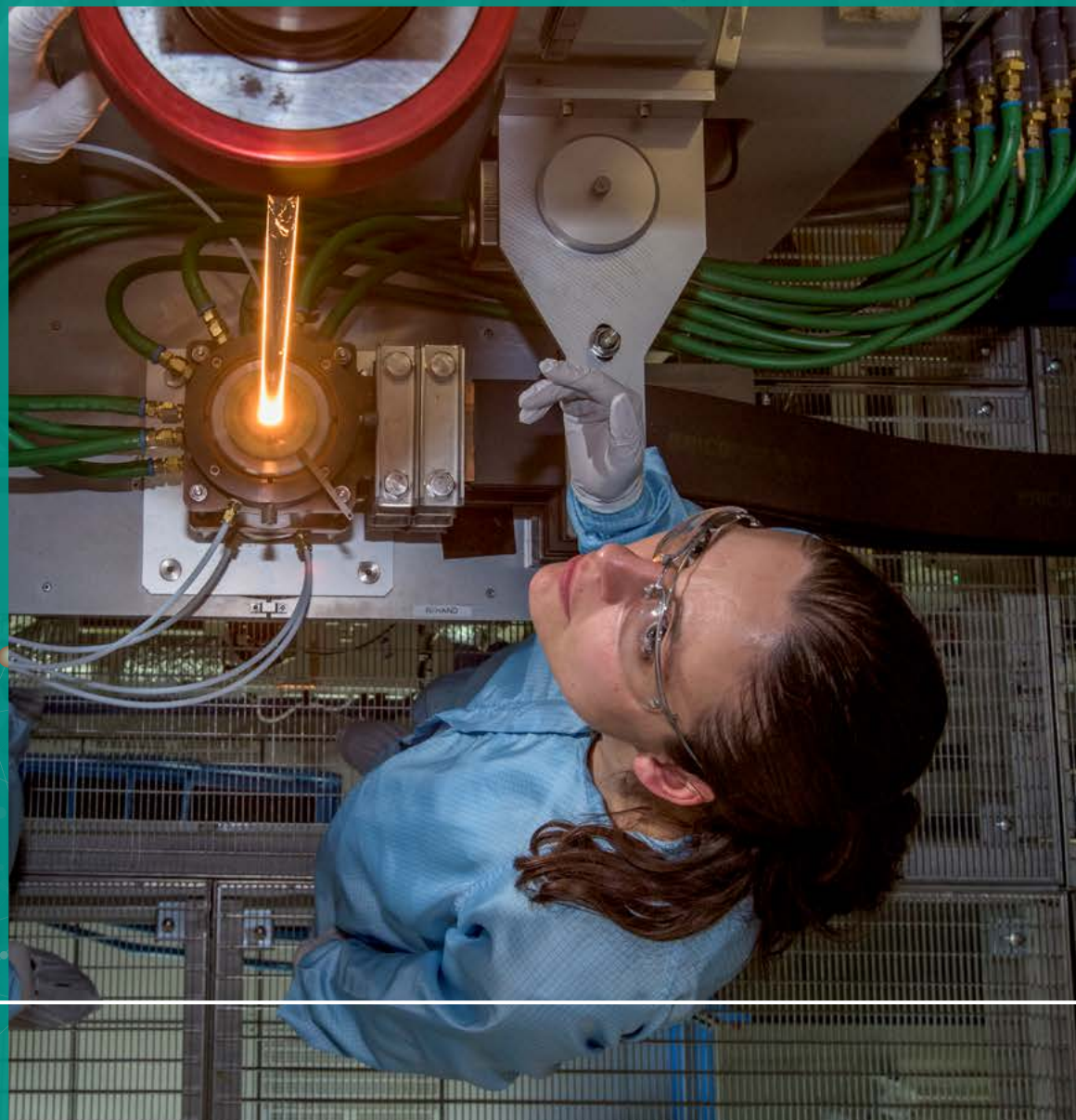




Engineering and
Physical Sciences
Research Council

Strategic Delivery Plan

2022–2025





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Professor Dame Lynn Gladden (*Executive Chair, EPSRC*)

Foreword

Engineering and physical sciences have transformed the world around us and will play a critical role in achieving a sustainable, resilient, and prosperous future. EPSRC will support the people, ideas, innovations, and technologies to achieve this, investing in a balanced portfolio of diverse, curiosity-driven research and focused mission-led programmes. We will work in partnership with our community and across UKRI to strengthen our outstanding research and innovation system, driving benefits for society and the UK economy.

The disciplines within EPSRC's remit underpin and advance all areas of science, engineering and technology, enhancing fundamental understanding and delivering business capabilities and innovations that drive a better world. This expertise was integral to the UKRI Covid-19 pandemic response, where engineering and physical sciences research quickly translated into policy impacts: from evidence to support the reopening of the events industry, to rapid vaccine manufacturing underpinned by years of fundamental and applied research.

The engineering and physical sciences community is well-connected, partnering and co-creating across disciplines and sectors to accelerate innovation and impact. These partnerships catalyse private sector investment, generating new jobs and contributing towards the government’s target of total R&D spend reaching 2.4% of GDP by 2027. Investment in science, engineering and technology produces the talented people and innovative solutions that boost the productivity of UK businesses, supporting innovation clusters and key industrial sectors across the country.

Adding value through investment, partnerships and leadership

The UK has an outstanding research base, which EPSRC builds upon and strengthens by investing in the people, ideas and technologies needed to tackle today’s priorities and create tomorrow’s opportunities. We are proactively collaborative in this endeavour, capitalising on our expertise and track record to work across UKRI and with other funders, including government at all levels and businesses, as well as the wider local, national and global research and innovation landscape.

Through these strong partnerships, we enhance the research and innovation ecosystem in line with the UKRI principles for change: supporting diversity and creativity, increasing local, national and global connectivity, enabling resilience through our funding routes, and widening engagement. We catalyse change and drive impact through our leadership; for example, in harnessing our existing partnerships to increase academic-business co-

creation and business co-investment in research, and in embedding environmental sustainability in everything that we do.

Delivering EPSRC’s vision and ambitions

EPSRC’s vision is for the UK to be recognised as the place where the most creative researchers can deliver world-leading engineering and physical sciences research. In creating this delivery plan, we have developed our ambitions and priorities to realise this vision, enabling our community to advance fundamental knowledge, while aligning our mission-driven investments to government strategies. Our investments will generate positive impacts on the sustainability, resilience, and prosperity of the UK, helping the country to respond to current and future national and global challenges, and delivering value for society.

This delivery plan arrives at a particularly exciting time for the research and innovation community: EPSRC welcomes the opportunity to deliver against [UKRI’s five year strategy](#), building on our successful history of driving interdisciplinary research and innovation working across UKRI’s councils. The research and skills training that we fund will be integral to addressing the challenges highlighted in the five strategic themes set out in the UKRI strategy. EPSRC investments will also enable UKRI to lead across the [Innovation Strategy’s](#) seven technology families and deliver key technologies identified in the [Integrated Review](#).

We have focused our plans in three areas:

- discovery-led research: reaffirming our commitment to the core disciplines of engineering and physical sciences
- mission-driven priorities: driving the translation of breakthroughs in engineering and physical sciences research through to social and economic benefit in net zero; artificial intelligence (AI), digitalisation and data; transforming health and healthcare; and quantum technologies.
- maintaining an effective ecosystem for engineering and physical sciences: providing the skills training, partnerships, places and infrastructure required by our community to deliver their ambition.

Balanced delivery of these three areas will ensure that the UK has the strong academic foundations, knowledge networks, skills and capabilities to realise strategic advantage as a science superpower.

I look forward to working across UKRI and with the wider engineering and physical sciences community to deliver EPSRC’s vision and ambitions.

Professor Dame Lynn Gladden
Executive Chair, EPSRC

September 2022



What we will achieve

EPSRC supports new ideas and transformative technologies which underpin innovations that benefit our economy, environment and society. Working as part of UKRI to deliver our five-year strategy, we will support the world-class engineering and physical sciences research and innovation system to make a substantial contribution to increasing UK-wide R&D spend beyond 2.4% of GDP.

