National Audit Office

REPORT

The National Space Strategy and the role of the UK Space Agency

Department for Science, Innovation and Technology

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HC 118

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National Audit Office

The National Space Strategy and the role of the UK Space Agency

Department for Science, Innovation and Technology

Report by the Comptroller and Auditor General

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Gareth Davies
Comptroller and Auditor General
National Audit Office

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Key facts

2021

the year the government published the National Space Strategy, the first UK cross-government strategy for space

73%

increase in UK Space Agency (UKSA) spending from 2018-19 to 2022-23 (from £373 million to £647 million)

£17.5bn

estimated total UK space industry income in 2020-21

1,590	estimated UK-based organisations with space-related activities in 2020-21
£647 million	UKSA spend on space in 2022-23; the Department for Science, Innovation and Technology does not have a good understanding of the total government funding for civil space across all public bodies
85% (£553 million)	of UKSA funding was on European Space Agency (ESA) programmes in 2022-23; ESA gives money through contracts to both industry and academia and provides access to large-scale space programmes which would be challenging to replicate nationally
48,800	estimated jobs directly provided by the UK space sector, while also supporting an additional 78,000 jobs across the supply chain in 2020-21
74%	of UKSA's high-level milestones in 2022-23 were delivered by planned deadlines
20%	vacancy rate within UKSA as of 31 March 2024

Summary

Background

1 Space science and technology plays a critical role in day-to-day life, shaping how society lives, works, and understands the world (**Figure 1** overleaf). Satellite services help to predict the weather, keep businesses connected and products moving, and are used to monitor the climate. Space also plays an important role in defence, enabling the defence of national interests as well as being an operational domain in its own right. The Department for Science, Innovation and Technology (DSIT) considers space to be a critical component to meeting wider government goals, including levelling up and becoming a science and technology superpower.

2 Space is an important and fast-developing sector. It has expanded from being an area of mainly scientific interest led by a few countries to a sector with increasing commercial use. A UK Space Agency (UKSA) commissioned report, undertaken by know.space, estimates that the total UK space industry income was £17.5 billion in 2020-21. Of the estimated 1,590 organisations with space-related activities, 162 generate space income of more than £5 million, with 14 organisations accounting for 81% of the total space-related income. The sector also directly provided an estimated 48,800 jobs while also supporting an additional 78,000 jobs across the supply chain in 2020-21.

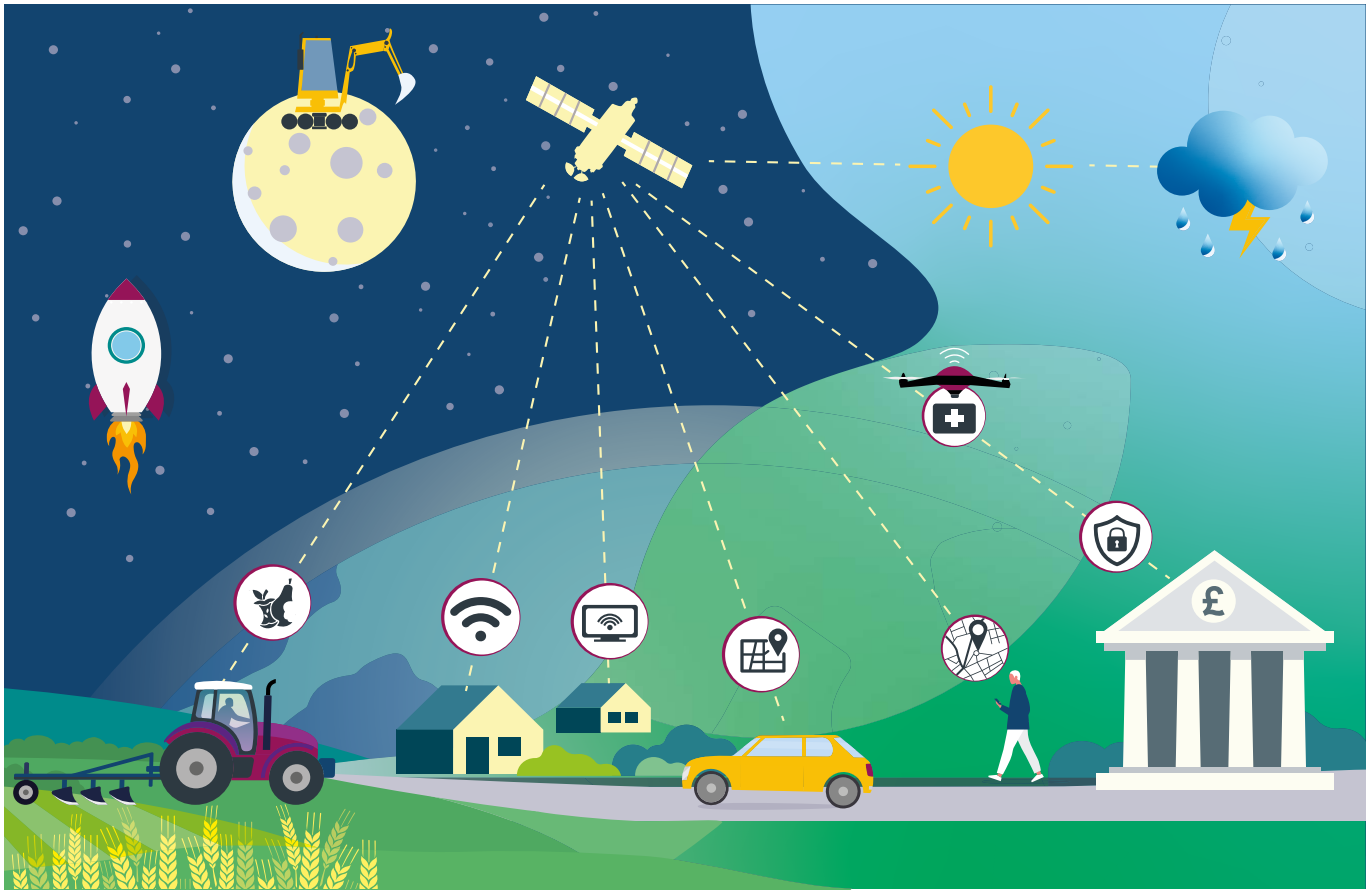
3 In September 2021 DSIT and the Ministry of Defence (MoD) jointly published the government's National Space Strategy (the Strategy).[1] It set an ambition to make the UK one of the world's most innovative and attractive space economies. The government did not set out the costs for implementing the Strategy, instead it stated that the Comprehensive Spending Review process would set budgets for government space activities for the coming years.

1 On 7 February 2023 the government announced that the Department for Business, Energy & Industrial Strategy (BEIS) would close, and its responsibilities would transfer to new departments, including the Department for Science, Innovation and Technology (DSIT). References to DSIT that relate to events prior to this date therefore refer to BEIS.

Figure 1

Examples of the uses of space technology

There is a wide variety of current and potential future uses of space technology, affecting day-to-day life, some of which are captured below



Resources
e.g. mining asteroids, comets and planets for resources such as water and metals

Tourism
e.g. human space travel for recreational purposes

Agriculture
e.g. more precise farming using satellites to reduce food waste

Internet
e.g. communication satellites provide internet access in rural areas

Television
e.g. wider variety of channels through satellite television

Transport
e.g. self-driving cars use navigation satellites for routing

Navigation
e.g. using navigation satellites to track location on a phone

Weather and climate
e.g. more accurate tracking and predictions

Health
e.g. satellite-enabled drones to carry medication to patients in remote areas

Finance
e.g. satellites enable secure digital financial transactions

Source: National Audit Office analysis of publicly available documents

4 Earlier, in February 2021, drawing on the preparatory work of the Strategy, the government had completed a Space Landscape Review, which examined the existing distribution of space functions across government. It made recommendations aimed at improving the distribution of responsibilities across government. Prior to this review, UKSA led on civil space strategy and policy. Subsequent to this review, DSIT has been responsible for coordinating civil space policy and UKSA has been the government's key delivery agency, responsible for developing and delivering UK civil space programmes across the UK space sector and with international space institutions. The MoD is the lead for defence space policy and UK Space Command is the defence lead for space operations, space workforce, and space capability. Several other government departments and public bodies also continue to play an important role.

5 This report examines whether DSIT and UKSA are set to secure value for money from their work overseeing and delivering the National Space Strategy. It covers:

- **Strategy and objectives:** Whether DSIT has clearly defined its objectives for the civil space sector in the Strategy and is effectively overseeing and coordinating its delivery (Part One);
- **Delivery:** UKSA's role and progress in delivering the Strategy, and the extent to which it has the required capacity and capability (Part Two); and
- **Monitoring and evaluation:** Whether there are appropriate mechanisms to monitor progress against the Strategy and evaluate outcomes (Part Three).

6 This report focuses on the civil domain of space and does not examine the defence activities, which fall under the remit of the MoD.

Key findings

Developing and coordinating the Strategy

7 The government has set out the UK's high-level approach to space, which has been welcomed by industry. In September 2021, the government recognised the growing importance of the space sector and level of government spending (estimated to have grown from £300 million in 2014 to £700 million in 2019 in the civil sector) and published the first civil and defence cross-government strategy.[2] The space sector is complex and cuts across science, commerce and defence, and does not have a universally applied definition. The Strategy set out the government's view of the opportunities for the UK in space and brought together civil and defence space activities for the first time. It identified five goals as well as the actions that government, academia and industry would need to take to achieve them. Examples of activities included launching rockets taking satellites into orbit from the UK; monitoring the sun for space weather events such as solar flares; and building a fleet of self-driving shuttles. Space sector stakeholders we spoke to told us that the Strategy helped to stimulate interest from investors and industry in the sector (paragraphs 1.6 to 1.12).

8 The government restarted its cross-government ministerial council on space in July 2023, after a two-year hiatus. DSIT is responsible for coordinating civil space activity in the Strategy, which is delivered through several other principal public bodies. Effective cross-government governance arrangements are therefore important for successful delivery. The government has two key arrangements for coordinating cross-government space policy: the ministerial level National Space Council (the Council) and the senior civil servant-level National Space Board (the Board). Both the Board and Council are advisory and include representatives or ministers from the main departments and delivery bodies with space policy interests. The Board aims to ensure coherent delivery of the Strategy between departments and to maintain cross-government momentum. The Council is responsible for coordinating government policy on space. However, it did not meet for over two years, until it was re-instated in July 2023. This may have reduced the government's ability to work effectively across departments and to make well-informed and productive decisions on space policy (paragraphs 1.17 to 1.19).

