

ENGINEERING AND TECHNOLOGY

We continued our commitment to recruit and develop the very best engineers and scientists.

Colin Smith CBE

Director – Engineering and Technology



In 2013, we invested £1,118 million in gross research and development (R&D) of which £746 million was funded by the Group, prior to receipts from risk and revenue sharing arrangements.

We continually pursue innovation that will improve the performance of our power systems and benefit our customers.

We have developed and actively deployed a new innovation portal to improve the exchange of ideas around the world as we invest to improve the efficiency of our global R&D footprint.

People

We have an engineering resource inside the Group of around 16,600 engineers. Many work as integrated teams across borders on our major programmes and a number of our top engineers, or Rolls-Royce Fellows, are recognised as world-renowned experts in their fields.

We continued our commitment to recruit and develop the very best engineers and scientists, and the first cohort of our evolving internal Specialist Academy has graduated in October 2013. The Academy has been designed for technologists who have the potential to join the Rolls-Royce Fellowship at the very top of our specialist career ladder.

Research and technology

World-class technology gives us competitive product performance. We generate the largest number of patents of any UK company, 549 new patent applications were approved for filing in 2013 (including Rolls-Royce Power Systems AG). To further expand our capabilities, we acquired Hyper-Therm HTC, a US-based specialist in ceramic materials; and SmartMotor, a world leader in permanent-magnet machines and drives technology, headquartered in Norway. In addition, we acquired from GKN

the 49 per cent of Composite Technology and Applications Limited (CTAL) that we did not already own, giving us 100 per cent ownership. CTAL is engaged in the development of composite fan blades and containment cases for the next generation of advanced turbofan engines.

In 2013, we further increased our investment in early-stage research and technology to about 20 per cent of the net R&D spend. We have good visibility of stable, long-term government match-funding for research investments in aerospace technologies following the creation in the UK of the Aerospace Technology Institute, and in the EU through the Clean Sky 2 Joint Technology Initiative in Horizon 2020 and continuous German support via Luftfahrtforschungsprogramm (LuFo) V.

University Technology Centres

In addition to our significant in-house R&D capability, we pursue advanced technologies via a global network of 29 University Technology Centre (UTC) partnerships. Each centre is part-funded by the Group and works closely with our engineering teams, undertaking specialist work led by world-class academics. In 2013, Nanyang Technological University joined this network with the launch of the Rolls-Royce@NTU Corporate Lab, a joint investment of SGD\$75 million (£38.5 million) between Rolls-Royce, Nanyang University and the National Research Foundation (NRF) of Singapore.

Our model of developing technology through collaboration with academia and other partners was recognised by the German Fraunhofer Institute for Production Technology which benchmarked 160 European companies. Rolls-Royce was one of five companies to receive the 'Successful Practices' award in technology management in 2013.

Research and development

Flight test results have shown the Trent XWB to be the world's most efficient large, civil, aero engine.

The Trent 1000 Package C received EASA certification in September and a few weeks later powered the newest version of the Dreamliner, the Boeing 787-9 on its first flight from Seattle, USA.

The Joint Strike Fighter F-35B, with short take-off and vertical landing (STOVL) capability provided by the Rolls-Royce LiftSystem®, successfully completed its second set of carrier trials aboard the USS Wasp in August 2013. In September, the T56 engine Series 3.5 technology enhancement program received FAA approval and has now been chosen to power the 'Hurricane Hunter' aircraft of the US National Oceanic and Atmospheric Administration.

In 2013, we received the Green Ship Technology Award for our Enviranship concept – a design for cargo ships that reduces CO₂ emissions by up to 40 per cent compared to similar diesel powered vessels.

Gross research and development (£m)

