



House of Commons
Science and Technology
Committee

**Satellites and space:
Government Response
to the Committee's
Third Report of Session
2016–17**

**First Special Report of Session
2016–17**

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Science and Technology Committee

The Science and Technology Committee is appointed by the House of Commons to examine the expenditure, administration and policy of the Government Office for Science and associated public bodies.

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The Committee is one of the departmental select committees, the powers of which are set out in House of Commons Standing Orders, principally in SO No 152. These are available on the internet via www.parliament.uk.

Publication

Committee reports are published on the Committee's website at www.parliament.uk/science and in print by Order of the House.

Evidence relating to this report is published on the relevant [inquiry page](#) of the Committee's website.

Committee staff

The current staff of the Committee are: Simon Fiander (Clerk); Marsha David (Second Clerk); Sean Kinsey (Second Clerk); Dr Elizabeth Rough (Committee Specialist); Martin Smith (Committee Specialist); Julie Storey (Committee Assistant); and Nick Davies (Media Officer).

First Special Report

On 15 June 2016 we published our Third Report of Session 2016–17, [Satellites and space](#) [HC 160]. On 11 November 2016 we received the Government's response to the Report, which is appended below. We are disappointed that it has taken the Government five months to respond, and trust that future Government Responses to our reports will not be delayed.

Appendix: Government response

The United Kingdom's Space Sector is thriving; growing faster than the economy as a whole; demonstrating the UK's excellence in science, technology and innovation; and providing significant benefits to the UK. We rely every day on space-enabled communications and applications, often without realising it, as well as being enthused by the example and achievements of those who work in the space sector.

Tim Peake's Principia mission, which has inspired millions of young people, and the UK's involvement in Rosetta's Philae lander, which made the first ever landing on a comet, are examples of recent achievements.

In December 2015 the Government published its National Space Policy setting out the four key principles that will guide Government action in the space sector:

- (1) Government recognises the critical importance of space to the UK
- (2) Government will act to ensure a safe space operating environment
- (3) Government will support the growth of the UK's space sector
- (4) Government recognises that space is an international endeavour.

The Government is currently developing a new Space Growth Strategy to set out how these principles will be put into practice.

The Government therefore welcomes the House of Commons Science and Technology Committee's Report on Satellites and Space, which is a very timely and useful contribution to the development of policies in this area. This document is the Government's response to that Report.

Report recommendation

Government and local authorities could use space-enabled services far more to help them to achieve effective and efficient policy delivery. Slow progress in this area, however, has been compounded by the inward-looking approach taken by the space and satellite sector, which has failed to engage with a broad range of stakeholders. The Space for Smarter Government Programme (SSGP) provides a means to remedy this situation. It has successfully worked in partnership with Defra to ensure that the full potential of satellite data will be playing its part in helping the Department to deliver its policy objectives. Other Government departments, however, are trailing behind. The modest resources currently attached to the SSGP do not match the clear emphasis placed by the

Space Innovation and Growth Strategy, the UK Space Agency, and the Government, on growing the space-enabled services market. The lack of a cross-Government roadmap for space services also presents a significant barrier to future progress. (Paragraph 25).

We recommend that the remit of the Space for Smarter Government Programme is broadened so that it is able to work, in conjunction with Government departments, to establish a cross-Government roadmap for using satellite data and developing space services. The roadmap should identify areas where the application of such services could help the Government deliver its policy objectives more effectively and where it would benefit from aggregating demand to reduce costs. This expanded remit must be supported by adequate resources. (Paragraph 26)

Government response

The Government is pleased that the Science and Technology Committee has highlighted the success of the UK Space Agency's Space for Smarter Government Programme (SSGP), and its role in helping Defra put satellites at the heart of their policy making. The programme continues to raise awareness of the role that satellite-enabled data and technology can play in effective and efficient public policy and service delivery. The programme continues to demonstrate these capabilities to a wide range of public sector stakeholders including those involved in emergency response, local authorities and devolved administrations.

