support long-term collaboration between industry and academia. By providing a stable research community and collaboration network, they can help to unlock short-term opportunities, allowing UK R&D to be agile and responsive. They can also reduce the precarity of R&D careers and support greater diversity in the R&D workforce. Compared to the precarity of grant funding which often sees people leave, long-term funding could better enable the retention of high-quality talent.

For 10-year R&D budgets to deliver the best outcomes, their design and implementation will need to be carefully considered in consultation with the R&D sector (19).

- **Strike the right balance between stability versus flexibility:** Bringing in some flexibility into 10-year budgets will be crucial to ensure they are a success, including flexibility to change direction as well as the ability to conduct shorter-term projects within a longer-term timeframe. For example, it will be important to have appropriate checks and balances to allow for reprioritisation of a programme in the face of new developments or political priorities. In addition, organisations could be given 10-year funding for core activities with the ability to bid for additional funding for emerging areas.

- **Introduce an exit point and strategy:** A longer-term R&D programme requires a clear exit point and strategy. There should be a requirement to stop things that are not working or not generating benefits.

Consideration also needs to be given to the criteria for who receives 10-year funding.

- **Consider the added value and benefit:** When deciding where to direct long-term R&D funding, consideration should be given to the additional value and demonstrable benefit from a long-term funding settlement, as well as which areas or sectors stand to benefit the most.

- **Consider the realistic timeframe on returns:** The length of the R&D cycle is different in different sectors. For example, the digital sector is typically more rapid and agile in contrast to the aerospace, nuclear or pharmaceutical sectors that have longer-term R&D cycles. Therefore, a 10-year budget may not be possible or appropriate for all sectors.

- **Ensure transparency and clear communication around parameters:** There needs to be a rational and transparent process when deciding which institutions and activities warrant long-term investment over others. Communication will be crucial so as not to be seen as 'deprioritising' sectors that do not get long-term investment plans, and risk segmenting the R&D sector further. It will be important to consider what other measures such sectors would be best suited to benefit from or whether long-term budgets will need to be allocated differently.

The UK Government should work with the R&D sector to develop plans for 10-year budgets as part of a wider strategic framework for R&D. This should include considering their design and implementation as well as the criteria for who receives 10-year funding, as set out above.

Maintain a broad and balanced R&D base

Support the breadth of R&D disciplines to drive mission outcomes

It is important to recognise the interdisciplinary nature of complex societal challenges that the missions hope to address, which will need to be informed by a range of R&D disciplines. The UK R&D base currently has strength in breadth, which is widely regarded as an asset. At the same time, there is not necessarily a good level of awareness among the public or government of the range of R&D sectors and disciplines that make up the R&D sector or contribute to economic and societal benefit. Therefore, care needs to be taken not to sideline valuable and necessary disciplines that constitute R&D (e.g. social sciences, humanities and the arts) and can contribute to the mission outcomes.

The UK Government must continue to support a breadth and diversity of disciplinary strengths in R&D. This should include ensuring a diversity of funding sources and types, both within UKRI and from other parts of Government.

Ensure a balance between applied and non-targeted discovery R&D

There is a risk that the UK Government's focus may be increasingly on applied research that aligns with its missions at the expense of non-targeted discovery research. A consistent theme raised in our discussions with stakeholders was the importance of not losing sight of the vital role of broad, discovery research in supporting the missions.

Innovation often emerges from longer-term, non-targeted discovery R&D. Sometimes, an innovation may have been in the pipeline for a long time before it emerges. In our roundtables, the example was given of the rapid development of the AstraZeneca vaccine during the COVID-19 pandemic. The pandemic provided the driver for the rapid translation of an existing research base into an innovation.

Quality-related (QR) research funding* is a flexible, longer-term funding source that allows universities to engage in long-term strategic projects, attract external investment, and provide career stability for the research community. However, QR funding is increasingly under pressure as institutions are having to increase investment to meet the full economic cost of research (20). The proportion of research costs covered by external funders has decreased over time, with UK Research Councils now funding only 68.9% of full economic cost (21). In England, this has been compounded by a 16% drop in real-terms QR funding from 2010/11-2024/25 compared to an increase in Research Council grant funding over the same period (20).

* 'QR' funding consists of un-hypothecated block grant funding allocated annually to universities in England by Research England, in Wales by the Commission for Tertiary Education and Research (Medr) and in Northern Ireland by the Department for the Economy. QR funding allows universities to engage in long-term strategic planning for research and is used to support a wide range of activities. Research Excellence Grant (REG) funding from the Scottish Funding Council is the equivalent to QR in Scotland.

