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## **ROLLS-ROYCE REACHES FUTURE TECHNOLOGY MILESTONE AS GOVERNMENT CONFIRMS FURTHER FUNDING**

Rolls-Royce has reached a new milestone in the development of its next generation of civil aerospace engines with its Advance3 demonstrator now running at full power. The news comes as the UK Government today confirmed further funding for the development of technologies that could be incorporated into future engine designs.

The Advance3 demonstrator is testing a new engine core that will deliver optimum fuel efficiency and low emissions. It is a key element in Rolls-Royce's future technology strategy to develop the Advance core for the UltraFan® engine design.

The full power milestone was achieved earlier this month in Derby, UK, as part of a demonstrator test programme that is gathering engine performance data across more than 2,800 parameters.

Meanwhile, the UK Government today confirmed funding for a range of projects that support Rolls-Royce's future technology vision. Included in the announcement was support for the E-Fan X programme, a ground-breaking partnership between Airbus, Rolls-Royce and Siemens that will seek to demonstrate the technologies required for hybrid-electric flight. With an AVRO RJ100 demonstrator aircraft expected to take to the skies as early as 2020, Rolls-Royce continues to make good progress in support of the project, with ground testing of the world's most powerful flying generator expected to start before the end of this year.

The Government also announced funding for a range of projects which will support the UltraFan engine development programme, including:

- CEMTEC – The development of Silicon Carbide-based Ceramic Matrix Composite technologies for future engine architectures, helping to reduce fuel consumption through reduced component weight while also improving cyclic life and reducing manufacturing lead times.
- CHASM – The design, integration and manufacture of new technologies to support the development of a power gearbox.

- IPCRESS – The development of an intermediate pressure compressor that is integrated with the UltraFan power gearbox.
- SUSSUDIO – A Rolls-Royce led project to develop the detailed design of an ultra-high bypass ratio gas turbine engine demonstrator.

Chris Cholerton, Rolls-Royce, President – Civil Aerospace, said: “We are continuing to deliver on our plans to bring our future technology strategy to life and running the Advance3 demonstrator at full power for the first time is a critical milestone towards introducing an UltraFan engine. We warmly welcome today’s announcement of government funding which supports both our near term and longer-term ambitions to pioneer the power that matters.”

The Advance3 core features a new ‘work split’ with a two-stage high pressure turbine and a single-stage intermediate pressure turbine. Engineers have attached the core to a Trent XWB fan system and a Trent 1000 low pressure turbine to create the completed demonstrator engine. The compressor system helps to deliver an overall pressure ratio of up to 70:1 for UltraFan.

Other key technologies for UltraFan are also making significant progress. The engine features a high-power gearbox, designed to deliver efficiency at high bypass ratios. Testing continues at our facility at Dahlewitz, Germany, and it has already successfully run at 70,000hp, a new record in the aerospace industry.

UltraFan will offer a 25% engine fuel efficiency improvement compared with the first generation of Trent engine and will be available for service from the middle of the next decade.

Advance3 receives funding and support from Clean Sky 2, the Aerospace Technology Institute and Innovate UK.

For high-res images please see here: <https://www.flickr.com/photos/rolls-royceplc/albums/72157644584413758>

### **About Rolls-Royce Holdings plc**

1. Rolls-Royce pioneers cutting-edge technologies that deliver the cleanest, safest and most competitive solutions to meet our planet’s vital power needs.
2. Rolls-Royce has customers in more than 150 countries, comprising more than 400 airlines and leasing customers, 160 armed forces, 4,000 marine customers including 70 navies, and more than 5,000 power and nuclear customers.
3. Annual underlying revenue was £15 billion in 2017, around half of which came from the provision of aftermarket services. The firm and announced order book stood at £78.5 billion at the end of December 2017.

4. In 2017, Rolls-Royce invested £1.4 billion on research and development. We also support a global network of 31 University Technology Centres, which position Rolls-Royce engineers at the forefront of scientific research.
5. Rolls-Royce employs 55,000 people in 50 countries. Approximately 19,400 of these are engineers.
6. The Group has a strong commitment to apprentice and graduate recruitment and to further developing employee skills. In 2017 we recruited 313 graduates and 339 apprentices through our worldwide training programmes.

**For further information, please contact:**

**Oliver Walker-Jones**

Head of Communications – Civil Aerospace

Rolls-Royce plc

Tel +44 (0)7584 601195

[oliver.walker-jones@rolls-royce.com](mailto:oliver.walker-jones@rolls-royce.com)

[www.Rolls-Royce.com](http://www.Rolls-Royce.com)