In this delivery plan, we build on our strong track record of working across UKRI, and in partnership with government, businesses of all scales and the wider local, national and global research and innovation landscape. We will convene and catalyse these communities so they are more resilient, and better connected to deliver national and global priorities. We will also enhance business co-investment, including by supporting clusters of leading-edge expertise across UK nations and regions.

Our plans are framed around eight cross-cutting priorities, which we have developed to deliver against the UKRI Strategy, support research and innovation across our remit, and address government and National Science and Technology Council (NSTC) priorities. These priorities, outlined below, provide balance across our portfolio: three address discovery research, four deliver mission-inspired research, and the eighth ensures an underpinning effective ecosystem.

Discovery research

EPSRC will support the UK's ambition to be a science superpower by investing in **world-class ideas** through discovery research through three priorities across our core disciplines:

- Physical and Mathematical Sciences Powerhouse.
- Frontiers in Engineering and Technology.
- Digital Futures.

EPSRC's investments in these areas deliver clear long-term economic, social and environmental benefits, as shown in case studies later. Our core disciplines underpin and advance all areas of science, engineering and technology development across UKRI, producing tools and technologies that form the foundation of future UK prosperity.

Mission-inspired research

We will target **world-class impacts** focused on four mission-inspired research priorities:

- Engineering Net Zero.
- AI, Digitalisation and Data: Driving Value and Security.
- Transforming Health and Healthcare.
- Quantum Technologies.

These interdisciplinary challenges underpin the five strategic themes set out in priority 5.1 of UKRI's strategy; for example, to build a green future and

build a secure and resilient world. They respond to business needs and the Innovation Strategy's seven technology families, especially through programmes in AI and quantum technologies, and scoping options for digital twins. These priorities will support delivery of government strategy while building resilience to future challenges following the Covid-19 pandemic.

An effective ecosystem for engineering and physical sciences

Our eighth and final priority is to enable delivery across our remit by supporting **world-class people, places and innovation** through a more inclusive, connected and resilient ecosystem. We will maximise UK prosperity by:

- developing the skills that underpin and encourage multidisciplinary research and deliver economic growth, while attracting and retaining the next generation of global research leaders, research software engineers, instrument technicians, innovators and business leaders.
- enhancing the institutions and research infrastructure needed for excellent research and innovation.
- catalysing business co-creation and investment across the UK. By co-working with businesses across the supply chain we will translate early stage research and innovation into the business R&D base, while providing the skilled people for more effective engagement with rapidly advancing technologies.

- using our knowledge and connectivity across UK nations and regions to support research and innovation clusters that meet local strengths and needs. This will contribute to levelling up commitments, benefitting economic growth, local productivity across key sectors, and a wider variety of publics.
- recognising that research is a global endeavour, working with international partners to address shared priorities and ensure that the UK remains a world leader in engineering and physical sciences, at the forefront of collaborating on global challenges.

Framed around the six UKRI Strategy objectives, this delivery plan sets out how we will deliver these eight priorities to realise our wider vision, transforming both our research communities, and UK productivity and prosperity more widely.

We will do this while continuing to innovate and drive greater efficiency and agility, contributing to the UKRI objective of being a **world-class organisation** and providing value for money in line with the public's expectations. We will proactively manage our portfolio across our priorities, maintaining a focus on yielding tangible short, medium and long-term benefits from our research. We will enhance positive outcomes from our activities, including by enhancing environmental sustainability across our operations and funded activities.

Our purpose

EPSRC enables the UK to be recognised as the place where the most creative researchers can deliver world-leading engineering and physical sciences research.

Our principles for change – we will embed the principles of diversity, resilience, connectivity and engagement across all our work, to drive change and create the conditions for an outstanding research and innovation system

Our strategic objectives provide the framework for how we will achieve our vision and realise our principles, through world-class:

People and careers	Places	Ideas	Innovation	Impacts
<ul style="list-style-type: none"> Creating an effective ecosystem by: <ul style="list-style-type: none"> Delivering essential STEM skills for the UK through investment in people. Championing a research culture where everyone is respected, valued and able to contribute and benefit - embedding equality, diversity and inclusivity in everything we do. 	<ul style="list-style-type: none"> Creating an effective ecosystem by: <ul style="list-style-type: none"> Enhancing UK prosperity through local, national and international partnerships, nurturing excellent research and strengthening clusters across UK nations and regions. Delivering world-leading capital and digital infrastructure – and championing the people and teams that enable this. 	<ul style="list-style-type: none"> Investing in discovery research to support the UK's ambition to be a science superpower, investing in three priorities across our core disciplines: <ul style="list-style-type: none"> Physical and Mathematical Sciences Powerhouse. Frontiers in Engineering and Technology. Digital Futures. 	<ul style="list-style-type: none"> Creating an effective ecosystem by: <ul style="list-style-type: none"> Co-working with business, facilitating deep partnerships and securing private co-investment. Connecting research and innovation. Accelerating translation, commercialisation and knowledge exchange, to realise the full potential of EPSRC-funded research. 	<ul style="list-style-type: none"> Investing in mission-inspired research, delivering key technology families, addressing UKRI's five strategic themes and transforming sectors, with four priorities: <ul style="list-style-type: none"> Engineering Net Zero. AI, Digitalisation and Data: Driving Value and Security. Transforming Health and Healthcare. Quantum Technologies.

Supported by **a world-class organisation**: being an efficient, agile organisation, empowering our staff, catalysing outcomes through partnership and leadership, and improving the sustainability of our operations.



Objective 1: World-class people and careers

At the heart of thriving research and innovation systems are talented, empowered people and teams. The UK needs a diverse academic and business workforce with the right skills to maximise the benefits of scientific and technological advances. Investment in engineering and physical sciences creates a strong UK ecosystem that is globally attractive to researchers and innovators.

We will recognise and value the diversity of roles required for effective engineering and physical sciences. This includes researchers and innovators, and the essential contributions of wider support systems including project managers, technical and administrative support, software specialists, and those who maintain our infrastructure.

1.1: Investing in people to deliver skills

EPSRC will build on our strong track record to attract, develop and retain talented people and teams across career stages. We will promote skills development and mobility across disciplines and career paths, including wider exploitation of fellowships for research software engineers, research technical professionals and applied research. Through this, we will deliver essential higher-level skills for the UK.

We will work across UKRI to support people across the research and innovation system, reducing bureaucracy and silos. This will reflect increased collective working across UKRI's £2 billion People, Culture and Talent portfolio, with initial evolution of our fellowships investments, and longer-term changes to doctoral student investments.

We will:

- start to implement the recommendations of our doctoral education review, including through the investments below.
- continue to recognise the importance of flexible studentship funding through further investment in our doctoral training partnership.
- recruit doctoral students to our existing Centres for Doctoral Training (CDTs), and launch a call in autumn 2022 for new CDTs. The call will address key interdisciplinary engineering and physical sciences needs aligned to our three discovery and four mission-inspired priorities, and to regional, national and global drivers. It will seek significant business leverage and co-creation

- support doctoral students through our Industrial CASE award allocations, discussed in section 4.1.

1.2: Shifting research culture to support people and teams

EPSRC will champion a research culture where everyone is respected, valued and able to contribute and benefit. We will empower our community to embed equality, diversity and inclusion (EDI) and enact change in their own environment, promoting greater collaboration and sharing good practice. We will champion and support open and responsible research and innovation, and encourage public engagement across our funded activities.

We will:

- publish and implement our EDI action plan in 2022, focusing on issues arising in the engineering and physical sciences research community. An example is improving our policies and practices to enhance accessibility and working environments for researchers with disabilities.