The UK Government should take action to address the decline in the value of QR funding in England and ensure that QR funding is uplifted in line with new R&D commitments. The Scottish and Welsh Governments should also ensure that Scottish and Welsh universities have access to the flexible funding they need to support discovery research.

Fix the fundamentals of the R&D system

Mitigate the impact of financial pressures on universities

The UK's universities are a national asset and play a pivotal role in the R&D and innovation landscape through their teaching, research, and knowledge exchange activities. They bring a range of diverse benefits to the UK's R&D system and to society more broadly (12). They have a central role in bringing together industry and others to create local partnerships that drive cutting-edge R&D in world class facilities.

The financial sustainability of the research system is vital to the future success of R&D in the UK. One issue that has come under renewed focus is the significant financial pressure facing UK universities (22). They have substantial gaps in their current R&D funds, stemming from shortfalls in the UK's current research funding model, including both public and charitable funding provisions. To deliver their role in the R&D ecosystem effectively, universities must be supported to achieve a sustainable financial model across both their teaching and research activities.

As has long been the case, cross-subsidy of research from university teaching budgets is common among UK universities, especially from international student fees. However, changes to UK immigration policy in 2024 are serving as a deterrent to international students, which has led to a reduction in overseas student numbers (23). A diminishing international student population is already exacerbating existing shortfalls in university research budgets.

These losses in cross-subsidy from teaching budgets and the real-terms stagnation in charitable research support funds are already reducing the amount of money available for research conducted in UK universities. This would be a substantial sum: universities invested £6.1 billion into their research in 2022 (24).

Businesses and service providers that rely on the supply of R&D and innovations universities provide will simply go and find it elsewhere rather than stay in the region, or even in the country, and lose it. To retain this vital resource, it is imperative that the UK and devolved governments support UK universities to achieve long-term financial sustainability.

Take short-term action to support universities while longer-term reform is carried out. A holistic review of the funding mechanisms for university-led R&D (and universities more broadly) is needed to increase 'end-to-end' coverage of the costs of research activity and protect the UK's world leading research sector.

Support a more competitive immigration system

Attracting international talent is essential to support a thriving, collaborative UK R&D sector that in turn drives economic growth. R&D-intensive businesses and institutions as well as the public sector rely on a skilled workforce to support their sustained growth and innovation. Therefore, it is critical that the immigration and visa system, and associated costs, do not act as a barrier to attracting the most talented researchers to the UK.

Research is a global endeavour. Migration brings enormous benefits to the UK R&D sector, increasing international collaboration and knowledge exchange. This is in addition to the benefits of diversity in the workplace and the value that different viewpoints and cultural approaches bring to research.

Furthermore, the UK currently has a shortfall of workers with science, technology, engineering and mathematics (STEM) skills. The Institution of Engineering and Technology (IET) estimated a shortfall of over 173,000 workers in the STEM sector, an average of 10 unfilled roles per business in the UK (25). This skills gap will only widen as the UK R&D sector expands and evolves. The UK Government's 2021 R&D People and Culture Strategy estimated that the R&D sector will need at least an additional 150,000 researchers and technicians by 2030 to sustain the UK's ambitions for R&D (26). While it is important to increase domestic talent through upskilling the existing workforce and increasing the number of people training in STEM, in the short-term international talent is needed to fill these skill gaps.

Under the current Government, the tone and messaging on immigration and international students has shifted, which is a good first step for UK R&D. The Government has announced plans to publish an immigration white paper later this year that will aim to link immigration and skills policy and review the rules around recruiting high-skilled workers from overseas (27). It intends to review visas, particularly in the areas of AI and life sciences. While we support the Government's ambitions to attract international talent, any changes to the immigration system need to make it simpler for individuals and businesses to navigate and consider how to attract talent across all of R&D. It should also retain effective existing visa routes, such as the Global Talent visa (28).

Moreover, total upfront immigration costs are higher in the UK than other research-intensive countries. Last year, the UK immigration and visa system saw changes that have increased upfront costs and restricted eligibility criteria for overseas workers and their dependents. Analysis by the Royal Society has shown that from 2021 to 2024, total upfront immigration costs in the UK increased by up to 58% depending on visa type (29). Total upfront costs are higher in the UK than all other countries in the Society's analysis. When excluding the UK from the international average, UK upfront costs are up to 17 times higher. Evidence gathered by CaSE indicates that visa costs were already prohibitively expensive for researchers before the changes introduced in 2024 (30). The changes have since further reduced the attractiveness of the UK as a destination for international applicants bearing the burden of these costs.

