

Rolls-Royce: Zero emissions bird set for 2020

23 December 2019, by Nancy Cohen



Credit: Rolls-Royce

Rolls-Royce has taken the wraps off its one-seater electric plane. This was a first look that drew global interest from news sites last week, as the big date is set for Spring next year to fly. The plane could become the world's fastest all-electric aircraft; the plane will target a speed of over 300 miles per hour.

[CleanTechnica](#)'s Nicolas Zart listed the partners in the undertaking: "The project includes electric motor and controller manufacturer YASA and aviation startup Electroflight, with funding from the Aerospace Technology Institute (ATI) and the Department for Business, Energy & Industrial Strategy and Innovate UK."

The team is also using ANSYS Fluent to work on the project. ANSYS is a software company in the business of engineering simulation.

"If you've ever seen a rocket launch, flown on an airplane, driven a car, used a computer, touched a mobile device, crossed a bridge, or put on wearable technology, chances are you've used a product where ANSYS software played a critical

role in its creation," said the company in describing itself. ANSYS tools, for example, are being used to balance the cooling system pre-production, on test.

[Reuters](#) said the first flight would be performed "by an experienced pilot in late Spring 2020 at a location yet to be decided, but possibly in the Welsh countryside."

Sarah Young reported for Reuters. The article reflected on the reason behind the keen interest: beyond Rolls-Royce, it is a hunger to see some progress on electric flying technology.

The Reuters article listed ample reasons for such interest in progress: the issue of global greenhouse gas emissions; the issue of climate change; the recent spread of the "flight-shaming" movement on social media. Even the name of the project, ACCEL, hints at a desire to push forward. ACCEL stands for Accelerating the Electrification of Flight.

The design involves a white plane with "a bulging neck where its [electric motor](#) technology sits behind a propeller on its pointed nose," said Young.

The propeller is driven by three high power density axial electric motors, said the Rolls-Royce news release.

In addition to speed goals, Rolls-Royce talked about another first—"the most power-dense battery pack ever assembled for an aircraft," said reports. ACCEL is touted to have the most energy-dense battery pack ever assembled for an aircraft. Rolls-Royce said "It can provide enough power to fly 200 miles (London to Paris) on a single charge."



Credit: Rolls-Royce

Rolls-Royce: "Its 6,000 cells are packaged to minimise weight and maximise [thermal protection](#). An advanced [cooling system](#) ensures optimum performance by directly cooling cells during the high-power record runs."

What about taking care of the battery challenge in their electrical plane design?

"Creating the fastest all-[electric aircraft](#) was never going to be done overnight," said Rolls-Royce, and the battery would need to be powerful enough to beat a series of speed and performance records—but (1) light enough to fly and (2) stable enough not to overheat.

"To ensure the project's success we are monitoring more than 20,000 data points per second and measuring battery voltage and temperature. We are also monitoring the overall health of the powertrain, which is responsible for powering the propellers and generating thrust."

Guy Norris in [Aviation Week](#) provided a capsule view of what Rolls-Royce can learn from the ACCEL project.

"Targeted specifically at developing know-how in energy storage and higher power density electrical systems, ACCEL is how Rolls is learning about the integration, packaging and management of lithium-ion batteries as well as gaining a better

understanding of the thermal analysis of center cells."

Norris said that "Battery pack temperatures will be regulated using an active thermal management system configured with coolant pumps and a radiator mounted beneath the nose."

What's next? The team are integrating the electrical propulsion system in preparing the plane to make its "run for the record books," said the company. Matheu Parr, ACCEL project manager, Rolls-Royce, said they would be going to work with "demanding test environments before going for gold in 2020."

The recent unveiling of the plane was at Gloucestershire Airport.

In November, [The Guardian](#) quoted Rob Watson, director of Rolls-Royce Electrical. He was talking about the significance of the move to electric engines. "A third era in aerospace is emerging around us now, and it is enabled by electrification," he said. "From our perspective, it's a really exciting opportunity for us to help pioneer this third era."

CleanTechnica's Zart weighed in: "As we close this year, and a decade with it, I'm left grinning. Just 7 years ago I wondered when electricity would take to the air and when the convergence of the automotive and aviation industries would collide. It's happening. Stay tuned for more."

More information:

www.rolls-royce.com/media/pres...he-record-books.aspx

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