- fund an EDI sharing hub to harness existing resources including outcomes from EPSRC's Inclusion Matters portfolio (see case study) and our published EDI expectations.
- working across UKRI and with the British Academy, fund an EDI Caucus of interdisciplinary experts to provide research insights that will inform policy and practice across the research and innovation system.
- champion and support public engagement, aligned to the forthcoming UKRI public engagement strategy and to our place-based activities. We will encourage researchers to inspire the next generation of STEM people, involve diverse publics in research with potential public benefits including net zero, AI and digital technologies, and enhance public and patient involvement and engagement in our health and healthcare programmes.

Case studies

Empowering researchers to decarbonise rail transport

Research carried out by an EPSRC-supported PhD student has demonstrated the feasibility of introducing fleets of hydrogen trains, to support rail decarbonisation and therefore net zero commitments. The project demonstrates how EPSRC supports people to build connections in academia and industry to deliver impact.

Charles Calvert's EPSRC-funded PhD research, supervised by Dr Stuart Hillmansen, formed a vital part of the HydroFLEX project, a collaboration between the University of Birmingham and British rolling stock owner Porterbrook to develop the UK's first full-scale hydrogen train. The plan is to be able to retrofit current in-service trains to hydrogen by 2023, improving efficiency and sustainability.

Promoting Equality, Diversity & Inclusion among researchers and innovators

Our 2018 Inclusion Matters call funded 11 projects to accelerate culture change with respect to equality, diversity and inclusion. This includes the multidisciplinary STEMM-CHANGE project at the University of Nottingham, which has highlighted specific EDI impacts and challenges, alongside recommendations and good practice

interventions to improve processes, cultures and behaviours. This has included a report drawing out the specific impacts of the Covid-19 pandemic on the technical community, who are critical to research success. The report outcomes will support advancement of EDI across the breadth of research teams.





Objective 2: World-class places

EPSRC will nurture excellent research and innovation in places across the UK. We will enhance prosperity by supporting the clusters, institutions and infrastructure that attract global talent and help address regional inequalities. Many of our investments contribute to levelling up commitments by co-locating research and infrastructure investments within clusters of regional industrial strengths.

We have previously enhanced and broadened our relationships with stakeholders by introducing a team of heads of regional engagement, placed strategically across UK nations and regions: Northern Ireland, Scotland, Wales and England's East and West Midlands, North West, and North East, Yorkshire and the Humber. These have already informed EPSRC's national approach; for example, influencing a call to enhance clusters of academia and businesses in the financial services industry. We will continue to identify areas for collaboration, using local insights to deliver benefits across the UK.

2.1: Local, regional and national partnerships and clusters

EPSRC has a strong track record of connecting the people and organisations required to tackle societal and economic challenges and solve problems, wherever they are. Through this delivery plan we will continue to develop strong, mutually beneficial partnerships built on trust and openness: with businesses, universities, public sector research establishments, government, devolved administrations and other key stakeholders across the research and innovation landscape.

We will strengthen existing partnerships and clusters, and develop new co-created opportunities in engineering and physical sciences and beyond, built on national and local insights. Local partnerships and clusters are also key to delivering our innovation plans in section 4.

We will:

- build on the success of our institutional impact acceleration accounts (detailed in section 4.3) with £50 million to develop complementary place-based impact acceleration accounts, supporting growth in regional clusters and capabilities.
- widen and tailor our communications to demonstrate our approach to place and regional engagement, including by building new relationships with key local stakeholders and clusters through our heads of regional engagement.
- explore opportunities to align investments with local ambitions, across our mission-inspired research priorities where appropriate, and through our Centres for Doctoral Training call (see section 1).
- consider regional diversity in recruitment for our advisory structures, to broaden input into EPSRC's decision making, and ensure that local insights inform our approach towards a collaborative vision for UK engineering and physical sciences.
- establish place-based investments, including £2 million for a network to develop academic-business partnerships aligned to regional clusters of financial services businesses. We will monitor the effectiveness of this investment in expanding business networks, and look to extrapolate learning into our broader business engagement and place-targeted activities.
- trial innovative approaches to enable the government's levelling up commitments, such as facilitating co-delivery of research with local civic and business leadership. We will build on the established networks of our heads of regional engagement, our portfolio knowledge, and recommendations from our recent civic-academic partnerships survey.

We will enhance prosperity by supporting the clusters, institutions and infrastructure that attract global talent and help address regional inequalities

2.2: International partnerships

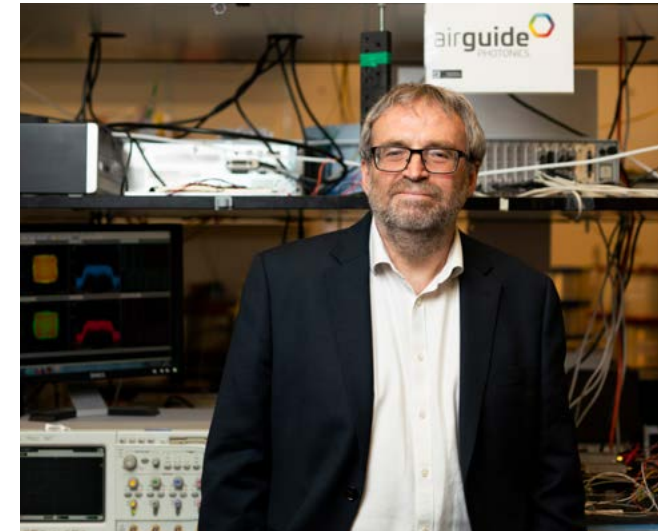
The UK is at the forefront of addressing global societal and economic challenges that have engineering and physical sciences at the heart – including climate change, cyber security and long-term sustainable growth. More than 40% of the projects we fund have international links.

We will work with overseas research funders and communities, deepening partnerships with key countries to strengthen the UK's international profile as a partner of choice, in the context of the UKRI trusted research and innovation principles. Through this, we will facilitate joint working between the UK research community and their preferred global partners, while attracting global talent and inward investment to give the UK a competitive advantage.

We will:

- connect our research and innovation base with international leaders through c. £30 million for Centre-to-Centre grants, c. £10 million for early career researcher international collaborations, and additional joint funding agreements.
- develop new joint activities with overseas partners such as Canada, Germany, India and Japan, to share expertise, address mutual priorities and support delivery of the Integrated Review and government science and technology priorities.

- build on our partnership with the USA National Science Foundation, expanding our joint funding agreement across our discovery research remit and with the ambitions to grow co-funded collaborations in priority areas of AI, net zero and quantum technologies.
- address challenges facing low and middle income countries investing c. £11 million to develop partnerships and position the community for future official development assistance calls.



Support for research and innovation clusters

EPSRC's previous investments have already catalysed innovation across the UK, often linked to regional strengths and clusters:

- the world-leading South Wales compound semiconductor cluster, bringing together EPSRC-funded academic research centres, a UKRI Catapult, and businesses from the complete technology chain. The cluster generates more than £600 million in revenue each year, employing more than 2000 people. Over £25m of EPSRC funding has supported expertise, skills and technology development.
- Silicon Gorge in the South West of England, one of Europe's most significant high-tech regions, featuring academic centres at the
- Universities of Bath, Bristol, Exeter and West of England, along with key UK and international businesses.
- cyber security in Northern Ireland, with investments such as the £5.5 million Innovation and Knowledge Centre for Secure IT (see case study in section 4).
- Photonics in Southampton, where decades of EPSRC support for pioneering work at the University of Southampton has driven a thriving cluster in and around the city. Over 1500 jobs have been created through over 50 companies at the vanguard of photonics innovation, underpinning the UK's £13.5 billion photonics industry.

2.3: Research infrastructure

EPSRC will support and enhance research infrastructure at all scales: from single items of laboratory equipment through to large-scale national facilities. This includes working with the community to strengthen cases to the UKRI infrastructure funding process. We will also champion the visibility, recognition and career development of research technical professionals (see section 1).

Through this, we will sustain world-class research across the landscape, aligned where appropriate to regional clusters. Equipment sharing across institutions and with industry is now well-established across the EPSRC portfolio and will continue to be an important characteristic of our investments, where appropriate. Improving the environmental sustainability of the portfolio will also be a key focus for selecting future investments.