The Government fully recognises the potential for wider uptake and the importance of this national programme in delivering wider sector growth, and has stated its ambition to continue the programme in the UK Space Agency's Key Performance Indicators for the Agency's 2016/17 Corporate Plan. To deliver this the Government believes that senior championing and engagement is essential. An example of such championing and engagement is the cross-Government working group to increase awareness of, and ultimately increase the uptake of, Earth Observation data within Government. The business plan for a Government Earth Observation Service, which is currently being written, will provide evidence and impetus to accelerate progress. Initiatives such as this, with the co-sponsorship of departmental customers and the facilitation and neutral access to suppliers offered by SSGP, will be an accelerant for a more integrated approach between the centre of government and the programme.

The space sector has made significant progress in its attempts to be more outward-looking, recognising the importance of space applications as an enabler of other sectors. The industry-led Space Growth Action Plan, published in 2014, identified eighteen priority markets that they believed could be worth £1bn each to the UK by 2030. Since then, the sector has been developing a series of market reports that provide more detail on these opportunities.

The establishment of the Satellite Applications Catapult was a clear recognition that growth of the space sector would be realised through the use of space-derived data and services in non-space sectors—and this engagement activity has been a major focus of the Catapult's work since it was established.

The UK Space Agency is engaging with Local Enterprise Partnerships and Devolved Administrations to both raise the profile of space as a way to provide new or more efficient public services and also to help them to recognise how space could support economic

growth in their identified sector / smart specialisations such as transport, offshore energy or healthcare. The Satellite Applications Catapult and the UK Space Agency are deepening this engagement through establishing a jointly funded network of regional centres and fellows whose roles are to raise the profile of the sector to local partners including non-space industry, broker collaborations to the Catapult or local support and therefore support the expansion of the space (enabled) sector. The power of these interventions is that they are brought together as a network to share best practice and broker solutions across the UK.

The UK Space Gateway at Harwell provides a focal point to support the sector's growth aspirations through providing facilities and expertise that can support companies from across the UK. RAL Space, ESA's European Centre for Space Applications and Telecommunications and the Satellite Applications Catapult work closely together through providing conferences and networking events that enable companies to learn more about the applications of space. For example, work is currently underway on the campus to better engage healthcare and the life sciences, exploiting research on the International Space Station and opportunities that space brings to, for example, provide robust telecommunications that can improve health outcomes in remote communities.

The future growth of the sector will be underpinned by a clear strategy shared by Government, industry and academia. The UK Space Agency is leading development of a new Space Growth Strategy that brings these stakeholders together with clearly defined and agreed actions to help the sector meet its shared target of 10% of the global space market by 2030.

Report recommendation

Through its promotion of the establishment of a UK Spaceport by 2018, the Government has placed the UK in a prime position to take advantage of the next leap forward in space technology—the development of re-usable, commercial spaceplanes. The focus on a horizontal-only launch capacity, however, may be too narrow and risk limiting the use and value of a UK spaceport to the industry. (Paragraph 35).

Before publishing its final 'technical requirements' for a UK spaceport, we recommend that the Government sets out the rationale, with supporting evidence, for limiting the scope of the proposed spaceport to accommodating only the horizontal launch of suborbital flights. The Government should also explain how it is ensuring that the spaceport plans will be further refined to meet the needs of UK space and satellite businesses, and what it will do to ensure that the proposal attracts the necessary private investment. (Paragraph 36)

Government response

The Government intends to establish the UK as the European hub for low cost launch of small satellites. In parallel, we are supporting the development of the separate emerging market for sub-orbital flights. If we move quickly, we have the opportunity to be the first to provide both. The Government recognises that it must clearly set out the action plan to capture these new markets for the UK we are already examining the case for both horizontal launch and vertical launch options for small satellite launches. The Modern Transport Bill will contain legislation to allow for a variety of launch options, including

horizontal, vertical and single-stage-to-orbit systems. The Government plans to introduce safe and practical regulation, together with access to launch ranges, at competitive pricing that will attract commercial operators.

