LAUNCH UK

LaunchUK: Leading the commercial space age

LaunchUK

Visit the **LaunchUK webpage** or visit us at: UK Space Agency @spacegovuk

Email spaceflight@ukspaceagency.gov.uk for information about the programme.

APPLY for a licence for spaceflight activities or contact the Civil Aviation Authority at CommercialSpaceflight@caa.co.uk

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Introduction

The UK has been a pioneer in space technology for over 50 years. From the development of early rocket technology embodied by the UK's Black Arrow launcher to the development of the first 150lb microsatellite, our heritage speaks to the demands and opportunities of the new commercial space age.

New small satellite constellations are improving our access to data and revolutionising services such as satellite navigation and earth observation to enhance the way we see ourselves and interact with our planet. Today, space is accessible to a new range of private companies, academic institutions, and public sector customers, all eager to harness the scientific research and commercial opportunities available, with the UK being at the forefront of this evolution.

The UK is a pioneer in major space technology and services. We have extensive upstream and downstream capabilities with world-leading telecoms and earth observation satellites, tracking and monitoring capabilities and universities that are globally respected for their space science research.

There are a wide range of opportunities and organisations available to support space-related companies in the UK, from incentives such as reduced taxes, simpler planning rules and financial benefits, to innovation funding and research grants.

On 9 January 2023, the UK made history by conducting the first ever orbital launch attempt from UK soil through Virgin Orbit at Spaceport Cornwall. This landmark moment clearly demonstrated the UK's growing launch capability which will be followed by vertical launches from Scotland in the coming year. There are also a number of aerodromes around the UK, each with their own unique geography and local infrastructure, giving the UK the capability to host a variety of different types of spaceflight activity including both horizontal and vertical launch.

The UK is Europe's leading small satellite launch destination, offering a direct end to end route to launch - from small satellite design, testing and manufacture to a range of competitive, responsive launch offerings. Supported by a modern and flexible regulatory environment, strong business environment, talented workforce, and a world-class space sector – all the benefits of a modern space ecosystem are located here. The UK stands ready to host and support your space business to thrive, so we invite you to join us in our mission and realise your spaceflight ambitions here in the UK.

This brochure sets out the UK's natural advantages as the premier destination for developing, licensing, launching, and exploiting small satellites and other pioneering space services.

Whether you are an established space company, a start-up or a new entrant to the sector, based in the UK or overseas, you will be part of a thriving space ecosystem that offers everything you need to succeed in the new space age.

LaunchUK: The UK's Spaceflight Programme

The UK Space Agency plays a major role in delivering the government's **National Space Strategy**, catalysing investment in the UK space sector, enabling missions and capabilities and championing space for the benefit of our planet and its people. We support a thriving space sector in the UK, which generates an annual income of £17.5 billion and employs 48,800 people across the country.

Government's vision is for the UK to be the leading European provider of small satellite launch by 2030 – providing world-leading capability, bringing new markets to the UK and inspiring the next generation of British space professionals.

So far, we have made available £50m grant funding to kick-start commercial activity to grow new markets and ignite a fast-paced UK spaceflight sector and creating social and economic benefits for communities right across the UK. This includes:

- £31.5m to help establish vertical launch services from Scotland comprising: £2.5 million to Highlands and Islands Enterprise (HIE) to develop Spaceport Sutherland; £5.5 million to Orbex to build a new rocket for launch from Sutherland; and £23.5 million in two separate grants to Lockheed Martin to establish launch operations from SaxaVord Spaceport and to build an orbital manoeuvring vehicle in Reading which will launch on Lockheed Martin's pathfinder launch.
- Up to £1.3m to develop business plans for

