

£166 million cash injection for Green Technology and 60,000 UK jobs

- £166.5 million cash boost will drive forward developments in critical technology needed for a green industrial revolution including carbon capture, greenhouse gas removal and hydrogen
- Funding package will help benefit energy-intensive businesses like Tate & Lyle, BAE Systems and Celsa Manufacturing, creating over 60,000 well-paid green jobs across the UK, cutting business costs and helping to revitalise industrial heartlands
- UK government powering ahead with ambitious commitments set out in the Prime Minister's 10 Point Plan for a green revolution just six months ago

The green technology required to help the UK meet its world-leading climate targets has been given a £166.5 million cash injection, just six months on from the publication of the Prime Minister's 10 Point Plan for a Green Industrial Revolution.

The multi-million pound investment, awarded to innovators, businesses, academics and heavy industry right across the UK, will accelerate the delivery of the critical game-changing technologies needed to further drive Britain's climate change ambitions, while creating over 60,000 jobs across the UK.

The £166.5 million funding package announced today (Monday 24 May) will develop technologies in carbon capture, greenhouse gas removal and hydrogen, while also helping find solutions to decarbonise the UK's polluting sectors including manufacturing, steel, energy and waste.

This investment will help put the UK at the forefront of the green technologies of the future, while supporting British industries to lower costs, remain competitive and protect jobs as they improve their energy efficiency and transition to a green economy.

This significant investment will help the UK meet its ambitious climate commitments, including reaching net zero emissions by 2050 and the world's most ambitious climate target of reducing UK emissions by 78% by 2035 compared to 1990 levels.

Energy Minister Anne-Marie Trevelyan said:

We are determined to tackle climate change and make it win-win for both our planet and our economy. Today's major cash boost – targeted at our most polluting industries – will encourage the rapid development of the technologies we need to reign in our emissions and transition to a green economy, one that reduces costs for business, boosts investment and create jobs.

Just six months ago, the Prime Minister set out a clear 10 Point Plan for creating and supporting up to 250,000 British jobs as we level up and build back greener from the pandemic. Today we're boosting our armoury for the fight against climate change and backing innovators and businesses to create green jobs right across the United Kingdom.

The Prime Minister's ambitious 10 Point Plan committed to removing ten megatonnes of carbon dioxide, generating 5GW of hydrogen by 2030, and creating 250,000 green jobs.

Today's announcement takes the UK closer to delivering on these commitments and includes:

- £60 million to support the development of low carbon hydrogen in the UK and to identify and scale-up more efficient solutions for making clean hydrogen from water using electricity. This will take the UK one step closer to using low carbon hydrogen in key industries across the UK – from powering transport such as trains and ships to factories and the heating systems in our homes. This funding will help create around 8,000 hydrogen jobs set out in the 10 Point Plan.
- £37.5 million to fund the largest government programme of greenhouse gas removal methods helping cement the UK's status as a world-leader in this technology. Of this, twenty-four projects across England and Wales will receive up to £250,000 to fund innovative designs that develop new ways of removing greenhouse gases from the atmosphere and store them safely, and a further 5 projects will receive up to £4.5 million each to investigate the viability of adopting greenhouse gas removal methods at scale.
- £20 million to support the development of the next generation Carbon Capture, Usage and Storage (CCUS) technologies so they can be deployed at scale by 2030. This could include funding innovative technologies that widen the suitability of CCUS to a larger range of UK industrial uses such as chemicals and cement, reducing the cost of deploying CCUS and helping industrial waste or power sector companies to capture and store harmful emissions from the source, before they are emitted into the atmosphere.
- £20 million to establish a new virtual Industrial Decarbonisation Research and Innovation Centre that will accelerate the decarbonisation of key energy-intensive industries which currently make a significant contribution to UK emissions. Run by Heriot-Watt University, Edinburgh, the Centre will bring together new technologies and address the challenges faced by industrial areas, helping to provide solutions that reduce costs, risks and emissions. This centre will connect and empower the UK industrial decarbonisation community with over 140 partners, including industry and business, government and regulatory agencies and world-leading academics, working together to deliver an impactful innovation hub for industrial decarbonisation.
- £16.5 million through the Industrial Energy Transformation Fund to develop new technologies and processes that help energy-intensive sectors cut their emissions, while reducing their energy bills. Projects

receiving funding include Tate & Lyle to decarbonise its London sugar refinery and cut emissions by up to 90% and Celsa Manufacturing to install new technologies that improve energy efficiencies in the process to melt scrap metal and produce steel. BAE Systems will also receive funding to install energy efficient technology that could save equivalent annual emissions of around 700 households.

