

PIONEER



Funded by
UK Government

PIONEER

Global Science for Global Good

A UK Prospectus for Opportunities Beyond Horizon Europe

Contents

Foreword by the Secretary of State.....	3
Foreword by the Minister of State.....	6
Pioneer Commitments.....	8
Executive Summary.....	9
Pioneer Talent.....	18
Pioneer Innovation.....	27
Pioneer Global.....	36
Pioneer Infrastructure.....	42
Next steps and approach to engagement.....	46

Foreword by the Secretary of State

From the Enlightenment through to the industrial revolution and into the modern world, Britain has been a relentless driver of innovation. From pioneering work on the jet engine to the invention of the world wide web, our innovators, scientists and engineers have led the world, winning on average a Nobel Prize every year for the past two decades. From Fleming and Franklin to Hodgkin and Hawking, science and innovation is embedded in our DNA.



It is important to celebrate our successes, but we cannot rest on our laurels and must set our ambitions higher than ever. Our 10 Point Plan for Britain as a Science Superpower and Innovation Nation is central to our ambition that we remain a world leader in Science, Research, Technology and Innovation (SRTI). And this Government's commitment to SRTI has been evidenced by the creation of a brand-new dedicated Department for Science, Innovation and Technology which I could not be prouder to lead.

I know how important it is to back our ambitions with action. That is why our accelerated SRTI investment across the public and private sectors is in place to ensure that the UK has the tools it needs to tackle the challenges of tomorrow. That is why the Chancellor recommitted in the Autumn Statement to raising public R&D investment to £20 billion per year by 2024/25 from £15bn in 2021/22 – a 33% increase. That is why we are investing in new high-risk, high-reward research with the new Advanced Research and Invention Agency, and cutting taxes to encourage larger companies to do more R&D.

To fully realise our potential, the UK must leverage its expertise and experience on a global scale, as set out in the Integrated Review. We value our unique position as a key player in the global scientific community and are committed to ensuring that UK researchers, innovators, universities and businesses can collaborate with Europe and the wider world.

Above all, it is our scientists, researchers and innovators who are the key to us realising our ambitions. That is why this Government has listened to the voices from the sector and why I have been prioritising meeting and engaging with sector representatives in my new role.

After listening to UK researchers, innovators, universities and businesses, I understand not only how important Horizon Europe is to you, but also the value of certainty. We are discussing association to Horizon Europe with the EU, and hope our negotiations will be successful. That is our preference. But association would need to be on the basis of a good deal for the UK's researchers, businesses and taxpayers. If we are not able to secure association on fair and appropriate terms, we will implement Pioneer – our bold, ambitious alternative.

The UK welcomes the EU's recent willingness to engage in discussions on UK association to EU programmes. Discussions will need to reflect the lasting impact of two years of delays to the UK's association which means researchers and businesses across the UK have missed out on over two years of a seven-year programme.

We have been continuing to listen to your voices as we look forward to taking forward discussions with the EU on UK association. Our understanding of the value that the UK SRTI sectors places on Horizon Europe, including the European Research Council grants, where the UK has so much to offer, underpins the reason why we continue to look for a way forward with the EU on Horizon Europe.

This is why the UK is engaging swiftly and constructively with the EU and why I travelled to Brussels on 4th April for an introductory meeting with Commissioner Mariya Gabriel to discuss research collaboration including the UK's expectations around association to Horizon Europe.

The UK is clear that association would need to be on the basis of a good deal for the UK's researchers, businesses and taxpayers. If we are not able to secure association on fair and appropriate terms, we will implement Pioneer - our bold, ambitious alternative. In this event, the UK would instead build on and strengthen the values that underpin its research success and build a tailored, inclusive and outward-facing programme as an alternative to association to Horizon Europe. In this scenario, remaining funding allocated to association would be used for UK R&D programmes, including those to support international partnerships, including where possible third country participation to Horizon Europe.

This prospectus sets out our draft plan for Pioneer – our programme that would be ready should we not be able to agree fair and appropriate terms for Horizon association with the EU. Given the need for certainty for the sector we believe it is important to circulate our alternative plan so that researchers, innovators and businesses can feed into it and help shape it. Otherwise we would face further delays and uncertainty which we are not prepared to accept, as our top priority is supporting the sector to continue with their groundbreaking work.

Pioneer would receive the same amount of funding as the UK would have paid to associate to Horizon had we associated from 2021 to 2027. This means the UK would invest around £14.6bn in Pioneer to the end of 2027/28, including the support we are already providing to the sector via the Horizon Guarantee. Because the UK would have been a net contributor to Horizon, this means UK researchers would receive more funding from Pioneer than they would have from Horizon had we associated in 2021.

Based on the arrangement within the TCA, we would expect to make a contribution to Horizon that exceeds receipts to UK entities. Under Pioneer, all our funding would go to UK scientists and innovators.

Our receipts from Horizon would be uncertain as they depend on the performance of UK participants in competitive processes. Over the last MFF (2014-20), the UK's receipts from Horizon 2020 fluctuated by 40% between different years of the programme. But if you simply took the average receipts over that period, UK scientists would illustratively receive over £3bn more under Pioneer.

With this level of investment, Pioneer would supercharge our mission to cement and enhance our position as a science and tech superpower, by backing brilliant British scientists to collaborate with their counterparts across the world. It would boost global inward investment, too, embedding innovation in every element of the economy.

If implemented, Pioneer would work alongside the National Science and Technology Council (NSTC), the Advanced Research and Invention Agency (ARIA) and the International Science Partnerships Fund (ISPF). We would work with the National Academies (NAs), UK Research and Innovation (UKRI), Devolved Administrations and other government departments and funding partners, in partnership with universities and businesses around the UK, to strengthen research collaborations with countries across the globe, including in Europe, ensuring that Britain is open to the best and brightest global talent, innovation and programmes.

Our partners and stakeholders have been very clear that, under any circumstances, working with researchers and innovators in Europe is vital for UK researchers and businesses. That is why a key part of Pioneer would be funding for uncapped Third Country Participation (TCP) in Horizon Europe until 31 March 2025, so UK researchers and businesses can retain access to those European projects they find most valuable, ensuring the UK's scientific community can continue to collaborate across the world. Government would engage stakeholders on its approach to funding for Third Country Participation beyond 31 March 2025 and make an announcement by October 2024.

Building on lessons learned from the 2019 Smith-Reid review, it is really important to me that we are engaging diverse voices from across the SRTI sectors – it is key to creating a programme that works for everyone. I want to take this opportunity to thank all those researchers, universities and businesses who have contributed to the thinking in this prospectus so far. I now want to use the launch of this prospectus to significantly scale up engagement with UK researchers, universities, businesses and stakeholders. I am keen to engage with the sector in the weeks to come, to ensure these proposals provide the best possible plan for the UK SRTI community. Setting out the details of this programme today provides a basis for this engagement and will ensure that, regardless of the outcome of the negotiations on association, we will continue to lead the way in the centuries to come.

A handwritten signature in black ink, reading "Michelle Donelan". The signature is written in a cursive style with a large, sweeping initial "M".

The Rt Hon Michelle Donelan MP
Secretary of State for Science, Innovation and Technology

Foreword by the Minister of State

In a world in which the global race for Science, Research, Innovation and Technology (SRTI) is increasingly competitive and the global challenges we face increasingly urgent, we must focus on building ever-stronger relationships in SRTI with allies and partners around the world. That is why as UK Science Minister over the last 15 months I have worked tirelessly to negotiate and deepen our international SRTI relationships and I am delighted to be able to continue this work as Minister of State for Science, Research and Innovation in the new Department for Science, Innovation and Technology.



Having spent my time as a Science Minister engaging deeply across the UK's SRTI sector, I understand why the EU science programmes, including Horizon Europe (and its predecessor Horizon 2020) have been so valued by the business innovation and research communities and why the collaboration they offer has been so important. That is why we welcome the EU's recent openness to discussions on UK association following two years of delays and why we are engaging constructively with the EU regarding Horizon Europe association. But association would need to be on the basis of a good deal for the UK's researchers, businesses and taxpayers. If we are not able to secure association on fair and appropriate terms, I believe we do have a genuine opportunity to launch a bold alternative programme that deepens our global science commitments in the best interests of UK scientists and their partners around the world. As well as deeper "bilats" with strategic R&D powerhouse economies, it would feature wider "Minilats" and "Multilats" around key Global Challenges to push hard to maximise the global impact and benefits of UK SRTI.

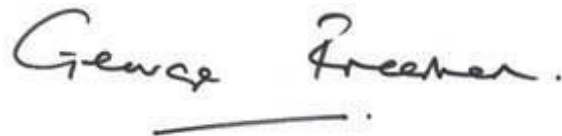
By better harnessing our deep science, engineering, creative industries and technology expertise to tackle the urgent global grand challenges we all face, we can simultaneously attract billions of pounds of inward investment to the UK R&D ecosystem, deepen our global talent and tech transfer collaborations and unlock a sustainable cycle of long term growth, economic resilience and productivity, creating new opportunities in the UK Innovation Economy all around the UK.

Pioneer offers the opportunity to refresh our R&D ecosystem with more agile SRTI funding models that would benefit from substantially less bureaucratic application processes and ease private sector co-investment. Under this Pioneer plan the UK would invest around £14.6bn over seven years, ensuring that UK researchers and businesses receive more funding than they would have received under Horizon Europe.

Delivered and designed by trusted partners, including the UK's prestigious National Academies, and the full breadth of UKRI, this Pioneer programme would boost links

between industry-led cutting-edge innovation and world-class research by accelerating commercialisation and attracting top global talent to our internationally recognised facilities. We would foster collaborations with established and developing economies around the world, while maintaining research collaborations with European partners, including through uncapped Third Country Participation (TCP) in Horizon until March 2025. And we would underpin all this by a major surge of funding to upgrade our SRTI infrastructure so key to world-class R&D.

We absolutely recognise the overarching support of the R&D sector to re-join Horizon as a foundation for deeper international SRTI collaboration which is why we are engaging constructively with the EU regarding Horizon Europe association. As we fine-tune these proposals with the help of our trusted stakeholders, we must also recognise the unique opportunity, if association on fair and appropriate terms is not possible, to use this Horizon funding in a way that maximises funding for, and global impact of, the UK's world leading SRTI sector. Either way, these are exciting times for UK SRTI.

A handwritten signature in black ink that reads "George Freeman." The signature is written in a cursive style and is positioned above a short horizontal line.