2 We have not audited these estimates.

9 DSIT has not provided enough clarity or detail on its strategic ambitions to allow delivery bodies and stakeholders to plan to achieve them. Although the Strategy set out high-level roles and responsibilities across government, it did not set out clear and specific aims, or provide guidance on the outcomes that the government wants to achieve in a set timeframe, or priorities for guiding departments' and industry's efforts. DSIT recognised that the Strategy is broad, and had originally intended to provide more detail through an implementation plan. However, DSIT told us the minister at the time decided not to do so. Nearly two years after publishing the Strategy, DSIT and the MoD published the National Space Strategy in Action policy paper. This provided an update on what had been achieved so far and a broad high-level view of upcoming policy work. However, it lacked detail on how the government intended to prioritise delivery of the rest of the Strategy. Departments and industry stakeholders we spoke to were also not always clear on the roles and responsibilities or which team or department was leading on certain areas. Without clarity and transparency there is a risk of gaps or duplication of effort or funding within government, and loss of confidence and insufficient support for industry (paragraphs 1.13 to 1.16 and 1.20 to 1.22).

10 DSIT does not yet fully understand the government's overall funding to and requirements for the space sector. DSIT needs this understanding so that it can support the government to optimise how public money and activity is used to effectively allocate available resources and prevent gaps and duplication, and shape the sector in the way the government requires. It has visibility of UKSA spending, which has increased from £373 million in 2018-19 to £647 million in 2022-23, an uplift of 73%. However, DSIT does not have a good understanding of the total government funding for civil space across all public bodies. For example, DSIT knows UK Research & Innovation (UKRI) funds space activities, including through Rutherford Appleton Laboratory (RAL) Space, but UKRI does not separately track space funding as distinct from its overall budget.[3] Other areas of government spending that draw upon space capabilities include using satellite data to map crops to support more productive agriculture, or electronic monitoring tags to track offenders (paragraphs 1.23 to 1.29 and Figure 4).

3 Rutherford Appleton Laboratory (RAL) Space is the space hub within UK Research & Innovation (UKRI) and carries out space research and technology development.

11 DSIT has identified that the government's commercial approach to the sector will need to change, and it will need to develop capabilities across government in order to achieve this. DSIT believes that, as the space sector grows, the government will need to change from being a primary funder to an influential customer of the sector. It is therefore aiming to increasingly use public procurement to shape and grow the industry rather than principally using grant funding. Government contracts can increase a company's visibility and credibility, enabling it to attract further private investment, and providing a more secure income stream than grants. In March 2024, two-and-a-half years after the Strategy was published, DSIT published its *Space Industrial Plan* (the Plan). The Plan identified a need to change the way the government works with industry, defined the capabilities it is seeking to develop in the UK, and set out a number of levers it seeks to use to influence the sector to achieve its ambitions. These levers include changes to its relationship with industry and the regulatory environment; the government's approach to space procurement; and increasing access to finance. The success of some of these interventions will be dependent on the government developing its capability in areas where it is currently immature. For example, the government has identified it will need to improve its approach to government space procurement and become a more intelligent customer of space technology, as awareness of opportunities across departments is limited (paragraphs 1.30 to 1.35).

The UK Space Agency's role in delivering the Strategy

12 UKSA has been proactive in working to align its activities with the Strategy. In its Corporate Plan 2022–25 (the Corporate Plan), UKSA mapped its work to the Strategy under eight priorities, including areas on innovation, levelling up, discovery and launch. UKSA has also sought to place most of its programmes within these priorities (for example the programme of work with the European Space Agency (ESA) to explore Jupiter is aligned with the Discovery priority, and monitoring fluxes in carbon dioxide is aligned with the Earth Observation priority).[4] In the Corporate Plan, UKSA also identified the need to make changes to its organisational structure and governance, to both enable it to achieve the Strategy's objectives and improve organisational culture following poor results on bullying and harassment in the Civil Service People Survey. A transformation programme was launched by UKSA in 2022 and was originally planned to be complete in March 2024, but it is still underway and now is intended to be completed by March 2025. Activities so far have included simplifying the organisational structure and governance and identifying new office locations across the UK to move closer to stakeholders. Since 2021, the percentage of UKSA staff who have reported they had been bullied or harassed, or discriminated against in the last 12 months has decreased; however, it is not possible to determine whether this change is attributable to UKSA's transformation programme (paragraphs 2.2 to 2.7, and Figures 5 and 6).

4 In November 2023 UKSA decided to change the way it refers to 'projects' and 'programmes' to 'initiatives' and 'priorities' respectively. For consistency, the terms 'project' and 'programme' are used throughout this report.

13 UKSA and DSIT's process for allocating UKSA's £1.75 billion budget for 2022 to 2025 had some weaknesses but they are improving the approach for the next spending review period. In late 2021 to mid-2022, UKSA worked with DSIT to undertake a prioritisation process, drawing upon a range of available information, that informed the 2022 to 2025 spending review preparations, where UKSA received £1.75 billion over three years. UKSA collated information from existing businesses cases and new proposals and developed a series of metrics to support the prioritisation exercise. DSIT and UKSA have acknowledged that, while there was good engagement and a collaborative approach, they also needed to make improvements for the next spending review. They therefore jointly undertook a lessons learned exercise which made recommendations for improvements. This covered a range of issues, for example, some staff reported that they felt that the Strategy was not used to drive change, but its breadth was instead being used as a hook to justify individual programmes. Some staff also felt there needed to be more information relating to programme outcomes, objectives or deliverables. In preparation for the 2025 spending review, DSIT and UKSA have produced a draft prioritisation framework and benefits framework to support decision making, though it will not be possible to evaluate these until spending review preparations are complete (paragraphs 2.8 to 2.10).

14 The UK does not yet receive contracts from ESA proportionate to the value of the funding UKSA provides. UKSA is working with ESA to ensure this is the case by the end of December 2024. Routing spending through ESA gives UK space companies and academics access to large-scale space programmes which would be challenging to replicate nationally. For example, UKSA, alongside other countries, is investing into ESA's JUICE mission, which aims to orbit Jupiter and three of its largest moons and has a total cost of around €1.6 billion. The UK government's presence on ESA's boards and committees helps to ensure it has influence on ESA's decision-making processes and policies. Of UKSA's overall annual spend, 85% (£553 million) went to ESA in 2022-23, and UKSA has committed to spend around £1.84 billion from 2023 to 2027. ESA aims to allocate its contracts to countries in proportion to their contribution to ESA's budget. This means that the UK should expect to receive contracts proportionally to the value of the UK's investment in ESA, excluding ESA's internal operating costs.[5,6] In February 2023, a UKSA Executive Committee meeting paper reported that UK companies received an estimated £0.93 for every £1 UKSA contributed to ESA, excluding ESA's internal operating costs, and that the UK had the highest estimated cumulative deficit of any ESA member, equating to around €168.5 million since October 2015. UKSA, with the help of ESA, is working to increase the value of contracts the UK receives. By quarter four 2023, UKSA reported the UK's return increased to £0.96 for every £1 contributed, but this means UK industry and academia are still not benefitting in terms of contract value from the full funding given to ESA by UKSA (paragraphs 2.11 to 2.13 and Figure 7).

5 The value of contracts received is calculated on the basis of the technological value of the contracted activities and is dependent on sufficient bids received from UK companies. Low-amount and low-technical value procurements, non-space procurements and third-party funded activities are not included in this calculation.

6 ESA's internal operating costs include organisational overheads, project team labour and any technical assistance provided by other ESA directorates.

15 UKSA has not made as much progress as it planned on its programmes. UKSA delivered 74% of its high-level milestones in 2022-23 against its planned deadlines. UKSA told us its performance improved in 2023-24 with an expected 78% of its high-level milestones complete, with some projects continuing to experience delays.[7] Delays to UKSA-led programmes (excluding ESA projects) resulted in an underspend of around £48 million in 2022-23 against UKSA's original £144 million budget.[8] UKSA told us it is expecting to meet its financial target of not having a material underspend in 2023-24.[9] The main reasons for the delays are (paragraphs 2.14 to 2.16):

- **Delays producing business cases for funding approval:** Between April 2022 and December 2023, UKSA prepared around 45 business cases for spend over £500,000. A number of these were not produced within the planned timeframes, but UKSA does not hold data on exactly how many were completed late or on the length of the delay. UKSA and DSIT consider reasons for the delays include a lack of capability and capacity to produce them, and the challenge in providing evidence of benefits for innovative projects which meet HM Treasury's guidelines (paragraphs 2.17 to 2.22);
- **Staff shortages:** As of 31 March 2024, UKSA had 89 vacancies, around 20% of the 444 staff it required. Of the posts that were filled at that time, 21% of UKSA staff were temporary employees, which risks corporate memory being lost, can be more expensive and can limit how effectively an organisation or certain teams are run. It also reported in March 2024 that nine of UKSA's 17 teams identified resources as being a factor constraining successful delivery of priority milestones (paragraphs 2.24 to 2.25 and Figure 8); and
- **Factors outside of UKSA control:** External factors have at times limited progress of UKSA projects, for example, due to geo-political events or the COVID-19 pandemic (paragraph 2.26).

16 UKSA wants to increase its use of alternative commercial interventions, such as procurement, to improve support for industry and attract more private investment, but it has not yet worked out the implications of this shift. UKSA predominantly uses grants to support the sector, but, in line with DSIT's ambitions (see paragraph 11), UKSA considers it needs more public procurement to continue to grow the sector. UKSA has started a project to consider the implications for its processes, capabilities, structures and systems – for example, whether it will need to develop further commercial skills in any of the alternative interventions, and ensure appropriate permissions are in place in order to utilise them. At the time of our fieldwork in early 2024, UKSA was still in the early stages of exploring the options available to support a revised commercial approach (paragraphs 2.27 to 2.30).

7 We were not able to verify the milestone data for 2023-24 as our fieldwork for this report took place before UKSA had completed the end-of-year review of its performance.
8 The impact of around £25 million of this underspend was mitigated by bringing forward ESA payments and the remaining £23 million of underspend was surrendered to DSIT to be repurposed.
9 We were not able to verify the underspend figures for 2023-24 as our fieldwork for this report took place before the financial audit had been completed on UKSA's accounts.