Credit: Science Museum Group (SMG) / Docubyte

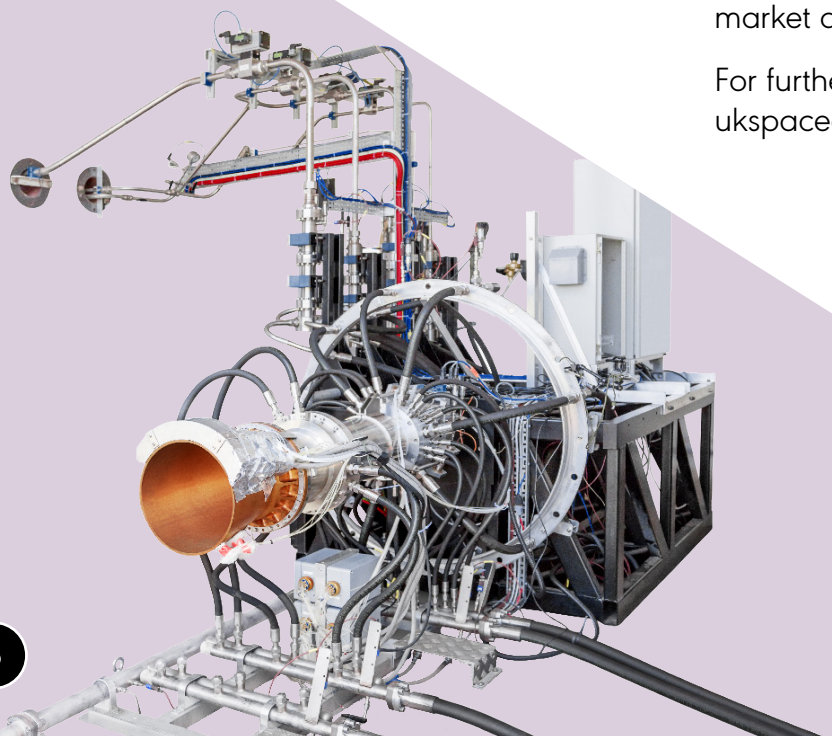
small satellite launch and sub-orbital flight from airports in Machrihanish, Snowdonia and Cornwall.

- £11.34m as part of £20m central and local government funding to support horizontal launch by Virgin Orbit from Spaceport Cornwall.
- £2.9m in the pilot of the Technology Challenge is supporting teams from industry and universities to develop technology, products and services that will enhance the UK spaceflight supply chain, strengthen international competitiveness and catalyse further investment. One project will recycle materials, including natural cork, to create thermal protection solutions for launcher propulsion systems and launch vehicles with a lower environmental impact, while another will develop launcher components out of lighter and more cost-effective metal composites, reducing the risk of creating space debris.

We also invest further in the UK's spaceflight sector through our complementary membership to ESA and involvement in the ESA Boost! Programme, an optional programme that the UK has subscribed to since 2019. This includes an initial investment of £12m in 2019, followed by reinvestment in the programme at CM22 in 2022. Boost! provides tailored support to UK companies developing commercial space transportation services and related infrastructure and has been a major success for UK companies since its introduction in 2019, working in tandem with national grant funding to maximise development of commercial space services in the UK. The focus of Boost! is developing commercial small-scale space transportation services and associated infrastructure. UK-based companies benefit from ESA's extensive heritage and expertise in launch, supporting growth of our domestic launch industry.

To date, we have funded four UK-based companies through Boost totalling £12m of investment and supporting the development of orbital launch vehicles and novel in-orbit services. Applications for the next phase of the Boost programme are now open, and we intend to further develop the UK's launch market and leverage private investment.

For further information contact csts@ukspaceagency.gov.uk



Credit: Science Museum Group (SMG) / Docubyte

Our vision

We will build one of the most innovative and attractive space economies in the world, and the UK will grow as a space nation. We will protect and defend the UK's interests in space, shape the space environment and use space to help solve challenges at home and overseas. Through cutting edge research, we will inspire the next generation and sustain the UK's competitive edge in space science and technology.

The UK's goals

- Grow and level up our space economy
- Promote the values of Global Britain
- Lead pioneering scientific discovery and inspire the nation
- Protect and defend our national interests in and through space
- Use space to deliver for UK citizens and the world

How we will achieve the goals

- Unlocking growth in the space sector
- Collaborating internationally
- Growing the UK as a science and technology superpower
- Developing resilient space capabilities and services.

Why the UK?

The UK is well placed to host new commercial spaceflight activities. We have:

- **the right geography** to access a range of valuable polar and sun-synchronous orbits, popular among the many new small satellite constellations being planned which are forecast to create a £10bn global launch opportunity over the next 10 years.
- **the right environment** to develop new launch services and one of the best places in the world to set-up a new business, carry out innovative research or develop new technology. It has the most flexible and internationally competitive regulatory framework in the world, which will support innovation and a thriving commercial launch market.