George Freeman MP

Minister of State (Minister for Science, Research and Innovation)

Pioneer Commitments

Our commitment in publishing this plan is to set out a coherent plan to strengthen the UK's position as a 'science and technology superpower' if we are unable to associate to Horizon Europe. If it proves to be necessary, Pioneer would deliver substantial funding across four key pillars:

A) Talent:

- i. A bold programme of support for world-class R&D talent across all researcher career stages;
- ii. Larger, longer and more flexible awards than Horizon equivalents; and
- iii. Work with the community to identify good practice and avoid pitfalls of EU funding.

B) Innovation:

- i. Focused investment to bring together industry, the third sector, universities, institutes and other key partners to develop and fund bold SRTI 'moonshot' programmes to tackle some of the biggest global challenges of our time;
- ii. Fast-track commercialisation and deployment of new technologies and innovations, building on UK strengths and drawing on multiple research disciplines and industry insights to boost UK strategic advantage and productivity; and
- iii. Agile funding mechanisms that provide a surge of investment to kickstart innovation alongside longer term programmes that galvanise change.

C) Global collaboration - deeper collaborations with established and developing economies around the world, while maintaining research collaborations with European partners:

- i. Focused investment to work with key strategic international partners on top research priority areas including through an expanded International Science Partnerships Fund (ISPF);
- ii. European collaboration through funding for all eligible consortia for Third Country Participation in Horizon until 31 March 2025. The Government would engage stakeholders on its approach to funding for Third Country Participation beyond this date and make an announcement by October 2024; and
- iii. Discovery-driven investment to increase opportunities for UK researchers to lead research with the best in their fields across a wide range of disciplines in Europe and globally.

D) Infrastructure - additional funding targeted to boost the underlying enablers of high-quality SRTI to ensure researchers and innovators have access to world-class infrastructure across the UK.

Launching Pioneer would not be closing the door on Horizon. Funding Third Country Participation would allow the UK to access parts of Horizon, including the large transnational multi-partner collaborations that are so highly valued by UK researchers and businesses.

Executive Summary

The Government is committed to science and research collaboration – that is why the Government agreed to associate to European research and innovation programmes, including Horizon Europe, Copernicus and Euratom Research & Training under the Trade and Cooperation Agreement (TCA). The programmes provide a valuable shared platform for collaboration with European counterparts. Unfortunately, the EU delayed our association for two years despite the UK making every effort to unlock progress, including launching formal consultations last summer.

We are discussing association to Horizon Europe with the EU, and hope our negotiations will be successful. That is our preference. But association would need to be on the basis of a good deal for the UK's researchers, businesses and taxpayers. If we are not able to secure association on fair and appropriate terms, we will implement Pioneer – our bold, ambitious alternative. In all circumstances, the Government will ensure that UK researchers benefit from world-leading collaboration with colleagues from Europe and beyond.

Throughout this period of delay, Government has continually acted to ensure funding is set aside to pay for association, but Government has also kept investment flowing, committing over £1 billion to date through the Horizon Europe Guarantee, and £684 million of direct funding to UK Science and Research, Fusion and Earth Observation. This has only partially mitigated the impact of the delays.

As the Integrated Review (IR) sets out, the race for global science technology and innovation is increasingly competitive, for prosperity and for defence. In order to deliver a prosperous and secure future the UK must maintain and build collaborations with partners around the world. The uplift in overall R&D funding must catalyse large global and industrial flows alongside, which makes international connection, with the EU and beyond, vital. This would support delivery of the Science and Technology Framework, our systemic approach to making the UK a science and technology superpower by 2030. Our approach also complements and supports delivery of the ambitions in the International Technology Strategy.

If the UK cannot agree fair and appropriate terms with the EU, the Government would implement an ambitious set of alternative R&D programmes, designed in partnership with business and academia, that would enable collaboration with emerging nations and S&T powerhouses around the world. These programmes have been designed to work with bodies including the prestigious National Academies and using the full breadth of UKRI, with the final delivery partners to be confirmed once it is known if these proposals need to be implemented. These alternative R&D programmes would build on the UK's existing strengths to bolster the UK's position in an increasingly competitive global race for leadership in SRTI.

The UK must be ready to deploy funds via a new programme, if revised association terms cannot be agreed, which reflect the aspects of Horizon most valued by researchers and innovators across multiple sectors and disciplines. This is why government has worked with R&D leaders to develop and publish these plans in draft. The Government would like to thank the universities, businesses and stakeholders who have contributed to our thinking over the past several months. The Government has included many of their recommendations within this document and would welcome the use of this publication as an opportunity for broader, more intensive engagement across the sector on the proposals, particularly on innovation where joint work with businesses and researchers will be critical to success.

Pioneer Overview



Pioneer is not designed to replicate Horizon like-for-like. Rather, it has been designed to include new and more agile models of funding SRTI and leverage UK strengths to support discovery research, new global collaborations, jobs and investment across the country. Designed to support delivery of the Science and Technology Framework, our systemic approach to making the UK a science and technology superpower by 2030, Pioneer would see the UK invest around £14.6 billion over seven years.

Incorporating goals and challenges outlined by the Science and Technology Framework, Integrated Review (IR), the R&D Roadmap, International Technology Strategy, National Data Strategy, the R&D People and Culture Strategy, the Innovation Strategy, the Cyber Security Strategy and the Future of Compute review, Pioneer would contribute to cementing the UK's position as a Science and Technology Superpower. It would seek to make the most of the UK's multi-disciplinary strengths across physical, social, mathematics, engineering, medicine and biological sciences, as well as the arts and humanities and employ these multi-disciplinary strengths in the service of the world, to tackle the big global challenges of our times.

At the heart of Pioneer is a commitment to invest in the people, discovery research, global partnerships, infrastructure, high-growth businesses and innovation that are so critical to the UK's R&D system. The programme aims to make the UK the best place in the world for scientists and entrepreneurs to live and work. The UK's ability to attract and retain the best international talent is a crucial part of this aim. The GREAT global talent campaign would promote Pioneer globally and Pioneer programmes would be open to brilliant researchers, innovators and entrepreneurs through attractive and fast-track visa routes.

The UK would also seek to make the most of the science and innovation clusters across the country, building on Innovation Accelerators and Investment Zones. This will contribute to our commitment, as part of the Levelling Up White Paper, to increasing public R&D investment outside the Greater South East by at least 40% by

2030 to ensure that we are able to leverage expertise and talent across the country and retain our position as a world leader in SRTI.

Taking input from across the Research and Innovation sectors, Pioneer is comprised of four interconnected offers to boost that system, supported by the Horizon Europe Guarantee and a transitions package, set out in July 2022, that would ensure there is no gap in investment flowing to the sector. These proposals will serve as a starting point for further sector engagement before delivery.

How Pioneer would fit into the current funding landscape

Pioneer would complement the existing UK R&D funding landscape and form part of the Government's historic commitment to increase public sector SRTI investment to £20bn per annum in 2024/25. It has been designed to combine investment in both world class discovery research and innovation opportunities, knowing that each feeds into and improves the other.

Pioneer Talent would enhance the UK's investment in discovery research as well as the UK's already strong talent offer, building on the funding and opportunities offered by UKRI, the National Academies (NAs) and other leading funders of research. Pioneer Global would complement and enhance partners' existing international partnerships.

Pioneer Innovation would increase our support to business-led innovation across sectors, technologies and UK regions in partnership with research, helping businesses to grow through the development and commercialisation of new products, processes, and services and supported by UK-based and global collaboration.

Pioneer Global would increase our support to international SRTI through deepening our bilateral, minilateral and multilateral collaborations, global TechTransfer, and investment in programs tackling the global grand challenges facing our planet.

Pioneer Infrastructure would provide additional funding into UK SRTI infrastructure, building on successful programmes such as World Class labs, with new funding to diversify the UK's research organisations and support the underlying enablers that allow for greater international collaboration. Through these programmes, the Government is looking for opportunities to support early career researchers and take different approaches to funding to make the UK a globally attractive destination for talent, innovation and investment.

1. Pioneer Talent: Talent is the bedrock of the R&D system. Subject to future Spending Reviews, the Government would spend up to £2 billion in Pioneer Talent to the end of 2027/28. This would be a new flagship offer open to top talent from at home and abroad. It would be delivered in partnership with UKRI and the UK's internationally prestigious National Academies. The Government recognises the prestigious nature of the ERC grants and remains open to collaboration here.

However, the alternative would provide longer and bigger talent awards and have minimal bureaucracy, helping to attract top talent from around the world.

It would encompass a new set of prestigious doctorates, fellowships and professorships through **Pioneer Discovery**. Pioneer Discovery would address the needs of world-leading researchers by offering fellowships and awards that are longer in duration, at higher levels and have more flexibility than under Horizon Europe. Pioneer Discovery would support investigator-led research across all disciplines, from physical sciences to the arts and humanities, focused on both deep discovery and broad inter-disciplinary research with funding based on excellence. It would also provide unique and tailored development offers for researchers, including support for specialised leadership training and cross-sector networking and for international mobility, entrepreneurship and commercialisation of research with direct links to industry.

The Pioneer Talent offer would also include several innovative pilot programmes which would fund diverse and talented teams, investigator-led interdisciplinary research and attract top talent to the UK.

During this Spending Review period, the Government would open annual Pioneer Discovery calls which would offer up to 800 studentships, up to 370 international fellowships and up to 260 early-, mid- and late-career stage fellowships and awards, as well as funding for short-term mobility. These prestigious fellowships and awards would fund high-quality research projects, which would be assessed by rigorous application processes, including international peer reviews, to support brilliant researchers across disciplines.

- 2. Pioneer Innovation:** Pioneer Innovation would seek to galvanise UK innovation by bringing together research, businesses, the third sector and other key partners through domestic and global collaboration. Subject to future Spending Reviews, the Government would spend up to £3.5 billion to the end of 2027/28 in a portfolio of programmes would support our international science collaboration ambitions, draw on the best from different disciplines, and link in business, regulatory and policy ecosystems. It would aim to create opportunities and tackle issues for everyone in our society, as well as to develop the UK's strategic advantage, resilience and productivity.

At the heart of Pioneer Innovation would be a select number of inspiring moonshots - a guiding, tangible ambition to instil a sense of direction and offer concrete goal-oriented solutions to tackle issues facing society that seem intractable but could be transformational for society if solved.