Report recommendation

Major Tim Peake, the UK Space Agency, the European Space Agency, and countless others have, together, inspired a nation through their excellent educational outreach and public engagement work around the Principia mission. It is vital that this enthusiasm for space is harnessed and is used to foster an enduring public interest in the UK's space sector, and the opportunities it holds. (Paragraph 40)

We ask the Government to outline its plans to ensure that the legacy of the Principia mission continues to raise public awareness of the UK's leading role in the global space sector, while also inspiring the next generation of scientists and engineers, long after Major Peake returns to Earth. (Paragraph 41)

Government response

The success of the Principia education programme (with over a million young people engaged in one or more Principia education activities) has demonstrated the disproportionate power of space to make an impact on Science, Technology Engineering and Mathematics (STEM) engagement, while the space sector is in great need of more and better-skilled STEM graduates.

The Government therefore intends to maintain a significant programme that incorporates suitable elements of the Principia programme into the annual cycle of the UK Space Agency's education programme. Some aspects will continue as now, using the inspiration of human spaceflight to inspire young people, while some will be widened to draw on the rest of the UK space programme. By this means we plan to harness the excitement of the Principia programme to continue to engage large numbers of school children with STEM in general and space in particular.

A new round of grants has already been awarded to external groups to continue this work, most of which are extensions of existing successful projects, such as the Aberdeen Science Centre (funding to build a 'Principia Science Lab' to inspire young visitors about science in space), Earth Observation Detective (using imagery from space in schools to explore topics such as land use, volcanoes and climate change) and TimPix (extension of a schools' experiment investigating space radiation using detectors in schools and in space).

Report recommendation

We were clear in our reports on Big Data and, most recently, Digital Skills, that the UK is facing a digital skills crisis. This crisis is already apparent in the space and satellite sector, where the need to process and analyse large amounts of data from satellites, and transform them into valuable insights, is a pivotal component of the Space Innovation and Growth Strategy. Without urgent action, data skills shortages could undermine, and potentially stall, the industry's progress towards its ambitious 2030 growth target. Existing initiatives, and the inspirational value of the Principia mission, are insufficient to tackle the magnitude of the problem. (Paragraph 48)

The Government should, as we recommended in our recent Digital skills crisis report, commit to addressing this crisis through a Digital Strategy published without further delay. (Paragraph 49)

Government response

Supporting the transition to a fully digital economy will be part of our Industrial Strategy. Digital skills will be a key component of our strategy to accelerate these benefits and we will look at how we raise digital skills at all levels, from basic digital skills through to the advanced skills needed by businesses.

The Government has already identified the problem of handling large datasets as one of the things that most concerns employers. The Government is working to address the wider STEM skills needed as well as the digital needs in particular. This is a complex area and includes interventions at different ages, across different topics and using different techniques (such as teaching resources, careers information and inspirational activities).

Whilst handling large data is a problem that extends well beyond the space sector, the UK Space Agency is nevertheless looking at ways to support training in this area—for example through training courses for Global National Satellite System (GNSS) and the use of environmental data sets (particularly combinations of commercial and government data sets), and through coordination of student placements in industry (many focused on computing projects to handle or interpret large datasets for a wide range of applications). It is also working with university groups to share this understanding of industry skills needs and best teaching practices in order to improve the computing training of graduates. At the younger age ranges, the UK Space Agency will continue to promote inspiring computing activities in schools, for example by continuing its collaboration with the Raspberry Pi Foundation, started to support the Principia Astro Pi project.