The UK Government should take immediate action to reduce upfront visa costs for researchers and associated roles. Any changes to visa routes need to make it simpler for individuals and businesses to navigate and should consider how to attract talent across all of R&D.

Invest in regional capacity building for R&D

Investing in regional R&D can play a significant role in delivering a more R&D intensive UK and create opportunities for new jobs and industries across all parts of the UK. It is therefore positive to see the industrial strategy green paper recognise the role of R&D and innovation in driving regional economic growth, and the Government's ambition to ensure the benefits of R&D are felt across the UK. More than 60% of people in all UK regions feel it is important that their region carries out a lot of R&D (31).

Regional capacity building for R&D is an important but often overlooked requirement. For a region to benefit from R&D investment it needs to have capacity to carry out R&D. Building R&D capacity requires different types of funding and investment. When funding is allocated based on narrow performance criteria, this reinforces monopolies across industries and regions. This means existing top performers are more likely to secure funding awards, leading to stronger track records and enabling stronger bids in future funding rounds. Capacity building must be considered to ensure diversity in our R&D ecosystem. Furthermore, it is important to consider the other enablers of R&D that are required, such as changes to planning law, infrastructure and skills capacity.

Provide continuity of R&D funding

Providing a continuum of funding can support longer-term collaboration between industry and academia, and sustain capacity, skills, collaborations and culture shifts that have been built up over the course of a project or programme. Bringing together sectors can also help to share best practice, knowledge and skills, which is helpful in the face of new and emerging developments in R&D. Sustaining regional funding can also allow local authorities to incentivise international businesses to establish sites in their region and, ultimately, conduct growth-stimulating production activity there, benefitting the regional and UK economy.

Within a framework of longer-term funding and stability, flexibility is needed to be able to change focus and direction in the face of new developments. Similarly, continuity need not be seen as a guarantee of future funding, rather adopted as a form of continuous 'stewardship' of a project by funders, increasing bid efficiency and streamlining future funding rounds, even if it is still applied for in tranches.

Support access to critical R&D infrastructure

Regional economic growth requires leveraging and capitalising on existing R&D strengths. This requires developing a better understanding of R&D capacity across the UK, and supporting access to critical large-scale, national facilities and infrastructure in supporting collaborative R&D and innovation. Examples include sites and facilities such as Harwell, Diamond Lightsource, ISIS Neutron and the Muon Source and Daresbury Laboratory. It is likely that developing an understanding of capacity will require a sector-by-sector approach.

For example, the Satellite Applications Catapult has developed a Space Capabilities Catalogue which provides a comprehensive taxonomy on existing research strengths, organisations, geographic locations, and infrastructure capabilities. JISC has optimised the use, sharing, efficiency and sustainability of research infrastructure assets, including research equipment, facilities, and laboratories, across all disciplines.

Support inter-regional collaboration around R&D strengths

It is important to create an environment that is collaborative rather than competitive between regions. Inviting multiple regions to bid for the same pot of funding can invite competition where regions may naturally complement each other. Engaging with different regions or clusters early and establishing how they might use their regional strengths to work together, within a fixed funding allowance, would avoid the need for regions to retrofit collaboration into competitively acquired project funding.

Nurturing partnerships between regional stakeholders such as civic bodies, universities and businesses can help to co-produce, attract investment and deliver for a region. Place-based collaborative networks between different types of organisations can support longer-term planning in a region and collaborative opportunities in R&D.

For example, the Wales Innovation Network is an initiative that facilitates collaboration across universities in Wales, helping to form partnerships and share infrastructure and expertise. In another example, the Oxford Road Corridor in Manchester is a partnership between universities, the NHS, businesses, and the property company Bruntwood.

Ensure regional R&D and innovation support is fit for purpose

Following the UK's departure from the European Union (EU), the UK no longer receives EU structural funds. A significant proportion of these funds were allocated for R&D and innovation, helping to support a wide array of projects building research capacity across the UK. Some regions were more reliant than others on this type of funding. For example, EU structural funds significantly contributed to developing R&D capacity and infrastructure in Wales. The Learned Society of Wales showed that the per capita contribution of the European Regional Development Fund (ERDF) funding to research and innovation in Wales was €125 per capita: five times the UK average of €23 per capita (32). When EU structural funds were replaced by the UK Shared Prosperity Fund there was much less focus on funding for R&D capacity building and many successful innovation support programmes came to an end. Without this type of funding to build R&D capacity, it is difficult for less research-intensive areas of the UK to benefit from the economic growth that investment in R&D provides.