The Government would work in partnership with stakeholders to develop the programmes of work, pulling together our world class discovery researchers and our world class innovators to tackle a range of issues.

Across Pioneer Innovation, the Government would use a range of short, medium and longer-term approaches to funding, varying the approach according to the needs of the moonshot or programme and to bring in a wide range of different businesses, researchers and sectors. Funding mechanisms would include quick-start catalyst programmes, challenge prizes and Eureka.

The Pioneer Innovation portfolio would focus on four priorities reflecting the National Science and Technology Council's priorities and the Innovation Strategy as well as complementing the main themes of Pioneer Global: health innovations; green industrial growth; resilient UK; and transformative technologies. It is designed to be fast and agile, with funding that is quick and straightforward to access for partners from across research and business, including SMEs.

- 3. Pioneer Global:** This is an ambitious programme to deepen and broaden international SRTI collaboration beyond the EU to ensure UK SRTI is doing more to understand, tackle and develop solutions to the wider global challenges facing our planet. The Government would spend up to £3.8 billion in Pioneer Global by 2027/28, subject to future Spending Reviews.

Pioneer Global is designed to enable broader collaborations than those available through Horizon Europe and support global research and innovation collaboration through dynamic, agile and catalytic funding, working bilaterally (building on the UK's successful strategic partnerships), "minilaterally" (convening groups of countries on specific urgent global challenges like agritech), and multilaterally including through influencing standards and increasing reliance in global supply chains. Environmental resilience, pandemic resilience, resource security – in food, medicine, energy and key supply chain pressure like critical minerals are examples of the many areas Pioneer Global could address.

Pioneer Global would include as a key aspect funding for Discovery-driven bottom-up collaborations with researchers around the globe and third-country participation in Horizon Europe, in line with a key recommendation from Universities UK to bolster international co-investigators investment. It has been designed with input from domestic and international stakeholders, in response to clear feedback from the UK SRTI sector.

- 4. Pioneer Infrastructure:** This is a new programme of once-in-a-generation investment of up to £1.7 billion by 2027/28, subject to future Spending Reviews, into world-class national and international R&D infrastructure and lab facilities, an area that was not funded under Horizon Europe. Pioneer infrastructure would upgrade and support new world-class infrastructure assets to support our international science collaboration ambitions, unleashing the full potential of the UK's world-class Public Sector Research Establishments (PSREs), universities, Institutes, national labs and research organisations. Pioneer would also provide additional flexible formula funding for universities, for example through Quality-Related (QR) funding for English universities with additional funding for the

Devolved Administrations, to ensure the sector is supported to make the most of the new opportunities in Pioneer programmes.

In addition to these new programmes, the Government would also provide immediate and targeted investment through familiar domestic and international programmes to minimise disruption to the sector. This investment would: deliver more awards for the UK's most prestigious talent and innovation schemes; provide funding for UK researchers, institutions and business to collaborate internationally in programmes such as Horizon (Third Country Participation) and Eureka; and provide direct funding to UK universities and research intuitions to help them attract and retain world-leading talent. Building on the UK's existing R&D funding programmes and infrastructure, this investment would make sure there is no gap in funding flowing into the sector as Pioneer is rapidly stood up. More detail is available in the [20 July 2022 Publication on Transitional Measures](#).

This document sets out how the Government envisages that it would implement and deliver Pioneer, should the Government decide that it is needed. This could be subject to change and would be confirmed upon the launch of each scheme.

Benefits of Pioneer

Pioneer is a new programme designed to deepen both UK and global investment and international impact of UK science for global good, better meeting the needs of the UK SRTI community, supporting researchers and innovators in the UK to work with partners around the world, and strengthening the UK's position as a science superpower and innovation nation.

Pioneer has been designed with consideration to the benefits of Horizon and the way it works: Pillar 1 focused on prestigious fellowships and top talent; Pillars 2 and 3 on wider global collaborations and innovation. Underpinning all of this is our commitment to boosting both discovery research and innovation. There are elements of this that we have chosen to reflect in our plans – but in others, we think the needs of the UK's SRTI community will be better served by pursuing new opportunities.

Pioneer would:

- Provide more funding for the UK R&D sector over this Spending Review (SR) period and across the Multiannual Financial Framework (MFF) than it would have received via Horizon.
- Fund continued work with partners across Europe in large collaborative projects via Third Country Participation (TCP) until 31 March 2025. The Government will engage stakeholders on its approach to funding for Third Country Participation beyond this date and make an announcement by October 2024.
- Give the UK more autonomy over R&D funding and allow the UK to experiment with new funding approaches.
- Provide more generous talent awards for discovery-based research, with less bureaucracy than Horizon Europe, helping to attract top talent from around the world.
- Deliver on UK innovation priorities and provide focused funding to develop SRTI science partnerships with strategically important countries around the world.
- Provide more funding for UK infrastructure and institutes around the UK.
- Ensure the UK is the destination of choice for brilliant researchers, innovators and entrepreneurs, supported by attractive and fast-track visas and settlement schemes.

Other European Programmes

Copernicus and Euratom R&T are the two other collaborative European research programmes that were covered under the TCA, and therefore alternative plans must be considered if the terms for association are not fair and appropriate. Although not considered part of the Pioneer programme, alternatives to these programmes would ensure continued UK leadership across the Earth Observation (EO) and Fusion sectors.

Copernicus

The first phase of Earth Observation (EO) investment was launched in November 2022 to respond to the delay in Copernicus participation and lack of transitional measures available to the sector: details can be [found here](#). This package of support will grow the already thriving EO sector, focusing on how EO technology and data can help tackle global challenges such as climate change - creating attractive opportunities for talented individuals to develop their skills and build their careers here - and exploring exciting new international collaborations. It will offer a range of national and international projects with a strong emphasis on climate and weather science, contributing to global awareness and action on climate change. The Government is working with the EO sector to define further investment and support opportunities.

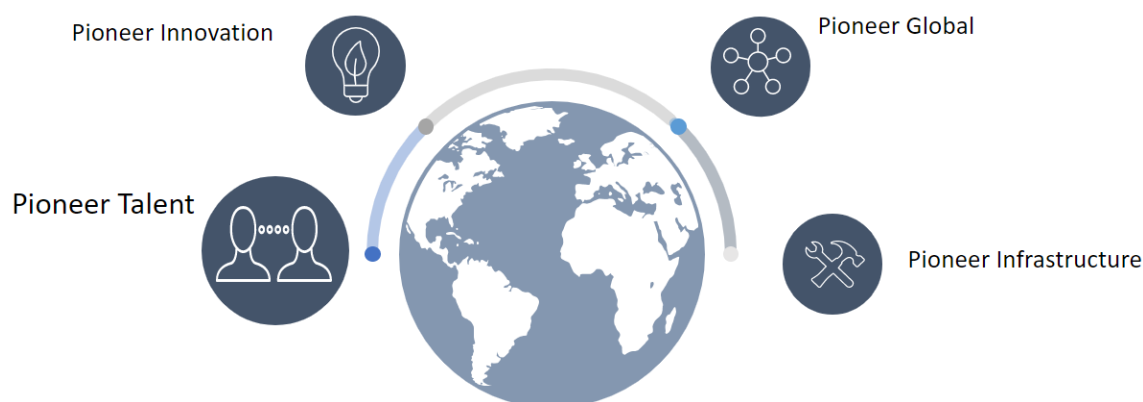
Euratom R&T

Fusion energy could be the ultimate solution in clean power production, delivering virtually inexhaustible safe, low-carbon energy with no long-lived radioactive waste.

The Government set out its Fusion Strategy in 2021, committing to invest in cutting-edge research programmes and facilities to grow the capability of UK industry and make the UK the global hub for fusion innovation. In November 2022, the UK set out the first stage of investment into an enhanced UK fusion programme providing £126m of support to the sector. Building on this, and should Euratom association not be possible, The Government would develop new globally unique UK capabilities and facilities, grow the fusion supply chain and form new international collaborations worldwide. The UK would remain committed to the success of ITER and would explore how to continue contributing our world leading expertise and experience to the project.

The Government will publish details on the UK's fusion plans in due course.

Pioneer Talent



In an increasingly competitive global race for leadership in SRTI, the ability to attract, develop and retain top research talent is becoming increasingly vital to UK R&D. The UK cannot rest on its laurels and take its attractiveness to researchers for granted. The UK Innovation Strategy and R&D People and Culture Strategy, both published in 2021, set out the Government's goal to make the UK the best and most exciting place in the world for top research and innovation talent.

The UK recognises the esteem with which the prestigious European Research Council talent schemes are held and would remain open to collaboration in future in any scenario. However, Pioneer Talent would build on the UK's already prestigious portfolio of talent investment, offering UK and international researchers and their teams access to high-quality, discovery-led fellowships and awards, underpinned by world-class application review processes to support excellent research.

UK Research and Innovation (UKRI) and the UK National Academies (NAs) would deliver the programme, with expert panels specific to the research proposals, strong domestic and international elements in peer review, and criteria that focus on excellence and encourage novel research, including both interdisciplinary and multidisciplinary proposals. Funding would be longer in duration, at higher levels and more flexible than under Horizon Europe and its European Research Council (ERC) and Marie Skłodowska-Curie Actions (MSCA) funding. Application processes would also be tailored to the award or fellowship on offer, with reduced bureaucracy, ensuring researchers can start their projects quickly.

The prestigious and unique Pioneer Talent offer would fund investigator-led, curiosity driven research based at the UK's world-class universities, institutes and research organisations across all disciplines from engineering to medical sciences to the arts and humanities.

Addressing the needs of the sector, it would provide additional funding for early to mid-career stage researchers and support inward and outward international mobility. It would drive commercialisation by creating new links between academia and industry, and targeted development programmes would develop researchers' leadership and entrepreneurship skills. Pioneer Talent would aim to make the UK the destination of choice for brilliant researchers and their teams, supported by the UK's existing Global Talent visa, a route which supports mobility for leading scientists and researchers from around the world. Researchers and their teams would be able to apply for fast-track routes of the Global Talent visa, provided they meet certain conditions.