Report recommendation

The Government, Innovate UK, the Satellite Applications Catapult and the British Business Bank have, by working with industry, helped to create opportunities for companies with a high growth potential to access much needed capital. While there is scope to improve access further, the establishment of the UK's first dedicated investment fund for space is an encouraging and important step in the right direction. (Paragraph 53)

Government response

The Government welcomes the Committee's recognition of the value of the venture capital fund for space, which will provide an important stimulus to the growth of the UK's commercial space sector. The Government has also partnered with industry in the Satellite Finance Network, an initiative to provide a common platform for all investors interested in the space sector. This includes regular pitching events, advice and a dedicated programme to help recruit Non-Executive Directors with space backgrounds.

Report recommendation

In response to our report, the Government should provide details of its progress on developing an export promotion plan for space. This should include information on export finance initiatives that will assist the space sector and how these compare with our international space and satellite competitors. (Paragraph 56)

Government response

At the start of this year the Government established a high-level Strategic Space Export Committee to identify business barriers that prevent industry from winning exports for satellite products or data services, and to identify and champion export opportunities for the sector. The Committee is co-chaired by Government and industry (Directors from UK Space Agency and UKspace, respectively) and also includes senior representation from Innovate UK, UK Trade and Investment and UK Export Finance. The Committee is supported by a UKspace Export Working Group comprising members of UKspace.

As a result of the Committee a stronger coordination mechanism now exists across Government to promote UK space capabilities. In 2016 space trade-related events have taken place in the USA, China, Indonesia and Mexico, and further events are in the planning stage. Events to showcase space export capabilities are also regularly included in Ministerial overseas visits.

UK Export Finance's capacity for satellite transactions is the equivalent of our main competitors in the USA and France, and where possible we collaborate with their export credit agencies through reinsurance arrangements. In recent years UK Export Finance has provided several facilities to support the satellite sector, including £35.5m for the supply of a satellite by Astrium to Russian Space Communication Co. in 2013/14, and £22m for an EADS Astrium satellite contract with Measat International in 2014/15. UK Export Finance has actively raised its profile with the major UK satellite manufacturers and operators and is currently working on several active projects in the sector. UK Export Finance is not so well known in the UK's emerging "downstream" service sector; the Government is therefore raising awareness of UK Export Finance through the Satellite Finance Network and the Satellite Applications Catapult, and by attendance at sectoral conferences and trade fairs.

Report recommendation

A lack of flight heritage is a significant barrier that space and satellite SME's must surmount if their products are to become a commercial success. (Paragraph 60)

Given the scale of this barrier, we recommend that additional resources are made available to Innovate UK, so that it is able to expand further its In-Orbit Demonstration programme. (Paragraph 60)

Government response

The Government welcomes recognition of the valuable role played by Innovate UK. As the Government's prime channel for supporting business-led innovation, Innovate UK has a key role to play in increasing economic growth and productivity across the UK. The

Government has substantially increased the funding given to Innovate UK, from £359m in 2010/11 to £567m in 2016/17. At the 2015 Spending Review, the Government committed to maintaining spending on innovation. Future decisions about the funding level for Innovate UK will be taken as part of the Government's spending reviews.

Innovate UK has recently expanded the in orbit demonstration programme to include a cubesat-based solution, delivered through the Satellite Applications Catapult. This builds on the expertise developed through the UK Space Agency-funded UKube-1 demonstrator. The first four missions are open to new applications in the use of cubesats, intended to demonstrate new services from space, rather than pure technology demonstrators. Consideration is being given to extending the TDS series of missions for larger satellite platforms, or even hosted payload missions.

Report recommendation

Timely access to finance is vital if innovative UK companies are to reach their growth potential and break into the global space and satellite market. We are disappointed, therefore, to hear that the £60 million investment in Reaction Engines and its SABRE rocket, announced by the Government in July 2013, had not reached the company by February 2016. Delays of this nature risk blunting the competitive edge of nascent players in the sector by increasing the financial uncertainty that they face. We were particularly concerned to learn that material changes were made by BIS to the conditions of the grant without giving prior warning or explanation to Reaction Engines. (Paragraph 65)

Direct Government investment is an important element of space and satellite funding and should be conducted to the highest professional standards. The Government, however, appears to have fallen short of these standards in its dealings with Reaction Engines.

