

Spotlight on Dstl's world-leading science: video

News story

Our experts describe some of their incredible innovative work, putting the science inside UK defence and security.



During British Science Week 2021 we are putting the spotlight on some of the incredible innovations that are taking place.

The Defence Science and Technology Laboratory (Dstl) works to develop new science across land, sea, air and space, not just for the Armed Forces but for the security of the United Kingdom and its allies.

This year's theme for British Science Week is 'Innovating for the future'. To celebrate our world-leading science we asked our experts about some of the incredible innovative science they are involved in, including a [collaborate regenerative medicine project featured in pages 28 to 33 of Soldier magazine](#), growing universal blood in the laboratory to save lives and speed recovery from devastating combat injury.

[Innovation here at Dstl](#)

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Northumberland river sets new course after bank breach

The natural phenomenon, which had been expected and prepared for by the

Environment Agency and its partners, saw part of the river merge into adjacent Caistron Lakes near Rothbury.

Around half of the river was flowing from the main River Coquet into the lakes area, with the stored water held in place by the lake's raised aggregate bank.

This bank has now naturally breached meaning most of the River Coquet is now flowing through the lakes area. This has not led to any increased flood risk for the area.

The River Coquet has now set a new course, depleting a 500m stretch of the original channel.

Fish rescues

Environment Agency fisheries specialists have this week been relocating fish in this cut off stretch of river to ensure their survival. Over 250 fish have been rescued and returned to the main river, including juvenile salmon, trout and lampreys. Experts are also working with Natural England to monitor the new course and any environmental impact.

Stephen Merrett, Flood Risk Operations Manager for the Environment Agency in the North East, said:

We've been closely monitoring the River Coquet over recent years and together with partners developed an incident response plan to reduce the impact on the community and environment.

The bank holding the impounded water has now breached, and as expected, the river has taken a new course. The River Coquet is a naturally wandering river and erosion, switching channels or the formation of new channels is an entirely normal occurrence.

It's a protected conservation area and so allowing this natural process to take place ensures it remains a good habitat for wildlife and environmental features.

A meeting in 2019 involving agencies including the Environment Agency, Northumberland Rivers Trust, Natural England, and landowner, fisheries and Northumberland County Council representatives, discussed the potential issues with the River Coquet and the likely future overtopping or breach.

Caistron Lakes were created many years ago when the River Coquet overtopped into a sand and gravel extraction site.

The Environment Agency had worked with Northumberland County Council to put in place additional flood risk measures in Rothbury – such as closing footpaths and car parks – should the bank breach during high river levels.

These have now been removed.

Regulator launches campaign to help charity trustees be “certain in uncertain times”

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Over £90 million government funding to power green technologies

- UK government to drive forward next generation green technologies with over £90 million funding, as part of the government's £1 billion Net Zero Innovation Portfolio
- new tech in energy storage, floating offshore wind and biomass production will support highly-skilled jobs across the UK
- green innovators urged to bid for funding to develop new technologies that will enable the UK to build back greener

£92 million investment will enable green innovators to drive forward the next generation of technologies that will help the UK transition to clean, green energy and tackle climate change, the government announced today (Tuesday 9 March).

The government has launched 3 new innovation challenges across key areas of the green energy sector including energy storage technology, floating offshore wind and biomass production.

These new challenges will help develop innovative technologies that will reduce the costs of deploying them across the energy sector, support thousands of highly-skills jobs across the UK, grow the economy and deliver the Prime Minister's [ten point plan](#).

Energy Minister Anne-Marie Trevelyan said:

The UK's energy innovators have been vital to us becoming a world-leader in clean green technology, helping us to go further and faster as we tackle climate change.

This funding will allow us to develop new ways of unlocking the potential for green energy as we continue making big strides towards our goal of eradicating our contribution to climate change by 2050.

Energy storage innovation

Of the £92 million government investment, £68 million will further the development of energy storage technologies to support a future renewable energy system. These new innovations will accelerate the commercialisation of a first-of-a-kind storage that can hold energy from wind turbines and solar panels, as well as heat, over long periods of time, including months and years, until it is needed by consumers.

The supply of energy from renewable sources can be intermittent, so effective storage is important to ensuring clean energy that is reliable. Energy storage is expected to be one of the key components in a smarter, more flexible low-carbon energy system which can maximise the use of renewable generation.

Floating offshore wind

£20 million funding will power innovation that unlocks the full potential of floating offshore wind technology around the UK coastline, allowing turbines to be situated in areas where it is too deep for them to be embedded on the seafloor. These tend to be locations where wind strengths are stronger and more consistent as they are further out to sea and further support the government's commitment to power every home in the country with wind by 2030.