- **Pioneer Discovery:** A new flagship talent offer of investigator-led awards and fellowships to make sure that the UK attracts and retains the very best research talent from in the UK and internationally across all disciplines, comprising:
 - **Pioneer Doctoral Training** – PhD studentships;
 - **Pioneer International Fellowships** – global inward and outward fellowships for post-doctoral researchers;
 - **Pioneer Open Award** – flexible research funding across all career stages, primarily early career researchers;
 - **Pioneer Discovery Fellowships** – mid-career stage research funding;
 - **Pioneer Research Professorships** – research funding for advanced-career stage leaders in their fields;
 - **Pioneer Entrepreneurship & Impact Awards** – across career stages to explore commercialisation and societal impacts of research; and
 - **Pioneer Short-term mobility** – mobility funding across career stages to academic and business organisations.

- **Pioneer Team-led Environments and Interdisciplinary Award pilots:** An additional set of ground-breaking new talent programmes to help create the new career paths that traditional academic career paths struggle to provide for, via piloting:
 - Dynamic, team-led environments;
 - Investigator-led, curiosity-driven interdisciplinary ideas; and
 - Flexible offers to help attract key research talent to the UK.

Pioneer Discovery – the UK's Flagship Research Talent Offer

Following consultation with the SRTI sectors, the Pioneer Discovery offer has been designed to address gaps in the UK's domestic offer and ensure the UK continues to attract and retain researchers in the UK. Pioneer Discovery would feature elite global fellowships and awards to empower talented people, from PhD students to the most

established researchers, to undertake cutting-edge discovery research across the UK's world-class universities, institutes and research organisations. It would span all disciplines, research settings and sectors, and would be open to the best researchers and their teams from the UK and abroad. Key features would include:

- **Longer and larger fellowships and awards** than are available under Horizon Europe, in addition to funding for doctoral training and international inward and outward mobility. Addressing feedback received from researchers that they need the time and resources to be able to establish significant, long-running research projects at scale, Pioneer Discovery would provide awardees with funding for long-term (up to 10 year) and high-value fellowships (from £2 million up to £10 million);
- Funding for **disciplinary, multidisciplinary and interdisciplinary discovery research provided to talented researchers and their teams at all career stages**, from those at the very early stages right through to established leaders in their fields;
- Open via the UK's existing fast-track **Global Talent visa**, a route which supports mobility into the UK for leading scientists, researchers, and their teams, from around the world;
- More **dedicated and attractive development offers** than under Horizon Europe, tailored to supporting researchers in their career progression, including by building their leadership, entrepreneurship and commercialisation skills with direct links to industry. It would also maximise **opportunities for UK researchers to get experience abroad** and return to the UK with increased connections and skills;
- **Funding that is led by the individual researcher, giving them flexibility** to choose the best environment in which to pursue their research endeavour and supporting them to move between academia and industry as their career progresses;
- **Building on recommendations of the 2022 Tickell 'Review of research bureaucracy'**, Pioneer Discovery would look to minimise the burdens placed on researchers whilst also following a comprehensive peer review process. It would include a tailored and proportionate process for researchers applying to individual schemes and regular reviews to ensure the application and onboarding processes continue to work well for researchers and funding organisations; and
- **A world-class peer review processes for assessing applications** reflecting the highest global standards for enabling visionary and high-risk/high-potential research and including international peer review participants.

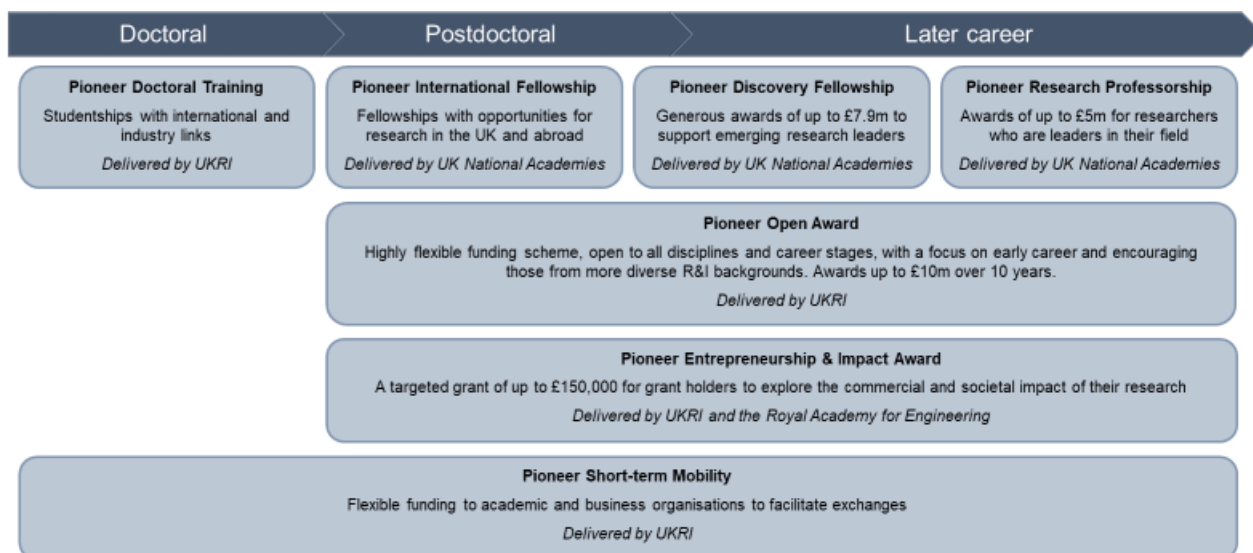


Figure 1: summary of Pioneer Discovery offer

Pioneer Discovery – Prestigious Fellowships & Awards across all career stages

Early-career stage offer:

Pioneer Discovery would introduce a new **Pioneer Doctoral Training** offer that complements and enhances the existing UK offer with new PhD studentships delivered through UKRI. These new studentships would increase collaboration with industry and international partners, focusing on cross-sectoral and international research projects and training.

For example, Pioneer PhD studentships could include collaborations between Higher Education Institutes and businesses working on new methods of data analysis, ways of 3D printing, or understanding digital engagement.

The Pioneer Discovery postdoctoral offer addresses gaps in the UK funding landscape by providing greater certainty and security for early-career researchers. Delivered by the four National Academies, the generous 3-year **Pioneer International Fellowships** would support researchers at the start of their career with funding committed over this Spending Review Period. It would provide them with the opportunity to undertake discovery research around the globe, further building far-reaching international networks:

- The **‘Incoming’ global fellowships** build on the success of the Newton International Fellowships attracting talented international early-career researchers to establish their research in the UK; and
- The **‘Outgoing’ global fellowships** would support outward mobility of UK researchers to develop their research overseas before returning to the UK.

For example, the Pioneer International Fellowships could support engineering researchers from around the world to spend three years at the UK's centres of excellence in applied engineering and technology research. At their host institution and with links into industry, such as the National Grid, their research could make the UK's electricity networks ready for increasing renewable energy generation.

In addition, early career researchers would be the primary beneficiaries of the **Pioneer Open Award**.

Mid-career stage offer:

To support emerging research leaders and their research groups – both from overseas and in the UK – Pioneer Discovery would offer a **Pioneer Discovery Fellowship** with funding committed over this Spending Review Period lasting between 5 and 10 years to best meet the needs of the individual researcher and their team. Delivered jointly by the four National Academies and covering all disciplines, the award would focus on attracting and retaining outstanding researchers, giving them the freedom and stability to focus on their research vision, and address challenging research questions.

For example, through the Pioneer Discovery Fellowship a researcher in Glasgow could explore quantum technologies and secure communications; a clinician scientist in Belfast could research treatments for traumatic brain injuries; and a team of archaeologists in Manchester could develop an AI-based method for dating remains.

Later-career stage offer:

Pioneer Discovery would also support researchers who are distinguished leaders in their field with a track record of significant research achievements through the delivery of a **Pioneer Research Professorship** offered across the four National Academies..

The Professorships would include evolutions of some existing, prestigious National Academy schemes including The Royal Society Research Professorship, The Academy of Medical Sciences Professorship and The Royal Academy of Engineering Chair in Emerging Technologies. The offer would also include a new Pioneer Research Professorship, delivered by the British Academy, ensuring all disciplines are covered.

For example, the Pioneer Professorships could attract and retain global research visionaries and support them to lead start-ups pioneering new technologies such as large-scale space structures or engineering biology, with the potential to deliver lasting societal benefits globally.

Across all career stages:

Recognising the diversity of the research community, the UK would offer a new single, highly flexible **Pioneer Open Award** for individuals undertaking cutting-edge discovery research with funding committed over this Spending Review Period. Delivered by UKRI, this funding would provide the UK alternative to the ERC starting grants. It would encourage applications from all career stages who are following more diverse careers and for whom the current research funding system may be challenging. This includes those in academia, industry and the public and the third sector, technical roles and those whose research projects span multiple disciplines. While early career researchers would be the primary beneficiaries of the open award, it would enable any researcher or innovator to apply for awards up to the value and duration their research warrants (up to 10 years and £10 million).

For example, the Pioneer Open Award could support talented researchers based in a university to collaborate with a business to carry out cutting-edge research on crop breeding.

Discovery research can often translate into new solutions to societal challenges. Those behind these breakthroughs need support to bring them to market. The new **Pioneer Entrepreneurship & Impact Awards** make available funding of up to £150,000 for researchers to explore the potential commercial and societal impact of their research.

These awards would be open to Pioneer Discovery award holders, existing UK-based ERC grant holders, successful ERC applicants, and those who are funded through the UKRI Horizon Guarantee while it operates.

For example, funding under the Pioneer Entrepreneurship & Impact Awards would enable a social science researcher to develop a commercial version of a software, enabling new advances in research methods to be commercialised and sold under licence.

To enhance support for dynamic careers and international collaboration across all career stages, UKRI would deliver a new **Pioneer Short-term Mobility offer**, which would receive funding committed over this Spending Review Period. This would

provide flexible funding to academic and business organisations to support inclusive short-term placements and exchanges between organisations.

For example, the Pioneer Short-term Mobility offer could enable early career researchers in higher education to spend time in spin-out companies developing novel microscopes. It could also provide businesses with access to cutting-edge expertise and equipment in universities and it could link creative industry businesses with researchers in the social sciences, humanities and the arts.

Pioneer Discovery – How to Apply and Timing

The UK offer would be open to talented researchers at all career stages and from all backgrounds in the UK and from around the world, enabling them to conduct world-leading discovery research in the UK and (for international fellowships and exchanges) around the world. Most calls for funding would run on an annual basis. Full application guidance and details would be provided with ample time to allow detailed and considered applications. Pioneer Discovery would build on the recommendations of the 2022 Tickell Review of Research Bureaucracy, with application processes tailored and in proportion to the award or fellowship being applied to. There would be reduced bureaucracy in comparison to Horizon Europe, with successful awardees able to take up their awards faster than under equivalent schemes once an award decision has been made. There would be a tailored and proportionate approach to apply for specific schemes and regular reviews to ensure this process continues to work well.