EPSRC is committed to working across UKRI to deliver a coherent national digital research infrastructure within 5 years. This will enable UK researchers and innovators to harness the full power of modern digital platforms, tools, techniques and skills: an essential capability for the UK to lead partnerships on key global challenges, attract talent, and remain globally competitive.

We will:

- invest up to £190 million over the next three years in essential research equipment and facilities to support leading-edge research activities across engineering and physical sciences. This will include two further rounds of strategic equipment funding each year, and two institutional core equipment investments over the three-year spending review period.
- secure and deliver an ambitious pipeline of specific facilities, including £18 million for high-field nuclear magnetic resonance, £29 million for ultra-high field human MRI scanning (in collaboration with Medical Research Council), and £3 million for relativistic ultrafast electron diffraction and imaging.
- enhance nuclear energy research capability across the UK, making highly-specialised equipment available for exploitation by completing commissioning of the National Nuclear Users Facility.
- work with relevant communities to develop large-scale compute, data, skills and software infrastructure, delivering UKRI's vision for digital research infrastructure. In particular we will develop a business case for a UK-based exascale

compute capability.

- maximise the sustainability and usage of our infrastructure portfolio, considering sustainability broadly from an equipment, people and place perspective. We will build local collaboration and cross-sector initiatives, to improve accessibility of research infrastructure and technical skills to our diverse industry and user base.
- minimise the environmental impact of our research infrastructure investments, partnering with the community to enhance and share knowledge on the sustainability of research infrastructures, and piloting novel greener approaches.
- pilot UKRI problem driven, interdisciplinary approaches to developing next generation technologies in sensing and imaging (c. £1 million) and collaborative, community data infrastructure in physical sciences (c. £2 million).

Case studies

Strengthening creative industries in south west England

Built on 10 years of core EPSRC support, the Centre for the Analysis of Motion, Entertainment Research and Applications (CAMERA) is home to unique expertise and groundbreaking research into virtual reality and motion capture. Based at the University of Bath, CAMERA's skills and facilities have helped over 50 businesses to apply leading-edge technologies such as AI and machine learning to opportunities and challenges facing the £116 billion creative industries sector. CAMERA has been a cornerstone of growth in the sector, as well as the position of the south west England region at its forefront.

Catalysing a cyber security cluster in Northern Ireland

The Centre for Secure Information Technologies (CSIT) is at the heart of an innovation ecosystem, with over 40 companies providing almost 2,000 jobs in the Belfast area, and bringing £80 million per year into the local economy, including significant foreign investment. CSIT was established in 2009 as one of seven EPSRC-sponsored Innovation and Knowledge Centres, with co-funding from Innovate UK and Invest Northern Ireland.

Research at CSIT has led to ten new product concepts with a clear route to market and enabled the formation of six spinouts in areas including visual speech recognition and cryptography. CSIT have also supported seventeen start-up companies through their incubator programme.





Objective 3: World-class ideas

EPSRC will invest in the brightest ideas, creating the pipeline of future knowledge that will fuel the industries of tomorrow. We will identify emerging fields, take risks, and tackle problems through novel, creative approaches which bring a diversity of thought and experience. Through this, we will enhance resilience and sustainability in the research base.

We have set out three priorities which maintain and enhance discovery-led research, across mathematics, physics, chemistry, materials science, engineering and technology, computer science and ICT. These research areas are dynamic: they influence, and are influenced by, trends in global science and technology, driven by UK research expertise, infrastructure and excellence.

3.1: Physical and Mathematical Sciences Powerhouse

This priority covers a broad range of research, including chemistry, materials science, mathematical sciences and physics. Discoveries in these fields have transformed our understanding of the world around us, from the subatomic to whole planet level. Often driven by curiosity, these discoveries have created the building blocks for scientific and technical transformations that underpin all aspects of our lives, society and economy.

Our goal is to advance the science that provides the platform for the generation-after-next technologies to sustain the UK's global competitiveness. We will also highlight the role of research in these areas in opportunities aligned to the five UKRI strategic themes.

We will:

- catalyse new ideas and creativity in discovery science across the breadth of physical and mathematical sciences. This includes £6 million over three years to fund feasibility studies and short research projects through the small grants scheme in mathematical sciences.
- monitor and evaluate the outcomes of the additional £124 million investment made in 2020-2022 in mathematical sciences, capturing the impacts and successes from the different modes of investment to expand the evidence base of the key contribution of mathematical sciences to UK research and innovation.

Discovery research

We will ringfence a minimum of 30% of our financial headroom for purely responsive, discovery-led research. With at least £200 million of investment, this will encourage diverse, creative discovery research activities, with opportunities for team science and business collaboration alongside exploration of single investigator ideas.

Beyond purely responsive activities, we will signpost key strategic areas in other discovery-led research investments, including the new UKRI interdisciplinary responsive mode pilot, building momentum for the UK to compete on the global stage. We will evolve and simplify our Big Ideas initiative, making it easier for the community to influence our future funding opportunities.

Alongside our talent investments outlined in section 1, these funding routes are an integral part of sustaining the people and skills needed by UK business and research communities.

- enhance advanced materials research and leadership through planned investment of £95 million for a second phase of the Royce Institute.
- nurture high-risk discovery research in areas of potential high reward, connecting with industry and other partners to accelerate translation in areas such as catalysis, digital chemistry and materials discovery (c. £7 million).

New Horizons scheme

Our New Horizons scheme supports creative, high-risk discovery proposals. The process is simpler to minimise bureaucracy and speed up decision making for applicants, and the trialling of anonymous peer review aims to reduce bias.

The 2020 pilot phase focused on the mathematical and physical sciences community, investing £25.5 million in 126 adventurous projects. Through this delivery plan we will:

- build on learnings from the first phase by investing a further £15 million, supporting new paradigms in computer science, information technologies and engineering research.
- evaluate the research outcomes from first phase projects, and subject to that evaluation, invest c.£10 million in a further round.

3.2: Frontiers in Engineering and Technology:

The strength of UK engineering research lies in translating emergent ideas into new technologies and responsible solutions to local and global problems. EPSRC will enable the community to explore new solutions, knowledge and commercial applications, producing the skills and business creation opportunities that will enhance UK productivity.

Engineering disciplines are integral to catalysing multi- and interdisciplinary systems-based approaches, connecting with business, government and end users to drive application across sectors and society. A whole-systems approach is central to our thinking.

We will:

- identify emergent engineering and technology ideas and challenges, working in partnership with the research community and learned societies to complete and promote the community-driven Tomorrow's Engineering Research Challenges project, which will shape our future investment in engineering research across key societal challenges.
- fund the transformative ideas that will enable step changes in the UK's ability to deliver a greener, healthier, more resilient future. This includes working across UKRI in areas such as engineering biology (see section 5).
- support breakthroughs in core engineering understanding, tools and techniques enabling researchers and businesses to make, measure and model more efficiently and effectively. This includes evolving our capability in UK systems engineering and £3.5 million for fellowships in fluid dynamics.
- accelerate design to manufacture of the new materials needed for a more resilient, sustainable UK, working in partnership with Innovate UK and businesses.

- improve the UK's defence capabilities aligned to the government's Integrated Review, by investing at least £3 million in hypersonics, with the Science and Technology Facilities Council, and the Ministry of Defence.

3.3: Digital Futures

We will support a digital future that is resilient, environmentally sustainable and secure by design, to support the UK's economy, international leadership and sovereign capability.

Improvements to communications, computing and the internet will shape our future society and economy. Our investments will enable the research needed to develop responsible tools and technologies that will underpin these critical advances. We will achieve wider impact by increasing the pull-through of these technologies to commercialisation.

Delivering this priority also relies on our plans outlined in section 1 to develop, attract and retain digital research infrastructure professionals, ensuring the UK has the skills to capitalise on these innovations

We will:

- support high risk and high reward research in both hardware and software that deliver future computing paradigms, such as neuromorphic computing.
- deliver low-powered digital systems, including design, novel materials, software,

semiconductors and devices. This includes £8 million for research in sustainable low-powered, low-cost computing to enable energy efficient devices and components.