We therefore ask the Government to explain, in response to this report:

- (a) *why it changed the conditions of the grant made to Reaction Engines almost two years after announcing the investment;*
- (b) *why it estimated that the first £35 million would be made available in 2014/15 and did not foresee any delays that EU State Aid regulations might present;*
- (c) *whether any other space and satellite SMEs have been affected by similar delays in direct Government investment reaching them; and*
- (d) *the key lessons it has learnt from this project and what changes it will make to the conduct of any future direct investments in the UK space sector. (Paragraph 66)*

Government response

The announcement in July 2013 did not promise funding immediately, but was an in principle decision to fund, subject to the development of a suitable business case. The reason the funding was not disbursed sooner was because Reaction Engines had not

produced a full business case that met the Government's requirements. However, we recognise that communication between the parties could have been improved so everyone shared the same expectations and understanding of the process involved.

The delays in starting the State Aid process arose due to Reaction Engines not having all of the required information for submission to the European Commission. Detailed project proposals and other supporting information were required by Commission officials to allow them to assess the UK Space Agency's State Aid application.

State Aid approval was received in August 2015, and £50 million of the total funding for SABRE was confirmed to Reaction Engines as a grant in December 2015; payments began in April 2016. The remaining £10 million is administered by the European Space Agency under a contract they signed with Reaction Engines to support the development of SABRE, and these payments have also started.

It is routine to wait for State Aid clearance before grant funding is disbursed.

Report recommendation

Basic research is integral to building a successful space economy. The vibrancy and success of the UK space sector has resulted in more excellent research projects requiring funding than there are funds available. There is, however, a more deep-seated, systemic problem; namely that, under the current research funding structures, some satellite and space-related research proposals fall between the remits of the different Research Councils, creating "orphaned areas" of space research. Projects should not miss out on research funding because of inflexible administrative boundaries. (Paragraph 73)

We are encouraged by Sir Paul Nurse's focus on establishing funding mechanisms to deal with cross-cutting issues in his review of the UK Research Councils. The Government must explain how the newly-established UK Research and Innovation, overseeing the UK Research Councils, Innovate UK and HEFCE research funding, will be structured to avoid perpetuating the damaging, cross-cutting funding gaps. We further recommend that representatives from the UK Space Agency are members of the Strategic Advisory Boards of the STFC and EPSRC, to help ensure a more comprehensive, joined up approach to delivering research funding for space and satellite science. (Paragraph 74)

Government response

There is a full spectrum of funding opportunities available across the different agencies that fund space-related research, and the UK Space Agency works closely with the Research Councils, and with Innovate UK. Nevertheless, the Government is keen to ensure that there is even more effective joining up, and the establishment of UK Research and Innovation (UKRI) will facilitate this, and improve access to cross-disciplinary funding. The UK Space Agency and UK Research and Innovation (once established) will work closely together, building on the close relationship that already exists between the UK Space Agency and the Research Councils. The Government agrees with the Committee on the importance of Board representation to facilitate joint working. There is already cross representation on advisory boards between the UK Space Agency and STFC, and the UK Space Agency and EPSRC are in the process of implementing a similar arrangement.