- **the Space Industry Act 2018** and Space Industry Regulations 2021 – enabling the Civil Aviation Authority to receive licence applications for launch activities.
- **A proven launch capability** following Virgin Orbit's launch from Spaceport Cornwall in January 2023, which will be followed by vertical launches from Scotland in the coming year.
- **the right environment** in which to grow your space business – the UK space sector was estimated to be worth £17.5 billion and employ c.48,800 people in 2020/21[1].
- **the right workforce** - labour productivity, (GVA per employee) was £144,000, 2.5 times the UK average of £56,614. The UK space workforce is the most highly qualified sector in the UK, compared to all other Office for National Statistics (ONS) sectors, with 77% of employees possessing at least a bachelor's degree.[1]
- **the right place for research and development** - an estimated £788 million was spent on space related R&D in 2020/21, equivalent to 4.5% of total industry income. This is up 17% from 2018/19.[1]
- **the right industry** to support and exploit new launch opportunities – our space and aerospace sector is world class and home to many thriving companies and capabilities.
- **strong global relationships** giving us access to markets, financing and supply chains all around the world.
- **a strong and vibrant** academic research community comprising over 100 institutions, globally respected as centres of space excellence and international partners.

1 Size and Health of the UK Space Industry 2022'

One of the large dishes at Goonhilly

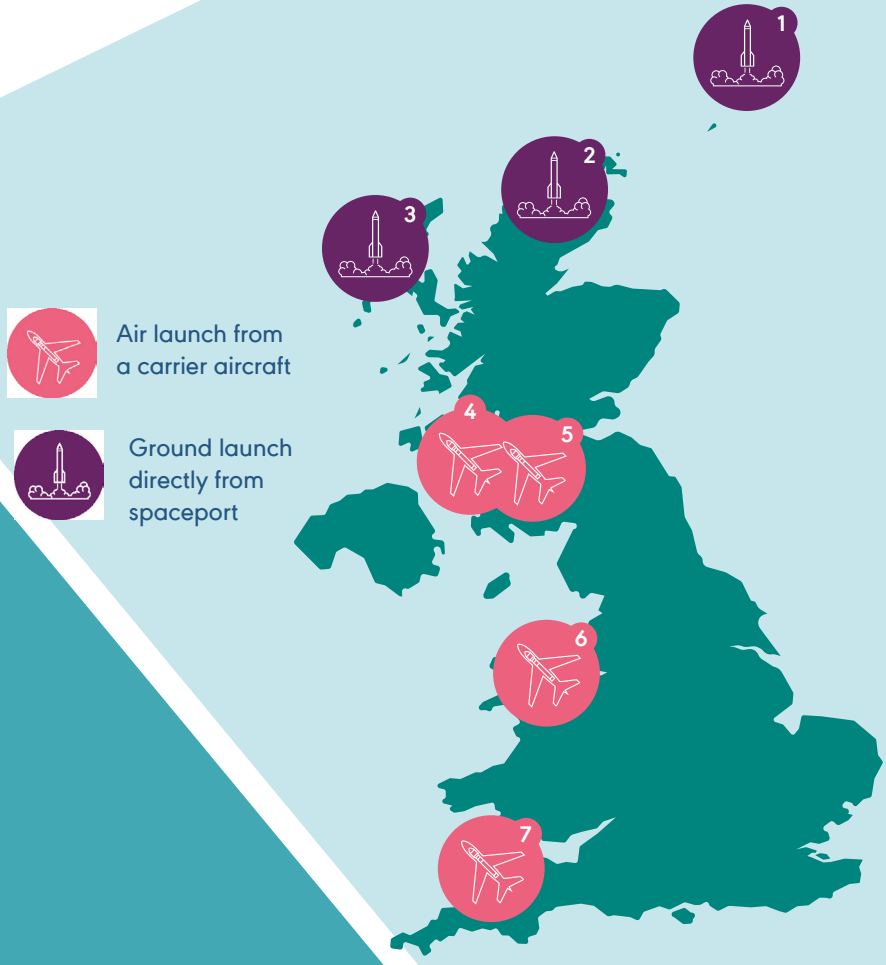
Antenna
Goonhilly Earth Station

Geography and location

The UK's long coastline and island location offers a safe flight path to desired orbits, making it well suited to host different types of launch services.

Scotland is the best place in the UK to reach in-demand satellite orbits with vertically launched rockets. There are also a number of aerodromes around the UK, each with their own unique geography and local infrastructure, giving the UK the capability to host a variety of different types of spaceflight activity including both horizontal and vertical launch.