17 DSIT and UKSA have identified that UKSA has more work underway than it can afford to continue, unchanged, beyond March 2025 without a budget uplift, and it may have to make difficult decisions on which of the Strategy's ambitions to prioritise. In response to its increased budget in the 2022 to 2025 spending review period and to meet the ambitions of the Strategy, UKSA (with contribution and oversight from DSIT) scaled up existing sector funding programmes, launched new ways to invest in science and technology, and signed up to long term international missions. It also chose to increase the UK's subscriptions to ESA. Before making this subscription, in November 2022 UKSA and DSIT identified UKSA would need to further increase its ESA budget due to higher inflation expectations, foreign exchange volatility, hedging costs and a previous modelling error of £377 million. By September 2023, UKSA estimated that, if it rolled forward beyond March 2025 every ongoing mission and chose to keep making other national investments at current levels, these could cost substantially more than the funding level it receives currently. Not all these activities are contractual obligations and therefore UKSA and DSIT are considering what the options might be for rescheduling, scaling down or discontinuing some activities, depending on the outcome of the next spending review. Such decisions could reduce the total value secured from some of UKSA's activities undertaken in this spending review period (paragraphs 2.31 to 2.35).

Measuring and evaluating progress against the Strategy

18 UKSA does not currently have a complete view of how it is progressing against its priorities, but it is working to develop one. UKSA does not have an established centralised approach to monitoring and evaluation. It has monitoring arrangements in place at the individual programme level, but this does not enable it to compare programme performance. It has also completed some project and programme evaluations. UKSA's delivery board monitors progress across its priorities through 22 output-focused metrics, which provide some visibility of progress at the priority level; however, these data have some limitations. UKSA accepts these limitations and, at the time of our fieldwork in early 2024, was taking steps to improve its monitoring and evaluation, including developing a benefits framework and an evaluation strategy, which it intends to publish in Summer 2024. UKSA has also developed a single principal measure for success (the North Star metric), which is intended to measure the total revenue and investment generated within the UK space sector that is attributable to UKSA support. UKSA commissioned a consultancy firm, know.space, to support the collation, collection and reporting of the metric. It found that, while aggregate analysis of the data alone cannot be used to determine attribution or a causal relationship, it is strongly suggestive of a link between UKSA's funding activity and sector-wide outcomes. For example, some companies that received UKSA funding went on to secure private investment (paragraphs 3.3 to 3.9).

19 At the Strategy level, DSIT is improving its view of progress but does not yet have a systematic framework for monitoring and evaluating progress across the whole Strategy. DSIT has oversight of UKSA's progress through its corporate reporting and has identified an initial set of progress indicators for the Strategy. The National Space Board also receives updates on some of the activities undertaken by public bodies with delivery responsibilities; however, it is not systematically monitoring progress against each of the Strategy's commitments. DSIT has faced challenges monitoring progress against the Strategy as it did not set out specific aims or outcomes. It also does not have a framework for evaluation, DSIT told us that strong monitoring data need to be in place before this can occur. DSIT is currently revisiting its objectives to be more defined and therefore measurable, with the intention of creating a standardised focus with which to monitor and evaluate progress towards the Strategy's goals. It is currently behind schedule but expects to complete this work in July 2024. Until this work is complete and a systematic process for monitoring progress is established, the government will not know whether it is making sufficient progress against the objectives set out in the Strategy (paragraphs 3.10 to 3.12).

Conclusion on value for money

20 Space plays a critical role in modern everyday life in the UK. It is vital for scientific discovery and is a fast-developing UK commercial sector which has grown to around £17.5 billion in 2020-21. The government did well to draw its many different interests and activities in this very diverse sector into a single vision in its 2021 national Strategy, which set high ambitions and helped galvanise the sector's interest. DSIT recognised that the original Strategy was broad and that it did not know how much it would cost to deliver. However, it did not produce the implementation plan that it had originally planned to, and three years later DSIT and UKSA are still in the early stages of identifying and developing the plans and capabilities needed to deliver the Strategy's ambitions.

21 The government substantially increased the scale of UKSA's funding and changed its delivery responsibilities in 2021, but DSIT did not provide clarity on the aims, outcomes or priorities for what UKSA was supposed to deliver and by when, or ensure that UKSA had the capability or capacity to deliver it. UKSA was proactive in working to align its activities with the Strategy and identifying a need to make changes to its organisational structure and governance but did not have sufficient planning, monitoring or evaluation arrangements or capabilities in place. As a result, its funding allocation processes had some weaknesses, some of its projects are behind schedule, and it does not have a complete view of whether it is on course to deliver the government's ambitions.

22 UKSA has recognised many of these weaknesses and has been putting in place arrangements to remedy them, including a revised approach to allocating funding, and improved monitoring and evaluation processes. UKSA has recently seen notable improvements in its Civil Service People Survey results. Similarly, it expects to report improved performance against its planned milestones and to meet its financial target of not having a material underspend for 2023-24. However, UKSA recognises that it has more to do. The sector is developing at a fast pace, and in planning for the future the government will need to balance the need to provide certainty with the need to be flexible and responsive to new opportunities. If UKSA is able to address these issues and DSIT provides the required clarity on the aims and outcomes of the Strategy, then they will be much better placed to secure value for money from the government's multi-billion pound investments in the sector and achieve the government's ambitions for the UK in space.

Recommendations

23 To ensure effective and transparent cross-government working arrangements, DSIT with other government bodies should:

a By December 2024, map out the roles and responsibilities of public bodies with a role in the space sector, and publish this to provide clarity for industry and academia to enable them to easily navigate the government's system.

b By December 2024, explore and implement the appropriate arrangements for cross-government working for the space sector. This should include clearly defining accountabilities for delivery and setting out the mechanisms for gathering information on the needs of different public bodies and understanding and coordinating cross-government spend on space-related activities.

24 To help build and provide confidence to the UK space sector:

c By June 2025, DSIT should, in preparation for and following the outcome of the spending review, assess whether there will be sufficient funding to achieve its ambitions and identified capabilities. Should there not be sufficient funding, DSIT should update its plans, setting out what would be deprioritised together with its longer-term funding ambitions.

25 To improve management and oversight of future financial commitments:

d By December 2024, DSIT and UKSA should undertake a joint review to understand how factors contributing to future commitments can be incorporated into financial management processes.

e DSIT and UKSA should evaluate the new prioritisation exercise and benefits framework designed to support spending review preparations, and identify whether this has enabled greater evidence-based decision making; and whether further improvements need to be made.

26 To measure the progress and benefits of government funding in the space sector:

f By December 2024, DSIT should define and establish output and outcome metrics to monitor cross-government progress against the Strategy.

g By December 2024, UKSA should review and confirm whether it is using the most appropriate metrics, including the North Star metric, to measure its progress.

Part One

Developing a national strategy for space

1.1 In this part, we set out the background on the space sector and the Department for Science, Innovation and Technology's (DSIT) role in producing the National Space Strategy and coordinating delivery. DSIT is responsible for setting the policy and coordinating responsibility for delivery in civil space. In order to do this, it needs clear objectives and plans for the sector, and strong cross-government oversight and coordination arrangements.

1.2 In this part we examine:

- the importance of the space sector to everyday life in the UK, the shape of the sector and the role of the government;
- the role of DSIT in developing an overarching national strategy for space and coordinating its delivery in the civil sector;
- funding for the strategy; and
- DSIT's plans for developing its approach to the sector.

The space sector and the role of the government

The importance of space and size of the sector

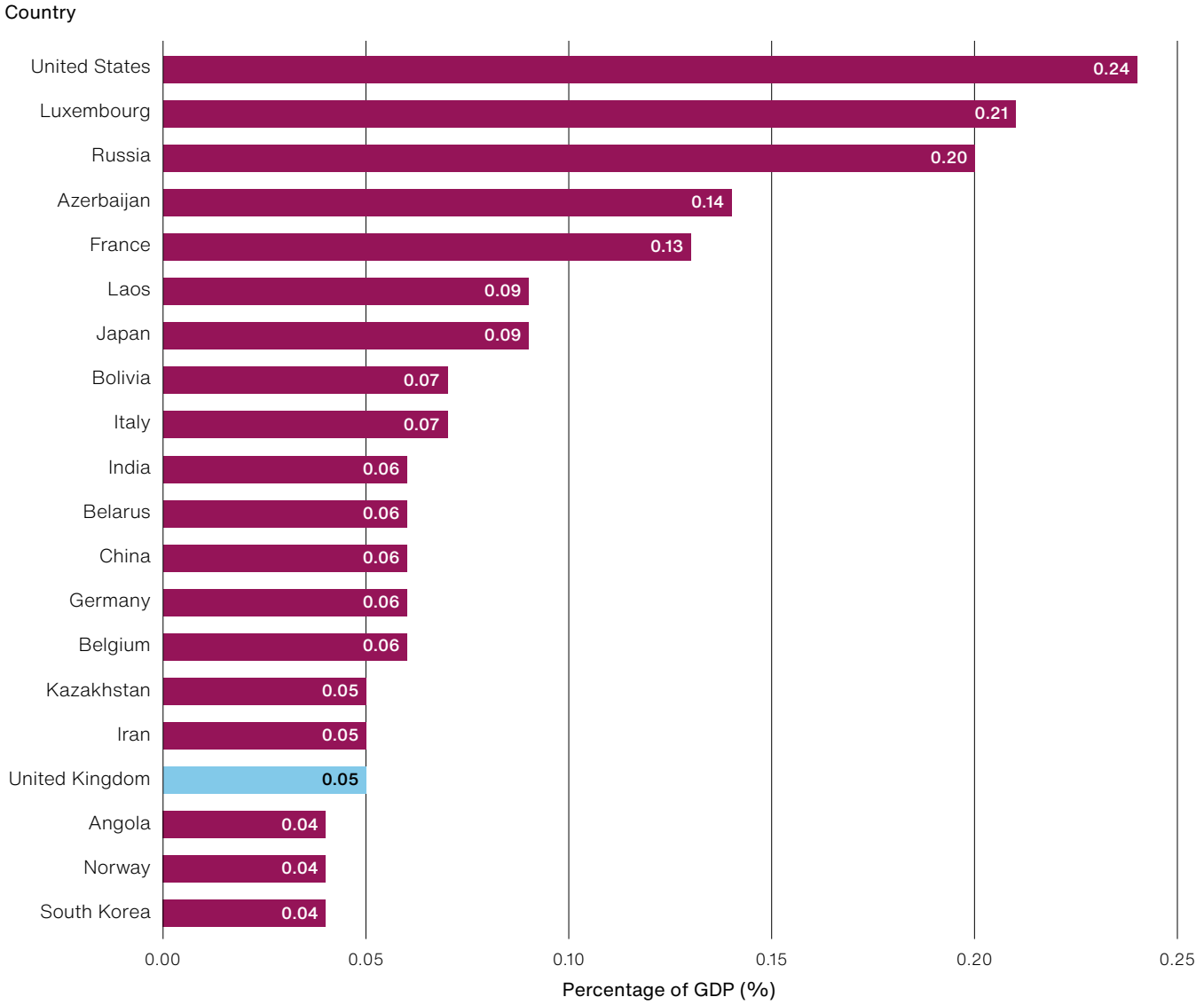
1.3 Space science and technology plays a critical role in day-to-day life, shaping how society lives, works, and understands the world. Satellite services help to predict the weather and to keep businesses connected and products moving, and are used to monitor the climate. Space also plays an important role in defence, enabling the defence of national interests and is also an operational domain in its own right. DSIT considers space to be a part of the UK's critical national infrastructure, contributing to wider government goals, including levelling up and becoming a science and technology superpower.