Report recommendation

The current licencing and regulatory regime has not kept pace with innovations in the space sector. While we welcome the changes made under the Deregulation Act 2015, the regulatory status quo risks stymieing a key growth area for the UK space sector, namely small satellites and constellations. The UK Space Agency (UKSA) is beginning to address industry's concerns. Progress has been slow, however, and focused on the specific case of Cubesats, rather than small satellites more generally. It is vital that, while the UKSA maintains its reputation as a responsible regulator, it also does not adversely impede innovation and growth in the sector. We are concerned that the UKSA's draft regulatory proposals, as they currently stand, risk complicating the process when the intention is to simplify regulation and make it more proportionate. (Paragraph 83)

We recommend that the Government, in response to this report;

- (a) *clarifies whether its published draft regulations are intended to apply only to CubeSats, or to small satellites more broadly;*

Government response

The 'traffic light' initiative was originally driven by a perceived lack of responsiveness when considering CubeSats. However, given the increasing standardisation of other mission designs it has been recognised that this approach should be extended to all standard missions.

Report recommendation

- (b) *sets out exactly how the Government's plans for a 'traffic light' approach will simplify regulation for small satellites, and make it more proportionate; and*

Government response

It is necessary to regulate in order to ensure appropriate safety standards for launch and orbits are met. Lack of regulation of orbits, in particular, would increase the risk of collisions between satellites, increasing space debris and creating a hazard for the satellites on which we depend—for communication, navigation, timing services and scientific research. The Government has long understood the need for a proportionate and enabling regulatory framework that supports long term sustainable growth whilst adequately managing Government's risk and national security interests. As the sector continues to grow and innovate it is important that the sector's regulatory framework meets the challenges of these changes.

To keep the UK's regulatory regime competitive and able to respond to technological changes within the sector, the UK Space Agency has introduced various working groups co-chaired with industry. This includes a regulation advisory group to help prioritise future regulatory reform and ensure the UK remains the best place for space business. This collaboration has helped the Agency confidently undertake a planned programme of regulatory reforms, to enable UK industry to fully exploit the opportunities available to them.

Space is a rapidly changing marketplace which often sees the introduction of disruptive technologies. Therefore, the Government, working with industry, is determined to ensure the UK's regulatory framework continues to adapt. Planned measures include implementing a 'traffic light' system to simplify satellite licensing under the Outer Space Act and evaluating options to streamline insurance requirements for satellite fleets and constellations.

The aim of the traffic light approach is to deliver greater transparency of the Outer Space Act licensing technical assessment process, a reduced burden on the operator / regulator for technical considerations of standard missions (by exploiting existing data at the disposal of UK Space Agency assessors) and improved predictability of the outcome prior to a licence application. This new regime could allow operators to benefit from a streamlined process and pre-determined risk assessment. This should also shorten the time to provide a decision/licence to the applicant. In addition for certain low risk 'green rated' missions it may also be possible to waive the insurance requirement for the operational phase of the mission. The UK Space Agency is currently undertaking trials of the traffic light system to ensure it is fit for purpose.

When regulating space activity there is a need to balance the risk of a collision in a congested and contested space environment with supporting growth and innovation. Therefore, these innovative approaches are designed to reduce the regulatory burden on business, generate efficiency savings and promote growth, while at the same time managing government's risks and ensuring it continues to meet its obligations under UN Space Treaties. This includes limiting the Government's (and ultimately the taxpayers) exposure to unlimited liability for any damage caused by UK space activity that these Treaties transfer to the UK.

Report recommendation

- (c) *outlines what work it is conducting to understand, and address, the debris risk posed by satellites, including satellite constellations and small satellites. (Paragraph 84)*

Government response

The UK Space Agency is one of the thirteen members of the international Inter-Agency Debris Coordination (IADC) Committee, which considers at space agency level the general risks posed by space debris. Our national experts, along with more than a hundred experts from other agencies including NASA, met at Harwell in March 2016 for the annual IADC meeting to discuss many issues, including the risks posed by small satellites and constellations in low Earth orbit. The UK is contributing to two of the IADC working groups which are currently modelling the impact of such missions on the long term evolution of the orbital environment and are identifying the most effective mitigation actions both in terms of design and operation of the space systems. By working with its international partners in technical forums such as the IADC, the UK Space Agency is able to develop scientific consensus on the best way to manage the hazard posed by debris and promote such measures within UN forums such as the Committee on the Peaceful Uses of Outer Space to enable a level playing field for UK industry. This includes developing

appropriate regulatory/oversight frameworks within domestic legislation such as the UK's Outer Space Act which is intended to manage national responsibilities and obligations associated with such space systems under the international treaties.