- £8 million for projects to develop innovations, such as repurposing textile waste, new clay production techniques for the ceramics industry and concrete manufacturing that support the rapid recovery and sustainability of UK industry. Projects include developing glazes for fast-fire manufacturing of ceramic tiles made entirely from recycled waste, creating a cost-efficient, low carbon concrete manufacturing solution using waste materials and developing the world's first, high temperature heat pump that can compete commercially with burning fossil fuels.
- £4.7 million will establish a new Transforming Foundation Industries Research and Innovation Hub. The hub will be led by Cranfield University and will help industries like metals, glass, cement, paper and glass to work together and address their common challenges while accelerating the development and adoption of new technologies and business models. This could include creating new, smart materials and processes that enable cheaper, lower energy and low carbon products.

On Wednesday, the newly formed Net Zero Expert Group will meet for the first time. Chaired by the Business & Energy Secretary Kwasi Kwarteng, this group was a key commitment set out in the PM's Ten Point Plan, and brings together an expert group as part of Task Force Net Zero to drive forward net zero targets, providing advice on tackling climate change and helping to develop new policies to support the development of the government's Net Zero Strategy. This will be published ahead of the UN climate summit COP26 taking place in Glasgow this November.

Challenge Director for UK Research & Innovation's (UKRI) Industrial Decarbonisation challenge Dr Bryony Livesey said:

The introduction of the Industrial Decarbonisation Research and Innovation Centre concept shows the commitment to not only fund largescale decarbonisation efforts, but to make sure we continually learn from and adapt to their early results and challenges. By enabling the Centre to build evidence on a range of areas from direct costs and emissions to skilled jobs and wider net zero policy, we believe we are creating a more adaptive and responsible path for the UK's big industry to take to remain at the forefront of a global low carbon culture.

Challenge director of UKRI's Transforming Foundation Industries challenge Bruce Adderley said:

For the Foundation Industries there are huge benefits to be gained

by looking at reducing and re-using waste materials that arise from the creation, processing and use of the products manufactured by these sectors, so it is inspiring to see so many innovations that tackle this challenge head on. The focus these projects bring on greener alternatives, lower emissions, and energy saving, will have an impact across the economy, support the move towards net zero in the UK, and we look forward to helping them bring their innovations to fruition. The research hub also represents a crucial step forward in addressing innovation in these industries, by introducing a more collaborative environment to share knowledge and experiences.

Professor Mercedes Maroto-Valer at Heriot-Watt University said:

The role of the Industrial Decarbonisation Research and Innovation Centre will be to consider a wide-range of opportunities and challenges for the industrial sector to decarbonise— starting with the industrial clusters and our joint ambition to deliver the world's first net zero industrial hubs by 2040. The research and evidence we'll work through with our academic and industry partners across the UK will not just focus on industry itself, however, but also how it will shape society and economies at both a local and national level. It's a key part of making sure the UK heads down the most effective path with its decarbonisation efforts and I'm looking forward to starting the journey.

£86 million of the total funding package announced today comes from the government's £1 billion Net Zero Innovation Portfolio, which provides funding for low-carbon technologies and systems, helping the UK end its contribution to climate change.

Projects receiving funding include:

- Professor Christopher Evans, UK Centre for Ecology and Hydrology is being backed with almost £4.5 million to manage and restore peatlands to maximise their greenhouse gas removal potential at farmland near Doncaster, and at upland sites in the South Pennines and in Pwllpeiran, West Wales. Peatlands store more carbon than any other ecosystem on land, but as a result of human disturbance they are rapidly losing this carbon to the atmosphere. This project will re-create, and where possible enhance, the environmental conditions that lead to peat formation, and to re-establish a secure long-term carbon store in the landscape.
- Celsa Manufacturing, Cardiff, Wales, will receive £3 million to install new technologies to reduce emissions and improve energy efficiencies in the process to melt scrap metal and produce steel. Further, this project could increase domestic scrap processing and production of steel in the UK, reducing the need to import materials from around the world – lowering the country's carbon footprint.

