ElectRRrification
An overview of exciting projects being pursued by Rolls-Royce Civil Aerospace
Intelligent Engine

Product

Services

Digital
Key areas of focus in Rolls-Royce’s Civil Aerospace division

All closely interconnected and being developed in parallel
All have a role to play in the decarbonisation of our industry

Collaborate on sustainable aviation fuels

Continue to evolve the gas turbine
Increase integration between airframe and engine
Develop alternatives such as electrification
Electrification is not new to Rolls-Royce

We have a group-wide team with a wealth of experience in electric and hybrid electric applications across different business sectors

Delivering fuel savings of between 15% and 50%
Why are we championing electrification in civil aerospace?

As a leading industrial technology company, we have a key role to play.

Potential game-changer for society

- Population growth and more mega-cities
- Opportunity to increase connectivity sustainably
- Different approaches to infrastructure and investment required

Potential game-changer for our industry

- Radical new aircraft/engine designs
- Gains in efficiency and emissions reduction
- New entrants and new scope of supply
Electrification in Civil Aerospace

We are working on both pathways in parallel

Partnership and collaboration are central to our approach

Evolutionary (incremental)

- More electric aircraft
- Electrical content increases – replacing mechanical and hydraulic systems
- Understanding of electrical technology becomes more important across the industry

Revolutionary (disruptive)

- Electric and hybrid electric aircraft in service
- New airframe and/or transport concepts
- New scope of supply
- New entrants in the market
- Market could structurally change
- Potential new regulatory approach
ACCEL

Aims to stimulate electrical supply chain, provide an independent path to electrical system capability acquisition plus learning how to de-risk electrical concepts.

Potential for zero carbon electric powered short-range regional and commuter travel.

Flight testing in 2020

Targeting new air speed records

In partnership with:
Electroflight Ltd UK
YASAUk
UK Government
E-VTOL

Opportunity to collaborate with a range of strategic partners.

Battery provides additional take-off, hover and landing capability. Wings rotate to 90 degrees with option to take off and land vertically or conventionally.

Adaptable to personal & public transport, logistics & military; no re-charging required.

Deploys M250 (helicopter) gas turbine technology to generate electricity to power 6 electric propellers.

Could take off in the early 2020s.

1/6 scale model wind tunnel testing successfully completed; indoor/outdoor flight testing in H2 2019.
E-Fan X

Developing the world’s most powerful flying generator (ground testing starts Q3 2019)

Designed to demonstrate that the fundamental challenges of hybrid-electric propulsion at this scale can be overcome

A building block towards hybrid electric commercial aircraft at the scale of today’s single aisle family and beyond

An Avro RJ100 reconfigured to test series hybrid system

Integrating a 2MW Electric Propulsion Unit (EPU), a 2.5MW AE2100-based power generation system and a 2MW battery

Scheduled to fly in 2021

In partnership with:
Airbus
ATI UK
Clean Sky 2
Aston Martin Volante concept

Powered by a Rolls-Royce hybrid propulsion solution (based on M250 gas turbine).

Offering fast, efficient urban, and inter-city congestion-free air travel for 3 people.

Developing high-performance battery technology and integrated motor and power electronics.

A design study to show how electric propulsion technology can be used to create exciting new air vehicles.

Could enter into service mid 2020s

In partnership with: Cranfield University Cranfield Aerospace Solutions
It’s about much more than the aircraft

Electrification could enable a shift in transport mode for civil aviation but innovative thinking is required right across our industry:

- Transportation policies and subsidies
- Physical and cyber security requirements
- Digital ticketing
- Airport design
- Ground infrastructure and air traffic management
- Regulatory requirements for certification and airworthiness
- Potential single pilot operation
- Mobility as a service