The UK Government's devolution white paper discusses how support for R&D or innovation could be part of the role of new local government structures, including mayoral authorities (33). As devolution plans are developed, it will be important to ensure that places without mayoral authorities or new local government structures do not lose out on innovation funding support. There is an opportunity to explore how new mayoral and local government structures could take on stewardship of regional R&D and innovation funding focused on building research capacity, particularly in light of the end of EU structural funds.

- **Conduct a comprehensive mapping of the R&D infrastructure landscape to identify any gaps and encourage and assist wider access to research and innovation infrastructure. This should include UKRI keeping infrastructure databases up to date across specific sectors.**
- **Design large scale inter-regional collaboration into national strategic planning and funding calls.**
- **Funding agencies should work with local government and mayoral authorities to provide continuous stewardship of regional R&D programmes and innovation initiatives even once a programme ends.**

Drive adoption and uptake of innovation

Support translation and commercialisation within R&D-intensive start-ups and scale-ups

For R&D to contribute to economic growth, and the missions more generally, it is necessary to support translation and commercialisation into innovation as well as uptake and diffusion across public services.

For some sectors, the development cycle of turning an idea into application can be long and complex, with many issues only coming to the fore once the process is underway. This often represents a barrier to adoption and uptake. For example, while graphene was discovered in 2004, it has taken around 20 years for it to translate into product innovations. This has represented significant investment in people, facilities and research.

Support for R&D intensive businesses at the scale-up stage is a particular issue. The ability to access the right type of finance at each stage of development is critical to enable R&D focussed businesses to scale and grow. Providing continuity of funding is vital in supporting the commercialisation journey beyond the 'valley of death'. The scale-up funding gap has been raised consistently in recent years, including in CaSE's report Backing Business R&D that provides a series of recommendations on how to tackle it (16). The Government should now focus on delivering and implementing existing recommendations. It is welcome that the Government has committed to making it easier for start-ups and scale-ups to access external sources of financial support.

In addition, there are challenges around access to the R&D infrastructure that supports businesses to scale and grow. In particular, access to infrastructure that supports the journey from research to commercialisation can be prohibitively expensive.

Consider how access to scale up infrastructure could be subsidised or develop ways of bringing in joint funding with industry to reduce the upfront cost.

Invest in skills for adoption of innovation

Adoption and diffusion of innovation requires having the right skills in place. In the face of new technology, investment in skills alongside these innovations is needed to train up people to both invest in and use innovative technologies. The launch of the Science and Technology Venture Capital Fellowship, which is supported by DSIT, is a welcome initiative to strengthen investment professionals' knowledge of the UK's deep tech and life sciences industries (34).

When adopting innovation, cross-departmental collaboration within the Government will be critical to help pull innovations and skills provisions through to be implemented in other sectors. For example, new healthcare innovations arising from DSIT need the buy in and skills training to adopt them to be provided by the Department of Health and Social Care.

The digital and green transitions and emerging technologies such as AI are changing the global skills landscape. Therefore, there needs to be consideration on how to prepare the future workforce for the types of skills that are needed. Investment in skills is needed alongside the development of innovations to ensure people stay updated with technology. However, the shortage of STEM skills in the UK is an ongoing problem and has been estimated to cost the UK economy £1.5bn per year. The IET's 2021 Skills Survey identified that half (49%) of engineering businesses are experiencing difficulties in the skills available to them when trying to recruit (35).

Support non-traditional routes into R&D jobs alongside PhD training, including for example apprenticeships and bootcamp style training opportunities. The Entrepreneurs in Residence programme is an example of a programme of learning by teaching that has been helpful in bringing in role models and is highly replicable across sectors.

