

EPSRC's Allocation and Strategic Delivery Plan:

High-level Summary

UK Research and Innovation



**Professor Dame
Lynn Gladden**

EPSRC
Executive Chair

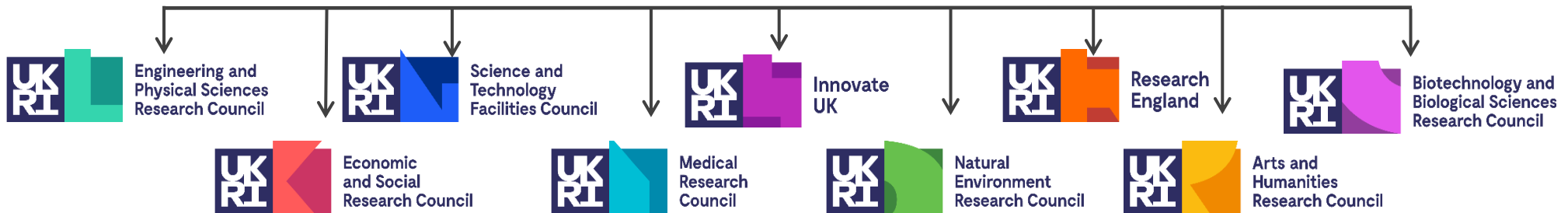


**UK Research
and Innovation**



**Professor Dame
Ottoline Leyser**

UKRI Chief
Executive

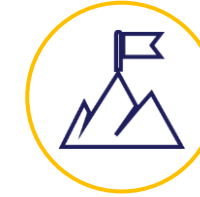
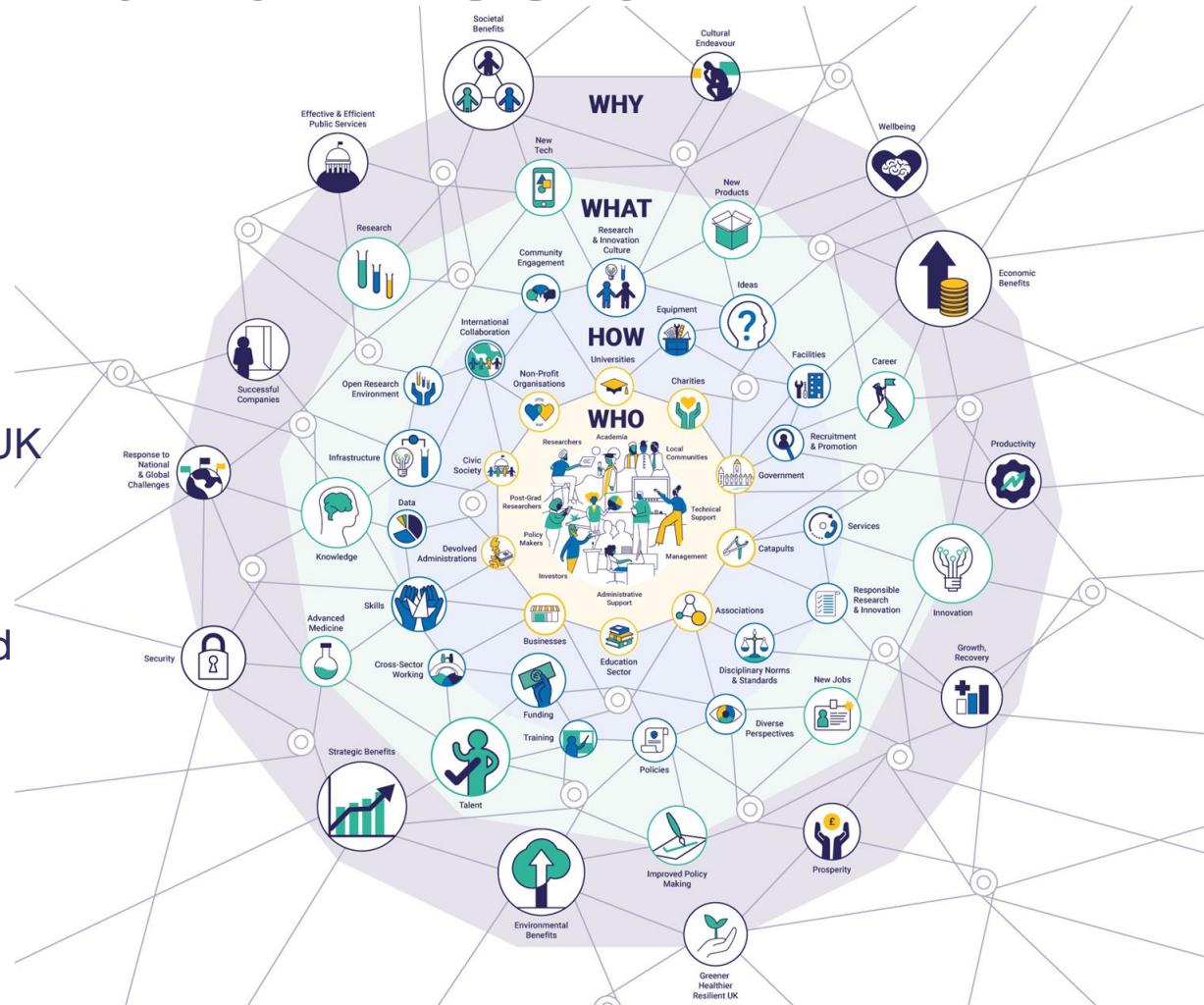