Government will work with any location interested in developing a commercial spaceport, and there are a number of potential launch sites the length of the country. Wherever you are based in the UK, you are only ever a few hours from industrial centres, world class service providers, cultural centres and global logistic hubs.



Prospective UK spaceports

1. Shetland, Scotland
2. Sutherland, Scotland
3. Western Isles, Scotland
4. Campbeltown, Scotland
5. Prestwick, Scotland
6. Snowdonia, Wales
7. Newquay, England

Industrial capability and skills

The UK is a world leader in small satellite technology applications, telecommunications, robotics and earth observation, and UK universities are among the best globally for space science. Government is providing support and investment across the whole of the UK to encourage the growth of local space clusters and deliver the connected ecosystems and vibrant businesses needed for the UK space sector to flourish.

Companies such as AAC Clyde Space and Spire in Glasgow and Surrey Satellite Technology Limited in Guildford lead the UK's thriving small satellite industry, alongside a burgeoning downstream sector that develops applications to exploit satellite data.

Government is committed to growing modern industrial capability across the UK, and is investing in new space facilities, technology and centres of excellence to ensure the UK remains at the forefront of the new commercial space age.

Examples of our world-leading industrial and academic hubs include:

Space Park Leicester is a collaborative community of industry, academics and students working together to drive growth in space and space-enabled sectors. Building upon their heritage and space-science excellence, they undertake world-leading research, impactful innovation and offer a wide-range of skills and educational development opportunities, they cover innovative upstream engineering through to the downstream capture, analysis, and application of space data.

Harwell Space Cluster in Oxfordshire hosts 105 space organisations including the UK Space Agency, Rutherford Appleton Laboratory Space, the Satellite Applications Catapult, the Science & Technology Facilities Council and the European Space Agency's European Centre for Space Applications and Telecommunications. UK government has committed £99 million for a **National Satellite Test Facility** in Harwell to provide facilities for the assembly, integration and testing of space payloads and satellites. This facility will enable UK industry to develop next generation launch technologies, satellites, and testing capabilities to construct satellites and deliver payloads into orbit.

Westcott Space Venture Park based in Buckinghamshire is home to 88 organisations, leading in the areas of space and rocketry, technology, and engineering. Its aim is to be recognised by innovators worldwide as a UK centre of excellence for global technology, with a focus on space and security for sustainable growth. Westcott has seen substantial growth, and in 2021 unveiled a new gold standard national rocket test facility. Based in the Vale Enterprise Zone, the new National Space Propulsion Test Facility, which received £4 million in funding from the UK Space Agency, is the only facility of its kind in the UK. It is also one of only three in the world and will create around 60 jobs.

Modern and supportive regulatory and licensing frameworks

The Civil Aviation Authority (CAA) is the regulator for spaceflight activities from the UK as well as space activities carried out by UK entities abroad. The CAA undertake all Space Industry Act 2018 regulatory functions, in addition to regulating activities under the Outer Space Act 1986.

As of July 2021, the CAA is able to accept licence applications for the operation of spaceports, provision of range control services and the carrying out of spaceflight activities. Government has collaborated with existing space launching nations, governments, and industry and has created a streamlined and simplified licensing process, which is estimated to take between 9 and 18 months to complete from the point that an application is submitted.

The CAA is committed to applying the regulations proportionately, which is fundamental to its approach of all regulation.

If you are interested in carrying out spaceflight activity, or associated activity under the Space Industry Act 2018, or the Outer Space Act 1986, and/or would like to meet the Civil Aviation Authority to discuss your plans or apply for a licence, please contact commercialspaceflight@caa.co.uk

The Space Industry Act 2018

The UK's Space Industry Act 2018 (SIA) is an ambitious and forward-looking piece of legislation, specifically designed to address the challenges and opportunities presented by a rapidly evolving space industry. The Act:

- makes provision for effective regulation of all spaceflight and associated activities carried out from the UK
- gives the regulator powers to grant launch vehicle operator, satellite operator, spaceport and range control licences
- allows for the creation of safety and security regulations across licensed activities, and other supporting provisions
- gives the regulator powers to monitor licensed activities and enforce compliance with legislation, licence conditions and the UK's international obligations
- contains provisions on liabilities and insurance that strike a balance between managing the risks of space activities and the benefits it brings to the UK economy
- gives the government powers to establish an outcome-focused, proportionate regulatory regime which fits a range of technologies and activities

The Space Industry Regulations 2021 ('the regulations') and associated guidance documents came into force in July 2021. Together with the Space Industry (Appeals) Regulations 2021 and the Spaceflight Activities (Investigation of Spaceflight Accidents) Regulations 2021, the regulations implement the SIA and create the regulatory framework necessary for commercial launch operations to be licensed in the UK.