- invest in future communication systems across satellite, wired and wireless connectivity, semiconductors and photonics technologies. We will establish a platform for the development of a hub-based research and innovation ecosystem for industrial-academic co-working and business creation, engaging with the Department for Digital, Culture, Media and Sport, with a first phase of £6 million.
- provide world leading infrastructure to tackle the most challenging simulations in science and engineering, taking full advantage of ARCHER2 and preparing for exascale compute capability. Our high-end computing consortia will be refreshed, providing continued effective and flexible access to computing resources for researchers and other users (£3 million).
- invest at least £6.5 million in software and skills required to take advantage of next-generation large-scale research computing, in areas including high-performance, high-throughput and exascale computing, AI, machine learning, and data science.

Case studies



Commercialising discovery research

Technology developed by Professor Rachel Oliver at the University of Cambridge is enabling the next generation of micro-LED displays, key features of future TVs, wearable devices and smartphones. Oliver founded spin-out company Poro Technologies in 2020 to commercialise the new technology, and the company has just secured £15 million investment to continue its growth.

The new class of porous gallium nitride technology created by Oliver can be used to manufacture multiple colours of LED using a single material system, enabling simpler manufacturing and improved reliability. The new technology means high quality micro-LED displays can more easily be scaled-up for the mass market. The spinout builds on EPSRC support for fundamental gallium nitride research, led by Oliver and colleagues.

Optimising solar energy forecasts through fundamental research

Tracking solar energy generation is difficult, as solar power suppliers range from tiny domestic solar panels to field-sized industrial solar farms. More accurate forecasts reduce the need to keep back-up power stations on standby, saving financial and energy resources.

The University of Sheffield's Sheffield Solar Group have created the Microgen database, a public-industry-academic collaboration which collects solar power information from almost one million locations around the UK and uses fundamental research from mathematics and machine learning to improve the National Grid's forecasts of the electricity that can be supplied by UK solar panels. This will potentially save National Grid around £13 million per year.

Objective 4: World-class innovation

EPSRC has an extensive record of working in sustained and highly productive partnerships with business and the wider innovation ecosystem, including Innovate UK. We have developed 15 strategic partnerships with key innovation-led UK businesses, alongside wider two-way discussions with critical businesses through our Business Engagement Forum.

Through this delivery plan we will build on our strong base of business involvement across funding routes: encouraging even greater co-creation and co-investment, expanding our strategic partnerships, and making it easier for large businesses and SMEs to invest in research and development. This will contribute directly to the government's vision for the UK as an innovation nation, and the commitment to ensure total R&D spending reaches 2.4% of GDP by 2027.

Working across UKRI and with businesses of all scales, EPSRC will fund the people, collaborations and technologies across disciplines and sectors to secure a competitive advantage for UK businesses. This investment will also enhance societal and economic prosperity in places across the UK, fostering greater alignment between our projects, local and regional priorities, and clusters of economic activity.

EPSRC's strength lies in the breadth of our investments: our commitment to innovation starts from our investment in discovery research, essential to delivering the solutions of tomorrow. We will harness this to accelerate the translation of research and ideas into tangible outcomes and commercial solutions – maximising the societal, environmental and economic impact of our investments. We will encourage a responsible and inclusive approach to innovation, ensuring that more of society can benefit from and influence research.

4.1: Co-working with Business

We will continue to co-create with business, facilitating deep partnerships spanning fundamental research to commercialisation, towards the government's 2.4% target. This builds on our strong existing track record with ~£1.8 billion leverage in our existing portfolio, and partnerships on over 50% of our awards: from skills training including our Centres for Doctoral Training, to critical mass investments co-created with business, to the most fundamental research projects across our remit.

We will:

- increase business co-investment in the UK's engineering and physical sciences research base by at least 20% from its value in our current portfolio.
- invest at least £88 million in our flagship Prosperity Partnerships. Through these, we will co-create impactful collaborations between researchers and business, focused on high value sectors and national priorities (see highlight box for further details). Of this, c.£20 million will focus on earlier-stage collaborations to catalyse future strategic partnerships, and to support cross-sector challenges involving multiple business and university partners; this will include collaborations aligned to local strengths in line with levelling up commitments. We will also explore enhancing the model to increase participation among SMEs.
- use sector-based networks and other approaches to facilitate better sharing of pre-competitive technologies, research knowledge, data and best practice across business partners and their supply chains.
- co-design transformative research with end-users, including through 3 residential workshops, each resulting in £3 million of funding to better understand and develop trustworthiness of autonomous robotic systems, ultrasensitive sensors, and novel computing architectures for machine learning. All are in collaboration with the National Security Technology and Innovation Exchange and UK government partners.

Prosperity partnerships

EPSRC's Prosperity Partnerships featured in the Innovation Strategy as a prime example of academic-business collaboration, driving private co-investment into the research base. The scheme demonstrates industry interest in supporting fundamental research, as part of the critical pathway to innovation.

Every £1 invested in R&D through EPSRC's Prosperity Partnerships secures ~£1.30 of additional private R&D investment. EPSRC has already invested in four rounds, with £129 million of EPSRC funds met with £167 million from business and £40 million from universities. Through this delivery plan, we will invest more and broaden the scheme to increase SME participation and earlier-stage collaboration.

- create opportunities for individual, business-relevant skills training and improved mobility between academia and the private sector. We will enhance and refine our approach to our Industrial CASE studentships, investing £18 million per year, and exploring opportunities to scale our investment to address unmet demand.
- ensure our strategy and investments are even better aligned to a diverse array of UK businesses, through enhanced existing strategic business relationships, and improved portfolio monitoring to identify gaps and opportunities to build relationships with further key business partners.

4.2: Connecting research and innovation

EPSRC has experience of developing and enhancing connections between research and innovation activities, often stemming from our strong business and civic stakeholder relationships. We enhance connectivity to create new opportunities and growth, including those aligned to local strengths (see section 2 for examples).

We will increase connectivity across the research and innovation system, pulling through research outcomes to be the next technology breakthroughs and business creation opportunities. Harnessing the full potential of research excellence across the UK, we will enable all UK nations, regions and communities to capitalise on opportunities to benefit from our investments, supporting levelling up commitments.

We will:

- work with Innovate UK to build on our collaborative portfolio, unleashing innovation through co-development of high business impact investments.
- catalyse long-term partnerships and accelerate innovations and technologies from our critical mass investments, including our funded institutes, hubs and prosperity partnerships. We will work closely with Innovate UK who have committed an initial inward investment of £5 million to enhance EPSRC's investment of at least £200 million investment in the Alan Turing Institute, Henry Royce Institute, Rosalind Franklin Institute and UK Quantum Technology Hubs.
- foster more collaboration between researchers, businesses, civic bodies and the public, particularly linked to our critical mass investments. We will work across UKRI to increase connectivity, unlock further SME and large business co-investment, and deliver public benefits.
- capitalise on the synergies between our research base and the Innovation Accelerators in the Glasgow City Region, Greater Manchester and the West Midlands, in partnership with Innovate UK.

4.3: Accelerating translation, commercialisation and knowledge exchange

Working closely across UKRI and with partner universities, we will capitalise on EPSRC's investments and institutes to realise the full potential of the research we fund. We will deliver this by brokering collaborations, and developing innovative initiatives to accelerate innovation and commercialisation.

Together, these actions will enhance positive impacts on science, society, the economy and the environment – driving prosperity locally, nationally and globally. Integral to this is promoting and supporting responsible innovation and inclusive public engagement.

We will:

- simplify and improve the innovation funding landscape within EPSRC's remit, working across UKRI and government departments by bringing together our research communities to solve challenging problems that cut across government and society.
- incentivise our research community through impact acceleration accounts, delivered as part of the harmonised UKRI-wide approach. We will invest £60 million, while enhancing our approach with even more emphasis on enabling emerging technologies, catalysing private co-investment, and building on the >1000 spinouts from past EPSRC funding.
- enable additional economic and societal impact, including through follow-on funds and opportunities within the UKRI commercialisation framework.