**UK Research
and Innovation**

UKRI Vision and Mission



Our **vision** is for an outstanding research and innovation system in the UK that gives everyone the opportunity to contribute and to benefit, enriching lives locally, nationally and internationally.



Our **mission** is to convene, catalyse and invest in close collaboration with others to build a thriving inclusive research and innovation system that connects discovery to prosperity and public good.



Science and
Technology
Facilities Council

Arts and
Humanities
Research Council

Engineering and
Physical Sciences
Research Council

Biotechnology and
Biological Sciences
Research Council

Economic and Social
Research Council

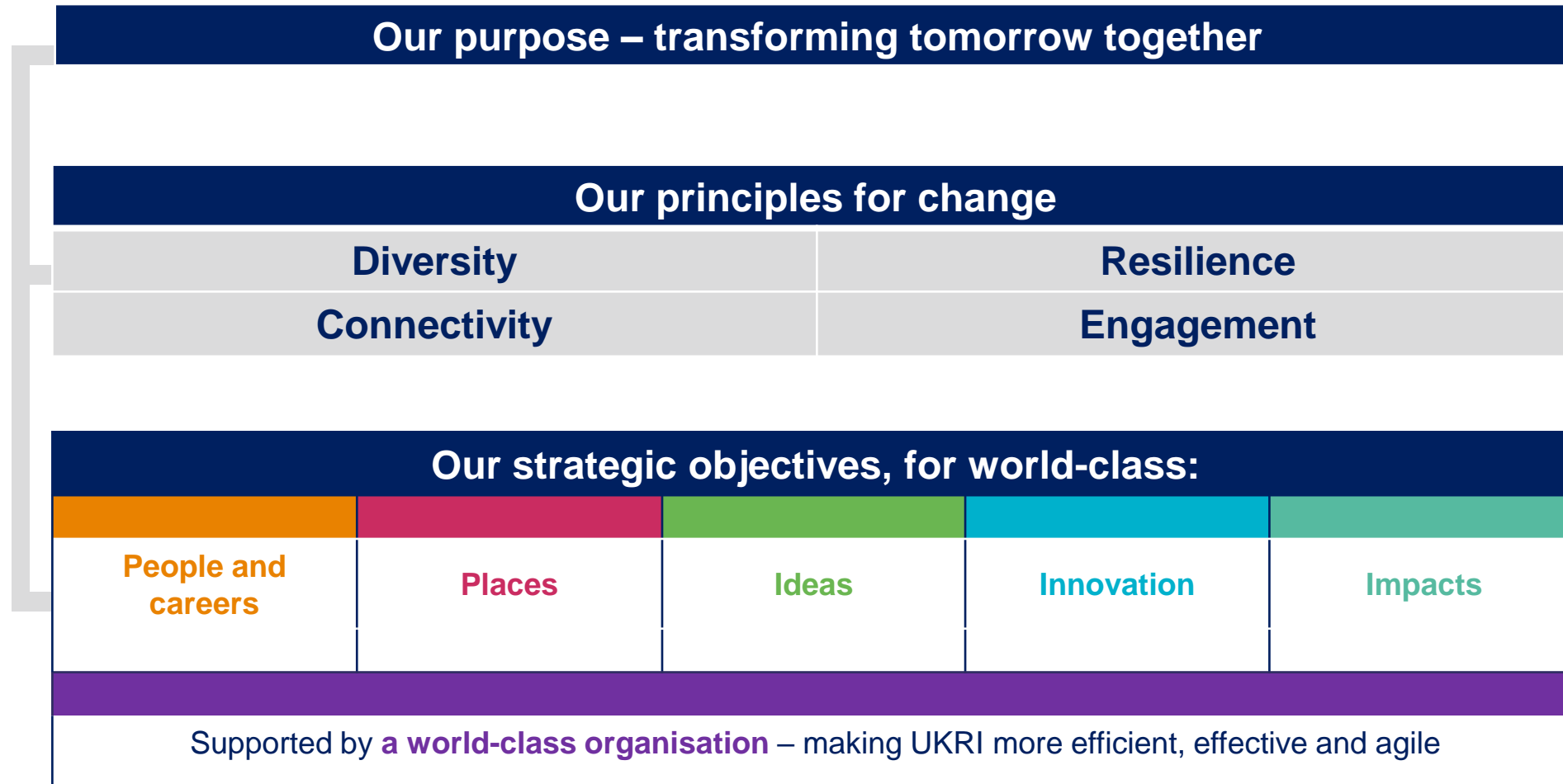
Research
England

Natural Environment
Research Council

Innovate
UK

Medical
Research
Council

UKRI Strategy – how it all fits together



UKRI Allocation Headlines

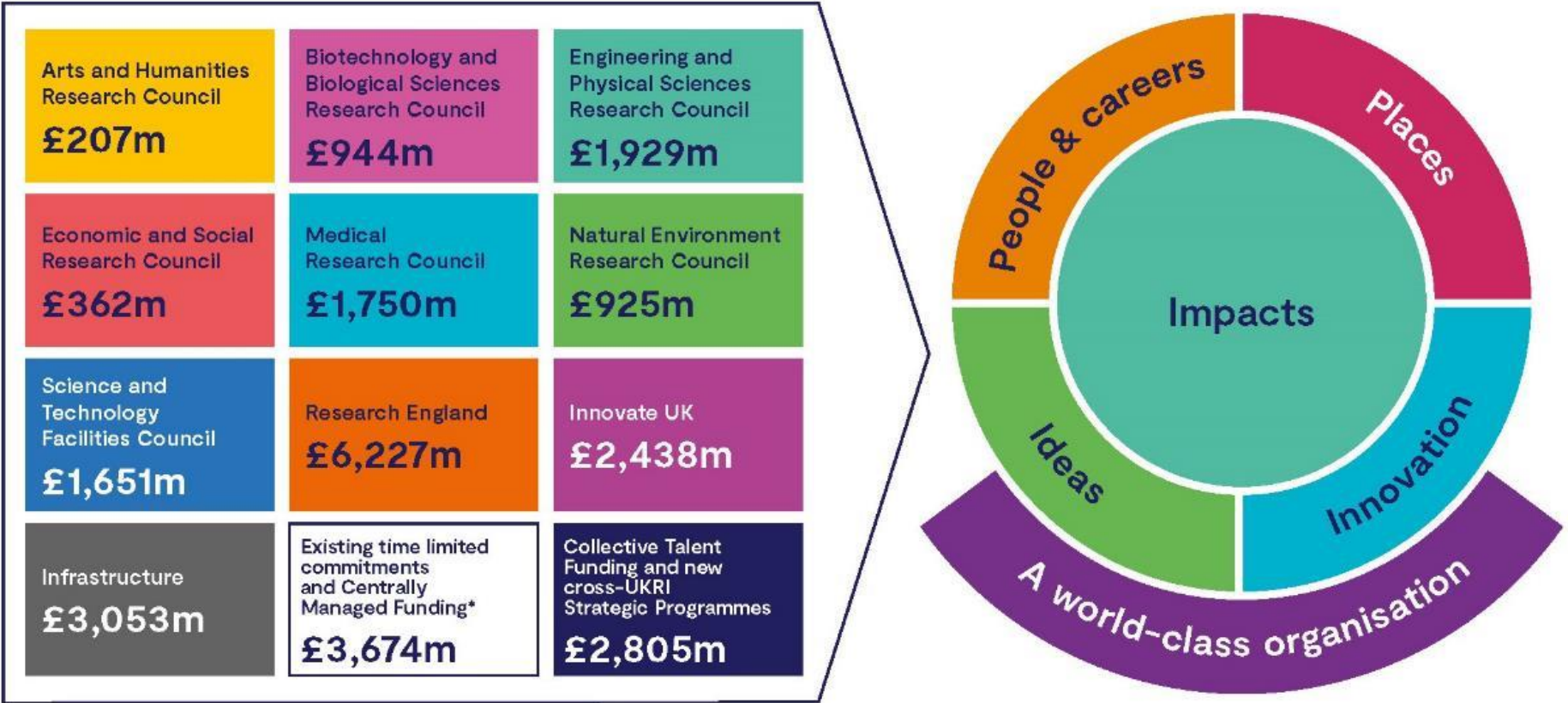
- March 2022: BEIS confirmed a total UKRI budget of **£25.1bn** for the three financial years 2022-23 to 2024-25.
 - A 14% increase in our budget between 2021-22 and 2024-25, rising from £7,785m to £8,874m.

	Total £m							
UKRI budgets	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Total	6,768	6,842	6,957	8,188	7,785	7,904	8,373	8,874

- **A multi-year budget for all parts of UKRI for the first time** – giving security to plan strategically as we deliver our five-year UKRI Strategy: Transforming Tomorrow Together.
- **New cross-UKRI Strategic Programmes** will leverage the strength and breadth of investments in R&I across our Councils, learning from our existing programmes.
- We will **work in a collective manner** across £2bn of talent initiatives, covering studentships and fellowships.
 - Harmonising further our talent investments, reducing bureaucracy, and making it easier and more efficient to work across disciplines and the R&I system, including the private, public and third sectors.
- **Maintain the balance of dual support** in England (64p per £1), providing stability of funding for higher education institutions.