1.4 Space is an important and fast-developing sector. It has expanded from being an area of mainly scientific interest led by a few countries to a sector with 20 countries spending 0.04% or more of their GDP on space, and a projected global worth of £490 billion by 2030. Many countries now choose to invest in the space sector due to its increasing commercial use, reflecting the growing interest in space and its importance in today's society (**Figure 2** overleaf).

Figure 2

The top 20 countries spending the most on space programmes as a percentage of GDP, 2021

The UK government spends 0.05% of its GDP on space, placing it in the top 20 of 86 countries, as of 2021



Notes

1 Different countries have different definitions of 'space'. This lack of standardisation means that international comparisons provide an imperfect perspective.

2 GDP represents the total value of all goods and services produced within a country in a specific period.

3 Expressing spend as a percentage of GDP allows us to understand the relative importance of a sector within each country's economy.

4 The data were originally created by Euroconsult. This is an assessment covering 86 countries investing today or tomorrow in space (as of 2021). Euroconsult used multiple sources to collect the data, including government space programmes and budgets from agencies' primary information, public sources, and estimates. The information has been harmonised and processed to form a coherent set of data.

5 Report commissioned by the UK Space Agency: know.space, *Size & Health of the UK Space Industry 2022*, updated 31 March 2023.

Source: National Audit Office analysis of *Size & Health of the UK Space Industry 2022 Summary Report* data

1.5 Using survey data and secondary analysis of company data sources, a UK Space Agency (UKSA) commissioned report, undertaken by know.space, estimated there were 1,590 UK-based organisations with space-related activities and a total UK space industry income of £17.5 billion in 2020-21. Of the 1,590 organisations, 162 generate space income of more than £5 million, with 14 organisations accounting for 81% of total space-related income. Organisations involved in the space sector engage in a wide range of activities and are spread across the UK, with many in South East England and London (**Figure 3** on pages 20 and 21). The sector also directly provided an estimated 48,800 jobs while supporting an additional 78,000 jobs across the supply chain in 2020-21.

The role of the government

1.6 The government estimates that from 2014 to 2019, UK civil annual spending on space increased from £300 million to £700 million, and the UK space sector has seen positive growth rates across most years.[10] To ensure a more coordinated approach to the space sector, and recognising the commercial opportunity for the UK, in February 2021, the government completed a Space Landscape Review. This examined the existing distribution of space functions across government, and made recommendations to improve the spread of responsibilities in the light of the ambitions in the upcoming National Space Strategy.

1.7 Prior to 2021, UKSA led on civil space strategy and policy. Following the landscape review, DSIT became responsible for coordinating civil space policy.[11] UKSA became the government's key delivery agency, responsible for developing and delivering UK civil space programmes across the UK space sector and with international space institutions.

1.8 Following the landscape review, in September 2021, DSIT and the Ministry of Defence (MoD) jointly published the government's National Space Strategy (the Strategy). It set an ambition to make the UK one of the world's most innovative and attractive space economies. The Strategy was then followed up in 2023 with a policy paper, the National Space Strategy in Action. This set out how the government is delivering on the ambitions set out in the Strategy and summarised its achievements so far.

1.9 The MoD is the lead for defence space policy and UK Space Command is the defence lead for space operations, space workforce, and space capability. Several other government departments and public bodies also continue to play an important role in the space sector.

10 We have not audited these figures.

11 On 7 February 2023 the government announced that the Department for Business, Energy & Industrial Strategy (BEIS) would close, and its responsibilities would transfer to new departments, including the Department for Science, Innovation and Technology (DSIT). References to DSIT that relate to events prior to this date therefore refer to BEIS.

Figure 3

Spread of organisations with confirmed space-related activities by UK region in 2020-21, with examples of projects undertaken

Organisations involved in the space sector have sites across the UK, with the largest concentrations in South East England and London

SaxaVord Spaceport in early 2024

Credit: SaxaVord

Orbex Prime on the orbital launch platform at the Orbex test site

Credit: Orbex

Example project(s):

The development of two spaceports in the Shetland Islands (managed by SaxaVord Spaceport) and Sutherland (managed by Orbex). If successful, the spaceports will enable companies to launch rockets carrying small satellites. UK Space Agency hopes that this will make the UK a one-stop-shop for satellite services, attracting new business and investment from around the world.

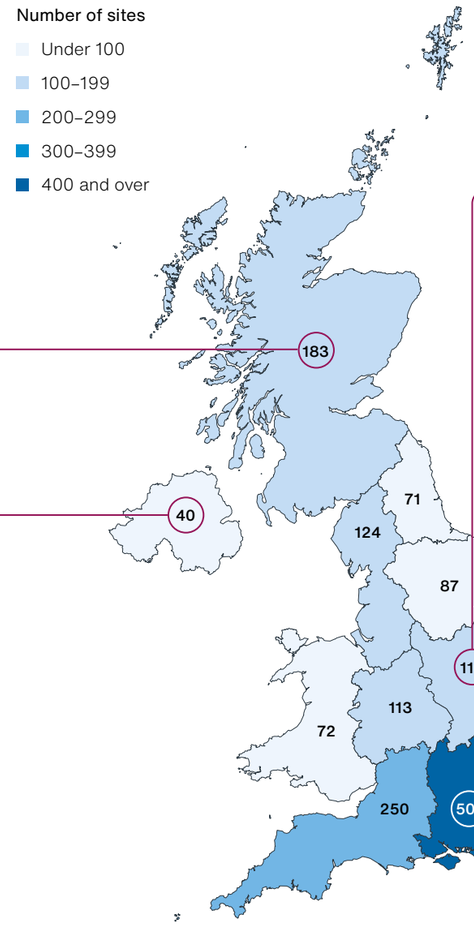
Satellite imagery and machine learning change detection at Skytek

Credit: Skytek

Example project(s):

The European Space Agency's range of earth observation satellites assist scientists in studying the earth.

Skytek, who has a site in Belfast, is using data from these satellites to detect changes to an area due to, for example, wind damage, storm surge or forest fires.



Example project(s):

The Einstein Probe is a satellite equipped with a new generation of X-ray telescopes that aims to search explosions across the universe and enable greater understanding of gravity. It is a collaboration led by the Chinese Academy of Sciences (CAS), with the European Space Agency, the Max Planck Institute for Extraterrestrial Physics (MPE), Germany, and the French Space Agency (CNES).

At the University of Leicester Space Park, a team of scientists were involved in advising on the work and testing of the telescope.

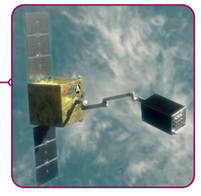
Artist impression of CAS's Einstein Probe

Credit: Zhiming Cai of MicroSat

Example project(s):

Space is getting more congested, with hard to track debris that could destroy a satellite.

At the Harwell Science and Innovation Campus, Astroscale is developing space debris removal services. One option, for example, is a satellite which can detect and capture debris, to allow it to be destroyed safely.



Artist impression of Astroscale's active debris removal satellite

Credit: Astroscale

Notes

1 The population data are based on survey response data on employment by industrial site (i.e. an office or facility involved in space-related activities) supplemented by desk-based research for non-respondents (e.g. company reports and websites). Space-related activity refers to the wide-ranging activities related to the delivery of a space product or service, across the supply chain. Data are published in the report commissioned by the UK Space Agency: know.space, *Size & Health of the UK Space Industry 2022*, March 2023.

2 In addition to the sites in the map, there are a further three sites which are located on Crown Dependencies and 57 which are other/undefined. These are not shown on the map.

3 The total of regional sites exceeds the total number of organisations in the UK as some organisations have presence in multiple regions.

Source: National Audit Office analysis of the *Size & Health of the UK Space Industry 2022* report by know.space and other published information. Boundary files from the Office for National Statistics licensed under the Open Government Licence v.3.0. Contains OS data © Crown copyright and database right 2024

Developing and coordinating the government's approach to space

The National Space Strategy

1.10 For a strategy to be set up to secure value for money, it should have a clear purpose and well-defined objectives. These should be understood consistently across delivery organisations and relevant stakeholders. Where opportunities are unclear or uncertain, perhaps because a sector is new or using innovative technologies, the uncertainty and areas subject to change should be acknowledged.

1.11 The space sector is complex, cutting across science, commerce and defence, and does not have a universally applied definition. The Strategy set out the government's view of the opportunities for the UK in space and brought together civil and defence space activities for the first time. It also aimed to galvanise interest from industry.

1.12 The Strategy set out the government's vision to make the UK a meaningful actor in space. It identified five goals:

- to grow and level up the UK space economy;
- to promote the values of Global Britain;
- to lead pioneering scientific discovery and inspire the nation;
- to protect and defend national interests in and through space; and
- to use space to deliver for UK citizens and the world.

It also set out the actions that the government, academia and industry would need to take to achieve these goals. Projects identified in the Strategy included launching a rocket taking satellites into orbit from the UK, monitoring the sun for space weather events like solar flares, and building a fleet of self-driving shuttles. Space sector stakeholders have highlighted that the Strategy helped to stimulate interest in the sector.

1.13 We found that the Strategy did not, however, set out clear and specific aims, or provide guidance on the outcomes that the government wants to achieve in a set timeframe. It lacked detail on how its broad aims would be achieved and did not specify which areas the government would be focusing its efforts on. In the Strategy, for example, the department identified five goals, four pillars and 10 initial focus areas; however, it did not set out how they inter-relate, or which should be prioritised.

1.14 The objectives in the Strategy were also general in nature. Where the government has set specific objectives and outcomes, it needs to be able to assess whether it is achieving them. Where possible, the government should set objectives that are specific, measurable, achievable, realistic and timebound (SMART). DSIT identified 69 commitments underlying the Strategy. We reviewed them and found that while some were more specific and provided more detail than others, only four (6%) were SMART. An example of a non-specific – and therefore difficult to measure – objective is: "We will level up our space sector and ensure that the space economy works for everyone across England, Scotland, Wales, and Northern Ireland." In a briefing to ministers in July 2021, DSIT noted that, while a SMART headline target would be useful, it was unable to have confidence, in advance of the 2022 to 2025 spending review, that the government funding required to achieve the target will be available.