How the R&D sector could better communicate the value of R&D to the missions

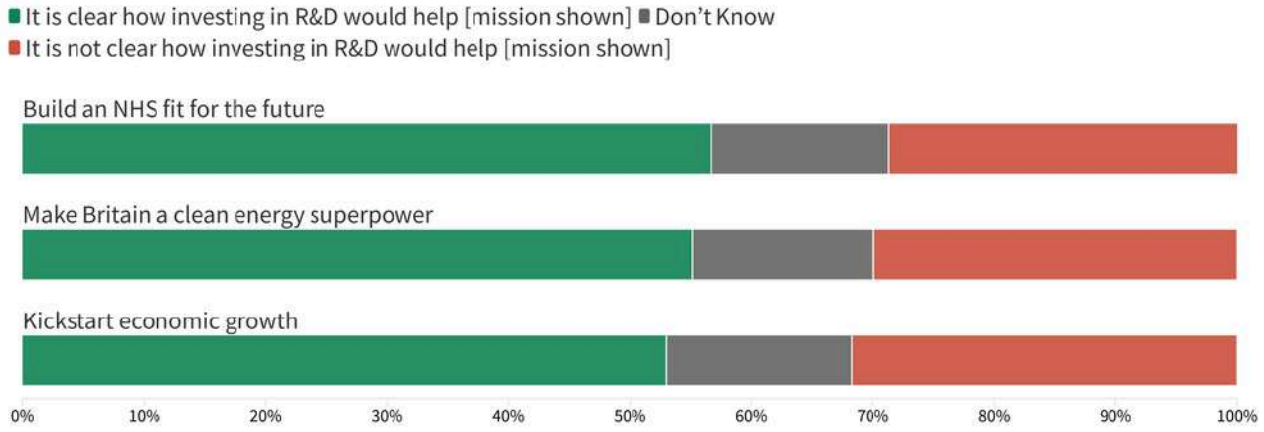
The election of a new UK Government presents a clear, and rare, opportunity for the R&D sector to make its case afresh. The challenging financial context surrounding the 2025 spending review likely means difficult decisions for public finances, risking the erosion of support for, and investment in, R&D. The sector needs to tell a more compelling story about R&D that demonstrates both how it can tackle society's problems and help the Government achieve its ambitions. This will require collaboration to create and convey a unified and powerful message from the sector. If done right, this could make R&D feel more human and more local, helping strengthen R&D's connection with the public.

CaSE's research into public attitudes to the UK Government's missions and R&D demonstrated that although a majority (72%) think the Government should use R&D as a tool to achieve its missions, the public are not completely clear about how investing in R&D can help achieve these goals (13).

Many people think R&D has an essential or important role to play across all mission-based objectives, with particularly strong majorities in areas relating to the NHS, economy, and clean energy missions. Despite this, only around half said it was clear how investing in R&D would help each of the NHS, economy, and clean energy missions, with around 30% saying it was not clear for each mission. While R&D is considered a useful part of the strategy to achieve the missions, it isn't the most obvious approach for most people.

These findings formed an integral part of our roundtables with R&D stakeholders on the role of R&D and the missions. The evidence from those discussions, along with CaSE's wider work on public attitudes to R&D, underpins the following recommendations to R&D stakeholders about how to better communicate the value of R&D in pursuing the Government's missions.

How clear is the role of R&D in the UK Government's missions?



Source: Public First polling for CaSE • Sept 2024
In general, which of the following comes closest to your view? n=3,258

Emphasise both the short-term and long-term benefits of R&D to policymakers

While there has been broadly consistent support for investing in R&D across successive UK Governments, there is an inherent tension between the political timescales within which government operates and the time lags to impact from R&D. Sometimes impact from R&D can involve small, incremental improvements over a long period. This can lead to unrealistic expectations from government about the time it takes between specific R&D investment announcements to seeing a return on that investment.

This presents a challenge for the UK Government if, despite having a long-term vision, it seeks shorter-term outcomes ahead of the next general election. There is a risk that the UK Government overlooks the value of patient and sustained investment into R&D in addressing difficult challenges. Consistency and long-termism are clearly important for every government to buy into to prevent damaging fluctuations in R&D funding, so the sector should not lose sight of emphasising the long-term benefits of R&D to government.

However, the R&D sector also needs to take ownership and be accountable for the quick wins, including highlighting and championing them to the UK Government when they occur. Case studies are an effective way of showcasing impact from R&D along the translation journey for each of the missions and demonstrating both the short- and long-term benefits of sustained R&D investment. In addition, more consistently talking about the importance of long-term investment and incremental gains in the context of R&D success stories can help to bolster this view in the public's minds.

The R&D sector should clearly communicate any immediate benefits, as well as the longer-term benefits, of R&D to demonstrate the value of sustained investment. This could include the use of mission-aligned case studies, framed in ways which emphasise and quantify the investment that led to the stated impact.

Articulate to policymakers how existing, interdisciplinary R&D supports the missions

It is important to recognise that progress on the missions will likely require a whole systems approach. This will require effective communication of the breadth of R&D disciplines, and the interlinkages between these, that contribute to solving the missions.

Much of the UK's R&D takes place within multi and interdisciplinary research environments and networks, with universities playing a vital role in clustering this diversity of expertise (12). R&D institutions are, therefore, uniquely placed to catalyse the open exchange and flow of ideas across research disciplines and collate these insights. To maximise the benefit of pre-existing, mission-applicable knowledge, it must be synthesised by the research community and accessibly communicated to political audiences. There is a responsibility for the R&D sector to work with the Government and its Chief Scientific Advisers network to demonstrate how UK R&D can support rapid progress across all the missions.