Delivering the UKRI Strategy: Total Funding Allocations 2022-23 to 2024-25

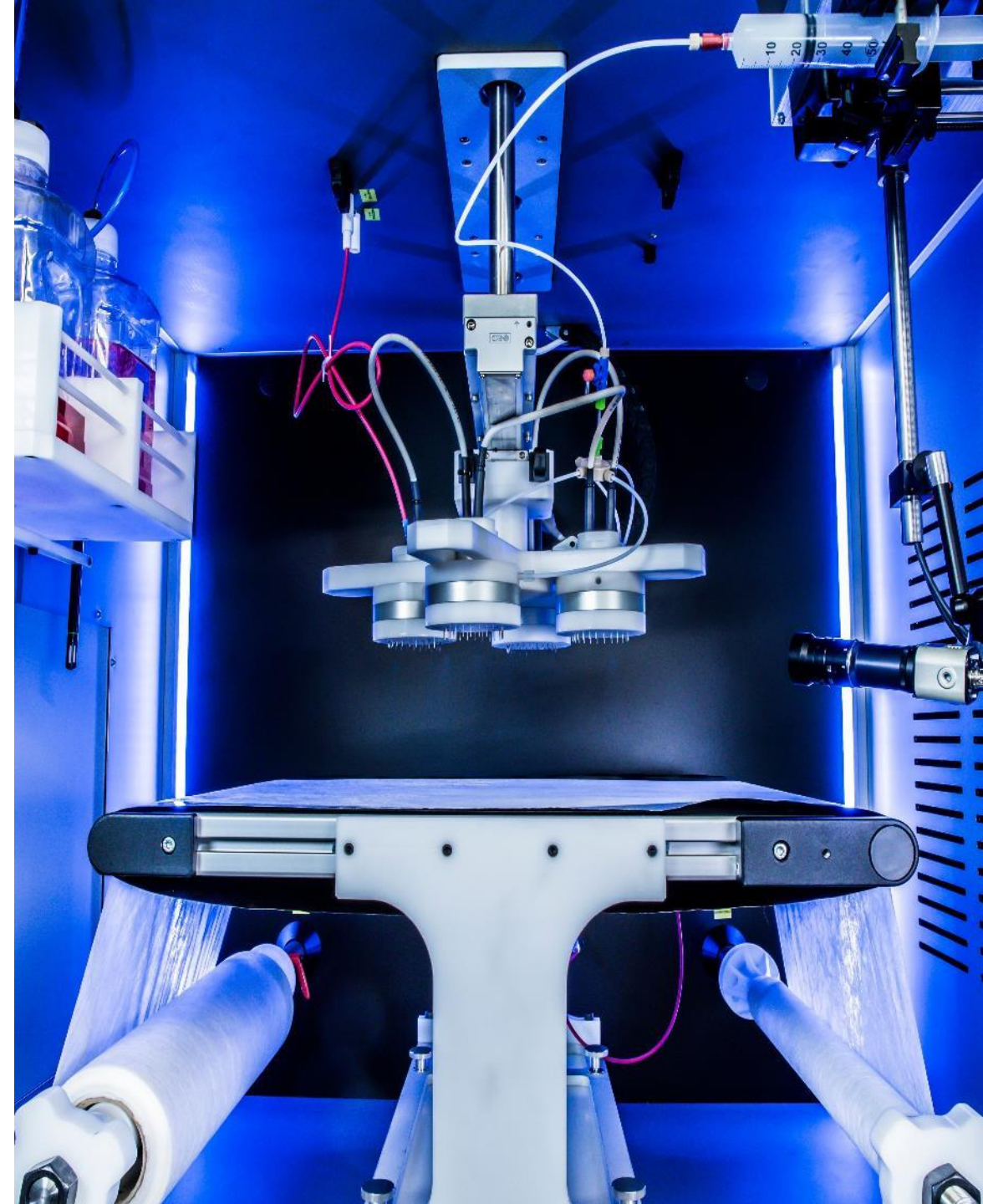
Delivering the UKRI Strategy: total funding allocations, 2022-23 –2024-25



*includes existing cross-UKRI Strategic Programmes (and other time limited commitments such as COVID interventions), support for UKRI transformation, public engagement, and open access

UKRI collective funding

- £2 billion collective talent funding
- £482m fund for significant investments in infrastructure across UKRI
- Piloting a £65m interdisciplinary responsive mode programme
- Funding aligned to 5 strategic themes:
 - Building a green future
 - Securing better health, ageing and wellbeing
 - Tackling infections
 - Building a secure and resilient world
 - Creating opportunities, improving outcomes



Building a Green Future: A UKRI Strategic Theme

- Helping to improve the health of our environment and deliver net zero, securing prosperity across the whole of the UK.
- Our whole systems solutions will secure business growth, jobs, skills and increased productivity, ensuring a green future for all, addressing environmental and net-zero challenges in all sectors of the economy



EPSRC – powering UK science and prosperity

Our Vision

To make the UK recognised as the place where the most creative researchers can deliver world-leading engineering and physical sciences research.

