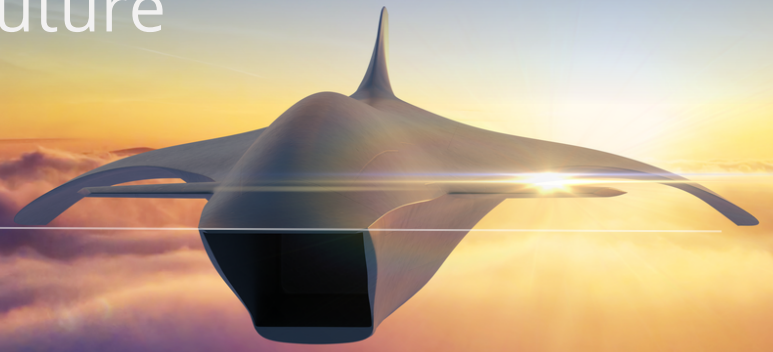


Revolutionising the future of hypersonics

Reaction Engines is a private UK technology company, innovating for security and resilience



UK strategic defence needs

Leveraging UK hypersonic technologies to improve mission-critical objectives and enhance military capabilities.

As the UK continues to position itself as a global leader against increasing international threats, strategic technology such as advanced high-Mach/hypersonic propulsion will be of critical importance for the security, resilience and defence of the nation. The war in Ukraine has shown the need for real-time intelligence. Uncrewed aircraft flying at speeds never before achieved in the history of aviation, making them invulnerable to air defence systems, will revolutionise Intelligence, Surveillance and Reconnaissance (ISR) missions, giving crucial advantage on the battlefield.

A number of countries have made significant progress in hypersonic technologies, including the United States, Russia and China. The latter two are developing advanced cruise missiles that can be launched from aircraft, ground launchers and ships or submarines, along with hypersonic missile capabilities. To stay strategically ahead of our adversaries, who are already pursuing this next-generation capability, it is crucial that the UK continue to invest in hypersonic capabilities to guarantee our national security and maintain our technological edge.

HVX programme

Through the HVX programme, Reaction Engines and Rolls-Royce are working in collaboration with the Royal Air Force's Rapid Capabilities Office (RCO), the UK Government's Defence Science and Technology Laboratory (Dstl) and the National Security Strategic Investment Fund (NSSIF) to establish the UK as a leader in reusable hypersonic air systems. HVX's immediate objective is to rapidly mature technologies which can deliver a step-change reduction in the cost of developing a reusable, affordable hypersonic air vehicle. Reaction Engines' innovative thermal management and SABRE combined-cycle engine technologies are key foundations for the programme.

In combination with Rolls-Royce's world-beating gas turbine technology and ability to design and integrate complex systems and products, this brings a formidable capability to take on the challenging problems inherent with hypersonic flight. With the ground test campaign well underway, the HVX Programme is providing a unique opportunity to raise the UK's profile in developing skills and technology in this fast evolving area.



The UK as an innovation powerhouse

Maximising global opportunities and investment through unique UK capabilities to strengthen collaborative relationships.

The development of air-breathing hypersonic systems represents the perfect opportunity for UK technology to be at the cutting edge of aerospace innovation in a crucial domain, cementing the UK's position as a science and technology superpower.

Success will demonstrate Britain's leadership role on the global stage, combining soft power with unrivalled defence capabilities. In April 2022, the UK, U.S. and Australia announced they would cooperate on the development of hypersonic and counter hypersonic capabilities via the AUKUS security partnership. This will provide the UK with opportunities to take a leading role in AUKUS Pillar II, particularly when it comes to hypersonic capabilities, enabling a more dynamic and agile approach to international collaboration to fully leverage innovation and partnerships.

This UK led game-changing technological advancement will also act as a catalyst to inspire the next generation, seeing an uptake in STEM subjects as well as unleashing innovation and growth in every corner of the UK.

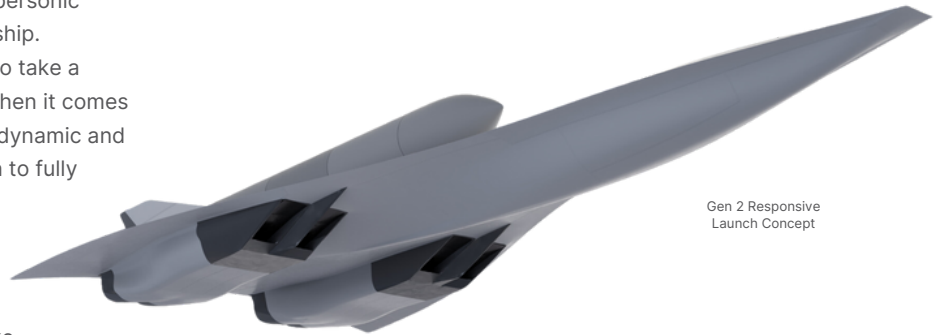


Enabling future markets

Leveraging adjacent hypersonic technologies to other markets, such as responsive space launch and atmospheric flight.

As space becomes a more contested domain, it is important that the UK and its allies can respond rapidly to real time events by **a)** integrating a payload, **b)** mobilising and **c)** launching, all in a matter of hours. A reusable advanced air-breathing launch system will make this possible.

With the New Space Economy booming, there is demand for reliable and sustainable launch vehicles, particularly to enable space-based solar power and in-orbit manufacturing. Hypersonic technologies are providing this opportunity to enable future markets, driving dual-use capabilities and growing UK economic prosperity, whilst bolstering UK resilience and improving the UK's ability to prevent and respond to risks.



Gen 2 Responsive Launch Concept

Policy priorities

- Provide strategic commitment to hypersonic programmes with invested long-term plans that have clear governance and leadership structures.
- Unlock a regulatory environment which facilitates rapid testing and development of hypersonic technologies.
- Leverage international frameworks for a more dynamic and agile approach to collaboration.
- Simplify the process for achieving regulatory readiness to make it less expensive and onerous for rapid innovation.
- Accelerate technology adoption through targeted mechanisms to allow for scale-up at a commercial level.