R&D institutions across the UK should coordinate with government Chief Scientific Advisers and collaborate both internally and externally to synthesise and translate their research in a way that is accessible to political audiences.

Highlight the diversity of R&D that supports the missions at a local level

Outdated perceptions of what constitutes R&D, as well as the low visibility of the contribution of R&D across all the missions, represents a risk for the R&D sector's advocacy. As an example, participants at a CaSE roundtable highlighted developments in policing, safety and security that stem from research on generative AI and fake information. The All-Wales Policing Academic Collaboration (AWPAC) is an example of a collaboration between Welsh universities and police that aims to improve policing through research.

There is a need to make the full range of UK R&D more visible to both public and political audiences. CaSE's public opinion research has found that two thirds of the public don't feel well informed about local R&D, but a similar proportion (65%) would like to hear more (10) and that foregrounding the purpose of R&D and the place it's happening are effective connection points (7).

The benefits that an R&D project could bring to local communities, areas or regions will be at the forefront of the minds for politicians, authorities and the public. The R&D sector should recognise this and emphasise these benefits when seeking to build levels of support.

Alongside emphasising the diversity of what constitutes R&D at the government level, individual representatives and organisations across all research disciplines must be supported to showcase their R&D at a local level. CaSE's report People and Places: How to put R&D on the map (36) offers recommendations on how R&D can open up its doors to local communities. This can include developing and reviewing long-term plans for engagement, and considering how organisations will actively address inclusion. For example, representatives would benefit from going out into communities, rather than expecting the public to come to their institutions. Some pioneering parts of the R&D sector are already making great progress in building links with their communities in this way.

- **Those seeking to raise the profile of R&D should highlight the breadth of research activity being conducted in the local area, by opening up their establishment's doors and going out into local communities.**
- **R&D advocates from all disciplines should foreground the place and purpose of their work, as effective ways to convey the value of R&D to both political and public audiences.**

Champion diverse voices and messengers from the R&D sector

When advocating for the value of R&D to society, the R&D sector starts from a strong position. Public trust in researchers is high, with a majority mostly or completely trusting scientists to be honest about how helpful R&D is to the public (69%) and trusting researchers to be honest about how much money the Government should be investing in R&D (59%) (37).

However, there is a need to highlight the diversity of roles and people working in the R&D sector, and to champion these voices as advocates for the value of R&D to society and to the UK Government's missions. CaSE's research shows that stereotypes persist about the roles and people involved in R&D, with the public generally starting with a narrow view of what the R&D sector does (10). Yet there are many strong examples within the research community of ways of using a range of voices to develop compelling narratives for how R&D can serve society. Organisations must do more to engage public audiences with messages that highlight the range of valued skillsets and non-traditional paths into R&D.

R&D institutions, universities, funders and local organisations should champion excellence and diversity in R&D when engaging with the public. This must include establishing mechanisms to ensure that those who act as local R&D messengers or advocates are adequately incentivised and recognised for their valuable engagement work.

Embed and innovate ways of involving and engaging the public with mission-led R&D

CaSE believes that increasing public involvement in R&D process will lead to research that better serves society. It will bring fresh perspectives and motivation, challenge norms, and help identify new research questions. The public will be brought closer to the research system, developing skills and strengthening their emotional connection to R&D. In turn, this will help form the basis for sustained public and political support for the R&D sector's work.

R&D stakeholders should consider using innovative ways to involve and engage with the public on R&D, including in underserved communities who may mistrust R&D activities. This might include giving the public a role in decision-making processes or involving the public in the research itself. There are many transferable lessons that can be drawn from the health and medical research communities, where patients are regularly involved in the research process. CaSE's recent dialogue exercise exploring public views on society's stake in R&D supported participants to iteratively develop a set of People's Principles for Involvement in R&D (Box 2) (38). These describe how the public can be meaningfully and purposefully involved in R&D. Considering how these four People's Principles can be adopted into the sector's work will be vital in forging a stronger relationship between the public and the R&D community.

Creatively engaging the public on what R&D is, and its value to their lives and to the Government's missions, has the potential to increase public awareness and generate political support for R&D. The potential of local, relatable and creative tools and methods was highlighted in CaSE's roundtables. CaSE's report People and Places: How to put R&D on the map (36) describes three pilot studies that sought to build local identities for R&D, and recommends that R&D organisations use physical spaces to engage communities such as through R&D trails, building hoardings or QR codes that reveal what is happening "behind closed doors" in R&D buildings.