1.15 UKSA told us that the breadth of the strategy and lack of clear priorities meant that it was not sure what activities to pursue and what to prioritise its funding on. Industry stakeholders highlighted that the lack of clarity on government's priorities could lead to a lack of investment in the UK. DSIT accepts that the Strategy is broad, and had originally intended to provide more detail on how the Strategy would be delivered through an implementation plan. However, DSIT told us the minister at the time decided not to. Nearly two years after publishing the Strategy, DSIT and the MoD published the National Space Strategy in Action policy paper. This provided an update on what had been achieved so far and a broad high-level view of upcoming policy work. However, it lacked detail on how the government intended to prioritise delivery of the rest of the Strategy.

1.16 As the space sector has many advancing technologies which present new options that are not yet mature and fully realised, there is likely to be some uncertainty and change to objectives of the Strategy. The government recognises some uncertainty in the Strategy, for example, stating that it will regularly map and fully understand its capability needs from space as technology advances and new opportunities emerge.

Strategy oversight and coordination

1.17 DSIT is responsible for coordinating civil space activity in the Strategy. As of 2021, there were 10 principal public bodies which had responsibility for delivering aspects of the Strategy.[12,13] To successfully deliver cross-government objectives, effective governance and decision-making structures need to be in place. Our cross-government working good practice guide sets out that stakeholders also need a clear and shared understanding of roles and responsibilities.[14] Without clarity and transparency, there is a risk of duplication of effort or funding within government, and loss of confidence and insufficient support for industry.

1.18 The Space Landscape Review led to changes in the governance structure for the Strategy, with the creation of the advisory cross-government National Space Board (the Board) to help with coordinating government policy on space. The Board aims to ensure coherent delivery of the Strategy between departments and to maintain cross-government momentum. Its membership includes the main departments and delivery bodies with space policy interests, including DSIT, the MoD, the Department for Environment, Food & Rural Affairs (Defra), the Department for Business & Trade (DBT), and the Department for Transport (DfT). Other public bodies may be invited on an ad hoc basis as needed. The board does not record attendance or whether non-Board members were invited to a board meeting, making it hard to track whether the Board has oversight of all relevant activities across government.

1.19 The Board also supports the National Space Council (the Council), an advisory inter-ministerial group co-chaired by the Science, Innovation and Technology and Defence Secretaries of State. The Council is responsible for coordinating government policy on space. However, the Council did not meet for over two years, until it was re-instated in July 2023. This may have reduced the government's ability to work effectively across departments and make well-informed and productive decisions on space policy.

1.20 The Space Landscape Review also found that responsibilities and accountability across the landscape were not widely understood either within government or by industry. Subsequently, the Strategy set out at a high-level the principal government departments and agencies with broad responsibilities for delivering it.

12 The Department for Business, Energy & Industrial Strategy (BEIS), the Ministry of Defence (MoD), the UK Space Agency (UKSA), UK Research & Innovation (UKRI), the Foreign, Commonwealth & Development Office (FCDO), the Department for Transport (DfT), the Department for International Trade (DIT), the Department for Environment, Food & Rural Affairs (Defra), the Department for Digital, Culture, Media & Sport (DCMS), and the Cabinet Office.

13 Machinery of government has changed since 2021, such that some of the 10 departments have now been reformed into different departments. BEIS has been replaced by the Department for Science, Innovation and Technology (DSIT), Department for Energy Security & Net Zero (DESNZ) and Department for Business & Trade (DBT). In addition, DCMS has been replaced by DSIT and Department for Culture, Media & Sport.

14 National Audit Office, *Cross-government working, good practice guide*, July 2023.

1.21 To provide more clarity on who was responsible for what, in 2021, DSIT identified the roles and responsibilities for key commitments underlying the Strategy and assigned each commitment to one or more government bodies.[15] There are 69 commitments altogether. UKSA is either solely or jointly responsible for the most commitments with 48 (70%) allocated to it, followed by the Department for Business, Energy & Industrial Strategy (BEIS) with 22 (32%) and the MoD with 19 (28%). Other than UKSA, BEIS and the MoD, there were 27 (39%) commitments where other government departments and bodies were responsible.[16] DSIT does not have documents setting out which departments are responsible for Strategy commitments since changes to the departmental structures in February 2023. It told us that the commitments remained allocated to the teams who were originally responsible, including those which may have moved to new departments.

1.22 We found that some of the issues identified in the Space Landscape Review remain. Despite the establishment of a dedicated space directorate in DSIT and the transfer of responsibility for policy and strategy to DSIT, departments and industry stakeholders we spoke to were not always clear on the roles and responsibilities of government in the space sector, or on which team or department was leading on certain areas. Industry stakeholders also expressed some confusion about who they should deal with in government for different issues.

Funding for the Strategy

1.23 When developing and coordinating the delivery of a strategy, the government should have a clear understanding of the funding that is needed to deliver it, and visibility of public sector interest and investment in the relevant sector. This enables the government to better prioritise funding and resources to make best use of its available budget and to understand the role that public sector investment will play in the sector.

1.24 The government funds space in a variety of ways, ranging from 'upstream' activities, such as investing grants directly in rocket launch facilities, or funding space research, to purchasing 'downstream' services, such as weather data produced by satellites in space. The government did not set out the costs for implementing the Strategy; instead it stated that the Comprehensive Spending Review process would set budgets for government space activities for the coming years.

15 On 7 February 2023 the government announced changes to the departmental structure. This included closing BEIS and transferring its responsibilities to new departments, including DSIT. References to DSIT that relate to events prior to this date therefore refer to BEIS. As the commitments were set out prior to this departmental change, the number of commitments which departments have responsibility for are based on the previous structure. For example, some commitments which BEIS had responsibility for may have moved into one of the other departments that was created in the departmental changes, such as DBT.

16 BEIS, MoD, UKSA, UKRI, DIT, FCDO, DfT, Defra, DCMS and the Cabinet Office.

1.25 DSIT has good visibility of UKSA spending, its key body for delivering civil space programmes. UKSA has increased spending by 73% in recent years, from £373 million in 2018-19 to £647 million in 2022-23. The majority of UKSA's annual budget is spent on government's investment in the European Space Agency (ESA), which peaked at 85% of UKSA's budget in 2022-23 (£553 million) (**Figure 4**) and is expected to fall to between 60% and 70% in the years 2023-24 and 2024-25.

1.26 Commitments to ESA programmes are agreed every two to four years, and fall outside the normal HM Treasury spending review cycle. The UK government invests in two types of ESA programmes: the mandatory element to cover the science programme and ESA Basic Activities, and optional programmes based on the UK's strategic national priorities and capability requirements.[17] The UK government's presence on ESA's boards and committee helps to ensure it has influence on ESA's decision-making processes and policies. In 2022 the UK committed to spending around £1.84 billion over five years.[18] This investment included:

- UK leadership of the Rosalind Franklin mission to search for signs of life below the surface of Mars;
- a new satellite, TRUTHS, to calibrate climate measurements from space;
- three new UK astronauts, including the world's first para-astronaut;
- research in telecommunications to enable faster 5G and future 6G connectivity, and to support constellations of Low Earth Orbit satellites; and
- strengthening space sustainability via satellite management, maintenance and removal.

1.27 DSIT does not yet have visibility of total direct spending on civil space across the departmental group or government. For example, DSIT knows UK Research & Innovation funds space activities, including through Rutherford Appleton Laboratory (RAL) Space, but it does not separately track space funding as distinct from its overall budget.[19]

1.28 DSIT has not yet assessed other areas of government spending that draw upon space capabilities. Examples include the use of data or satellite services across government for communication and positioning. These services are used across government to monitor offenders on parole using electronic monitoring tags, or mapping crops to support more productive agriculture.

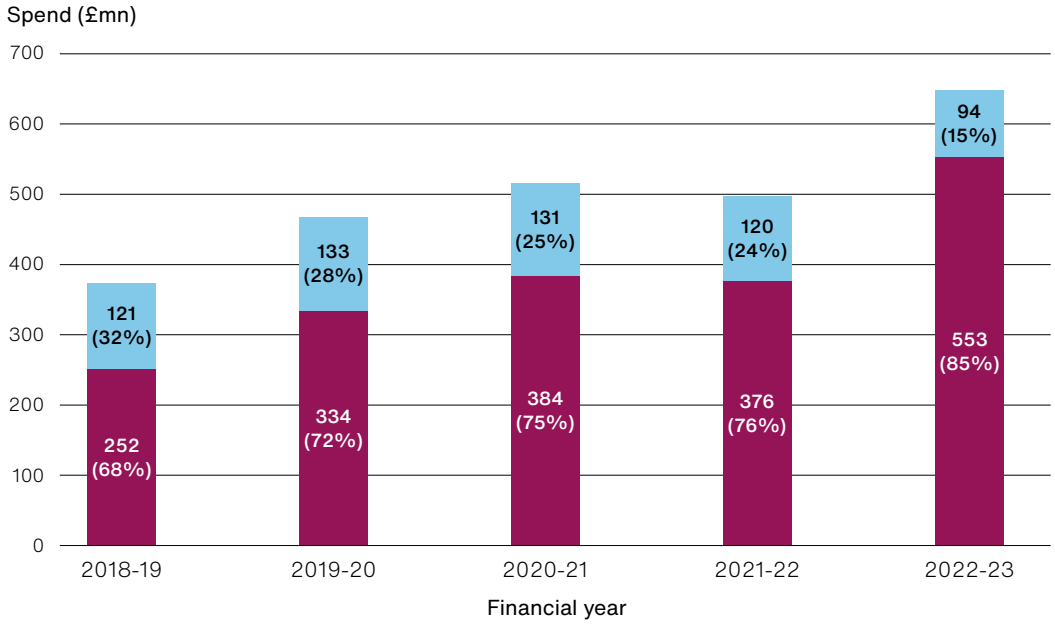
1.29 Without this information, the government is unable to develop a comprehensive evidence base to support cross-government investment. The government will therefore be unable to make best use of its available funding or understand the role that public sector investment will play in the sector.

17 ESA Basic Activities includes Discovery, Preparation & Technology Development, Mission Operations Infrastructure, Sites & Common IT Investment and Engineering Labs & Test Centres.
18 All subscriptions to ESA programmes are made in euros so GBP figures are subject to foreign exchange rates. The total investment figure includes budget to manage inflationary impacts and volatility in foreign exchange rates.
19 Rutherford Appleton Laboratory (RAL) Space is the space hub within UK Research & Innovation (UKRI) and carries out space research and technology development.