Innovative technologies could include advancing vital components such as dynamic high voltage cable systems, moorings for challenging seabed conditions and foundations.

Sustainably sourced biomass

Biomass projects will benefit from £4 million government investment aimed at increasing the production of sustainably sourced biomass in the UK – supporting local economies and regional growth, as well as creating jobs in rural areas.

Biomass is organic matter that can be used for fuel in green energy production or to substitute for fossil fuel derived products elsewhere in the economy. It is a key component for the UK to achieve its decarbonisation

commitments, with the Climate Change Committee stating that sustainable biomass can play a significant role in meeting long-term climate targets.

New innovations will help scale up sustainably sourced biomass feedstocks and the production of energy crops – low-cost and low-maintenance crops grown solely for green energy production, including forestry – as well as helping to achieve improvements in yields, cost reductions and profitability.

Notes to editors

[£5 million boost for local authorities to tackle air pollution](#)

Local authorities across England have been granted more than £5 million in government funding to deliver innovative projects to improve air quality.

The money, from the government's Air Quality Grant, helps councils develop and implement measures to benefit schools, businesses and communities and reduce the impact of dirty air on people's health. More than double the funding awarded in 2020 has been made available for this year's grant, meaning a raft of particularly strong applications are being supported.

The application process especially welcomed projects to tackle fine particulate matter (PM2.5) which is known to be the pollutant of greatest harm to human health. Plans to increase awareness and encourage long-term behaviour change were also successful.

These projects complement the wider UK plan for tackling roadside nitrogen dioxide concentrations, which includes a £3.5 billion investment into air quality and cleaner transport. The plan is supporting the uptake of low emissions vehicles, getting more people to cycle and walk, and encouraging cleaner public transport.

Proposals which have won funding include projects and campaigns to:

- partner with GPs to train them as Air Quality champions to raise awareness of the health impacts of air pollution in their surgeries;
- promote anti-idling and organise school street closures at pick-up and drop off times;
- encourage the uptake of electric taxis;
- enhance educational programmes for schoolchildren.

The £5,129,295 awarded in this round of funding means that almost £70 million has been awarded through the Air Quality Grant since it was launched in 1997. Since 2010, notable projects to receive funding include campaigns to promote greater awareness of pollution from domestic burning; a project to promote

electric charging points for canal boats; and collaborations with local businesses to develop low or zero-emissions freight.

These projects have contributed to the significant improvement in air quality seen in the UK in recent decades – since 2010, emissions of fine particulate matter have fallen by 11%, while emissions of nitrogen oxides have fallen by 32% and are at their lowest level since records began.

Environment Minister Rebecca Pow said:

“Air pollution has improved significantly since 2010 but remains the greatest environmental risk to human health.

“This funding demonstrates our commitment to improving our air and also our openness to innovation, through pioneering initiatives such as campaigns to encourage greater use of electric bikes and education programmes teaching children about the harms of fine particulate matter.

“We know local authorities are in the best position to address the issues they face in their areas. These projects demonstrate how they can deliver innovative solutions for their communities and we will continue to work with them closely to offer ongoing support.”

Transport Minister Rachel Maclean said:

“From promoting anti-idling to increasing the uptake of electric taxis, the Air Quality Grant will help to clean up our air as we look to build back greener and lower our carbon footprint.

“The funding announced today will take us one step closer to meeting our climate change obligations, improving air quality and supporting economic growth right across the country.”

The Air Quality Grant forms part of the wider UK Plan for Tackling Roadside Nitrogen Dioxide (NO₂) Concentrations, which includes a £3.5 billion investment into air quality and cleaner transport.

As a result of the NO₂ plan, and alongside the Air Quality Grant, the government has been working with 61 local authorities – and providing £880 million in funding – to reduce NO₂ concentrations through local plans that will deliver required improvements in the shortest time possible.

There are connected plans and initiatives that promote the uptake of low emissions vehicles, getting more people to cycle and walk, and encouraging cleaner public transport.

The government has also recently taken bold action to cut pollution from household burning – the single largest source of the pollutant Particulate Matter (PM_{2.5}), which is the most harmful air pollutant for human health – with bans on the sale of coal and wet wood for domestic burning coming into force from May this year.