Contact the Civil Aviation Authority's Spaceflight Team to find out more about the UK's Spaceflight Regulations.

Limiting operator liability

The UK government recognises that the issue of insurance and liability is a critical one for the sector, in particular regarding limiting operator liability.

Liabilities and insurance requirements set out in the Space Industry Act (SIA) and associated regulations will help enable commercial spaceflight and associated activities take place from the UK, creating the conditions for horizontal and vertical launches from UK spaceports and continued licensing of orbital activity

All operator licences issued under the Space Industry Act will include a limit of operator liability. Therefore, no operator will face unlimited liability for actions carried out in compliance with licence conditions and the SIA.

For satellite operators, the limit of operator liability set out in an orbital operationslicence is €60m for standard missions and operators are required to take out or hold insurance for that value. The limit of liability and insurance requirement may be higher for higher risk missions. The insurance requirement can be waived for the lowest risk missions. The UK government will shortly be consulting on proposals to move to a variable-limit approach based on safety and sustainability aspects of the proposed mission, which could result in operators' liability limits being reduced from the current standard requirement and lead to reduced insurance costs.

For launch activity from the UK, the insurance requirement and launch operator's limit of liability is determined using the Modelled Insurance Requirement (MIR). This is calculated for each launch based on the specifics of each mission and takes into account factors such as the geographical location and the type of launch vehicle used. Satellite operators' liability for the launch phase is set at the same amount as the launch operator's limit of liability and this can be satisfied by being included as an additional insured on the launch policy, rather than taking out a separate insurance policy.

The SIA and the regulations make provision to regulate all spaceflight activities and associated activities, such as operating a spaceport or providing range control services, carried out from the UK. 'Spaceflight activities' encompass both sub-orbital and space activities. The Outer Space Act 1986 (OSA) previously regulated all space activities carried out in the UK or by UK entities overseas. However, now that the SIA is in force, the OSA will apply only to space activities carried out by UK entities overseas. Click here to find out more about the different types of licences needed for UK spaceflight.

Sustainability

The UK government is working closely with operators, insurers and the wider space sector to develop and implement a world-leading approach to sustainable operations. This includes the industry-led Space Sustainability Standard, development of sustainability principles for satellite operations and other initiatives such as new liability limit approaches to incentivise sustainable operations. This framework provides a comprehensive package to increase investment in the UK launch and operations market.

International co-operation

With established international relationships and a reputation for high regulatory standards, the UK is firmly positioned to thrive in a competitive global spaceflight marketplace. We have used our strong global partnerships to work with international partners to secure the agreements we need to enable UK launch including with Ireland, Iceland, Portugal, the Faroe Islands and Norway to secure their support for UK launch activities.

The UK is a respected and active player in multilateral organisations such as the United Nations (UN) and the European Space Agency (ESA). Our membership of these organisations complements our national technical, scientific, legal and business expertise.

Through forums such as the UN Committee on the Peaceful uses of Outer Space (UN-COPUOS) and its sub-committees, where topics such as space resource utilisation, space traffic management and space sustainability are discussed, the UK plays a leading role in championing responsible space regulation. We build strong relationships with international regulators to ensure consistency in our approach and build upon the lessons learned from our partners.

Through these partnerships we are ensuring that the UK has access to markets, financing and supply chains all around the world and that our regulatory regime is globally competitive.

US-UK Technology Safeguards Agreement

Space is a global business, and we work internationally where this benefits all parties. The United States (US) has a long heritage of launching spacecraft and we are supporting UK companies to work with established US firms while building our national capability. **The US-UK Technology Safeguards Agreement (TSA)** is a treaty between the government of the United States of America and the government of the United Kingdom. It enables US companies to operate from UK spaceports and export space launch technology to the UK. Furthermore, it also ensures that US-originating spaceflight technology is properly protected when in the UK whilst enabling UK companies access to revenues and customers previously unavailable.

