

Power to the plane

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Work has begun on a record-breaking, 120-meter wingspan plane and it's up to a small team of engineers from Newcastle University to make sure it gets off the ground.

Led by Professor Barrie Mecrow, the Newcastle team has secured a major contract with the UK's QinetiQ to help create the US-based Boeing 'SolarEagle'.

Developed under the 'Vulture II' project, joint funded by the US Government and Boeing, SolarEagle will be a 120-meter wing span, solar-powered, unmanned plane that will be able to remain in the air continuously for five years, feeding back data from the skies.

It is the job of the world-leading Newcastle University team to keep the propellers turning, developing a motor that will be four times more efficient than a conventional aircraft engine whilst being able to operate

at temperatures lower than the coldest arctic winter.

Professor Mecrow, head of the university's Centre for Advanced Electrical Drives, said it was incredibly exciting to be part of such a major feat of engineering.

“This plane will have the longest wingspan ever – the only thing that comes close is the Airbus A380 which measures in at a wingspan of around 75m. This is more than half as big again – more than the length of a football pitch.

“Newcastle University has a long-standing reputation for its world-leading research into the design and development of specialist motors and electronics but this will still be a big challenge for us.

“In general, the more powerful a motor, the bigger and heavier it is. In this case, the motor will have to be powerful enough to drive the propellers to get this gigantic plane off the ground while still being super efficient and incredibly light-weight.

“And the work is particularly challenging because the plane will be flying at a height of more than 60,000 feet where temperatures can be below minus 60 degrees and conventional systems stop working.”

This is the second time the team has played a part in making aviation history. Last year they played a key role in the development of QinetiQ's Zephyr – a much smaller unmanned aerial vehicle which successfully completed a world record two weeks of non-stop flight powered only by energy from the sun.

Smashing all endurance records for an unpiloted vehicle, the Zephyr was the culmination of many years work by some of the world's most talented engineers including the team from Newcastle University.

The Defense Advanced Research Projects Agency (DARPA) is contributing \$89million (£56million) to the Vulture II programme with Boeing providing additional investment funding. The programme, which will culminate with a demonstration flight, is due to be completed in early 2014 and the Newcastle team hopes to have the first two prototypes of the [plane](#)'s motors ready to test in the next six months.

Professor Mecrow added: “Here at Newcastle we are building on half a century of experience that grew around the region’s heavy industry – driving motors and generating electricity.

“Today, more than half of all electrical energy generated in the world is used to drive motors and we are working on ways of making this process ever more efficient.”

Provided by Newcastle University

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