Case studies

Accelerating materials innovation through business partnership

Major consumer goods company Unilever was able to scale up and manufacture a new polymer in just 2 years, significantly shortening the time to product launch and generating an unprecedented return on investment. They were supported by their partnership with the University of Liverpool, building on 20 years of EPSRC funding and a legacy of institutional leadership in materials chemistry. This has translated into the £81 million Materials Innovation Factory, with investment by Unilever, the university and Research England to discover and develop innovative new materials. The Factory brings together academics with SMEs and major international companies to enable translational research in fields including pharmaceuticals, performance coatings and energy materials.

Partnering academia and industry to commercialise green transport

In 2021 national public transport provider Go-Ahead Group ordered 20 hydrogen-powered buses as part of its commitment to decarbonising its bus fleet by 2035. With a range of 640 miles and emitting only water, the buses will improve urban air quality and reduce our reliance on fossil fuels.

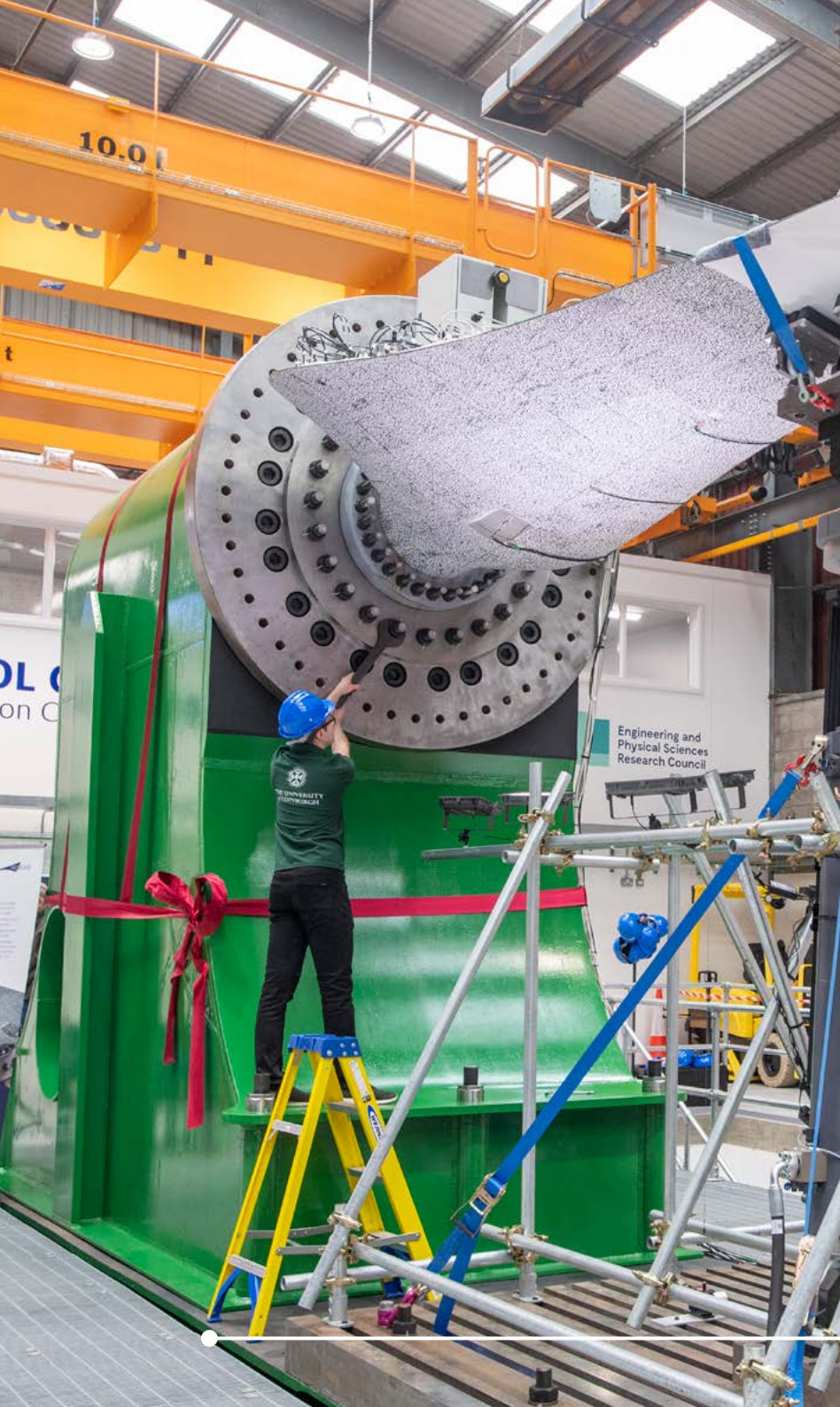
EPSRC's Prosperity Partnership between Queens University Belfast (QUB) researchers and bus company Wrightbus Ltd built on 25 years of collaboration to use modelling and techniques to rapidly develop the bus, funded by the Advanced Propulsion Centre.



Objective 5: World-class impacts

We will focus on four mission-inspired, interdisciplinary challenges, working across UKRI, but with engineering and physical sciences activities at their core. Advances in these areas will impact aspects of everyday life and the breadth of industrial sectors, from how we will ensure the future of carbon-intensive UK industries, to improved data-driven decision-making by government and businesses, through to life-saving NHS services.

We will deliver on the government's [Innovation Strategy](#), investing in the seven technology families identified in the strategy. This will involve working across UKRI and in partnership with government departments, with clear targets for business leverage, and emphasis on regional impact and international collaboration.



We will:

- co-lead development of a programme with BEIS, Innovate UK and the Biotechnology and Biological Sciences Research Council (BBSRC) to derive strategic advantage from high potential platform technologies in areas such as AI, quantum technologies and engineering biology.
- support manufacturing technologies for a sustainable future, including through refreshed investment in hubs (see highlight box) and by partnering with BBSRC and Innovate UK in a strategic investment to enable businesses, academic researchers and other stakeholders to catalyse and expand research, innovation, and commercialisation in sustainable biomanufacturing across the UK (£4 million from EPSRC).
- partner with BBSRC in engineering biology and work with Innovate UK to develop opportunities in advanced materials.
- lead for UKRI in creating the conditions for an integrated research and innovation programme in AI and data science.
- lead the evolution of the next phase of the National Quantum Technologies Programme working with that programme's Strategic Advisory Board and Programme Board.
- develop a digital twins use case in decarbonising transport.

- establish hubs in semiconductors, photonics and 5G+ communications (as described in section 3.3), and ensure these are networked into existing quantum technologies hubs to maximise convergence across technology families.

5.1: Engineering Net Zero

Engineering and physical sciences research is critical to the discovery, development and deployment of solutions to tackle climate change, enhance sustainability and ensure economic prosperity and fairness. EPSRC will continue to support a whole systems approach to developing the technological solutions which will decarbonise our economy and society, to create a sustainable net zero future.

Our plans align to the UKRI Building a Green Future strategic theme, as well as the [UK's Net Zero Research & Innovation Framework](#) and the [British Energy Security Strategy](#). Our interventions will build a diverse, inclusive and interdisciplinary research and innovation community working across UKRI, academia, business, government, the public and international partners to create lasting and sustainable benefits for all.

We will:

- stimulate development of entirely new and transformative low and zero carbon, and zero pollution technologies and systems, including £20 million in partnership with industry and across UKRI to set up two hubs in hydrogen and alternative liquid fuels.

Manufacturing and the circular economy

The development of manufacturing processes, systems and networks spans the topics of world-class ideas, innovation and impacts. Our aim is to drive a sustainable, resilient, thriving and productive UK-wide manufacturing sector and a truly circular economy through mission-led investments. We will do this by supporting both the transformation needed in existing approaches and in the longer term by enabling a fundamental rethink of product and service systems, where appropriate to do so.