Figure 4

UK Space Agency (UKSA) funding for the European Space Agency (ESA) compared to total funding, 2018-19 to 2022-23

UKSA has spent between 68% to 85% of its budget on ESA from 2018-19 to 2022-23



Notes

1 These values are taken from UKSA's 2022-23 annual report and accounts.

2 All numbers have been rounded to the nearest million.

3 Spend not allocated to ESA is spent on, for example, national programmes and resourcing UKSA.

Source: National Audit Office analysis of UK Space Agency data

Developing the government's approach to growing the sector

1.30 The Strategy was very broad and only indicated at a high-level what the government wanted the shape of the UK civil sector to look like. For example, it did not set out which particular aspects it was prioritising for growth through its grant funding, other commercial activities, or other government activities such as regulation.

1.31 In March 2024, two-and-a-half years after the Strategy was published, DSIT published its Space Industrial Plan (the Plan) which gave more details on how it plans to grow the sector and also to signal where it considers there will be demand from the government. It set out that there are 22 capabilities that it considers the UK will require in space. The March 2024 document set out the five that it wants the sector to focus on first. These are:

- space domain awareness (the ability of satellites to detect and sense other objects in space);
- in-orbit servicing, assembly and manufacturing;
- space data for earth applications;
- position, navigation and timing; and
- satellite communication technology.

1.32 The Plan did not define how the 22 capabilities would be developed. Instead, the government committed in the Plan to follow up with a national space capability development plan by Autumn 2024, which will give more definition of the other priorities not covered in the Plan, as well as more specific plans on how it is going to deliver each of the 22. This is intended to cover a review of existing capability in these areas, and a management framework to coordinate the delivery.

1.33 DSIT outlined in the Strategy that, as the space sector grows, the government will need to change from being a primary funder to an influential customer of the sector. It is therefore aiming to increasingly use public procurement to shape and grow the industry via commercial contracts rather than principally using grant funding. Government contracts can increase a company's visibility and credibility, enabling it to attract further private investment, and provide a more secure income stream than grants.

1.34 The Plan also identified other commercial interventions and relationships that the government intends to use to shape and grow the sector, and achieve the government's vision. The levers it identified were wide ranging and included the government's relationship with industry, membership to ESA, the regulatory environment, investment and financing, space procurement, developing skills in the workforce, and international trade.

1.35 A number of these areas are relatively underdeveloped or immature at present. For example, government's space procurement is decentralised, with limited awareness of opportunities across departments. DSIT recognises it will need to improve the coherence and efficiency of all government space procurement and become a more intelligent customer of space technology. It has also identified a need to build a longer-term, mature relationship with industry. Industry stakeholders told us that it was difficult to understand what they can expect from the government, who they should be liaising with, and when key meetings and engagement events were taking place.

Part Two

The work of the UK Space Agency in delivering the Strategy

2.1 In this part we focus on the UK Space Agency's (UKSA) role and progress in delivering the National Space Strategy (the Strategy). It examines:

- the progress UKSA has made in aligning its organisation, activities and funding priorities with the Strategy;
- the status of delivery of UKSA's work programmes; and
- the challenges UKSA faces with continuing to grow the space sector and deliver everything it has planned.

Aligning UKSA's role and funding with the Strategy

The corporate plan and transformation

2.2 UKSA used its Corporate Plan 2022–25 (the Corporate Plan) to align itself more closely with the Strategy.[20] The plan was based on the aims of the 2021 Strategy and the Space Landscape Review, and covered the three-year spending review period (2022 to 2025). It set out eight priorities for where it would focus its resources, and mapped these against the Strategy's aims (**Figure 5** on pages 30 and 31). Alongside this it developed a transformation programme to ensure its operational and cultural set up supported delivery of the eight priority areas. The priority areas include aspirations to have the first small satellite European space launch from UK soil, and to encourage innovation across the space sector.

20 UK Space Agency, *Corporate Plan 2022–25*, July 2022.

Figure 5

Summary of the UK Space Agency's (UKSA) priorities, 2022–2025

UKSA has eight priorities differing in budget and number of commitments

Priority	Budget 2022–2025 (£mn)	Summary of UKSA Commitments	Example of Activity	Link to commitment from National Space Strategy Ten Point Plan
Launch: Developing UK launch capability	38	Deliver three UK launches. Co-fund the development of launch infrastructure and technology. Manage international agreements and raise awareness.	In January 2023, UKSA worked with Virgin Orbit to conduct the first UK Horizontal Launch at Cornwall Spaceport.	Capture the European market in commercial small satellite launch.
Innovation: Unleash innovation across the space sector	465	Catalyse investment in the UK. Support sector-led developments of innovative technologies. Help UK organisations to collaborate on global research and development. Build on their partnership with Australia – known as the UK–Australia Space Bridge.	On 17 April 2023, UKSA announced the launch of the International Bilateral Fund (IBF), with up to £2 million initially available for approximately 30 proposed projects.	Unleash innovation across the space sector.
Discovery: Gain a deeper understanding of the Universe	696	Join new multinational experiments on the International Space Station. Work with the European Space Agency (ESA) to explore Jupiter and its moons and study energy. Partner with nations on bilateral science missions.	UKSA invested £37 million into the ESA led Euclid mission to explore how gravity, dark energy and dark matter have shaped the universe.	Expand our horizons with space science and exploration.
Earth Observation: Grow the UK's Earth monitoring capabilities	456	Deliver the MicroCarb mission. Help UK organisations to collaborate on global research and development. Support research and development. Provide leadership in using space technology and data to tackle climate change.	UKSA is aiming to deliver the MicroCarb mission no earlier than 2025 with the French Space Agency to monitor fluxes in carbon dioxide.	Fight climate change with space technology. Improve public services with space technology.
Low Earth Orbit (LEO) Assets: Improve public services with space technology	16	Conduct a scoping exercise to understand how UKSA can maximise the benefits of the UK's capabilities. Support the uptake and advancement of strategic UK LEO capabilities.	In March 2024, UKSA launched the first funding call worth up to £60 million for UK companies and researchers to develop innovative satellite communications technology.	Improve public services with space technology. Lead the global effort to make space more sustainable.

Figure 5 *continued*
Summary of the UK Space Agency's (UKSA) priorities, 2022–2025

Priority	Budget 2022–2025 (£mn)	Summary of UKSA Commitments	Example of Activity	Link to commitment from National Space Strategy Ten Point Plan
Sustainability: Make space more sustainable	92	Continue Space Surveillance and Tracking service. Work with the Ministry of Defence to deliver a new National Space Operations Centre. Explore options with ESA to capture and remove debris from LEO. Take leading role in responsible space behaviour.	In September 2022, UKSA awarded £4 million to two space companies to remove space debris.	Lead the global effort to make space more sustainable.
Levelling-up: Develop space clusters around the UK	114	Help space organisations collaborate. Reduce barriers to entry for companies. Attract new companies. Invest in new projects.	In May 2023, UKSA launched a £50 million fund to support the development of cutting-edge research and development facilities.	Develop our world-class space clusters.
Inspiration: Upskill and inspire the future workforce	22	Raise awareness. Ensure all young people have access to inspiring space resources which will help them understand how Science, Technology, Engineering and Maths (STEM) subjects increase their life opportunities. Increase STEM pupils. Improve access to the skilled people that the sector needs.	In May 2024, UKSA announced that it had awarded just over £1 million to 15 projects under the Space for All fund. The fund aims to inspire young people to pursue STEM education and attract talent to the UK space sector.	Improve public services with space technology. Upskill and inspire our future workforce.

Notes

1 The information for the summary of UKSA commitments and commitments from the strategy's Ten Point Plan columns is taken from UKSA's *Corporate Plan 2022–25* (the Corporate Plan). The information in the example activity column is taken from UKSA's Corporate Plan and other publicly available documents.

2 The figures for the allocated budget are based on UKSA's updated finance summary table to the Corporate Plan which was published in May 2024 and totals £1.9 billion. UKSA were allocated £1.75 billion in the spending review period 2022–25, which was subsequently increased by £180 million against which UKSA had an underspend of £30 million in 2022-23. Numbers may not sum due to rounding.

3 The International Space Station is a large spacecraft in orbit around Earth where crews of astronauts and cosmonauts live.

4 MicroCarb is a joint mission between UKSA and the French Space Agency intended to characterise greenhouse gas fluxes on Earth's surface and gauge how much carbon is being absorbed by oceans and forests.

5 The Space Surveillance and Tracking service is the detection, tracking and cataloguing of space objects to determine their orbits.

6 The current UK Space Operations Centre, based at RAF High Wycombe in Buckinghamshire, monitors space constantly with the aim of protecting and defending the UK.

Source: National Audit Office analysis of publicly available documents

2.3 UKSA ensured its management structures aligned with these priorities by putting a single director in charge of each priority area who is accountable for spending. To further simplify the structure, UKSA has sought to place most existing and new programmes within its eight priority areas to provide a clear line of sight from programme to objective.[21] Examples of these programmes are: working with the European Space Agency (ESA) to explore Jupiter in the Discovery priority; inspiring young people to move into science, technology, engineering, and mathematics (STEM subjects) in the Inspiration priority; and monitoring fluxes in carbon dioxide in the Earth Observation priority.

2.4 The transformation programme included a wide range of activities, for example plans to build a better understanding of its key stakeholders, to use data and technology that facilitate and accelerate smarter working and developing services that support the implementation of efficient and effective operational processes, and reorganising its location to be close to stakeholders.

2.5 UKSA was at that stage also facing a cultural challenge with a number of staffing issues and used the transformation programme as a response to improve its overall culture. In the 2021 Civil Service People Survey, nearly one in five UKSA staff surveyed (19.4%) reported they had been bullied or harassed over the last 12 months (**Figure 6** on pages 33 and 34). This was the highest reported levels across the 101 participating government organisations.

2.6 UKSA originally planned to complete the transformation programme by March 2024. However, in early 2023, the programme was reviewed and refreshed and UKSA decided that it required a further year, until March 2025 to deliver and embed the transformation. Activities to date have included simplifying the organisational structure and governance and identifying new office locations across the UK to move closer to stakeholders. Future work will include continuing to tackle bullying, harassment and discrimination and moving staff into the new office locations.