Attracting the best researchers, scientists and innovators from around the world is critical and the Government's aims to make the UK the destination of choice for brilliant researchers and their teams. Pioneer Talent would aim to make the UK the destination of choice for brilliant researchers and their teams, supported by the UK's existing Global Talent visa, a route which supports mobility for leading scientists and researchers from around the world. Researchers and their teams would be able to apply for fast-track routes of the Global Talent visa, provided they meet certain conditions.

As announced in the Government's "Supporting UK R&D and collaborative research beyond European programmes" publication of 20 July 2022, whilst these new long-term Pioneer Talent programmes are established, government would also increase funding for existing schemes covering a broad range of disciplines via the National Academies and UKRI.

Pioneer Team-led Environments and Interdisciplinary Award pilots

The Government wants to help position the UK as one of the most exciting places in the world for the world's best researchers and innovators. In addition to Pioneer Discovery, the Government has developed a set of ground-breaking talent programmes to create new career pathways and support diverse and talented teams

to tackle key bottlenecks in SRTI. The Government would do this through piloting support for:

- Dynamic, team-led environments;
- Investigator-led, curiosity-driven interdisciplinary ideas; and
- Flexible offers to help attract key research talent to the UK.

Pioneer would include a new **dynamic team-led environments pilot** (subject to business case approval) to encourage the spontaneous formation of diverse and talented teams, providing sustained support to address key bottlenecks in SRTI and break down existing barriers. The pilot would support the UK to generate the evidence required to catalyse systemic changes that support the development of an even more agile, dynamic and impactful R&I system.

The Government understands that **interdisciplinary research** is very important. The UK has particular strengths here, and this is an opportunity to make the UK a magnet for global top talent. This would be pursued through UKRI's interdisciplinary responsive mode pilot, which would offer funding for interdisciplinary ideas emerging from the research community to deliver new breakthroughs and attract even more top talent. The Government would build on already planned investment with additional funding, supporting awards across each of the planned rounds of investment.

Pioneer Talent would complement the Government's efforts to look at attracting the leading stars in key science and technology fields. Following the Prime Minister's announcement in the autumn, The Government is launching a new initiative to target and attract the next generation of AI leaders from around the world. Its ambition is to find talented people before they have won a Nobel Prize or created the next unicorn, and support them to achieve those goals in the UK. The initiative would complement and build on existing government talent initiatives such as the Global Talent Network and the Turing AI Fellowships, but would focus on a new approach to identifying talented individuals and providing support to match them with opportunities in the UK.

Engagement

The Government has developed the Pioneer Talent offer through initial engagement with the research community and delivery partners. The Government would engage further directly with researchers, universities and businesses to finalise the detail of the fellowships and awards and reflect their views and wider values to co-develop a final offer that fully meets the needs and requirements of the research community. Further information on future engagement can be found at the end of the document.

Summary of Pioneer Talent

Aims

- Provide leading global fellowships and awards to top researchers across all career stages to undertake cutting-edge discovery research;
- Offer the best researchers and their teams larger, longer and more flexible fellowships and awards than Horizon Europe with tailored development offers to support their career progression;
- Ensure the UK is the destination of choice for brilliant researchers innovators and entrepreneurs, supported by attractive and fast track visa routes.

Programme

Pioneer Discovery:

- **Pioneer Doctoral Training** – funding new studentships with international and industry links;
- **Pioneer International Fellowships** – global inward and outward fellowships for post-doctoral researchers;
- **Pioneer Open Award** – flexible research funding across all career stages, primarily early career researchers;
- **Pioneer Discovery Fellowships** – mid-career stage research funding;
- **Pioneer Research Professorships** – research funding for advanced-career stage leaders in their fields;
- **Pioneer Entrepreneurship & Impact Awards** – across career stages to explore commercialisation and societal impacts of research;
- **Pioneer Short-term mobility** – mobility funding across career stages to academic and business organisations.

Pioneer Team-led Environments and Interdisciplinary Award pilots:

- Dynamic, team-led environments;
- Investigator-led, curiosity-driven interdisciplinary ideas; and
- Flexible offers to help attract key research talent to the UK.

Benefits

- Offer longer and larger elite fellowships and awards, helping to attract top talent from around the world.
- Offer attractive and flexible global fellowships and awards that support researchers' leadership, entrepreneurship and commercialisation skills and provide funding that is led by researchers, giving them freedom and flexibility.
- Offer researchers opportunities to get experience abroad and return to the UK with increased connections and skills, and fostering moves between academia and industry as their career progresses.
- Offer streamlined applications, approvals and funding processes, ensuring researchers can start their projects quickly after an award decision. Applications would be assessed through a world-class and international peer review process to encourage visionary and high-risk/high-potential research projects.

Pioneer Innovation



The scale and urgency of so many of the major challenges facing the UK and the global community can only be addressed through bold leaps in innovation. The pace of global technological change means that those businesses which embrace the opportunities of innovation would be at a significant advantage in the global marketplace. Seizing these opportunities will require the talent and expertise across multiple disciplines and sectors, meaning the Government needs to support the full breadth of our world-leading research institutions to deliver impact from their research. In turn, the UK must attract and unlock major co-investment and work closely with businesses and international partners to drive growth in sectors and clusters all around the UK.

Pioneer Innovation is a portfolio of programmes that would bring together the UK's world-class discovery research and innovative businesses in domestic and global collaboration to meet these challenges head on. It would galvanise UK innovation, investing quickly to create opportunities and tackle issues for everyone in our society, as well as developing the UK's global strategic advantage, resilience and productivity and attracting co-investment.

Pioneer Innovation is designed to complement our increased funding for world-leading research with agile, targeted, catalytic funding designed to unlock major co-investment. Learning from the Industrial and Global Challenge and Innovation of Horizon Pillars Two and Three, Pioneer Innovation aims to build UK capabilities and create and grow markets, helping new and existing British businesses to seize the opportunities of innovation-led growth working with international partners, and bringing significant economic and societal benefits to communities around the UK.

Directed by four broad priorities relevant to a wide range of technologies¹ and disciplines and underpinned by a combination of discovery research and innovation, Pioneer Innovation would support the development, of technologies and innovations across the full range of technology readiness levels (TRLs) levels, and across multiple disciplines and technology families, from bioinformatics and genomics to robotics and smart machines. Drawing on the UK strengths in science, engineering, arts, humanities and social sciences, it would drive commercialisation of new innovations and technologies to market, and their wider adoption and diffusion in our economy and society.

The portfolio is designed to be fast and agile, with funding that is straightforward and quick to access, alongside maximising impact.

The interventions across this Innovation portfolio would crowd in investment and magnify the UK's global reputation and impact as a global innovation leader and partner. International by default, the programmes would be open to global innovators who want to collaborate with UK partners to find solutions to these big challenges.

Pioneer Innovation would invest in:

- working with industry, including large and small businesses, to design and invest in programmes that contribute to four internationally significant and systemic priorities - health innovations, green industrial growth, resilient UK, and transformative technologies. For transformative technologies, this would include an increase in funding for technology missions, to include telecoms and semiconductors, AI, quantum computing and engineering biology;
- a new Moonshots programme looking at systemic global challenges that would be designed and delivered with input from industry and the research community; and
- a pulse of funding to catalyse activity and private sector co-investment in the near term, recognizing the impact of delays.

This would build on the landmark investment in innovation secured through 2021's Spending Review, which increased the innovation spend through Innovate UK to a budget of more than £1 billion/year by 2024/25. It also builds on the £250m investment in transformative technology missions, announced by the Prime Minister in the new Science and Technology Framework on 6 March 2023.

It is designed to complement and amplify the investments through the Pioneer Talent, Global, and Infrastructure offers, learning from the best elements of Horizon Pillars Two and Three. The variety of quick and longer-term interventions have been designed to enable accessibility across industry, business and research, including SMEs with opportunities to participate in different scale activities and bi- and multilateral partnerships.

¹ Including the technology families set out in the July 2021 Innovation Strategy

The Pioneer Innovation programme would be primarily delivered by UK Research and Innovation (UKRI) with a specific focus on building and growing multidisciplinary collaborations and reaching new researchers, businesses, and innovators. A small proportion of the funding would also be available to work through other existing institutes where these are the most agile, effective mechanisms for delivery for a particular sector or technology.

Our innovation priorities

Reflecting the National Science and Technology Council's priorities and complementing the main themes of Pioneer Global, the portfolio would draw on discovery research and innovation across a wide range of technologies and disciplines to deliver against four internationally significant and systemic priorities – health innovations, green industrial growth, resilient UK, and transformative technologies to deliver UK strategic advantage and boost productivity and growth.

1. Health Innovations - Human, Animal and Plant Health Science:

NSTC's ambition is that the UK leads the world in health and life sciences across the bioeconomy – drawing on the rapid advances in our understanding of biological systems to help prevent disease and pandemics, help citizens enjoy better physical and mental health, preventing disease and improving global health and economic resilience. Pioneer Innovation would seek to drive healthcare innovation across diagnosis, prevention and treatment to enable people to live healthier lives for longer and embed the UK's position as a leading global destination across the broad life science and bioeconomy sectors.

The portfolio would aim to accelerate human, animal and plant health research and innovation, to establish the UK as a global leader in biosecurity to protect our population from a range of biological threats, including emerging infectious diseases and antimicrobial resistance.

To achieve this ambition, this theme would connect and strengthen research, industrial, and third sector partnerships and invest in key interventions which could include bioinformatics, biomanufacturing and genomics, digital pathology and health behaviours. It would have applications across a range of areas including biosecurity and pandemic preparedness while also complementing the UK's life science missions.

This theme would explicitly consider how to ensure that health innovation funding is leveraged to ensure that products and interventions can reach adoption, deployment and scale-up into use, and be facilitated for commercialisation. This could be enabled through strengthening the interactions across funders in this area to ensure that there are no gaps across the innovation pipeline.

