£84 million boost for technology to power a green aviation revolution

- Green technology which could one day be used for taxi-like aircraft is set to revolutionise the aviation industry, with potential for zero-emissions air travel by 2023
- £84.6 million invested by government and industry in 3 ambitious aerospace projects based in Bedford, Bristol, and Cranfield
- projects will help the industry to build back better and greener, and have the potential to unlock up to 4,750 jobs across the UK

Nearly 5,000 jobs could be secured in making the UK's aviation sector greener, thanks to a multi-million-pound boost for 3 pioneering research and development projects announced today (Thursday 28 January) by Business Minister Paul Scully.

The winning projects represent a total investment of £84.6 million – half from the government, delivered through the ATI Programme, and matched by industry.

Each of the 3 projects will use British innovation and expertise in green technology to power zero-emissions flights, using alternative energy sources of hydrogen or electricity to reduce the industry's reliance on polluting fossil fuels.

From Bristol to Coventry and Cranfield to Orkney, these projects could help secure up to 4,750 design, engineering and manufacturing jobs.

Not only could this technology enable passengers to travel abroad in a greener fashion, in future it could enable the skies to be used for travelling much shorter journeys, similar to a local taxi service, reducing congestion on road networks, and allowing passengers to travel more quickly and locally.

Innovative aerospace technology is rapidly developing, meaning that there is the potential for zero-emissions flights to be a reality as early as the end of 2023.

Minister for Business, Paul Scully, said:

> These trailblazing projects are broadening the horizons of future air travel, towards a greener future where we may be able to hail taxis from the sky rather than on our streets.
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> This multi-million-pound boost will help to secure up to 4,750 jobs in these projects spanning the UK, and could pave the way to technological advances that will allow the industry to build back better and greener following the COVID-19 pandemic – and help

tackle climate change.

The following three projects are receiving funding:

- GKN Aerospace-led project H2GEAR will receive a £27.2 million government grant to develop an innovative liquid hydrogen propulsion system (a component that propels the aircraft forward) for regional air travel, which could be scaled up for larger aircraft and longer journeys
- ZeroAvia's HyFlyer II will receive a £12.3 million government grant to scale up its zero-emissions engines for demonstration on a 19-seater aircraft, showcasing its significant technological advances, meaning that customers can expect to fly on zero-emissions aircraft as early as the end of 2023
- InCEPTion, led by Blue Bear Systems Research, is receiving a £2.8 million government grant to develop a fully-electrified zero-emissions propulsion system for aircraft, that is powerful, quiet and efficient and could be used for smaller aircraft travelling short distances – even within the same city

The government is committed to helping advance the UK's future transport system through its extensive R&D Roadmap and to increase R&D public spending to £22 billion per year by 2024 / 2025. This investment comes ahead of our consultation on the Aviation Decarbonisation Strategy this year, set out as part of the Prime Minister's Ten Point Plan for a green industrial revolution, with jet zero and low carbon aviation as a key pillar to building back greener.

The announcement of today's grant winners is the latest in government support for the aerospace sector. It forms part of a wider £3.9 billion government-industry investment in aerospace research and development projects from 2013 to 2026 through the Aerospace Growth Partnership and delivered through the ATI Programme.

During the pandemic, aerospace companies have been able to benefit from the government's extensive business support measures including furlough, CBILs, and Bounce Back loans. The aerospace sector and its aviation customers are being supported with almost £11 billion made available through loan guarantees, support for exporters, the Bank of England's COVID Corporate Financing Facility and grants for research and development.

Notes to editors

1.The ATI Programme's grant winners have been chosen by the Department for Business, Energy and Industrial Strategy, Innovate UK, and the Aerospace Technology Institute. The total investment in the 3 projects will be £84.6 million, with £42.3 million government funding matched by industry.

2. The government also awards aerospace funding through the Future Flight Challenge, which in total will award £125 million of government grants, matched by industry, to companies investing in future aviation systems and vehicle technologies, enabling new classes of electric or autonomous air

vehicles.

3. Aviation has a crucial role to play in achieving the government's net zero commitment. To this end, in addition to funding, the government has established the Jet Zero Council, a partnership between industry and government to bring together ministers and industry stakeholders to drive the ambitious delivery of new technologies and innovative ways to cut aviation emissions.

4. This year, the UK will host the UN climate change conference, COP26, in Glasgow with partners, Italy. This will provide an opportunity for the world to come together and commit to urgent action. As hosts of COP26, the UK will lead by example during this unprecedented time. Guided by science, the UK will invest in a green recovery which creates sustainable jobs and addresses the urgent and linked challenges of public health, climate change, and biodiversity loss. The UK is committed to working with all countries and joining forces with civil society, companies and people on the frontline of climate change to inspire action ahead of COP26.