Mission Statement

EPSRC invests in world-leading research and skills to advance knowledge and deliver a sustainable, resilient and prosperous UK.

Our diverse portfolio ranges from digital technologies to clean energy, manufacturing to mathematics, advanced materials to chemistry.

We support new ideas and transformative technologies which are the foundations of innovations that improve our economy, environment and society.

In partnership and co-investing with industry, we work to deliver both national and global priorities

EPSRC Strategy

- **A balanced portfolio** that supports both discovery-led and mission-driven research and innovation and the infrastructure to underpin this
- Integrate **our institutes** (Royce, Turing and Franklin) into the mainstream EPSRC portfolio – providing long-term sustainability for institutes that do things universities cannot (hub and spoke model)
- Developing and retaining **talented people and teams** within a research culture where everyone is respected, valued and able to contribute and benefit
- Working closely with **business** to increase private investment and contribute to the government's 2.4% target
- Leveraging additional resource through **partnerships with government departments** including NIHR, DfT, BEIS, DCMS, MoD, National Security
- Leading across UKRI (including IUK) on **technology platforms** aligned with the Innovation Strategy, in particular: AI and quantum technology, and partnering with BBSRC (lead) on engineering biology
- Working with IUK (in particular) to secure funds additional to SR through **Technology Missions Fund** (BEIS)
- Proactive in co-designing and proposing activities within the UKRI '**collective funding**' or 'pooled' themes

EPSRC Investments Aligned to UKRI Strategy


People	Places	Ideas	Innovation	Impacts
<p>Investing in people, skills and teams</p> <p>Embedding equality, diversity and inclusivity</p>	<p>Local, national and international partnerships, nurturing excellent research and strengthening clusters across UK nations and regions</p> <p>World-leading capital and digital infrastructure</p>	<p>Investing in 3 discovery research priorities:</p> <ul style="list-style-type: none">• Physical and Mathematical Sciences Powerhouse• Frontiers in Engineering and Technology• Digital Futures	<p>Co-working with business</p> <p>Connecting research and innovation</p> <p>Accelerating translation, commercialisation and knowledge exchange</p>	<p>Mission-inspired research with four priorities:</p> <ul style="list-style-type: none">• Engineering Net Zero• AI, Digitalisation and Data: Driving Value and Security• Transforming Health and Healthcare• Quantum Technologies



EPSRC's 8 Strategic Priorities

Discovery-led Research

The Physical and Mathematical Sciences Powerhouse: curiosity driven discovery, with boundless potential



Frontiers in Engineering and Technology: unleashing our productivity potential

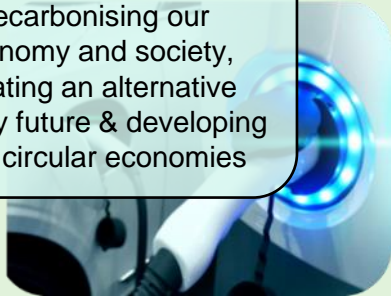


Digital Futures: the future of communications, computing and the internet



Mission-Inspired Research

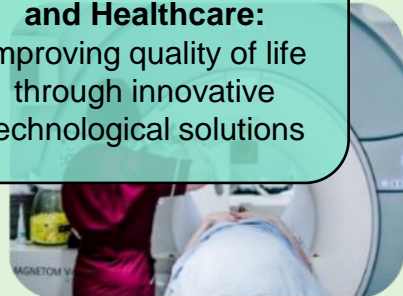
Engineering Net Zero: decarbonising our economy and society, creating an alternative energy future & developing truly circular economies



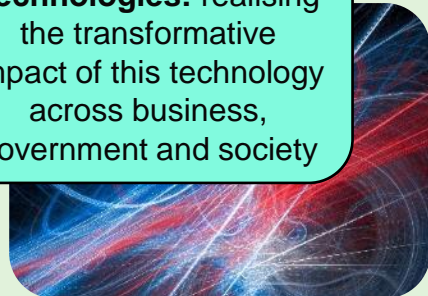
AI, Digitalisation and Data – Driving Value and Security: powering transformative change and the next industrial revolution



Transforming Health and Healthcare: improving quality of life through innovative technological solutions



Quantum Technologies: realising the transformative impact of this technology across business, government and society



International

Talent and Skills

Place

World Class Infrastructure

Impact

Business Engagement

An Effective Ecosystem for Engineering and Physical Sciences

Engineering Net Zero



Engineering Net Zero

EPSRC will support a **whole systems approach** to support the research and innovation critical to the **discovery, development and deployment of solutions** to tackle climate change, enhance sustainability and ensure economic prosperity.