2. Green Industrial Growth

NSTC is committed to supporting an environmentally sustainable and resilient UK, delivering on Net Zero and contributing to a globally sustainable natural environment through innovation and green industrial growth. Achieving net zero is the biggest challenge the planet faces, but also creates a significant opportunity for green industries and economic growth in areas such as earth observation and decarbonisation technologies and techniques. This can only be achieved by taking a multi-disciplinary approach drawing on the best from different disciplines, from social sciences to physics, from arts and humanities to engineering. Pioneer Innovation can stimulate collaborations that bring together partners across disciplinary and sector boundaries to deal with these issues, as well as bringing a whole systems approach, for example through efforts on net zero cities.

Building on our Net Zero Strategy, Pioneer Innovation would seek to embed the UK as a world leader and collaborator in sustainability, net zero and decarbonisation by investing in key technologies that underpin this ambition, across key industries that could include transport, infrastructure, agritech, energy and advanced manufacturing.

3. Resilient UK – resources and national security

From energy and resource supply shocks to geopolitical challenge, resilience is a key priority for the UK to thrive. Pioneer Innovation would link research and industrial partnerships and leverage international investment to deliver UK resilience and security which ultimately would support economic prosperity and productivity.

Key areas for potential research and industrial partnerships could include responding to challenges with new engineering, life sciences and social sciences solutions to help remediate the impact of human activity on the natural environment, protect biodiversity, advance climate resilient agriculture and aquaculture, and embed climate resilience solutions across society. Rather than focusing on the opportunities for economic growth in response to net zero, this theme would focus on mitigating the impact of a changing global climate with a strong focus on remaining resilient despite these changes.

Looking to resource resilience, it could explore future renewable energy, hydrogen production, agritech and understanding how our deep sea can provide access to a range of assets from critical minerals to future pharmaceuticals.

From a security perspective, it could include biosecurity, clean space, cyber-attack shielding, or integrated behavioural and technological techniques to improve public safety and resilience. One of the biggest challenges facing society is disinformation, social violence and radicalisation, for example, and we need to draw on social sciences, arts and humanities research to understand how best to address these challenges.

4. Transformative Technologies

From using Artificial Intelligence to improve the personalised treatment of rare diseases, to semiconductors vital to everything from phones to refrigerators, new technologies are already transforming the way we live and work. Pioneer Innovation would seek to harness our relative strengths to deliver a UK competitive edge in the technologies of the future and create a platform for growth. Raising technology readiness levels to enable us to make use of these technologies, and in turn driving increased productivity through deployment of these technologies, would generate world leading capabilities for the UK as well as create opportunities for economic growth and social change.

Pioneer Innovation would channel investment into the Technologies of Tomorrow identified in the Innovation Strategy and in particular the five strategic priority technologies identified by the National Science and Technology Council (NSTC):

- Artificial Intelligence;
- Engineering Biology;
- Quantum Technology;
- Future Telecoms; and
- Semiconductors.

Transformative Technology Missions

Work is already underway on the transformative technologies priority, with £250m invested at the Spending Review in transformative technology missions, focusing on Artificial Intelligence, Quantum and Engineering Biology, announced by the Prime Minister on 6 March 2023 through the new Science and Technology Framework. This would be expanded in Pioneer Innovation to include additional technology missions in Future Telecoms and Semiconductors. Through these missions and working with businesses and researchers, UKRI are delivering programmes focused on measurable, time-limited technology outcomes that would support the development, commercialisation and scaling of high potential technologies, including using Artificial Intelligence to move towards Net Zero in high emitting sectors and to deliver novel healthcare solutions; developing Quantum Computing to grow the UK's market share; and investing in engineering Biology for food systems.

The Moonshot Programme

At the heart of Pioneer Innovation would be a long-term moonshots programme – internationally inspiring moonshots delivering on a small number of tangible ambitions that deepen our strategic international collaboration in SRTI, as set out in the Integrated Review and International Technology Strategy, and develop concrete, goal-oriented solutions to problems facing our planet within the four priorities.

The Government knows how inspiring and galvanising moonshots can be. The most famous moonshot was John F Kennedy's 1961 challenge to land a man on the moon and safely return him to Earth within the decade. Our moonshot programme would seek to galvanise UK leadership in tackling recognised global problems which are seemingly insurmountable but could be transformational if resolved and are entirely measurable when achieved. Through a programmatic approach, the moonshots would invest in the discovery research, disruptive technologies, innovations and other breakthroughs that would make huge steps to solve these problems.

From the UK being the first country to sequence the entire genome of 100,000 NHS volunteer patients to create the world's first genomic medicine service, to delivering a Covid vaccine in record time, the UK has a legacy of delivering inspiring moonshots. Delivering a Covid vaccine drew on a wide range of academic disciplines, innovated in regulation, drew on social sciences to encourage take up, and worked with industry and the third sector to move from the fundamental research into manufacture and distribution in record time.

Pioneer Innovation would be inspired by the original moonshot and these groundbreaking moonshots in its approach. It would also learn from and be distinctive to the 2017 Industrial Strategy Grand Challenges and Industrial Strategy Challenge Fund.

Through a programmatic approach, the moonshots would invest in the disruptive technologies and other breakthroughs that would make huge steps to solve these problems. One size does not fit all, so the moonshots would be able to deliver funding across a range of mechanisms from grants, co-funding, and loans, to challenge prizes, as well as to catalyse private sector co-investment.

The moonshots programme would be developed in close partnership with business, academia and the third sector, drawing on the Council for Science and Technology's recommendations about the seven principles, where a moonshot should:

- excite and inspire the public, academia, and industry;
- help solve an important societal issue;
- be truly disruptive and ground-breaking;
- focus on areas where the underpinning science is at a stage to make a major breakthrough feasible;
- be specific and well-defined in what it sets out to achieve, with a clear timeframe for completion;
- take advantage of areas where the UK is, or is poised to be, a world leader; and
- generate significant additional benefits.

The first step would be to work with key public and private sector leaders, including small and large businesses, research communities and the public, to identify a small number of targeted and delivery focused moonshots that can deliver against Pioneer Innovation's four priorities. This process would start immediately with an opportunity to register your interest to be involved in a series of focused roundtables for each priority area. These facilitated discussions would help us to define the moonshots and identify the expertise and collaboration across the UK and internationally that would be required to deliver them. Selection of the moonshots would be by an expert panel drawn from across business and academic disciplines.

Following that, the Government would launch the programme with an open call to the market around the selected challenges, seeking both participation and investment.

One size does not fit all, so the moonshots would be able to deliver funding through a range of mechanisms from grants and co-funding, to prizes and loans. Each moonshot would have a central coordinating team that would monitor the programme and drive real outcomes against clear milestones.

Pulse funding

Recognising the challenges of ongoing delays to Horizon investment, Pioneer Innovation would also provide a pulse of rapid and agile investment across all four priority themes, to balance the longer-term moonshots programme with more immediate opportunities for access to funding, and to kickstart programmes, collaboration and investment opportunities.

Investment would be fast-tracked through Innovate UK via rapid engagement with Catapults, the network of Hubs and Institutes relevant to the four priority themes, to accelerate new technologies, products, systems and services to market with focused activity on development, scale-up & commercialisation. This fast-track activity would deliver exciting innovation discovery and development work and seed funding to bring new products and services to market, with mechanisms including:

1. **Quick start Catalyst programmes** (drawing on examples such as the original Biomedical Catalyst) which fast track funding to deliver exciting innovation discovery and development and commercial match funding to bring new products and services to market;
2. **Innovation sandpits** which bring businesses and researchers together to identify new programmes; and,
3. **Challenge Prizes** which would provide targeted rewards for innovators to develop breakthrough solutions for the most complex and challenging problems.

The funding would aim to build rapid momentum by priming sectors and kickstarting Pioneer priorities across the SRTI system, providing routes to attract and secure onward investment.

This pulse of funding would also look to accelerate the Gateway to Global Programme, working with Catapults to further facilitate SME access to global supply chains and accelerate commercialisation. It would further develop projects in themes and sectors relevant to the four priorities (for example use of space tech for agriculture and marine, or critical minerals supply chain development) that are already underway. It would seed and pilot new projects designed through engagement with research and business, to help UK organisations, including UK SMEs, more easily access international markets and supply chains by creating the networks and partnerships that open doors.

Eureka

Both Pioneer Global and Pioneer Innovation would be complemented by the Government boosting UK participation in the Eureka network, which comprises over 45 countries including all EU Member States. This would help UK SMEs and innovative businesses maintain and expand existing links with European partners while forging stronger connections with countries further afield, such as South Korea, Canada, and Singapore.

How to apply?

UKRI would issue the relevant competition and application guidance for the range of activities across this portfolio. Access to the schemes would be widely publicised to ensure businesses and research organisations across the UK are aware of the mechanisms and the application process. Industry-led and academia with industry bids would be particularly welcome. Where these opportunities are to be run by other organisations, they would advise on the relevant process.

Summary of Pioneer Innovation

Aims

Pioneer Innovation would seek to galvanise UK innovation and major private sector investment by harnessing innovations from existing industrial challenges to the development of tomorrow's technologies. This approach would draw on the best from different disciplines, from social sciences to physics, arts and humanities to engineering, and link in business, regulatory and policy ecosystems. It aims to create opportunities and tackle issues for everyone in our society, as well as to develop the UK's strategic advantage, resilience and productivity.

Programme

- At the heart of Pioneer Innovation will be a small number of inspiring moonshots - bold, tangible programme ambitions to instil a sense of direction and offer concrete goal-oriented solutions to tackle existential societal issues problems that seem intractable but could be transformational if solved, and will work in partnership with the sector to develop these.
- Across the programme The Government would use a range of short, medium and longer-term approaches including near-term "pulse" funding.
- The four priority themes for Pioneer Innovation are:
- **Green Industrial Growth:** Achieving net zero is the biggest challenge the planet faces but also creates opportunities for green industries and economic growth. We will build on our Net Zero Strategy to embed the UK as a world leader and collaborator in sustainability, net zero and decarbonisation.
- **Health Innovations - Human, Animal and Plant Health Science:** driving healthcare innovation to enable people to live healthier lives; embedding the UK's position as a leading global destination for life sciences; and accelerating human, animal and plant health research and innovation to establish the UK as a global leader in biosecurity.
- **Resilient UK – resources and national security:** linking research and industrial partnerships and leverage international investment to deliver UK resilience and security which ultimately will support economic prosperity and productivity.
- **Transformative technologies:** channelling investment into the five strategic priority technologies identified by the National Science and Technology Council (NSTC): Artificial Intelligence; Engineering Biology; Future Telecoms; Quantum Technology; and Semiconductors.