Report recommendation

To ensure that the pace of change does not slacken, the Government should commit now to a timetable for establishing regulations. (Paragraph 85)

Government response

The Government is currently carrying out trials of its proposed traffic light approach to Cubesats against real licence applications and is seeking to extend this to other standard systems. The Government will take the outcome of these trials into account in considering how, and when, to introduce revised regulations.

Report recommendation

We were reassured to hear that the relationship, and lines of communication, between Ofcom and the space and satellite sector are improving. We encourage the sector and the regulator to continue to work together to ensure that access to spectrum does not hinder the growth of the space and satellite sector. (Paragraph 91)

Government response

Spectrum is a scarce and valuable resource and there are both internal and external pressures on space sector frequency allocations. It is therefore vital that spectrum management policies enable growth without unduly constraining the potential of existing investment in space systems. In particular, investors need confidence that they will have long term access to spectrum resource. The UK Space Agency has a memorandum of understanding with Ofcom, setting out how the two agencies work together and how they join up with stakeholders through the Space Spectrum Advisory Committee. The UK Space Agency will build on its existing good relationship with Ofcom, industry and science groups, the International Telecommunications Union (ITU) and the wider spectrum community to challenge and promote the needs of the space and satellite sectors. The Government will also ensure that space is fully considered in spectrum policymaking.

Report recommendation

Over three-quarters of the UK Space Agency's expenditure is channelled through the European Space Agency which gives the UK a high return. An even greater return could be secured, however, through establishing a strong national space programme that builds on the foundations of the National Space Technology Programme. (Paragraph 98)

To place the UK space sector on a stronger footing globally we recommend that the UK Space Agency pursues an expanded national space programme, alongside its contribution to the European Space Agency. (Paragraph 99)

Government response

The Government has maintained strong investment in space, protecting the funding for space in the recent Spending Review. The UK's investment in the European Space Agency is an important part of our overall investment in space, from which we obtain excellent value. The European Space Agency is a membership organisation which contains members from both within and outside the European Union, and the UK will continue to be a member of the European Space Agency after the UK leaves the European Union. In addition to investing through the European Space Agency, the Government maintains a National Space Programme, the budget for which has grown from around £20million per year to £88million per year over the past five years. The Government notes the Committee's recommendation on expanding the national funding programme still further. The future level of funding for space, and the relative investment in the European Space Agency or through other means, are matters for future spending reviews and the annual process of budgetary decision making within Government.

Report recommendation

The UK space sector has historically suffered from a lack of strategic direction and purpose. The UK's first National Space Policy, setting out the Government's high-level objectives for the sector, has been over half a century in the making. Its publication last year represented an important milestone but it is regrettable that it failed to include a clear, detailed vision of the capabilities, missions, and technologies the UK should be advancing. This was a missed opportunity which should not be repeated in the UK Space Agency's forthcoming Civil Space Strategy. (Paragraph 109)

We recommend that the forthcoming Civil Space Strategy sets out how the Government's four, high-level objectives, outlined in the National Space Policy, will be delivered. We also expect the Strategy to address the problems we have identified in this report that could prevent the UK's space and satellite sector from reaching its ambitious growth targets. (Paragraph 110)

Government response

The Government's National Space Policy, published in December 2015, set out the four principles which the Government has adopted to guide its activities in space. The National Space Policy was therefore a high-level document, and was not intended to include detailed action plans. The Government is in the process of developing its new Space Growth Strategy, which will set out how the Government intends to put the principles in the National Space Policy into action in order to support the UK's economic growth. The Government will consider carefully the Science and Technology Committee's Report and recommendations in taking forward this work.