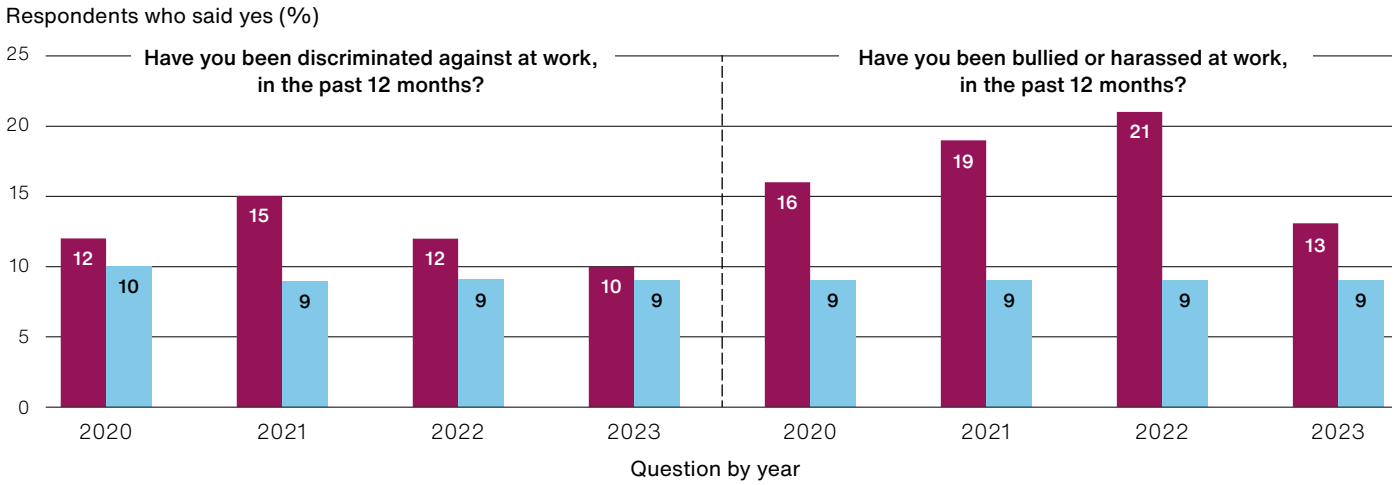
2.7 Since the Civil Service People Survey in 2021, the percentage of UKSA staff who have reported they had been bullied or harassed over the last 12 months has dropped from 19% to 13% in 2023. Similarly, the number reporting they have been discriminated against in the last 12 months has reduced from 15% in 2021 to 10% in 2023. It is not, however, possible to determine whether this change is attributable to UKSA's transformation programme.

21 In November 2023 UKSA decided to change the way it refers to 'projects' and 'programmes' to 'initiatives' and 'priorities' respectively. For consistency, the terms 'project' and 'programme' are used throughout this report.

Figure 6

Civil Service People Survey results on discrimination, bullying and harassment, 2020–2023

The percentage of people reporting discrimination, bullying or harassment at UK Space Agency (UKSA) decreased in 2023 but is still above the civil service average



Rank out of all civil service bodies	93 out of 106	98 out of 101	95 out of 102	77 out of 87	103 out of 106	101 out of 101	102 out of 102	85 out of 87
Count of UKSA employees who responded yes	30	35	26	27	38	46	46	34
UKSA survey response rate (Percentage of all staff)	86	84	77	81	86	84	77	81
Civil service response rate (Percentage of all staff)	66	62	65	65	66	62	65	65

Percentage of UKSA respondents

Average percentage of civil service respondents

Figure 6 *continued*
Civil Service People Survey results on discrimination, bullying and harassment, 2020–2023

Notes

1 The Civil Service People Survey is coordinated by the Cabinet Office and is run annually across the entire civil service, including over 100 bodies. It looks at civil servants' attitudes to, and experience of, working in government departments.

2 Completion of all questions in the survey is voluntary and may not represent all views across the civil service.

3 There may be some wider factors that are affecting the differences between UKSA and wider civil service responses. For example, UKSA respondents are more likely to be concentrated in specific areas, whereas civil servants from other bodies may be much more geographically dispersed. This results in cultural, socioeconomic and environmental differences which should be taken into consideration.

4 In 2023, the civil service responses included 16 bodies whose results were suppressed for one or more questions to aid anonymity. These have been removed from the rankings.

5 The rankings are ordered from the lowest number of people saying they have been bullied, harassed or discriminated against to the highest number of people who said they have been bullied, harassed or discriminated against.

6 Aggregated responses from groups of civil service organisations have been removed from the rankings for all years.

Source: National Audit Office analysis of Civil Service People Survey Results, 2020–2023

Prioritising and allocating funding

2.8 In late 2021 to mid-2022, UKSA worked with DSIT to undertake a prioritisation process that informed the 2022 to 2025 spending review preparations, where UKSA received £1.75 billion over three years. It sought to allocate this funding to specific programmes through a prioritisation process that took account of the Strategy's goals, pillars and the Ten Point Plan, and drew upon a range of available information. UKSA collated information from existing businesses cases and new proposals and developed a series of metrics to support the prioritisation exercise (similar to the five case model set out in HM Treasury (HMT) guidance). UKSA subsequently developed lower cost scenarios but found it hard to de-prioritise anything based on its need to support the broad and ambitious Strategy. UKSA concluded, together with DSIT, that there were weaknesses in the prioritisation.

2.9 DSIT and UKSA have acknowledged that, while there was good engagement and a collaborative approach, they also needed to make improvements for the next spending review. They therefore jointly undertook a lessons learned exercise, which made recommendations for improvements. This covered a range of issues, for example, some staff reported that they felt the Strategy was not being used to drive change, but its breadth was instead used as a hook to justify individual programmes. Sector stakeholders told us that any activity would meet the ambitions set out in the Strategy, and that it was therefore difficult to understand where the market opportunities were in the UK. Some staff also felt there needed to be more information relating to outcomes, objectives or deliverables.

2.10 In preparation for the 2025 to 2028 spending review, DSIT and UKSA are producing a prioritisation framework and benefits framework to enable greater evidence-based decision making, and use the learning from the lessons learned exercise. It also seeks to create a standardised approach to assessing and prioritising activities and evaluating them across UKSA's portfolio, though these have not yet been fully implemented or evaluated.

UKSA's delivery of its programmes

Delivery through the European Space Agency

2.11 UKSA's primary delivery mechanism is through money it gives to ESA, a non-European Union, inter-governmental agency that aims to shape the development of Europe's space capability and promotes cooperation and innovation. In 2022-23 UKSA invested around £553 million, amounting to 85% of UKSA's budget, making it the fourth largest contributor of all ESA member states (behind France, Germany, and Italy). UKSA chooses to invest in ESA as its technical knowledge, expertise and test facilities provide the opportunity to build national capabilities and grow the UK space sector. Working with ESA as a delivery partner also provides a mechanism for countries with smaller space budgets to take part in larger-scale missions. For example, UKSA, alongside other countries, is investing into ESA's JUICE mission, which aims to orbit Jupiter and three of its largest moons and has a total cost of around €1.6 billion.

2.12 ESA gives money through contracts to both industry and academia. It operates with the principle that it should try to ensure equity among its member states, taking into consideration their financial contributions. This involves allocating most of its contracts to countries in proportion to their contribution to ESA's budget. This means that the UK should expect to receive contracts proportionally to the value of the UK's investment in ESA, excluding ESA's internal operating costs.[22,23] A UKSA Executive Committee meeting paper in February 2023 set out that the UK's cumulative geo-return was 0.93, meaning that, for every £1 UKSA had invested in ESA, it estimated £0.93 was paid to UK organisations, excluding ESA's internal operating costs. It also stated that, from quarter four 2015 to February 2023, the UK had generated the highest cumulative deficit of any ESA member, of around €168.5 million. In response to the high deficits, UKSA created a taskforce in October 2022 with ESA to identify ways to return the value to 1 by end of December 2024, such as helping industry to improve their performance in ESA's procurement processes. UKSA reported an increase in geo-return to 0.96 as of quarter four 2023, but this means UK industry and academia are still not benefiting in terms of contract value from the full funding given to ESA by UKSA (**Figure 7** on pages 36 and 37). In comparison, France, Germany, and Italy achieved values between 0.99 and 1.02.

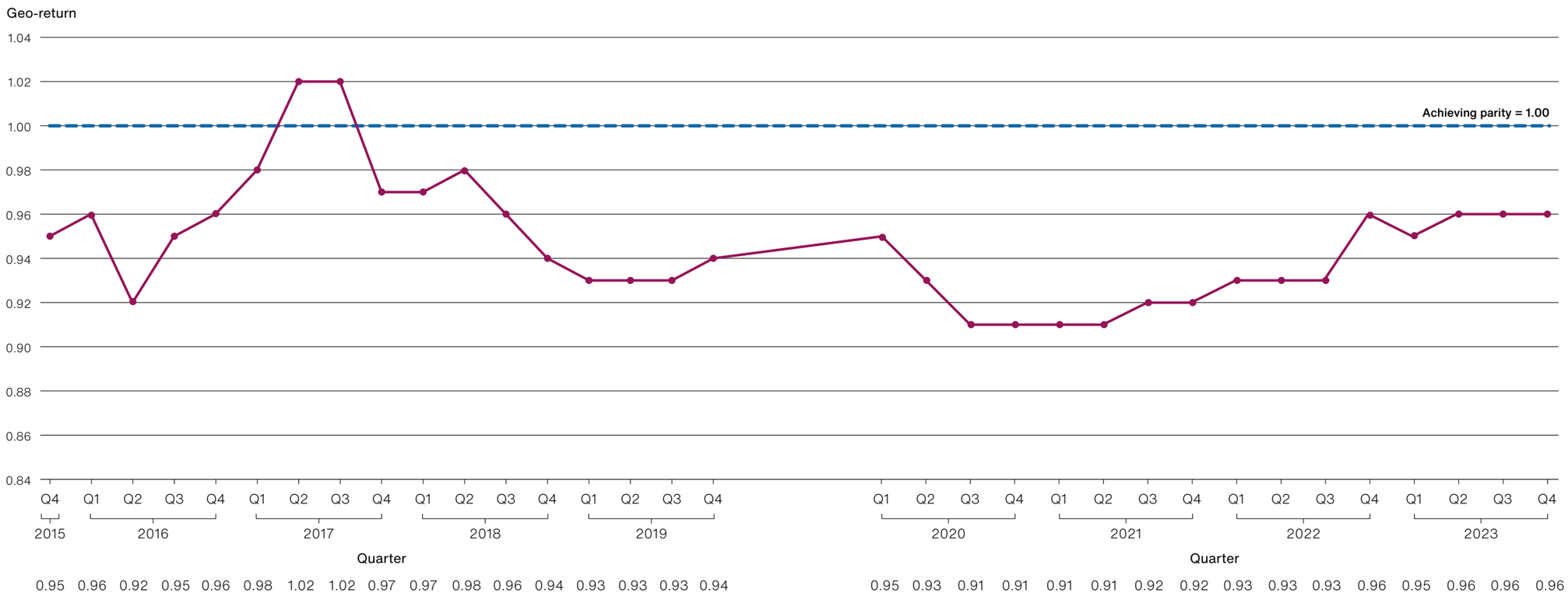
22 The value of contracts received is calculated on the basis of the technological value of the contracted activities and is dependent on sufficient bids being received from UK companies. Low-amount and low technical-value procurements, non-space procurements and third-party funded activities are not included in this calculation.