EPSRC will invest in up to eleven manufacturing hubs for a sustainable future (total value up to £124 million), supporting innovative business-led research in the engineering and physical sciences, including a specific focus on environmental sustainability and strategic technology advantage. We will also explore further strategic investments in manufacturing and the circular economy.

- develop negative emission technologies including greenhouse gas reduction technologies and carbon capture utilisation and storage solutions, establishing the foundations of a virtual carbon-negative institute to push the frontiers of carbon removal technologies.
- maintain an interdisciplinary approach to tackling future UK energy security, including through innovation in nuclear energy, and £20 million to support coordinating investments in energy systems integration, to help UK distribution and use of solar, bioenergy and offshore wind.
- produce zero carbon and waste solutions through extensive electrification, alternative sustainable fuels and the development of circular economies; for example, EPSRC and BBSRC will co-fund a call for sustainable plastic systems, including £5 million of EPSRC investment.
- deliver solutions to reduce our energy demand and increase efficiency across all greenhouse gas emitting, resource consuming and polluting systems and sectors, taking a whole systems approach working across UKRI.

5.2: AI, Digitalisation and Data: Driving Value and Security

We will generate scientific and technical advances to realise the benefits of AI and digital technologies, creating opportunities and improving outcomes for the UK economy and society.

Through this priority, we will deliver platform technologies that underpin a range of potential applications, as well as research and innovation across UKRI and its strategic themes. We will encourage adventure, pushing boundaries to realise the transformational impact of digital technologies across industry and society. A key outcome is enhancing national security to address the government's [Integrated Review](#) and the UKRI strategic theme Building a Secure and Resilient World.

We will:

- establish up to eight hubs (£80 million) across foundational AI, AI for Real Data and a number of application areas.
- bring academics and users together to solve challenges in AI, co-creating research, increasing translation into practice, and building flexible career pathways. We will work across UKRI to supercharge the UK's AI science base, with plans including:
 - doubling the number of Turing AI World Leading Fellows.
 - refreshing the portfolio of AI Centres for Doctoral Training, in line with the government's announced intention to fund an additional £117m.
 - uplifting the Alan Turing Institute's national convening and leadership role with at least a further £10 million per year.

- ensure the UK remains confident, capable and resilient as a thought leader in the fast-moving digital world, including by investing £7.5 million in cyber security research with partners such as the National Cyber Security Centre.
- scope future priorities, including building opportunities in Digital Twins; an initial focus will be up to £20 million on a Digital Twins decarbonising transport use case working with the Department for Transport.

5.3: Transforming Health and Healthcare

Engineering and physical sciences research plays a unique role in improving our health, from the development of new healthcare technologies and consumer health products through to digital improvement of the healthcare system and engineering of healthy environments. Almost everything we do involves working across UKRI and with the wider research and innovation system.

This priority underpins the UKRI strategic themes in Health, Ageing and Wellbeing and Tackling Infections, creating healthier environments and sustainable healthcare.

We will:

- enable a more sustainable and resilient healthcare system integrating manufacturing across scales (from population to personal level) and circular economy approaches. Our plans include up to £15 million for future healthcare manufacturing investments.

- maximise the potential of digital health and AI across personal health, treatment and the wider system, with up to £8 million for digital health hubs to increase skills and capacity, accelerate translation and enable rapid commercialisation of emerging digital technologies.
- continue to work with the National Institute for Health and Care Research on multiple long-term conditions and explore opportunities in other areas.
- support new knowledge and skills for healthier environments in the home, workplace and the community, including engineering solutions to meet air quality challenges by exploring a partnership with the Department of Health and Social Care.
- lead the design and development of future and affordable healthcare technologies including biopharmaceuticals, medical technologies, genomics and diagnostics with a programme of up to £20 million in partnership with the Medical Research Council, and follow on activities to build on our responsible neurotechnology networks.
- address major health challenges from regenerative medicine to tackling infections, drawing on digital chemistry and materials discovery, mathematics and the physics of life. This includes £40 million additional investment in the Rosalind Franklin Institute to build connectivity with physical sciences.

5.4: Quantum technologies

Quantum technologies are a key example of how EPSRC delivers research, innovation, skills and research infrastructure, converging expertise from across engineering and physical sciences to create transformative technologies with applications across many sectors.

EPSRC will continue to advance quantum technologies, building on our world-leading platform of research strengths to extend our leadership position in this strategically important technology. Through this, our ambition is to make the UK a quantum-ready nation in line with the government's [Integrated Review](#) and [Innovation Strategy](#).

We will:

- support the UK's National Quantum Technologies Programme into its third phase, refreshing the hub portfolio with an investment of up to £100 million.
- enable ongoing strategic and translational quantum technologies research in sensors and timing, enhanced imaging, computing and simulation, and communications through the phase 2 UK Quantum Technology Hubs.
- complete our programme to establish the £93 million National Quantum Computing Centre, and expanding the breadth and depth in quantum computing research and development.
- build international collaborations through the lead agency agreement with the National Science Foundation and other priority global partners (up to £10 million).



Making nuclear fusion commercially viable

Researchers at the Mega Ampere Spherical Tokamak (MAST) Upgrade experiment are tackling one of the biggest challenges with nuclear fusion reactors: the high temperatures which affect the lifespan of materials. They are testing a new super-X divertor, a system which dissipates heat, reducing exhaust components' heat exposure at least tenfold. This would allow a commercial nuclear fusion reactor to run for longer without repair, making the technology commercially viable. Unlike current nuclear fission reactors, nuclear fusion produces very little radioactive waste, little CO₂, and carries no risk of catastrophic failure. The MAST Upgrade experiment is supported by the UK Atomic Energy Authority (UKAEA), EPSRC and the EUROfusion consortium. This research will support UKAEA's plans to build a prototype fusion power plant in the next 20 years.

Supporting the global response to Covid-19

The spike protein is a major target in Covid-19 research, as it binds to human cells when infected. Researchers from Protein Production UK successfully isolated nanobodies, a type of antibody, and demonstrated that these bind to the spike protein of the SARS-CoV-2 virus,

blocking infection. These nanobodies are now available to researchers at the University of Oxford, as well as being a widely available tool to other research groups around the world. Protein Production UK is a collaborative project led by the EPSRC-funded Rosalind Franklin Institute, based at the Research Complex at Harwell.

Medicines manufacturing at the University of Strathclyde

With EPSRC, other UKRI and wider funding providing crucial support at key points, the University of Strathclyde has supported western Scotland leadership in the high-impact medicines manufacturing sector. The EPSRC-funded Future Manufacturing Research Hub in Continuous Manufacturing and Advanced Crystallisation (CMAC) has underpinned this, pioneering new ways to develop and make medicines. EPSRC funding, through the Hub and previous Centre for Innovative Manufacturing, has resulted in £45 million of industry cost savings, including £10 million for AstraZeneca through an improved process. CMAC supports small companies across the pharmaceutical supply chain, brokering new partnerships with major companies. The strong partnerships, catalysed by EPSRC's critical mass investments, have helped to secure investment for the £56 million Medicines Manufacturing Innovation Centre, enhancing UK leadership in this global sector.





Objective 6: A world-class organisation

As part of UKRI, EPSRC strives to be an efficient, agile organisation, which always seeks to innovate and continuously improve. Our outcomes-focused approach drives everything we do, ensuring that we invest through the most effective routes to deliver maximum impact. We will deliver our ambitions within our agreed operating expenditure budget.

We will empower our staff to achieve our ambitious plans, leveraging their extensive knowledge of our portfolio, close working relationships across UKRI, and partnerships that catalyse change within government at all levels, and the business and university communities. We are also committed to improving the sustainability of our operations, and of our research, innovation and skills programmes.