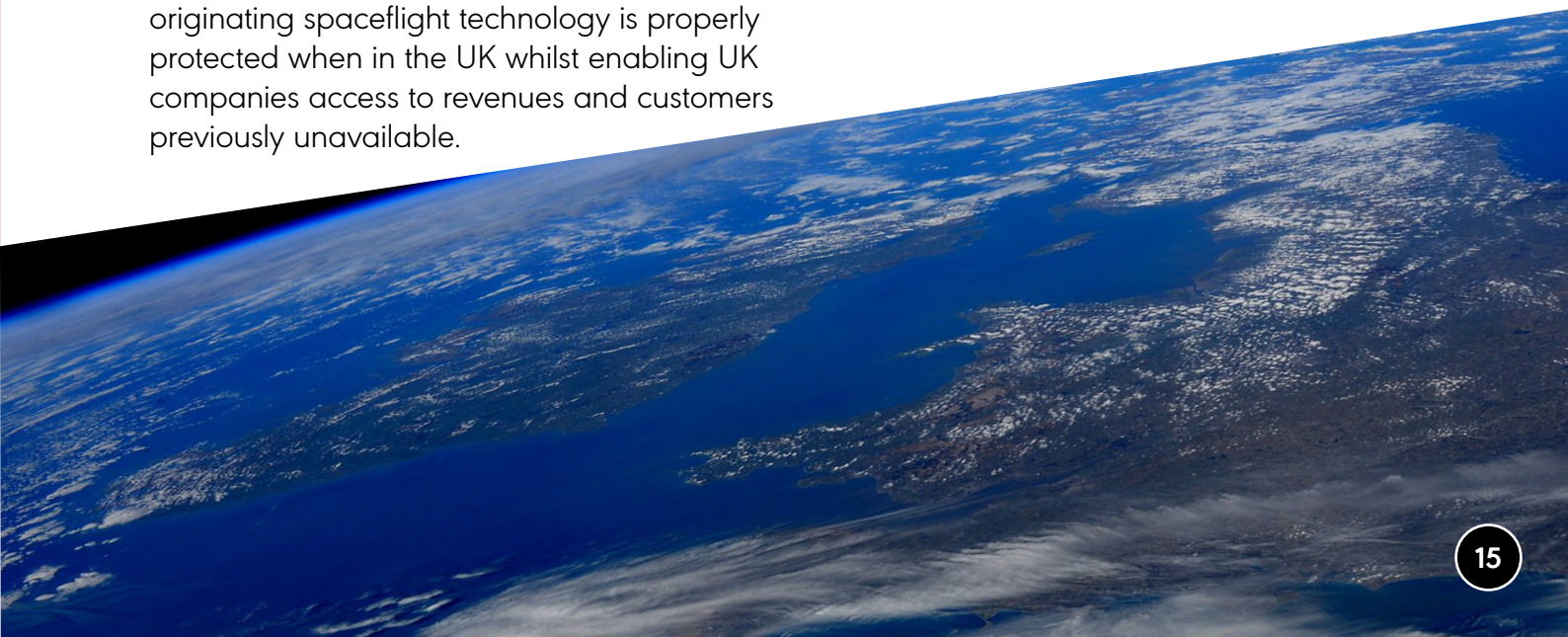
The TSA came into force on 29 July 2021, when the enabling legislation came into effect.

European Space Agency

The UK Space Agency remains a strong and active member of ESA, creating opportunities for UK based companies to access the global market and be involved in international space missions. We heavily invest in a range of ESA programmes, including the Boost programme outlined above, and represent the UK on European launch matters to ensure our national launch sector benefits from this relationship.

Neighbouring countries

Safety, security and protection of the environment are top priorities for the UK government – as laid out in the Space Industry Act 2018 – and this approach informs our discussions with our European neighbours. We have secured the cooperation of all potentially interested countries to the north and south of the UK and agreed how launches which fly over or near their territories will be managed in a safe and responsible manner.



The UK's business environment

The UK space sector is growing. UK space-related organisations produced £17.5 billion in income in 2020/21. Over a third (34%) of income was derived from exports, higher than the UK as a whole (30%). Europe was the largest source of exports income, followed by North America and Asia and Oceania.

UK space activities have a strong commercial focus, with 80% of income derived from direct-to consumer and business-to-business sales. Public customers accounted for 20% of income, with just over half attributed to defence which accounted for 10.2% of the total industry income.