R&D organisations should consider how they could adopt the People's Principles for Involvement in R&D into their own work, as a step towards meaningfully and purposefully involving the public in R&D.

Box 2: The People's Vision for R&D

To support a more society-centred vision for R&D, CaSE commissioned a deeper exploration of the public's views through a public dialogue. This focused on the public's emotional connection to R&D and ways the public can be involved in R&D. The dialogue, delivered by the National Centre for Social Research and the National Co-ordinating Centre for Public Engagement, brought together 33 members of the public for 10 hours across four sessions in May 2024. In the final sessions, participants worked collaboratively to develop four People's Principles for Involvement in R&D, which set out their expectations for the sector's behaviours.

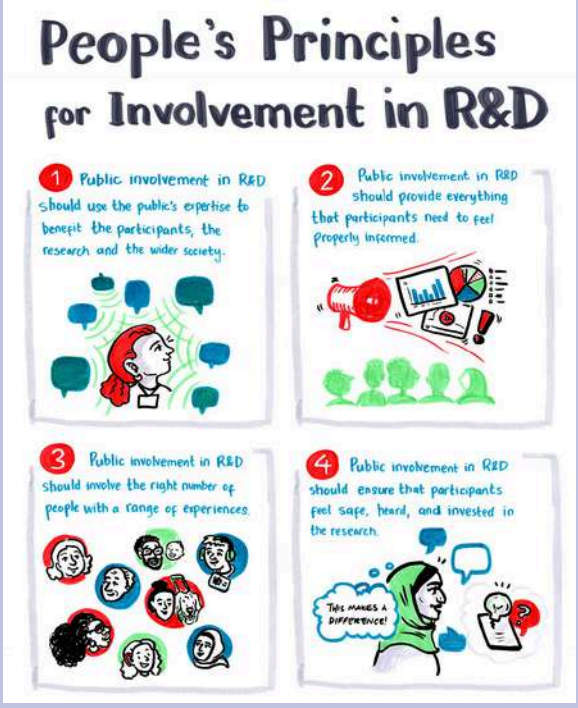
The People's Principles for Involvement in R&D (38)

1. Public involvement in R&D should use the public's expertise to benefit the participants, the research and wider society

2. Public involvement in R&D should provide everything that participants need to feel properly informed

3. Public involvement in R&D should involve the right number of people with a range of experiences

4. Public involvement in R&D should ensure that participants feel safe, heard, and invested in the research



Adopting the principles will require a commitment to change from all parts of the sector, underpinned by honest and practical conversations about how to value and resource involvement in R&D. CaSE has made recommendations to further embed public involvement in R&D around three connected challenges – culture, capacity and resourcing – and, as immediate next steps, CaSE calls on R&D organisations to:

- Undertake an engagement and involvement health check
- Form stronger and more purposeful partnerships and networks

Acknowledgements

We are grateful to the following organisations who have contributed to this work:

- AIRTO
- Anglia Ruskin University
- Babraham Institute
- Bruntwood SciTech
- British Heart Foundation
- Cell and Gene Therapy Catapult
- Centre for Science and Policy (CSaP)
- City St George's, University of London
- Confederation of British Industry
- Cranfield University
- Department for Business and Trade
- Department for Science Innovation and Technology
- Engineering and Physical Sciences Research Council (EPSRC)
- Fraunhofer UK
- Greater Manchester Combined Authority
- GW4 Alliance
- HM Treasury
- Imperial
- Institution of Chemical Engineers (IChemE)
- JISC
- Knowledge Exchange UK
- Lancaster University
- Lucideon
- Manchester University NHS Foundation Trust
- National Measurement Laboratory
- Norwich Research Park
- Nuclear Advanced Manufacturing Research Centre
- Plymouth University
- Power Networks Demonstration Centre, University of Strathclyde
- QIAGEN
- Research England
- Rolls Royce
- Royal Society of Biology
- Royal Society of Chemistry
- Royal Society of Edinburgh
- Satellite Applications Catapult
- Scottish Funding Council
- Scottish Prevention Hub
- Swansea University
- The Crown Estate
- The Learned Society of Wales
- UCB
- Ulster University
- University of Bath
- University of Birmingham
- University of Cambridge
- University of Edinburgh
- University of Exeter
- University of Manchester
- University of Sheffield
- University of St Andrews
- University of Strathclyde
- University of Warwick
- Wellcome Sanger Institute
- Wellcome
- Western Gateway

The views and recommendations expressed within this report are those of the Campaign for Science and Engineering (CaSE) and inclusion on this list does not imply endorsement for the contents of the report.