6.1: Being an efficient, effective and agile organisation

We will:

- deliver simpler, better funding processes and peer review, working across UKRI as part of the Simpler, Better Funding programme's vision and objectives. We continually evolve our grant awarding processes to try to reduce the administrative burden on the research system and to increase the diversity of applicants, as seen in innovative approaches like our New Horizons scheme (see section 3).
- review and streamline our operations, governance, advisory structures and stakeholder engagement, to ensure they contribute effectively to UKRI's new operating model. We will adapt EPSRC as part of UKRI's commitment to reduce operating expenditure.
- support delivery of a new cross-UKRI Enterprise Resource Management system through the SHARP programme.
- as part of UKRI, respond to all of the relevant Grant Review recommendations through our wider Reforming our Business and Operating Model organisational change programmes.
- maintain a focus on outcomes and impact, using data and evidence, and delivering proportionate monitoring and evaluating of our investments aligned to UKRI-wide approaches. We will evaluate progress against this delivery plan using a monitoring framework which includes routine advice and guidance from our Council. This framework

will ensure that we are delivering against the UKRI Strategy and government priorities.

- build and improve portfolio knowledge through data, analytics, tools and frameworks, to remain agile and responsive to new ideas and emerging challenges. Through this, we will develop our long-term strategic thinking and become more future-focused as an organisation.

6.2: Catalysing outcomes through partnership and leadership

We will:

- publish and implement our equality, diversity and inclusion action plan, discussed in section 1, aligned to the forthcoming UKRI EDI strategy. As an example, we will create the role of unconscious bias observers at peer review prioritisation and interview panels, to reduce bias in our decision making. We will also continue to use positive action for diversity in gender and race in our advisory groups and peer review college.
- improve the environmental sustainability of our operations and investments, by delivering our action plan in line with the UKRI Environmental Sustainability Strategy. EPSRC invests in science that enables environmental sustainability, including clean energy technologies, circular economy, sustainable manufacturing and low power computing. We will continue to use our role to support and improve the sustainability of our programmes. Building on existing interventions such as our Responsible Research and Innovation Framework, we will

enhance sustainability in our research and skills programmes, infrastructure investments and impact activities, and support the community to improve their environmental sustainability.

- embed trusted research and responsible innovation throughout EPSRC's technology-driven portfolio. We will work in partnership across the landscape to share learnings as part of UKRI's role as a national funder, maximising the positive impacts of the research we fund. By leading on trusted research, we will respond to the government's Integrated Review by protecting those working in our thriving and collaborative international sector.
- strengthen our relationships with government departments, public sector research establishments, learned societies, devolved administrations and local stakeholders, identifying new opportunities for collaboration and enhancing connectivity between research and policy.
- use communications to enhance our stakeholder engagement. EPSRC will contribute to effective UKRI communications, working with the research community to enhance recognition of how EPSRC-funded research underpins and advances all areas of science, leading to national and global impacts. Our approach will be flexible and agile, but focused on enhancing engagement with key audiences across the science and innovation community, parliamentarians and government at all levels, and the public.

Our budget

Budget category ^{i ii}	2022-23 (£m)	2023-24 (£m)	2024-25 (£m)
Core R&I Budgets	620.52	647.14	661.26
Existing cross-UKRI Strategic Programmes	53.01	36.64	20.04
Strategic Priorities Fund	53.01	36.64	20.04
Infrastructure*	124.18	85.37	69.08
World Class Labs	66.58	65.97	69.08
Digital Research Infrastructure Programme – phase 1b pilot projects (2022-23 – 2023-24)	4.00	2.00	0.00
Existing infrastructure investments: Rosalind Franklin Institute	2.00	0.00	0.00
Existing infrastructure investments: Royce	2.00	0.00	0.00
Existing infrastructure investments: Quantum	41.79	17.40	0.00
Existing infrastructure investments: National Nuclear Users Facility – capital	7.81	0.00	0.00
R&I Budgets – existing time-limited commitments	50.43	48.14	23.21
Mathematical Sciences Additional Funding Programme	31.00	28.80	21.00
Spherical Tokamak for Energy Production (STEP)	0.74	0.93	0.76
National Nuclear Users Facility (NNUF) – resource	7.48	12.86	0.00
ARCHER2	1.10	1.20	1.20
COVID interventions	10.11	4.35	0.25
Grand Total	848.13	817.29	773.59

* Infrastructure projects are detailed separately below. Note that further infrastructure allocations to Councils may be made during the Spending Review period from the Infrastructure Fund, Digital Research Infrastructure Programme and Carbon Zero Fund Programme.

Notes

- i. The figures provided in this document are in line with the 2022-23 – 2024-25 budget allocations for UK Research and Innovation. These are broken down by our budgeting and reporting categories, and exclude funding for ODA, Financial Transactions, and BEIS Managed Programmes. Figures are indicative and may vary over the course of the three-year period due to budget adjustments made as a part of on-going financial management and planning processes to maximise the use of our total funding.
- ii. From 2022-23 UKRI talent investments are managed collectively across the Research Councils. The funding for collective talent activities outlined in this delivery plan are accounted for in the broader collective talent funding line included in our Corporate Plan.

Infrastructure Fund projects include:*	Total lifetime allocation (some in future SR periods)
Infrastructure Fund: Wave 1 - Full project – 1.2 GHz Nuclear Magnetic Resonance (NMR) Spectrometer	17.63
Infrastructure Fund: Wave 1 - Full project – National facility for ultra-high field (11.7T) human MRI scanning Subject to business case approval, joint project with MRC	29.10
Infrastructure Fund: Wave 1 – Preliminary Activities – Relativistic Ultrafast Electron Diffractions and Imaging (RUEDI)	2.96

* Further allocations may be made during the Spending Review period. Excludes wave 1 preliminary activities where spend was in 21-22 only. Allocations include contingency, which may be returned if unused.

Image references

- Cover Novel optical fibres being made in the fibre drawing tower housed in the Zepler Institute clean rooms at the University of Southampton.
Credit: University of Southampton
- Page 2 ARCHER2 supercomputer.
- Page 3 Professor Dame Lynn Gladden, Executive Chair of the Engineering and Physical Sciences Research Council.
- Page 5 Researchers in the Sustainable Materials Innovation Hub at the Henry Royce Institute.
Credit: Henry Royce Institute
- Page 8 Dr Maria Pregolato, Lecturer in Infrastructure Resilience at the University of Bristol, photographed on the outskirts of Abergavenny. Dr Pregolato previously held an EPSRC fellowship.
- Page 10 Birmingham city centre, commissioned by UK Research and Innovation through Anthony Devlin.
- Page 11 Wrightbus StreetDeck Hydroliner, the world’s first hydrogen double deck bus.
Credit: Wrightbus
- Page 13 Professor David Richardson, Deputy Director of the Optoelectronics Research Centre, photographed at the University of Southampton, Southampton, 19 May 2022.
Credit: Adam Gasson
- Page 15 Professor Máire O’Neill, displaying technology linked to the Centre for Secure Information Technologies (CSIT) at Queen’s University Belfast.
- Page 16 Medicines research at the University of Strathclyde.
- Page 18 Stock computing/digital image licenced by UK Research and Innovation.
- Page 19 Henry Royce Institute Hub building launch.
- Page 23 28623 Darren Cosker and Motion Capture Equipment 16 March 2015. Darren fits sensors to Maree to illustrate new equipment for motion capture research. Client: Katrina Kelly - Research
- Page 24 The FastBlade facility in Rosyth, Fife.
Credit: Lesley Martin
- Page 27 EPSRC Resilience Project. Rebecca Shipley, Professor of Healthcare Engineering at UCL, and Tim Baker, Professorial Teaching Fellow, photographed at the UCL Mechanical Engineering department, London, 19 April 2021.
- Page 28 Pharmaceutical manufacturing at the Future Continuous Manufacturing and Advanced Crystallisation Research Hub, University of Strathclyde.
- Page 29 Picture shows Lucy Siegle – MC & Claire Spooner, EPSRC – discussing decarbonisation of transport systems. Taken at the UKRI “Be Part of the Solution: How Research and Innovation are Helping to Tackle Climate Change event at the iMax in the Green Zone at United Nations COP26, Glasgow UK on 02 November 2021.



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