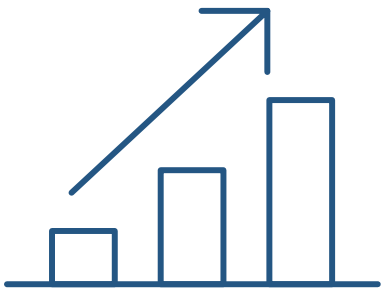
Direct space employment was about 48,800 in 2020/21; space activities supported over 126,800 jobs across the value chain. Space employment grew 6.7% from 2018/19, and comprised 0.15% of the UK workforce in 2020/21. The space industry contributed £7.0 billion of direct gross value added (GVA) (0.34% of UK GDP), and £18.3 billion total GVA across the supply chain.

Labour productivity, (GVA per employee) was £144,000, 2.5 times the UK average of £56,614. The UK space workforce is particularly highly skilled, compared to all other ONS sectors, with 77% of employees holding at least a primary degree.

An estimated £788 million was spent on space related R&D in 2020/21, equivalent to 4.5% of total industry income. This is up 17% from 2018/19.

Since 2012, the population of space organisations has grown on average nearly 21% per annum, with 1,590 organisations recorded in the latest reporting period. Every region in the UK hosts the headquarters of space organisations, with the South East, South West, East of England and Greater London hosting the largest space organisation presences.

(Source: **Size and Health of the UK Space Industry 2022 Summary Report)**



Business benefits

Whether a domestic or overseas organisation, the UK offers a range of benefits for businesses such as:

- Building a trusted, modern tax administration system, helping businesses get their tax right first time, through providing a streamlined, digital experience.
- Small and Medium Enterprises (SME) R&D tax credits which support SMEs that work on innovative projects in science and technology – this allows companies to deduct an extra 130% of their qualifying costs from their yearly profit, as well as the normal 100% deduction, to make a total 230% deduction
- SME Payable Tax Credits, which allow loss making SME's to 'surrender' the losses relating to the R&D relief in return for a payment (non-taxable) of 14.5%. The maximum payment on £100 qualifying R&D spend is £33.35.

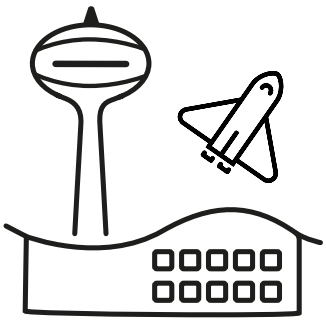
(Before applying for other government support please check with the authority which is providing that support to see whether it could restrict the company's ability to make a claim within the SME scheme. Note that if such a restriction applies an RDEC claim (see below) may still be available)

- Patent Box which incentivises UK companies to develop and commercialise patented products and processes and allows an effective 10% corporation tax on profits from the exploitation of qualifying patents and other qualifying IP rights.
- Research and Development Expenditure Credit (RDEC), which is a taxable payable cash credit currently payable at 13% of eligible expenditure, which is a form of tax relief aimed at larger organisations – RDEC is 13% (taxable) of eligible R&D project costs.

Trade support

The Department for Business and Trade (DBT) secures UK and global prosperity by promoting and financing international trade and investment and championing free trade. DBT's campaigns further enhance the position of UK-based companies in the international market. DBT's Space Sector Team are responsible for hosting space trade missions to priority countries, providing access to detailed information about new markets, and enabling access to a network of overseas market specialists. To find the latest information on DBT's space sector support, visit our space sector microsite. Looking for export opportunities? Search our online tools and services.

How to set up your business in the UK



The UK is a great place to start and run a space business and is a hub for space-related start-ups. The share of income generated by export in the space industry was above the UK average in 2020/21.

Government helps thousands of overseas businesses move here every year with expert help and advice. The Department for Business and Trade (DBT) can support your company with every aspect of the setup process in the UK. DBT can help your company get all the information it needs to get you up and running should you choose to invest in the UK.