Engineering Net Zero

Effective delivery involves collaboration across the landscape

- We are working with colleagues across UKRI, in government departments including **BEIS, DEFRA, DLUHC, DHSC** and **DfT**, and in academia, industry and the third sector to identify and influence Net Zero and sustainability research and innovation priorities and opportunities and co-create solutions in key areas.
- We are contributing to the decarbonisation and circularisation of all sectors and technologies including the **built environment, manufacturing, materials, agriculture and land use, heating and cooling, healthcare, computing and transport.**
- EPSRC, and UKRI, are also part of the **Net Zero Innovation Board (NZIB)** which acts to coordinate Net Zero R&D strategy and investment across UK Government. The **Net Zero Research and Innovation Framework** was published in October 2021 and details our collective priorities.



Engineering Net Zero

EPSRC will support a **whole systems approach** to research and innovation critical to the **discovery, development and deployment of solutions** to tackle climate change, enhance sustainability and ensure economic prosperity.

Reduce

Deliver solutions to **reduce demand and increase efficiency** across all greenhouse gas emitting, resource consuming and polluting systems and sectors taking a whole systems approach.

Replace

Produce **low and zero carbon and zero waste solutions** to meet our needs through extensive electrification, alternative sustainable fuels and resource efficiency to deliver **circular economies**.

Remove

Discover and develop **negative emission technologies** including greenhouse gas reduction technologies (GGRs) and carbon capture utilisation and storage (CCUS) solutions.

Redefine

Deliver critical mass investments in **sustainable manufacturing** transforming our industrial manufacturing processes to create and recover maximum value from products across their whole life cycle

Reimagine

Deliver **high risk, high reward** research whilst attracting, training and retaining talented **Net Zero researchers and innovations** in the UK.

Engineering Net Zero

Across the next 3 years we plan to:

Whole systems	Reduce	Replace	Remove	Redefine	Reimagine
<p>Scope and deliver the next phase of the UK Energy Research Centre with NERC and ESRC</p> <p>Embed a whole systems approach across the whole ENZ portfolio through developing support and guidance for applicants</p> <p>Invest in digital twins for transport with the Department for Transport to carry out research into digital twinning for decarbonising and improving the connectivity of UK transport systems.</p>	<p>Evolve our critical mass investment in energy demand solutions with ESRC to drive forward essential research to facilitate decarbonisation of our entire economy.</p> <p>Deliver new critical mass investments to support the move to a circular economy</p> <p>Investing priority areas such as digital technologies to drive a circular economy.</p>	<p>Invest in two Hydrogen Hubs to drive forward the national effort in hydrogen research</p> <p>Refresh the SUPERGEN programme working across UKRI to accelerate the impact of renewable technologies and to catalyse the discovery of the next generation</p> <p>Deliver research for a sustainable plastics system for the UK in partnership with BBSRC.</p>	<p>Scope the next phase of investments that are needed to drive forward current and next generation CCUS and GGR technologies including identifying how we partner globally to support this essential area.</p>	<p>Deliver a new cohort of manufacturing hubs for a sustainable and prosperous manufacturing sector in the UK.</p> <p>Partner with BBSRC and Innovate UK to advance biomanufacturing capabilities</p>	<p>Invest in the next 5-year phase of the UK Fusion Research Programme at UKAEA</p> <p>Support training and capacity building through the upcoming EPSRC CDT call</p>



Engineering Net Zero : Opportunities



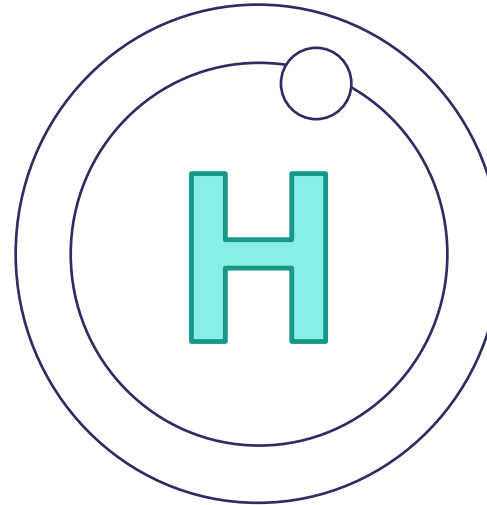
reduction in
energy demand



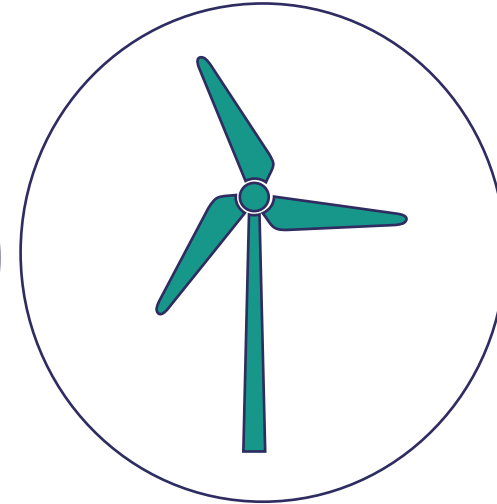
decarbonising
transport



decarbonising
industry:
negative
emissions
technologies,
sustainable
manufacturing