Benefits

- Taking a co-design approach to bring together disciplines and sectors to tackle some of the biggest global and social issues, spearheaded by inspiring moonshots that make the UK an attractive place in which to locate or to partner with to tackle these challenges.
- Flexible agile approach to funding using different mechanisms to give a short term boost to investment alongside longer term funding.
- Making the most of UK's strengths to build productivity and strategic advantage that results in jobs and growth across the UK.

Pioneer Global



The UK deeply values and appreciates the importance of global partnerships in SRTI. The UK's track record in collaborations across the decades will form the bedrock of our work to come.

For decades the UK has been widely respected as a global leader in international scientific, technology, research and innovation collaboration – from outer space to the poles to the deep ocean to nuclear physics to intracellular bioscience, to the broad sweep of the arts and humanities.

These investments have yielded impressive results, including:

- developing new antibiotics to tackle Anti-Microbial Resistance with South Africa;
- developing more resilient strains of rice with India;
- innovating new remote medical diagnostics with Malaysia;
- boosting energy storage research with the US; and
- ground-breaking research by the British Antarctic Survey on the ozone hole.

But Government must, and will, do much more, to build on these achievements to further cement the UK's position as a science and technology superpower. The recently released [International Technology Strategy](#) outlines the UK's approach to achieving this ambition, and highlights our commitment to building partnerships that will help us to deliver this goal. To stay on the competitive edge of SRTI requires active prioritisation, and strong international partnerships. International collaborations are increasingly critical to delivering better scientific outcomes, supply chain resilience, standards and to overcome shared global challenges such as climate change. The pressures of achieving environmental resilience, supporting healthy populations across the world, and harnessing the power of AI for growth are inherently global and the endeavour to solve them requires targeted partnerships.

Pioneer Global would enable UK researchers and companies to deepen:

- Discovery-driven collaborations;
- Collaborations with European partners through the Horizon (Third Country Participation) & Eureka programmes;
- Collaborations with R&D powerhouse nations and emerging science superpowers around the world; and
- International partnerships focused on urgent global challenges delivered through interdisciplinary methods and open to all academic fields from physical, sciences, mathematic, engineering, and biological sciences, to arts, humanities and social sciences.

By building stronger SRTI partnerships, Pioneer Global would support strategic autonomy through building up resilient supply chains and alternatives, equip the UK to shape and adapt technology shifts, and be a force for positive UK and global economic resilience and sustainable international development. It would support the Government's goal to put SRTI at the heart of the UK's alliances and partnerships worldwide, with consequent benefits for UK businesses and communities that flow from increased global cooperation, collaboration and trade.

European collaborations

Around two-thirds of Horizon Europe calls would still be open to UK researchers and companies as Third Country applicants. Third countries are not eligible for mono-beneficiary calls, such as those under the European Research Council (ERC) and Marie Skłodowska-Curie Awards (MSCA), European Innovation Accelerator (EIC) programmes or any call that is flagged under article 22.5 of the Horizon Regulation.

Early engagement with the UK research and innovation sector highlighted that Third Country Participation (TCP) is a key avenue for global collaboration. In response to this clear steer, [the Government document published on 20 July 2022](#) confirmed that government would fund access to Horizon Calls open for all eligible consortia as Third Country applicants, signing grant agreements before 31 March 2025. This funding would cover the lifetime of the grant. Reflecting the needs of the sector, government would engage stakeholders on its approach to funding for Third Country Participation beyond this date and make an announcement by October 2024.

Government's current estimate is that TCP would invest up to approximately £320 million in the current SR contributing to approximately £1.3 billion of investment in TCP over the lifetime of projects. Actual funding would depend on demand.

Global collaboration beyond Europe

UK science is a global force through Europe and beyond. This flagship programme would grow strong connections with key partners across the globe, prioritising support for research & innovation collaborations with UK geostrategic and thematic priorities. The UK would take a forward-looking approach to prospective partners, ensuring that the UK is leading collaborative efforts between nations with shared goals and growth potential in the field of scientific discovery. These priorities, which align with the Government's Integrated Review and input from UK and international stakeholders, could include tackling urgent global challenges from Net Zero, to pandemic prevention, improving health security, to more targeted opportunities for UK impact in areas like polar research and agritech.

By using science leadership to tackle global challenges, the UK would convene global collaborations between groups of countries. It would drive progress on specific issues through these 'minilateral' groupings, deepening collaborations over the coming months and years. For example, the UK could:

- Build on collaborations such as through the International Joint Initiative for Research in Climate Change Adaptation and Mitigation;
- Build new partnerships with global leaders in clean energy innovation to drive progress on Net Zero through Mission Innovation; a global initiative bringing together 23 countries and the European Commission; and
- Convene and deepen collaborations around emerging global SRTI challenges like space debris, polar research and tropical medicine and agriculture.

Discovery-driven elements of the programme would continue to ensure that world-leading UK researchers have access to those international partnerships (including multilateral) that are critical to delivering world-class research wherever in the world the best partners are based and across the full range of disciplines.

International scientific collaboration demands mutual respect for the key frameworks that underpin "scientia", free speech, the rule of law, open science, respect for intellectual property, research security. Through the UK's Presidency of the G7 in 2021 and the Research Compact, government set out its vision to promote the conditions of freedom, independence, openness, reciprocity and transparency under which science partnerships flourish. The UK is committed to building on this foundation to ensure an international environment which is both as open as possible and as secure as necessary and creating an environment which ensures a strong, diverse and resilient science community, allowing talent to reach its full potential. These commitments are enablers of the best scientific outcomes and the Government wants to go beyond creating the enabling environment, using this environment to realise the benefits of world-class science to address the most pressing global challenges such as feeding 9 billion people by 2050, addressing climate change, clean oceans, and ensuring the safe use of space.

All Pioneer Global activities would therefore build on the UK's leadership role in SRTI in the G7, G20, the Commonwealth and beyond.

An expanded International Science Partnerships Fund (ISPF)

The International Science Partnerships Fund (ISPF), launched in 2022, was designed to deepen scientific collaboration between the UK and international R&D powers on strategically important science themes. Under Pioneer Global this fund would be expanded to tackle global challenges and develop future technologies, positioning UK researchers at the heart of global solutions. An expanded ISPF would be delivered through established partners – UK Research and Innovation (UKRI), the UK National Academies and selected Public Sector Research Establishments (PSREs), such as the Met Office, UK Atomic Energy Authority (UKAEA) and National Physical Laboratory (NPL).

This expanded fund would:

- support long-term SRTI working with international partners on the UK's strategic research priorities of Resilient Planet, Transformational Technologies, Healthy People, Animals and Plants; and nurturing Tomorrow's Talent across all disciplines); and catalyse groups of countries collaborating on specific areas like agritech, funding projects in a more dynamic and agile way;
- tackle global challenges and develop future technologies, positioning UK researchers at the heart of global solutions;
- focus 70 percent of funding on priority countries, building on existing international partnerships between the UK and global partners; and
- Distribute a further 30 percent of funding to support a wider range of partnerships.

Strategic Multilateral and Minilateral Collaborations

Deploying UK SRTI to better tackle the urgent global grand challenges requires broad multi-lateral and wider international partnerships. The UK has always been a major leader / convenor in international SRTI – through our active engagement and often leadership in a raft of international science for global good.

Pioneer provides an opportunity for strategic bilaterals and key minilaterals bringing together groupings of nations working together on areas of research with shared interests and deep R&D heritage, to tackle urgent global grand challenges. For example, this could include work in polar research, where the British Antarctic Survey is a major player in both Arctic and Antarctic science, rapidly becoming a major geopolitical 'frontline' of global science, to agritech in Africa where UK science leadership has developed and scaled new drought and disease resistant crops, and livestock vaccines, to space sustainability where the UK is leading efforts with

international partners to help ensure a safe, sustainable and secure space environment.

Pioneer Global is intended to give the UK a vehicle to better support these vital international collaborations.

Discovery-Driven Collaborations

The SRTI sector has rightly stressed that discovery-driven approaches are critical to delivering world-class research. Consequently, Pioneer Global includes elements to ensure that world-leading UK researchers have access to those international partnerships (including multilaterals) wherever in the world the best partners are based and across the full range of disciplines and the ability to lead them.

In addition to the priorities-driven partnerships investment, funding would be expanded across investigator-led schemes to support curiosity-driven discovery research, which was highlighted by the sector as being highly valued and impactful.

These partnerships would bring together UK and global expertise to make new discoveries and develop solutions to shared challenges. This would use existing UKRI mechanisms so that opportunities can be launched rapidly, including UKRI research councils offering more opportunities for international co-investigators to participate in selected schemes.

In addition, government would expand investment in multilateral forums (for example the Belmont Forum, the Human Frontier Science Programme, and Mission Innovation) to create more opportunities for UK researchers to lead and shape global research, collaborate internationally, and gain wider and deeper networks for future research, as well as encouraging international co-funders to increase their own contributions.

Expanding our engagement in multilateral forums would provide critical alternatives to supporting multilateral international collaboration outside of Horizon Europe, where the UK can play a leading role in setting agendas and co-ordinating programmes. Research from these investments would have direct impacts on the future health, security, and economic growth of the UK, tackle global challenges such as food security and infectious diseases, and advance breakthroughs in emerging technologies.

How to Apply

Prospective researchers and innovators would apply via UKRI, UK National Academies (NAs) or the PSRE most associated with their field. Applicants would be provided with ample time to develop and submit proposals.

Engagement

Pioneer Global has been shaped through engagement with UK and international delivery partners and the wider researcher and innovation sector to determine demand, as well as capturing and reflecting their views and wider values. Further information on future engagement can be found at the end of the document.

Summary of Pioneer Global

Aim

Fund continued work with partners across Europe in large collaborative projects via new programmes, Third Country Participation in Horizon Europe (TCP) and discovery-driven research, to further cement the UK's position as a science and technology superpower.

Programme

Foster collaborations with established and developing economies around the world, while maintaining research collaborations with European partners including:

- Provide focused investment to work with key strategic international partners on top research priority areas including through an expanded International Science Partnerships Fund (ISPF)
- Maintain European collaboration through funding for all eligible consortia for Third Country Participation in Horizon until 31 March 2025. The Government will engage stakeholders on its approach to funding for Third Country Participation beyond this date and make an announcement by October 2024.
- Deliver discovery-driven investment to increase opportunities for UK researchers to lead research with the best in their fields across a wide range of disciplines in Europe and globally.

