

# Press release: Robots to fix underground pipes and help cut roadworks

- £26.6 million investment to build micro robots that can help repair the UK's vast underground pipe network preventing disruptive roadworks and road closures
- robots – including flying and underwater versions – will also inspect and maintain oil and gas pressure vessels and offshore wind turbines
- funding from the government's modern Industrial Strategy to invest in the industries of tomorrow

New micro robots will be built to repair the UK's huge underground pipe network, significantly cutting the disruption caused by the 1.5 million road excavations that take place every year.

Scientists from 4 British universities will use £26.6 million government investment to develop 1 cm-long robotic devices that use sensors and navigation systems to find and mend cracks in pipes. The traffic closures and disruption to businesses of these roadworks is estimated to amount to more than £5 billion. A further 14 projects backed by the government will see robots sent to hazardous work places such as offshore wind-farms and nuclear decommissioning facilities. Researchers will test new technologies, such as the use of artificial intelligence (AI) software on satellites in orbit to detect when repairs are needed, and drones for oil pipeline monitoring.

Science Minister Chris Skidmore said:

While for now we can only dream of a world without roadworks disrupting our lives, these pipe-repairing robots herald the start of technology that could make that dream a reality in the future

From deploying robots in our pipe network so cutting down traffic delays, to using robots in workplaces to keep people safer, this new technology could change the world we live in for the better. Experts in our top UK universities across the country are well-equipped to develop this innovative new technology.

We have put research and development at the heart of our modern Industrial Strategy, with the biggest boost to funding in UK history to create high skill jobs and boost productivity across the country.

UK Research and Innovation (UKRI) Chief Executive, Professor Sir Mark Walport said:

The projects announced today demonstrate how robots and artificial intelligence will revolutionise the way we carry out complex and dangerous tasks, from maintaining offshore wind farms to decommissioning nuclear power facilities.

They also illustrate the leading role that the UK's innovators are playing in developing these new technologies which will improve safety and boost productivity and efficiency.

The £26.6 million government funding boost is part of the modern Industrial Strategy, investing in the technologies of tomorrow and creating high skilled jobs across the country. The UK already develops world-leading robotics technologies, and these projects funded by the Industrial Strategy Challenge Fund and delivered by UKRI, will help make this a sector for UK businesses to grow and dominate international markets.

Health and Safety Executive Chair Martin Temple said:

The key purpose of the Health and Safety Executive is to save lives and prevent workplace injury and ill health. To achieve this, we need businesses to work with us and to be innovative in their thinking around managing risk in the workplace. New and emerging technologies are shaping our working environment.

As a regulator we want to encourage industry to think about how technologies such as robotics and AI can be used to manage risk in the workplace, safeguarding workers both now and in the future world of work.

## **The modern Industrial Strategy**

Our modern [Industrial Strategy](#) published last year, set out how the whole of the UK can build on these strengths, extend them into the future, and capitalise on new opportunities. Investing in science and research to keep us at the forefront of new technologies and the benefits they bring. Nurturing the talent of tomorrow – through more outstanding schools, world-leading universities and the technical skills that will drive our economy. And transforming the places where people live and work – the places where ideas and inspiration are born – by backing businesses and building infrastructure across every part of our country.

It has been taken forward at pace over the last year:

- innovative ideas that bring together world-class UK science, research and innovation to develop cutting edge products and services of the future have received an extra £1.7 billion making it the largest increase for 40 years (to £7 billion). That includes £210 million to develop new medical diagnostic tools and treatments, £90 million for the food and farming industry to embrace agri-tech and £184 million for 41 UK universities to train the next generation of world-class scientists

and engineers

- 6 sector deals between government and industry have been published – from construction and automotive to nuclear and the creative industries, including £1.9 billion of investment in life sciences and £1 billion for artificial intelligence. They are not only about attracting investment and growth, but also ensuring we have the skilled, diverse workforce we need for the future
- plans for new technical qualifications (T-levels) and to transform the quality and quantity of apprenticeships
- furthered the connectivity of Britain's towns, cities and rural areas, including the first allocations of the £190 million full-fibre challenge fund and £25 million for 6 5G test-beds across the UK
- opened the Transforming Cities Fund with billions of pounds ready to go to projects that drive productivity by improving connections within city regions
- opened the Faraday Institution in Oxford to keep the UK at the forefront of global battery manufacture
- announced plans for a new spaceport in Sutherland
- we now have the fastest growing infrastructure investment across the G7, providing £31 billion of additional capital spending to areas critical to improving productivity
- we have launched the £9 million Centre of Data Ethics and Innovation to act as an advisory body to government and regulators on ethics of data and its use, including for AI
- we recently launched the Patient Capital Fund, which will invest £2.5 billion in our most innovative companies
- we will shortly publish the Business Productivity Review setting out ways to support improving productivity in many of our smaller businesses.

## Projects

The Industrial Strategy Challenge Fund (ISCF) robotics challenge is a £93 million, 4-year programme that will develop robots to take people out of dangerous work environments and go into areas beyond human limits. The challenge will:

- develop robotic solutions to make a safer working environment in industries such as offshore energy, nuclear energy, space and deep mining
- increase productivity
- open up new cross-disciplinary opportunities

Innovate UK, part of UKRI, funded some of the projects through a new scheme called the Innovation Lab: a one-week residential workshop where some of the UK's best robotics researchers and businesses joined forces to create innovative project proposals.

The successful projects are:

## **Inspect, Maintain and Repair in Extreme Environments Collaborative R&D**

- autonomous aquatic inspection and intervention led by ROVCO Ltd
- Chimera – robotic inspection of pressure vessels led by Forth Engineering Ltd
- Connect-R led by Barrnon Ltd – an industrial-scale self-building modular robotic solution to provide robotic access to work-sites in hazardous environments
- Prometheus – a reconfigurable robotic platform(s) with advanced sensing for confined spaces led by Headlight AI Ltd
- MIMREE – Multi-Platform Inspection Maintenance & Repair In Extreme Environment (MIMRee) led by Plant Integrity Ltd

## **Demonstrator phase 2 projects**

- advancing underwater vision for 3D Phase 2 (AUV3D-P2) led by ROVCO Ltd
- LEO satellite based AI demonstrator led by Myrtle Software Ltd
- unmanned surface vessels for rapid environmental assessment in challenging inland waterways and tidal environments led by Safeguard Nautica Ltd
- autonomous robotic intervention system for extreme maritime environments (ARISE) Stage 2 led by Autonomous Surface Vehicles Ltd
- demonstrator for robotic inspection and maintenance of offshore wind turbine blades led by Bladebug Ltd
- in-service X-ray radiography of offshore wind blades (RADBLAD) led by INNVOTEK LTD
- autonomous, robotic and AI enabled bio-fouling monitoring, cleaning and management system for offshore wind turbine monopile foundations (RobFMS) led by Innovative Technology and Science Ltd
- WatchChainR led by Archangel Imaging Ltd
- offshore infrastructure robotic inspection system (OSIRIS) demonstrator led by Autonomous Devices Ltd