Details of today's winning projects

GKN Aerospace-led H2GEAR (Hybrid Hydrogen & Electric Architecture), Bristol

£54.4 million over 5 years – £27.2 million government grant, matched by industry.

H2GEAR will be delivered in collaboration with partners from GKN Aerospace's Global Technology Centre in Filton, Bristol. The project aims to develop a liquid hydrogen propulsion system for regional aircraft that could be scaled up to larger aircraft. This could create a new generation of clean air travel, eliminating harmful CO2 emissions and leaving water as the only by-product of flight. If successful, the project could help secure up to 3120 high value engineering and manufacturing jobs by 2032 / 2033 in Bristol, Coventry and Loughborough.

ZeroAvia-led HyFlyer II, Cranfield, Bedfordshire

£24.6 million over 2 years – £12.3 million government grant, matched by industry.

In 2019, the project was awarded an ATI Programme grant to produce a zero-carbon engine which was recently demonstrated on a successful test flight for a 6-seater aircraft – the largest hydrogen-electric aircraft worldwide. This latest round of funding will enable the consortium to scale up its hydrogen technology for use on a 19-seater aircraft, another stepping stone on the path towards the government's Jet Zero ambitions. The company will showcase the technology in various test flights, including a world-first long-distance zero-emissions demonstration flight of this size and power level in January 2023. It will also enable ZeroAvia to enter the formal certification process at the end of the project, so that customers can expect to fly on zero

emissions aircraft as early as the end of 2023. If successful, the UK-based consortium, including Aeristech and the European Marine Energy Centre, could help to secure 300 design jobs and 400 manufacturing jobs in Cranfield, Warwick and Orkney.

Blue Bear Systems Research-led InCEPTion (Integrated Flight Control, Energy Storage and Propulsion Technologies for Electric Aircraft), Bedford

£5.6 million over 2 years – £2.8 million government grant, matched with industry.

The consortium aims to develop a zero-emissions fully-electrified propulsion system for aircraft, which if scaled up, would be capable of powering a range of aircraft including unmanned drones and passenger aircraft. This will enable a broad range of new mobility services across the UK, from large cargo delivery to regional commuting. If successful, the project could help secure up to 30 new engineer jobs during the early certification and pre-production phases in Bedfordshire and Derby, and a further 600-900 manufacturing jobs during production in the UK.

Further quotes

Gary Elliott, Chief Executive of the Aerospace Technology Institute, said:

> Today’s announcement shows how the Aerospace Technology Institute (ATI) through its long-term funding is stimulating research in technologies to deliver future zero-emission flight. The ATI Programme is focused on innovation and sustainability: keeping the UK aerospace sector at the forefront of next-generation technology.
>
> And we are delivering vital support for companies both large and small – securing thousands of jobs across the country and generating strong economic return to the UK.

Simon Edmonds, Innovate UK’s Deputy Executive Chair, said:

> The need to change how we fly has never been more pressing, moving towards zero-carbon powered aircraft is one way we can cut greenhouse gas emissions. By investing in innovative UK companies and technologies we can ensure momentum is maintained and the country is well positioned in the markets that will emerge.
>
> Each of these projects are extremely exciting and we look forward to working with the partners to ensure their success.

Russ Dunn, Chief Technology Officer for GKN Aerospace, said:

> Hydrogen-powered aircraft offer a clear route to keep the world connected, with dramatically cleaner skies. The UK is at the forefront of this technology, and the H2GEAR project is an example of industry, academia and government collaboration at its best.
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> Working with our partners, and made possible by UK government investment, GKN Aerospace will develop and industrialise the breakthrough technology that will enable aircraft to fly with zero CO2 emissions from the mid-2020s. This will not only create thousands of jobs, but it will keep the UK at the forefront of the next generation of cleaner air travel for decades to come.

Val Miftakhov, Founder and Chief Executive Officer of ZeroAvia, said:

> The government’s backing for our 19-seat hydrogen-electric powertrain development programme will deliver a market-ready hydrogen powered solution for 2023 that makes passenger-ready zero carbon aviation a reality.
>
> The UK is at the forefront of sustainable flight and we are proud that the government has put its faith in us again to deliver another milestone towards the Jet Zero ambition.

Dr. Yoge Patel, Chief Executive Officer of Blue Bear Systems Research, said:

> Inception is an exciting, fast paced project that builds upon remarkable UK innovation and specialist engineering within our consortium. We are combining the best from aerospace and automotive sectors to create a next generation product using ‘more digital’ systems engineering practices. I look forward to engagement with aircraft manufacturers for our next steps.