Benefits

- Give the UK more autonomy over science funding and allow the UK to experiment with new funding approaches.
- Continue collaboration with European partners through Third Country Participation (TCP) while pursuing broader partnerships around the world.

Pioneer Infrastructure



World class science and innovation need world class equipment, laboratories and facilities. The Pioneer Programme is built on the underlying enablers of high-quality R&D in the UK: our organisational landscape and research-enabling infrastructure. The Pioneer Infrastructure programme would take advantage of a once-in-a-generation opportunity to provide surge investment in key national SRTI infrastructure across the UK.

Government would, if needed, upgrade and support new world-class national and international SRTI infrastructure assets, unleashing the full potential of the UK's world-class Public Sector Research Establishments (PSREs), universities, institutions, Catapults, national labs and research organisations across the whole of the UK. This would be new investment that would complement existing funding for infrastructure secured through the 2021 Spending Review (SR21) and build on science and innovation clusters across the UK, with a focus on attracting talent and supporting innovation and global collaborations. To create a thriving Science and Technology ecosystem in the UK that supports international science collaboration, the Government would consider infrastructure investments through use of the own-collaborate-access framework set out in the 2021 Integrated Review. Taking this approach would build infrastructure capability and capacity in the UK while also benefiting from our valued international partnerships.

Pioneer Infrastructure presents a bold plan to transform and modernise the capabilities of the UK's research and innovation institutions and deliver growth for the local areas and communities in which they operate. By investing in the underpinning assets which support research and drive the development, commercialisation and diffusion of new ideas, the UK would catalyse the growth of SRTI clusters across the UK, driving economic growth through innovation and supporting government's levelling up ambitions, including building on Innovation Accelerators and forthcoming Investment Zones. The objective would be to provide researchers and innovators across the country with access to internationally competitive SRTI infrastructure. Government

would also consider investments in response to technology developments such as the Future of Compute Review published 06 March 2023.

If the UK cannot agree fair and appropriate terms for association to Horizon Europe with the EU and association is not possible, then investment could include:

- **UK Research and Innovation (UKRI) World Class Labs programme (WCL).** The programme supports higher education providers and research institutes with funding to maintain and upgrade their research facilities and equipment, ensuring they remain internationally competitive, thus increasing the absorptive capacity of the SRTI system. Previous investments in WCL have included a £300 million boost in FY20/21, which delivered upgrades such as a £3 million grant for new autoclaves for the Disease Modelling Unit, part of the Quadram Institute Bioscience, £10 million for upgrades to Science and Technology Facilities Council laboratory equipment in Oxfordshire, Cheshire, Cleveland, and Scotland and over £1 million for "big data" centres on mobility, urban planning and resilience for Glasgow, Liverpool and Oxford.
- **UKRI Digital Research Infrastructure (DRI) programme.** Providing investment to enhance the digital capacity of the UK research system and support UKRI's vision of a coherent state-of-the-art national digital research infrastructure, including compute, data, people and code. UKRI's DRI would seamlessly connect researchers, policy makers and innovators to the computers, data, tools, techniques and skills that underpin the most ambitious and creative research, pathing the way for greater level of data sharing.
- **DSIT PSRE Infrastructure fund.** To address the same small to mid-range investments in equipment and facilities for all the UK's PSREs and national labs. This would allow us to upgrade the infrastructure capabilities of key national institutions to maintain their position as international centres of excellence. Investments here could include, for example, replacing the ageing Van De Graaf Accelerator at the National Physical Laboratory.

Connectedly, the Government sees an opportunity to grow the UK's network of infrastructure that supports later-stage R&D in innovative businesses, helping to address key shortfalls such as wet lab space for life sciences startups.

Strategic Investment in Research-performing Organisations

The [Independent Review of the Research, Development and Innovation \(RDI\) Organisational Landscape](#), led by Nobel Laureate and Director of the Francis Crick Institute, Sir Paul Nurse, examined the mix of organisations that do research across the UK. Building on research and wide stakeholder engagement, it considered whether the current mix is right, and whether it enables organisations to continue to do excellent research and translate this into benefits for the country. The Review's findings and

recommendations aim to ensure the landscape remains fit for driving long term sustainable growth, productivity, and societal benefits for the UK.

As set out in the [Government's plan](#) to cement the UK's place as a science and technology superpower by 2030, government will explore options and funding to diversify the UK's research organisations, aligned with Sir Paul's recommendations. This includes considering opportunities to support a range of innovative institutional models, existing and new, such as Focussed Research Organisations (known as FROs), working with industry and philanthropic partners to open up new funding for UK research, while continuing to support the existing landscape to function as effectively as possible. Pioneer Infrastructure would build on this, and the Government would consider innovative approaches to provide sufficient and sustainable financial support, as it seeks to leverage the UK's advantage in strategic areas, drive innovation, and unlock significant economic value.

How to Apply?

Where UKRI is the delivery partner it would run its programmes under the usual rules and timescales that apply to those schemes with any additional funding that might be available.

Application guidance would be provided with ample time to allow detailed and considered applications.

Engagement

The Government will engage with sector experts to identify gaps in the research landscape and assess scientific and strategic needs, as well as opportunities for co-investment. This includes considering a range of organisational structures, while continuing to support the existing landscape to function as effectively as possible.

Summary of Pioneer Infrastructure

Aim

- Target additional funding to boost the underlying enablers of high-quality SRTI.

Programme summary

- Upgrade and support new world-class national and international SRTI infrastructure assets, unleashing the full potential of the UK's world-class Public Sector Research Establishments (PSREs), universities, institutions, national labs and research organisations across the whole of the UK.
- This would be new investment that would complement existing funding for infrastructure secured through the 2021 Spending Review (SR21), with a focus on attracting talent and supporting innovation and global collaborations.

Benefits

- Catalyse the growth of SRTI clusters across the UK, driving economic growth through innovation and supporting government's levelling up ambitions.
- Support higher education providers and research institutes with funding to maintain and upgrade their research facilities and equipment, ensuring they remain internationally competitive.
- Enhance the digital capacity of the UK research system.
- Support the financial sustainability of the research landscape.

Next steps and approach to engagement

The Government's priority is to continue to support international collaboration in SRTI, and will continue to engage constructively with the EU regarding Horizon association. This is our preference, but the terms will have to be fair and appropriate for the UK, especially having lost out on two important years' worth of membership. However, if the UK is unable to reach fair and acceptable terms through discussions with the EU, the Government has been developing plans for a bold alternative. Working together with the SRTI community, this would allow us to achieve the ambition of cementing the UK's position as a science superpower and innovation nation.

This suite of programmes offers researchers and innovators around the UK a huge breadth of new opportunities to work collaboratively with partners across the globe, while also demonstrating that the Government will continue to protect the interests of businesses, researchers and innovators in the UK.

Building on lessons learned from the 2019 Smith-Reid review, the Government understands the voices of the SRTI community are vital to deliver an effective programme. This is why the Government has been working closely with, and will continue to work closely with, partners in the SRTI community to ensure that Pioneer is a programme that is equal to the needs and the challenges of the researchers, businesses and innovators who would use it. This programme, to be delivered working in partnership with industry, would create many opportunities for world-leading researchers and innovators, allowing them to access the UK's internationally recognised expertise, facilities and the resources needed to drive forward their ideas and make a significant contribution to global challenges.

Following the publication of this document, Government will continue to engage intensively with representatives across the business, research and innovation sectors on aspects of the Talent, Global, Innovation, and Infrastructure programmes, with the aim of ensuring that the proposals contained in the document encompass the whole SRTI community. As part of this process, the government would like to extend an invitation for feedback to the wide range of institutions and end users in the SRTI community. In particular, the Government would welcome the expert input of this community on the sections drawn out below as it strives to create the best possible programme of support to make real the vision of the UK as a Science Superpower and Innovation Nation.

Following the conclusion of these engagements, the Government will set out full detail on these programmes in due course.

Pioneer Talent

The Government has developed the Pioneer Talent offer through initial engagement with the research community and the SRTI sector, and will further test key features of the offer with these stakeholders. The Government will also test key elements of the

Pioneer Discovery offer with the research community, businesses, universities and delivery partners, including UKRI and the four National Academies, to ensure the offer is designed to attract and retain the most talented researchers in the UK and to provide the funding and support they need.

Specifically, the Government will be engaging on how to build strong links from research to society, industry and business, and on ensuring that not only the funding size and length of the awards are attractive, but also that full training and development opportunities to support researchers across all career stages are provided.

Pioneer Innovation

Through Technology Missions funding, UKRI and DSIT are already engaging with partners on what mechanisms such as challenges, missions and moonshots should look like, what would be the best balance of mechanisms to deliver the programme's ambitions and how to form the best balance of impact, breadth and accessibility.

UKRI will work to identify how best to bring in new businesses, from the UK and internationally, and those with innovative ideas, whatever the development stage.

UKRI and DSIT has also engaged with partners to develop the aims, objectives and content of the initial tranche of technology missions in AI, Quantum and Engineering Biology. This has included:

- Seeking expert stakeholder advice to undertake detailed analyses of market capabilities and opportunities for advantage;
- Drawing on the UKRI wide review of Artificial Intelligence which involved 300 external organisations;
- Working with strategic advisory groups such as the National Quantum Technologies Programme, the office for AI and the AI Council, the Engineering Biology Leadership Council, Bioindustry Associations and the Engineering Biology Advisory Committee; and
- Industry cultivation events to build communities of interest.

To develop Pioneer Innovation, DSIT established an advisory group comprising stakeholders across academia and industry to help shape and refine the four priority areas. DSIT and UKRI will engage more widely to shape the moonshots that would spearhead the four priorities, as well as to explore the best combination of mechanisms to deliver Pioneer Innovation's ambitions, and how best to balance impact, breadth and accessibility over the short, medium and long-term.

Pioneer Global

The Government will engage stakeholders on the global programme, including its approach to funding for Third Country Participation beyond 31 March 2025 and make an announcement by October 2024.

Pioneer Infrastructure

The Government will engage with sector experts to identify gaps in the research landscape and assess scientific and strategic needs, as well as opportunities for co-investment. This includes considering a range of new organisational structures, such as Focussed Research Organisations, while continuing to support the existing landscape to function as effectively as possible.

How to make contact

We look forward to engaging further across the UK's SRTI community on what is set out here.

Please return any comments to pioneer@beis.gov.uk