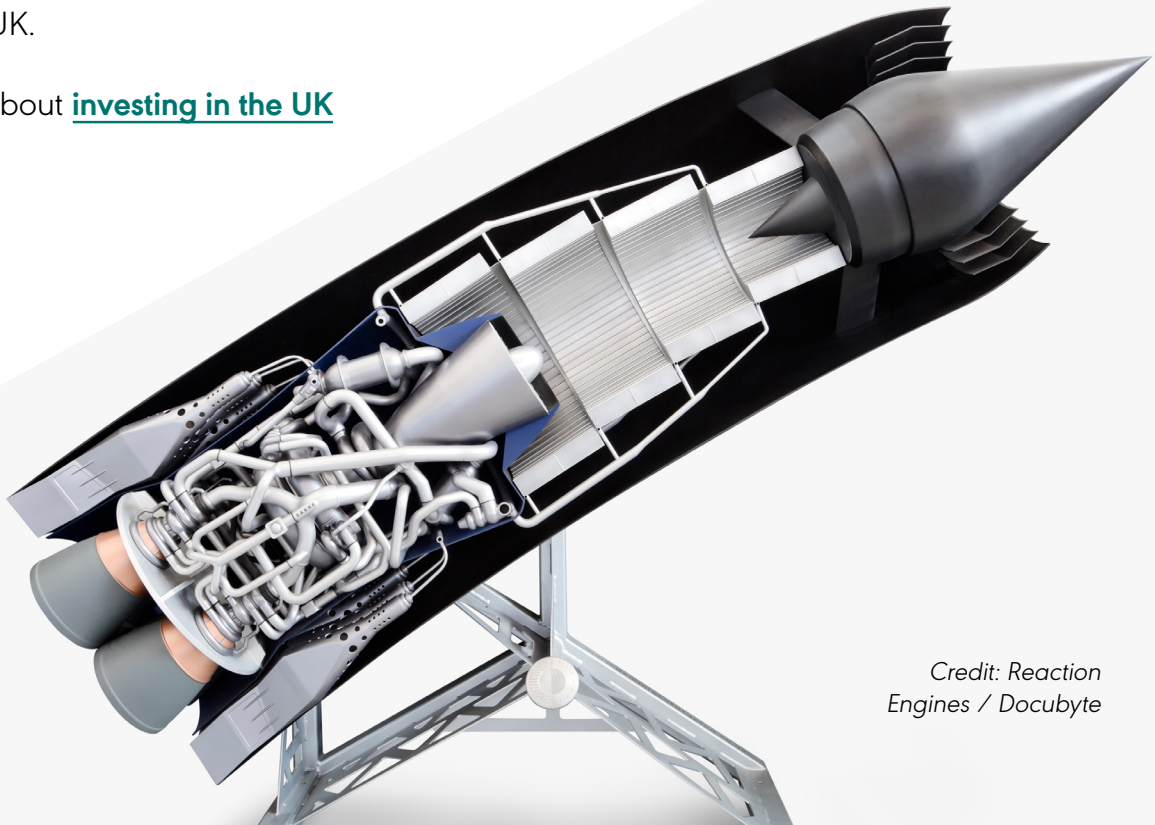
Find out more about **investing in the UK**

Research your industry

Need help to decide if the UK is the best place for your business? Contact our **Investment Services Team** to get market research and other expert help and advice.

Want to move your business to the UK?

Read our UK setup guide



Credit: Reaction Engines / Docubyte

Find out more about LaunchUK

VISIT the **LaunchUK webpage** or visit us at:

UK Space Agency @spacegovuk

EMAIL **spaceflight@ukspaceagency.gov.uk** for information about the programme and industry engagement opportunities such as our LaunchUK Industry Group, Regulation 1-2-1 and plenary sessions.

UKspace is the trade association of the British space industry and has been a leading voice for over 30 years. It promotes the interests of industry with the UK government, parliament and national and international stakeholders. UKSpace represent a diverse membership across the industry, and work in conjunction with its members to achieve the best business framework to promote growth.

ADS is the UK trade association advancing leadership in aerospace, security, defence and space, to enable prosperity and clean, secure growth for the UK. Whether representing industry, connecting their members with business opportunities or driving forward innovation and growth, ADS is at the forefront of an array of activities, events and programmes that benefit its members. ADS's 1200+ members are the custodians of a world-leading advanced engineering and services workforce.

techUK is the trade association which brings together people, companies and organisations to realise the positive outcomes of what digital technology can achieve. They create a network for innovation and collaboration across business, government and stakeholders to provide a better future for people, society, the economy and the planet. More than 900 companies are members of techUK.

SPAN provides the focus for academic research in the UK in the fields of Earth Observation, Space Engineering (including Communications and Navigation), Space Science, and Exploration. Comprising membership of over 100 UK universities and research groups, the community works with industry and government to coordinate UK strategic policy across all the space sciences.

UK SPACE AGENCY

Department for Transport

UK Civil Aviation Authority