- Saint-Gobain Glass, Eggborough, North Yorkshire, will receive over £1.4 million to deliver a new flat glass production furnace to improve the efficiency of its UK plant while reducing energy consumption, emissions and on-going maintenance costs. The company has designed a new furnace and production line component replacements that utilise the latest technological advances.
- Tate & Lyle, London, will receive over £500,000 to study how it can decarbonise its sugar refinery and reduce greenhouse gas emission by 90%. The company's Thames Refinery currently uses boilers fired with natural gas to generate steam and power for its refining operations, which emits carbon dioxide. The aim of the project is to explore new technology that reduces emissions and can also remove carbon from the air that could be deployed at Tate & Lyle's refinery and also at other sugar refineries around the world.
- Phillips 66 Limited, Humberside, will receive over £500,000 explore switching fuel in its gas refinery's industrial fired heaters with renewable and low carbon hydrogen. Doing so will help to decarbonise these heaters and significantly reduce emissions, while demonstrating the importance of hydrogen for industrial fuel.
- Over £250,000 for a Direct Air Capture (DAC) technology project led by Storegga, owned subsidiary Pale Blue Dot Energy, with technology partner Carbon Engineering (CE), engineering partner Petrofac Facilities Management, and support from the Universities of Cambridge and Edinburgh. DAC technology has the potential to accelerate UK net zero efforts by capturing carbon dioxide directly from the atmosphere so it can be stored permanently underground. This project will research and develop an alternative to using natural gas to power the calciner, which is a kiln that operates at high temperatures and a key step in the process. This will enable the system to run on clean energy only, eliminating the current requirement to co-capture the carbon dioxide from natural gas which is used in other systems.
- Scotland's Rural College alongside partners University of Strathclyde, Agri-EPI Centre and No Pollution Industrial Systems Ltd, is receiving over £200,000 to reduce the environmental impact of beef production. The project aims to capture the greenhouse gas methane from housed cattle and convert it to carbon dioxide and energy using a novel system. At the same time, manure and waste feed will be converted to a fertiliser and biogas that will be used to power farm sheds and produce low-carbon fruits and vegetables. As a result, farmers could improve their profitability, increase their selection of goods to sell and utilise natural resources through more sustainable low-carbon farming that reduces their carbon-footprint.
- BAE Systems, Glascoed, Wales, has been awarded over £82,000 to incorporate energy efficient technology that replaces a steam heating system at the company's Glascoed site. The project aims to reduce energy consumption and the company's carbon footprint by up to 25%, saving the equivalent annual emissions of approximately 700 households.
- William Cook Holdings Limited, Sheffield, will benefit from over £38,000 to improve energy efficiency and reduce its environmental footprint by recovering waste heat from its furnaces to produce electricity, among other uses.

Notes to editors

- The full greenhouse gas removal projects receiving the £37.5 million funding [will be published here.](#)
- The full projects receiving £8 million for industrial innovations [will be published here.](#)
- The full projects receiving £16.5 million funding through the Industrial Energy Transformation Fund can be seen here and the competition page here. These projects are the first tranche of winners to come from the Phase 1 2020 competition window.

Funding overview

- The Hydrogen Supply 2 (HYS2), CCUS Innovation 2.0 and Direct Air Capture & Greenhouse Gas Removal competitions are part of BEIS' £1 billion Net Zero Innovation Portfolio, which aims to accelerate the commercialisation of innovative clean energy technologies and processes through the 2020s and 2030s.
- The expression of interest process for the HYS2 and CCUS innovation competitions has opened today.
- Hydrogen Supply 2 (HYS2) will build upon the success of our earlier support for bulk hydrogen supply solutions, which accelerated progress on influential and award-winning projects like HyNet, Gigastack and Acorn.
- Projects in the earlier Low Carbon Hydrogen Supply competition made great progress, but we believe there are still technologies out there that could help bring down the cost of hydrogen supply if progressed further, so we are opening this second follow-on competition.
- The cost of producing and delivering low carbon hydrogen is far higher than for natural gas. We need to innovate to bring down the costs whilst maximising the UK role in the burgeoning global hydrogen economy.

The new £60m HYS2 innovation competition will be split into two streams:

- Stream 1 (up to £30m) will support development of solutions to a market entry stage, to help increase competition in the market, maximise potential future cost reduction and foster export opportunities. This Stream will be run over two phases, feasibility followed by demonstration. The funding will be split across four categories so we can bring on a diverse range of technologies; Low carbon hydrogen production; Zero Carbon hydrogen production; Hydrogen Storage and Distribution; and Net zero hydrogen supply solutions.
- Stream 2 (up to £30m) will support a few more developed projects, to help ensure UK hydrogen supply solutions remain competitive, maximising cost reduction for projects deployed in the 2020s. We hope it will create a pipeline of projects for the £240m Net Zero Hydrogen Fund.
- Industry or academic-led projects can apply for CCUS innovation 2.0 funding. Particularly we are looking to broaden the audience from the traditional power sector's interest in CCUS innovation, to gain greater interest of next-generation CCUS technologies in industry, waste and power sectors.
- UK is already home to leading carbon-tech companies such as Carbon

Clean, Carbon 8, Pale Blue Dot, Econic Technologies, C-Capture and CCM Technologies, who with UK public funding have allowed them to develop and expand their businesses and have recently raised tens of millions of private sector investments. The new CCUS innovation programme will continue this success by funding innovation that widens the applicability of CCUS to a larger range of UK industrial applications, increases the technology readiness level (TRL) of the novel CCUS technology, reduces the cost of deploying CCUS in the UK and create competitive pressure on existing first-generation CCUS technology.

The first CCUS call will consider grant application of:

- Up to £50,000 for industrial, waste or power sector companies performing analysis on next generation carbon capture technology that are most suited to their site or industrial sector.
- Up to £1 million for projects developing and piloting mid-stage (TRL 3-5) technology.
- Up to £5 million for projects demonstrating late-stage (TRL 6-8) technology at intermediate scale at site.
- The full list of winners for the GGR & DACS competition from the Net Zero Innovation Portfolio [will be published here](#)