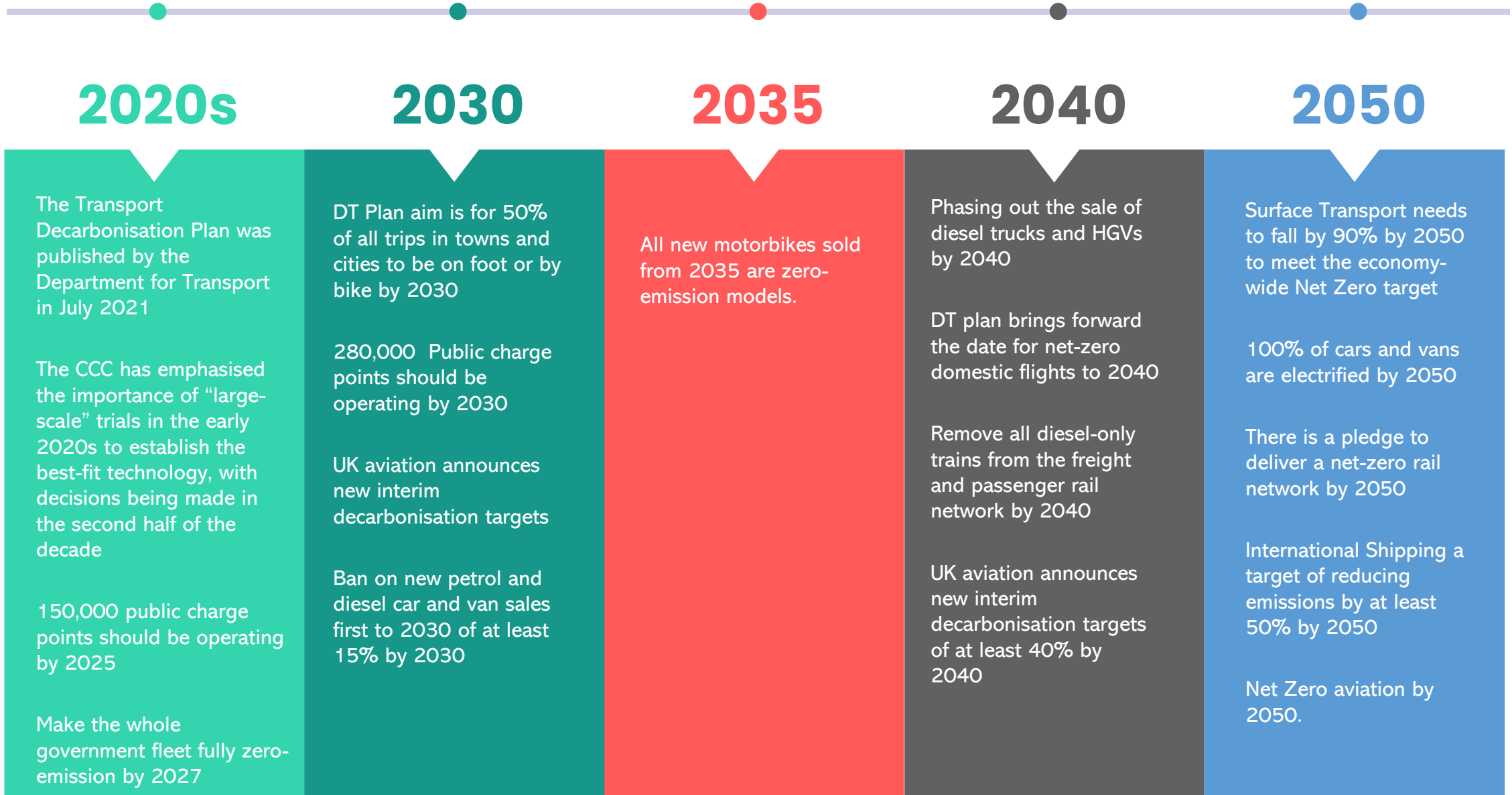


hydrogen



power: offshore
renewables,
bioenergy and
energy
networks

Key Milestones in Decarbonising Transport



Reduce and replace:

Decarbonising Transport

Approximately 80% of domestic transport emissions come from land-based transport, with maritime and aviation contributing less than 10% each; although both of these sectors have far less clear routes to decarbonisation.



Engineering and
physical sciences
breakthroughs have
made this a viable
option

The challenge

Despite numerous technological advances (notably in combustion engine efficiency), Transport CO₂ emissions for the UK have broadly remained unchanged for 30 years and it therefore continues to be the single largest emitting sector. This trend is likely to continue due to increased numbers of journeys offsetting gains made in vehicle efficiency and so this remains a difficult-to-decarbonise sector that will require deep, fundamental research to achieve the necessary change. To do so, zero emission propulsion technologies that deliver against key user requirements must be devised and rolled out at scale.