References

1) Press release: PM sets out blueprint for decade of national renewal, 10 Downing Street (2024)

2) Kickstarting Economic Growth (Plan for Change) PM's Office, 10 Downing Street (2024)

3) Invest 2035: the UK's modern industrial strategy, Department for Business and Trade (DBT)(2024)

4) Autumn Budget, HM Treasury (2024)

5) How R&D investment drives economic growth, CaSE (2022)

6) Returns to Public Research and Development, Department for Science, Innovation and Technology (DSIT) (2024)

7) CaSE Public Attitudes to R&D 2022-23, CaSE (2023)

8) Fixing the foundations: public spending audit 2024-25, HM Treasury (2024)

9) CaSE Public Attitudes to R&D and the General Election 2024, (Economic Growth), CaSE (2024)

10) CaSE Public Opinion Research Summary, CaSE

11) International talent is crucial if the UK is to achieve its research intensity ambitions, CaSE (2024)

12) Universities: A crucial component of UK R&D, CaSE (2024)

13) CaSE Public attitudes to R&D and the Government's Missions 2024, CaSE (2025)

14) SPECIFIC (accessed - February 2025)

15) Scottish Prevention Hub, Edinburgh Futures Institute (accessed - February 2025)

16) Backing Business R&D: Incentivising continued investment in UK innovation, CaSE (2024)

17) Jonker L, Fisher SJ. The correlation between National Health Service trusts' clinical trial activity and both mortality rates and care quality commission ratings: a retrospective cross-sectional study. Public Health. 2018 Apr;157:1-6. doi: 10.1016/j.puhe.2017.12.022. Epub 2018 Feb 10. PMID: 29438805.

18) 'Manchester Police to test Cambridge "pressure points"', University of Cambridge News (accessed - February 2025)

19) Long-term R&D funding, CaSE (2024)

20) Briefing - The impact of QR funding, Russell Group (2024)

21) Annual TRAC 2022-23, Office for Students (OfS) (2024)

22) 'Increased pressure on higher education finances', Office for Students (OfS) News (2024) (accessed - February 2025)

23) Rapid Review of the Graduate Route, Migration Advisory Committee (MAC) (2024)

24) Gross domestic expenditure on research and development, UK: 2022, Office for National Statistics (ONS) (2024)

25) Engineering Kids' Futures, The Institution of Engineering and Technology (IET) (2022)

26) Research and development (R&D) people and culture strategy, Department for Science, Innovation and Technology (DSIT) and Department for Business, Energy & Industrial Strategy (BEIS) (2021)

27) PM speech on migration: 28 November 2024, Prime Minister's Office, 10 Downing Street (2024)

28) Work in the UK as a researcher or academic leader (Global Talent visa), www.gov.uk (accessed - February 2025)

29) Summary of visa costs analysis, The Royal Society (2024)

30) The Skills Opportunity: Building a more innovative UK, CaSE (2023)

31) CaSE Public Attitudes to R&D 2022-23 (Who benefits from R&D), CaSE (2023)

32) The European Structural and Investment Funds – Contribution to UK research and innovation, Learned Society of Wales, Royal Society of Edinburgh, Royal Irish Academy, and the British Academy (2020)

33) English Devolution White Paper, Ministry of Housing, Communities & Local Government (MHCLG) (2024).

34) Science and Technology Venture Capital Fellowship, Department for Science, Innovation and Technology (DSIT) (2024)

35) Skills and demand in industry 2021 survey, IET (2021)

36) People and Places: How to put R&D on the map, CaSE (2024)

37) CaSE Public Attitudes to R&D and the General Election 2024, (Trust in R&D messengers), CaSE (2024)

38) People's Principles for Involvement in R&D, CaSE (2024)

CaSE Campaign for Science and Engineering

The Campaign for Science and Engineering (CaSE) is the leading independent voice for UK R&D.

We are a charity supported by a diverse membership including businesses, universities, professional bodies, research charities and individuals. Our members span the whole breadth of R&D – including discovery research, science, engineering, and innovation across the public, private, and charitable sectors.

We collaborate with our members, partners and the public to lend our clear, expert voice to decisions about research and development. We specialise in developing non-partisan, responsive solutions that help research and innovation to thrive in ways that improve people's lives and livelihoods.

Charity number: 1147492. Company number: 7807252.

www.sciencecampaign.org.uk

020 7523 5010

info@sciencecampaign.org.uk