The local authority schemes receiving funding in this round are:

Local authority	Project	Amount
Bedford Borough Council	Behaviour change and awareness project delivered in nurseries, schools and a university to encourage reduced car journeys, anti-idling and organise school street closures at pick up and drop off times	£99,775
Blaby District Council	Working with schools, local businesses and citizens to encourage behaviour change. Improvements to air quality monitoring and data for traffic management modelling	£139,300
Brighton and Hove City Council	Retrofit of 17 Double decker buses. Working in partnership with Lewes District Council, East Sussex County Council, West Sussex County Council, Worthing-Adur District Council, and Wealden District Council	£149,500
Bristol City Council	Particulate Matter monitoring and engagement programme to increase awareness and encourage behaviour change towards domestic burning	£122,597
Buckinghamshire Council	Pilot of employer salary sacrifice scheme to encourage a shift to electric vehicles	£97,900
Cambridge City Council	Purchase of sensors to monitor air quality levels to develop behaviour awareness campaign and inform future action to reduce Particulate Matter	£44,855
Cherwell District Council	Anti-idling campaign at level crossings, schools, hospitals and doctor's surgeries	£17,300
City of York Council	Feasibility study to reduce emissions for first and last mile light good deliveries in York and pilot of micro-consolidation centre	£297,237
Colchester Borough Council	Engagement with community to encourage behaviour change to improve air quality. Trialling of Pay as You Go electric cargo bike club	£248,700
Essex County Council	Collection and analysis of Air Quality and transport data to develop traffic management measures. Working in partnership with Colchester Borough Council	£249,755.57
Hammersmith & Fulham Council	Development of a borough wide construction site monitoring website	£136,800
Islington London Borough Council	Partnership with General Practitioners to train them as Air Quality Champions to deliver Air Quality improvement messages in GP surgeries	£143,832
Leicester City Council	Particulate Matter data gathering and mapping study to inform public engagement campaign	£249,600
Liverpool City Council	Schools Particulate Matter education and awareness programme supported by Air Quality data gathered by pupils with portable monitoring devices	£131,954

Local authority	Project	Amount
London Borough of Camden	Installation of electric points for use by licenced ice cream vans	£100,000
London Borough of Lambeth	Street by street mapping of Particulate Matter to form awareness programme	£31,158
Oxford City Council	Development of Air Quality community website. Working in partnership with Cherwell District Council, West Oxfordshire District Council, South Oxfordshire District Council, Vale of White Horse District Council, and Oxfordshire County Council	£162,500
Oxford City Council	Particulate Matter campaign to raise awareness and change behaviour towards domestic burning	£45,000
Sandwell MBC	Working with the Faith Community to raise awareness and change behaviour to improve local Air Quality	£75,760
Sefton MBC Air Quality	Creation of a public interactive immersive room teaching children about air quality. Enhancement of existing website to engage and support all Sefton Primary schools to learn about Air Quality	£122,500
Slough Borough Council	Encourage take up of electric taxis through behaviour and awareness campaign	£370,035
Southampton City Council	Particulate Matter data gathering to raise awareness and encourage improved practices for domestic burning. Working in partnership with Eastleigh Borough Council Winchester City Council, and New Forest District Council	£291,547.18
Spelthorne	Encourage take up of electric taxis through behaviour and awareness campaign. Working in partnership with Elmbridge Borough Council, Epsom and Ewell Borough Council, Guildford Borough Council, Reigate and Banstead Borough Council, Waverley Borough Council, Woking Borough Council, and Surrey County Council	£256,686
Staffordshire County Council	Engagement with schools and businesses to encourage behaviour change to improve air quality, and delivering events promoting electric vehicles. Working in partnership with Cannock Chase District Council, East Staffordshire Borough Council and Staffordshire Moorlands District Council	£296,828
Tunbridge Wells	Behaviour and awareness campaign delivered through an interactive digital educational package aimed at primary school children and their parents. Working in partnership with Canterbury City Council	£103,770

Local authority	Project	Amount
West Berkshire Council Air Quality	Anti-idling campaign for 3 boroughs and purchase of sensors to monitor air quality levels to develop future action to reduce Particulate Matter. Working in partnership with Bracknell Forest Borough Council and Wokingham Borough Council	£259,406
Westminster City Council	Engagement feasibility study to develop solutions for canal boat electric charging infrastructure	£60,000
Westminster City Council (Westminster Cross River Partnership)	Expansion on Clean Air Village 1, 2 and 3 – Engagement and behaviour change project that will implement a range of freight solutions in order to clean up London's air. Working in partnership with Westminster, London Boroughs of Barnet, Brent, Hammersmith & Fulham, Islington, Lambeth, Merton, Richmond upon Thames, Wandsworth and Kent County Council	£700,000
Wokingham Borough Council	Schools education programme to raise awareness and encourage active and sustainable travel choices. Development of Mobile app to help local commuters make sustainable travel choices	£125,000