The challenge

- Research centres focussing on cross-modal, interdisciplinary problems including behaviour change, economic and policy context and technology and infrastructure; with place being a cross-cutting theme across all these challenges to ensure a just transition across locations and demographics.
- Research projects focussed on mode-specific challenges for different sectors including aviation, land transport and maritime.
- Living Labs to illuminate and resolve large scale issues encountered during deployment and use in real world situations.

Where do UK GHG emissions come from?



Engineering and
Physical Sciences
Research Council



Discover

Develop

Deploy

Multimodal Approach

Improve **Transport Infrastructure** for all

Utilising **Research Infrastructure** to enable progress

Enabling the Community to **Maximise Impact**

Benefit from an
interdisciplinary
approach

Upskilling and
learning from
industry

Enabling
international
collaboration & reach

Commercialisation
engine of ideas

**Zero
Emissions
from
Transport**

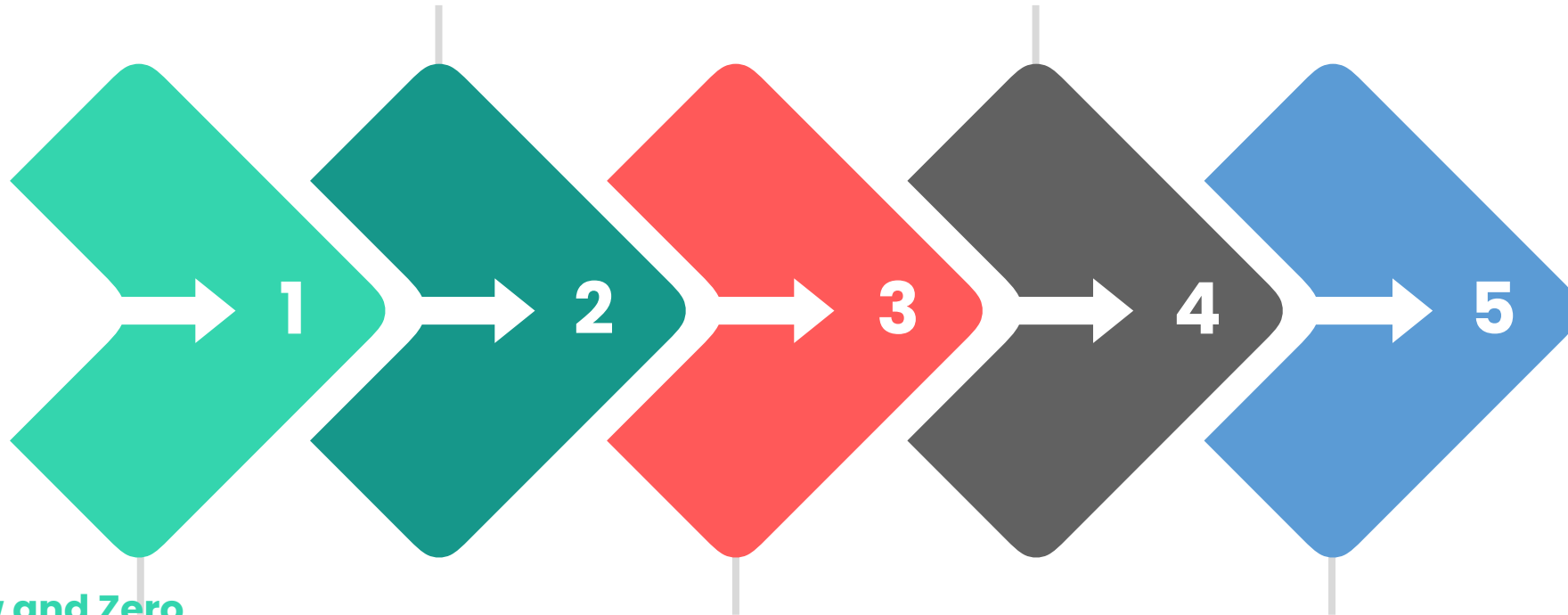
Key EP Decarbonising Transport Themes

Low and Zero Emissions Transport Infrastructure Solutions

Development workshop leading to business focused sandpits. .

UKRI Collective Funds

Building a Green Future and collective talent opportunities



Low and Zero Emissions Propulsion Systems

Scoping workshop to understand the needs of this space.

Sustainable Shipping

Development of cross council, international activity focused on developing low emissions pathways for existing shipping fleet.

Whole Systems

Utilizing Transport Networks Mid term reviews to understand challenge research needs.

Energy & Decarbonisation: The Team!

Heads of Energy & Decarbonisation

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Delivery Support

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Physical Sciences
Research Council

Place Based Impact Acceleration Account

What is a Place Based IAA?

Account that supports similar impact activities to an institutional IAA, but those activities should support the capabilities of a cluster to enhance regional growth.

Key features of PBIAAs are:

- delivery through a consortium (two universities minimum)
- Co-created with civic bodies and with significant business collaboration
- broaden access to impact funding
- Support a high density of impact activity within a cluster
- [Link to call information](#)
- Deadline: 25th April 2023