



Growth Fund

Reaction Engines Ltd (REL)

Reaction Engines Ltd was founded by Alan Bond and two engineers in 1989 and is now at the forefront of a pioneering high-tech programme. The business which is based at Culham Science Centre in Abingdon has made a breakthrough in aerospace technology and is developing SABRE, a hybrid jet/rocket engine that will be used to propel a new Skylon launcher into low earth orbit by 2020. What makes this project exceptional is that it will pave the way for a new generation of space planes that are lighter, reusable and can take off and land from conventional runways which will revolutionise the space industry.

David Willets MP the Minister for Universities and Science in November 2012 said: "SABRE has the potential to completely transform how we currently access space whilst further boosting the burgeoning UK space sector. By supporting this breakthrough technology we are giving the UK a leading position in a growing market of new generation launchers and removing one of the main barriers to the growth of commercial activity in space."

OxLEP identified space related technologies in its 2014 Strategic Economic Plan as an important sector to attract Foreign Direct Investment and a focus for Research & Development projects. Reaction Engines is a privately funded UK company and was awarded £140k from the Growing Places Fund in 2015 to install a quality assurance department that will employ a Quality Assurance Manager and Skilled Inspector. This forms an essential part of the manufacturing process as precision and quality standards are critical for the system parts and components of the project.

The unique SABRE engine can reach five times the speed of sound, burning liquid hydrogen with air from the atmosphere. It can also switch to a rocket mode using liquid oxygen when it reaches an altitude of 26km, allowing it to enter Earth's orbit. This is possible through the development of ultra-lightweight heat exchangers and frost control using advanced engineering techniques. These cool the incoming airstream very quickly and effectively, from over 1,000 °C to minus 150 °C in less than 1/100th of a second (six times faster than the blink of an eye).

To develop this ground breaking technology Reaction Engines recently celebrated the installation of a new £1.5 million state-of-the-art high vacuum furnace to assist in their SABRE Engine Programme at their pre-cooler testing facility which will be employed to conduct a series of complex braze trials before full production. The building of this unique enabling technology will lead to advanced engineering techniques required for commercialisation.

Under the strategic guidance of the UK Space Agency, the space industry contributes over £9 billion to the economy every year and supports thousands of highly skilled jobs. It expects to play a leading role in the next phase of European space collaboration and securing the future of the European Space Agency ECSAT facility in Oxfordshire.

The Managing Director of Reaction Engines, Mark Thomas was therefore delighted to announce on 1 August 2015 that the European Commission had approved the £50million UK support for the research and development of an innovative space launcher engine, under State Aid rules and commented “We’re delighted with the European Commission's decision to approve the UK Government grant to Reaction Engines. Combined with the on-going support from the UK Space Agency, it's a significant step forward for our SABRE development programme. It adds to the growing recognition that SABRE technology has the potential to open up a new field of aerospace propulsion, which could in turn revolutionise high speed transport and space access.”

When Skylon goes into service it will have the capacity to deliver 15 tonnes of equipment into space including satellites, cargo for the space station and telecoms in a reliable and cost effective manner for 1/50th of current rocket expenditure.

Development of the most powerful lightweight heat exchangers in the world used in the SABRE engine is ground breaking on aerospace propulsion systems and has been compared to the impact of the silicon chip on the computing industry. If successful it will lead to new products, markets and put Oxford firmly on the world map.

Reaction Engines have acquired Brite Precision and Crossman Engineering Ltd and currently employ 72 people, but are set to grow in the future. More information on this exciting project can be found on [Reaction Engines](#) Webpage.