£88 million to help unleash the productive power of the UK economy

- £88 million new government investment to help close the productivity gap between UK and major world economies and turbocharge British businesses
- investment will help power the next generation supercomputers which could improve business efficiencies, including providing up-to-the-minute weather forecasts
- funding will help kickstart the UK's largest and most ambitious productivity institute, helping examine how to boost productivity levels across the country

Levels of productivity across certain sectors in UK manufacturing, like aerospace, are among the highest in Europe, but overall UK productivity still lags behind major global economies and certain sectors, including chemicals and textiles, find it harder to grow.

By adopting new technologies and more efficient business practices, the productivity of businesses, particularly small ones, could be increased. This will help them to scale up and expand into new markets – boosting competition and ultimately benefiting consumers with lower prices or better quality products and services.

£43 million in government investment will support top researchers and analysts to explore how to turbocharge UK productivity levels through a new ambitious productivity institute; tackling barriers such as productivity imbalances between sectors and regions, poor management practices and skills investment.

Experts will work closely with businesses to power the UK towards a more competitive and resilient economy, as well as the public sector and policymakers, aiming to deliver benefits for both businesses and consumers. Increased productivity can drive up wages, lower prices of products and improve working conditions.

The announcement comes as ministers visit new infrastructure projects across the country to highlight government investment in connectivity. Infrastructure is one of the 5 foundations of productivity highlighted in the Industrial Strategy and the Prime Minister has been clear that this government will level up infrastructure across the country with new road and rail investment and full fibre broadband.

Business Secretary Andrea Leadsom said:

> Productivity matters – if we produce more, we can earn more, as individuals and as a society.
>
> Today's investment will allow us to develop pioneering software to

> harness the power of supercomputers and create a state-of-the-art Productivity Institute.

A further £45 million will be specifically invested by the government into the development of cutting-edge supercomputer software, set to transform whole sectors from agriculture and advanced aerospace to Formula One and pharmaceuticals with hyper-accurate weather predictions – helping them plan come rain or shine and in turn boost their productivity.

Involving the Met Office, this radical development could mean businesses will receive up-to-the-minute weather forecasts, so they are not 'caught in the rain' and can focus on delivering their products and services effectively and efficiently. This knowledge could help farmers protect crops for consistent food supplies, help airports keep flights running – and businesses can foresee the impact on infrastructure that cause downtime like flooding, for example.

With the potential to provide more accurate predictions, supercomputers are helping businesses plan methodically. Research software engineers and scientists will work together to futureproof the UK against the fast-moving changes in supercomputer designs, pushing the boundaries of science and preventing compatibility issues or lags – which could pose a threat to disciplines such as weather and climate prediction, to complex aircraft design and drug development.

Named 'ExCALIBUR', the project will ensure the UK can meet the scientific and engineering challenges of the future with maximum efficiency and safeguard future industry productivity.

Met Office Director of Meteorological Science, Simon Vosper, said:

> The ExCALIBUR project will establish a national capability in scientific computer software that mirror the real world, accelerating advances in a wide range of important areas that rely on cutting edge computer technology: from climate prediction to drug research and nuclear fusion.

Professor Jennifer Rubin, Executive Chair of Economic and Social Research Council, said:

> Raising productivity is arguably the greatest economic challenge of our time, and is needed to increase wages and living standards, and to ensure benefits can be spread across sectors and regions.
>
> This significant investment in understanding what will drive improvements in productivity is an important opportunity for research to make a contribution to improving quality of life and economic performance.

The £88 million funding forms part of the government's Strategic Priorities Fund (SPF), and follows the government reaffirming its commitment to invest at least 2.4% of GDP in R&D by 2027. The government has made making boosting productivity and increasing earning power a priority – making the most of untapped potential right across the UK.

1. About the Strategic Priorities Fund:

- the Strategic Priorities Fund supports high quality multidisciplinary research and development priorities
- this is the second wave of funding
- the SPF Wave 2 total programme funding allocation is £496.8 million

2. About the programmes:

- Transforming Productivity: National Institute of Excellence (ESRC) ESRC with Innovate UK HMT, BEIS, DWP and MHCLG

Funding requested: £42.2 million over 6 years.

Location(s): This funding is to create an institute that creates a national capability for productivity. HEIs, Institutes, PSREs will be able to bid for funding. The location of the Institute and any partners will be announced following a competitive process.

This SPF will invest in an ambitious, strategically driven, world class institute to provide a systematic understanding of what is required to solve the UK's productivity challenges. The institute will provide a convening hub for wider research as well as undertaking its own research, bespoke analysis and evaluations. The Institute will also design and test interventions: translating findings and scaling-up solutions in collaboration with business and policy-makers. The institute will be driven by high profile leaders; combining permanent academic researchers and analysts with seconded world-leading experts, drawing in outstanding fellows from relevant research, public and private sector organisations with an interest in understanding and improving productivity.

The project will be delivered with £30 million funding for the Productivity Institute and £11 million for open research calls.

- Harnessing Exascale Computing: Exascale Computing Algorithms and Infrastructure Benefiting UK Research: 'ExCALIBUR' (Met Office and EPSRC)

Met Office and EPSRC with STFC, UKAEA, NERC and MRC

Funding requested: £45.71 million over 5 years Location(s): The intention is to build a national capability through calls which are open to HEIs, Institutes, PSREs and/or businesses across the UK.

Fast-moving advances in supercomputer architectures will render current scientific simulation codes redundant. This poses a significant threat across a range of disciplines from weather and climate prediction, through complex

aircraft design and drug development, to frontier science fields including cosmology. The UK must harness the power of those advances in architecture to meet the scientific and engineering challenges facing society and mitigate the risk of this threat. Present approaches to scientific computing are not adequate to that task.

ExCALIBUR will design cutting-edge algorithms and software for the efficient solution of scientific problems on future generation supercomputers. A multidisciplinary cohort of research software engineers and scientists will work together to future-proof the UK against the fast-moving changes in supercomputer designs.

This will be delivered through knowledge integration activity between software engineers (£0.75 million), a scoping workshop to establish high priority use cases which will be developed through a mixture of open calls, commissioned research and single tenders (£5-7 million each), a second wave of use cases (~£2 million each), funding for disciplines with emerging requirements for high-performance algorithms (£3 million), cross-cutting research activities to drive impact (£10 million) and capital funds to develop proof-of-concept systems with new computer architectures in partnership with industry (£4.5 million).