23 ESA's internal operating costs include organisational overheads, project team labour and any technical assistance provided by other ESA directorates.

Figure 7

The UK's geo-return from contracts with the European Space Agency (ESA), 2015 to 2023

The UK Space Agency (UKSA) aims to gain the same amount of money back on its investments with ESA through contracts worth the same value (achieving parity), but has only managed this twice since 2015



Geo-return	0.95	0.96	0.92	0.95	0.96	0.98	1.02	1.02	0.97	0.97	0.98	0.96	0.94	0.93	0.93	0.93	0.94	0.95	0.93	0.91	0.91	0.91	0.91	0.92	0.92	0.93	0.93	0.93	0.96	0.95	0.96	0.96	0.96

Notes

1 ESA is an intergovernmental organisation with member states who contribute to ESA's budget and participate in its programmes. The UK is one of those states.

2 The geographical return (geo-return) is the value of contracts that a member of ESA receives in proportion to their financial contribution. The value of contracts received is calculated on the basis of the technological value of the contracted activities and is dependent on sufficient bids being received from UK companies. Low amount and low technical value procurements, non-space procurements and third party funded activities are not included in this calculation.

3 The dotted line shows a geo-return of 1 (also known as achieving parity), where the UK receives contracts worth the same amount as UKSA invested into ESA, excluding ESA's internal operating costs. If the geo-return is below 1, this means there is deficit and UK industry and academia are not being awarded contracts, in terms of contract value, from the full funding given to ESA by UKSA.

4 ESA calculates the geo-return values on a quarterly basis, according to the calendar year.

5 These geo-return values do not take into consideration contracts where the sub-contract(s) or any supplementary contractual arrangements are not currently known to ESA.

6 The geo-return does not take into consideration the economic, social, scientific, and technological benefits that can be gained by the UK from working with ESA.

Source: National Audit Office analysis of European Space Agency values provided by the UK Space Agency

2.13 Geo-return does not take into consideration broader economic, social, scientific, or technological benefits that can be gained from working with ESA. In February 2021, UKSA commissioned an evaluation of ESA investments. It estimated that the investments made with ESA from late 2019 to December 2024 (including ongoing commitments from 2016) would generate a return of £9.8 for every £1 invested (taking into consideration ESA's internal operating costs) in the longer term up to 2036 and beyond.[24] It expects this return on investment to come from increased knowledge, prosperity, security and protection and global influence.

Delivering national programmes

2.14 While the majority of UKSA's spending goes through ESA, it also delivers a wide range of programmes nationally. UKSA has not made as much progress as planned over the last two years with these national programmes. In its annual report 2022-23, UKSA set out that, of the 31 high-level delivery milestones that it planned to complete in 2022-23, it had successfully completed 23 (74%). For example, UKSA planned to get approval for its National Space Innovation Programme (NSIP), worth £45 million between 2023-24 to 2024-25, and to open the first call for funding for the programme by March 2023. However, the approval for the programme was only provided in August 2023 for £25 million between 2023-24 to 2024-25, and the first funding call was opened in September 2023. Similarly, UKSA intended to launch a funding call for the Space Clusters Infrastructure Fund (SCIF) in 2022-23 worth £50 million, but this was only opened in May 2023. UKSA told us its performance improved in 2023-24 with an expected 78% of its high-level milestones complete, with some projects continuing to experience delays.[25]

2.15 Delays to UKSA's national programmes have resulted in a large underspend and revisions to plans. In 2022-23, programme delays led to an underspend of around £48 million against UKSA's original £144 million budget. The impact of around £25 million of this underspend was mitigated by bringing forward ESA payments and the remaining £23 million of underspend was surrendered to the Department for Science, Innovation and Technology (DSIT) to be repurposed. In November 2023, UKSA therefore had to revise the goals within the Corporate Plan, to ensure they remained realistic while the organisation delivered its transformation programme. UKSA told us it is expecting to meet its financial target of not having a material underspend in 2023-24.[26]

24 This value was published by the Technopolis group and partners (know.space, Cambridge Econometrics and Science-Metrix). This ratio includes projections of expected spillovers based on the relevant literature and as such represents an upper bound estimate. We have not audited the methodology and calculations for this figure.

25 We were not able to verify the milestone data for 2023-24 as our fieldwork for this report took place before UKSA had completed its end-of-year review of its performance.

26 We were not able to verify the underspend figures for 2023-24 as our fieldwork for this report took place before the financial audit had been completed on UKSA's accounts.

2.16 UKSA faces three principal operational challenges that have contributed to its national projects being behind schedule:

- delays producing business cases for funding approval;
- staff shortages; and
- factors outside of UKSA's control.

Delays producing business cases for funding approval

2.17 Business cases are the mechanism used by the government to gain funding approval for projects or programmes. They set programmes up to deliver their intended outcomes and benefits to ensure they are properly scoped and planned and that the costs are justified from the outset. For example, they provide assurance that a programme is affordable and fundable over time, that they align with wider strategic objectives, and that they can be delivered successfully by the organisation and its partners.

2.18 Between April 2022 and December 2023, UKSA prepared around 45 business cases for spend over £500,000, at least one for each of its national programmes.[27] These had to go through various stages of approval depending on their size and whether they were deemed novel or contentious. For example, 16 of the 45 cases required DSIT approval, including seven which went to DSIT's investment committee as they had whole-life costs worth over £20 million. Three of these also went to HMT for approval.

2.19 UKSA has not been able to produce and secure approval for some business cases within planned timeframes. For example, at the time of our fieldwork in early 2024, the Launch programme phase 2 business case had taken over two years and had yet to be approved by HMT. Delays have caused funding calls to come out late in the financial year, but with requirements that funding will be spent by the end of the financial year. This means industry has limited time to use funding, and there is also a potential impact on investor confidence. UKSA does not hold data on exactly how many of the 45 cases were completed late or on the length of the delay.

2.20 DSIT and UKSA have identified various reasons for the challenges with producing business cases within planned timescales, including:

- disproportionate size of business cases compared to funding amount;
- limited capacity and capability to produce high-quality business cases; and
- the challenge in providing evidence of benefits for innovative projects which meet HMT's guidelines.

27 Some programmes have more than one business case depending on the stage of the programme and therefore the number of businesses cases prepared and reviewed exceeds UKSA's total programme number.

2.21 In addition to the individual national programme business cases, UKSA produces a business case for ESA funding. In Autumn 2022, after the business case had been approved by DSIT and had been submitted to HMT for approval, UKSA identified a modelling error in the business case. Following on from this, UKSA commissioned a Government Internal Audit Agency (GIAA) advisory review of its approach to quantitative modelling for business cases. The review, issued in June 2023, recommended various areas for improvement, including identification of the criticality of models, compliance with existing defined procedure, greater succession planning, and training.

2.22 UKSA is working to increase the efficiency and effectiveness of its business cases through staff training, additional assurance, bringing in external support, and taking on board the learning from the GIAA review. In 2023, DSIT also asked Lord David Willetts to produce an independent report looking into how the DSIT business case and approvals process can be improved. It included recommendations on capping the length of business cases and working with HMT to produce supplementary guidance to support the assessment of science and technology business cases. DSIT is making changes in light of the recommendations.

Staff shortages

2.23 As of 31 March 2024, UKSA identified that it required 444 staff and had approved funding for these.[28] However, 89 (20%) of its posts were vacant, and it was in the process of recruiting for 39 of these roles. It also reported in March 2024 that nine of UKSA's 17 teams (53%) rated their resources as Amber or Amber/Red, meaning that successful delivery of priority milestones is less likely.[29]

2.24 UKSA has a higher staff turnover than other government departments. For example, between August 2022 and July 2023, UKSA's turnover rate was 25%, nearly double the civil service average of 13.6% (March 2021 to March 2022).[30] In the 12 months to February 2023, 31 UKSA staff who left completed exit questionnaires. The reasons given for leaving were advancement/retirement, pay, culture, personal circumstances change, and bullying and harassment. Turnover at UKSA has since decreased to 15.2% from April 2023 to March 2024.

28 The 444 figure details the total number of employees required in UKSA, including staff who may be absent and their cover, for example those on maternity leave.

29 Green: Successful delivery to time, cost and quality appears highly likely. Green/Amber: Successful delivery appears probable. Amber: Successful delivery appears feasible but significant issues already exist requiring management attention. Amber/Red: Successful delivery is in doubt with major risks or issues apparent in a number of key areas. Red: Successful delivery to time, cost and quality appears to be unachievable.

30 The UKSA and civil service average turnover rates include resignations and internal moves within the civil service. UKSA told us that there are greater opportunities for staff to move internally within larger departments than in smaller arms-length bodies like UKSA. Therefore, it would expect UKSA's turnover rate to be higher than large government departments.

2.25 UKSA's challenges with capacity has meant it has needed to rely on a number of temporary staff. This has been exacerbated by UKSA needing to contribute to a DSIT wide headcount target agreed with HMT as part of the 2021 spending review and due to be met by the end of this spending review period. UKSA headcount was originally set at 310 and was then later increased to 320 in September 2023 when UKSA was asked by DSIT to develop a new Connectivity in Low Earth Orbit programme. At the time of our fieldwork the headcount target was under review and the new target had not yet been finalised. In March 2024, 9% of UKSA's staff were contractors, and a further 11% were fixed-term, on loan or had been seconded in. The number of contractors varied by team (**Figure 8** overleaf). In the 'Chief Executive Officer/Deputy Chief Executive Officer' team, for example, 19% of the employees were contractors. If contractors make up a high proportion of the workforce, it risks corporate memory being lost, can be more expensive and can limit how effectively an organisation or certain teams are run.

Factors outside of UKSA's control

2.26 UKSA also identified that external factors have at times limited progress of its projects. For example, the COVID-19 pandemic reduced the sector's operational capacity, which caused delays to the government's ambition to launch a rocket from the UK in 2022. Geo-political events have also caused delays. For example, the Rosalind Franklin Mars rover project was put on hold due to the Russian invasion of Ukraine, as Russia was previously heavily involved in the project and was meant to provide the launch.

UKSA future plans for delivering the government's growth ambitions

UKSA's approach to growing the commercial sector

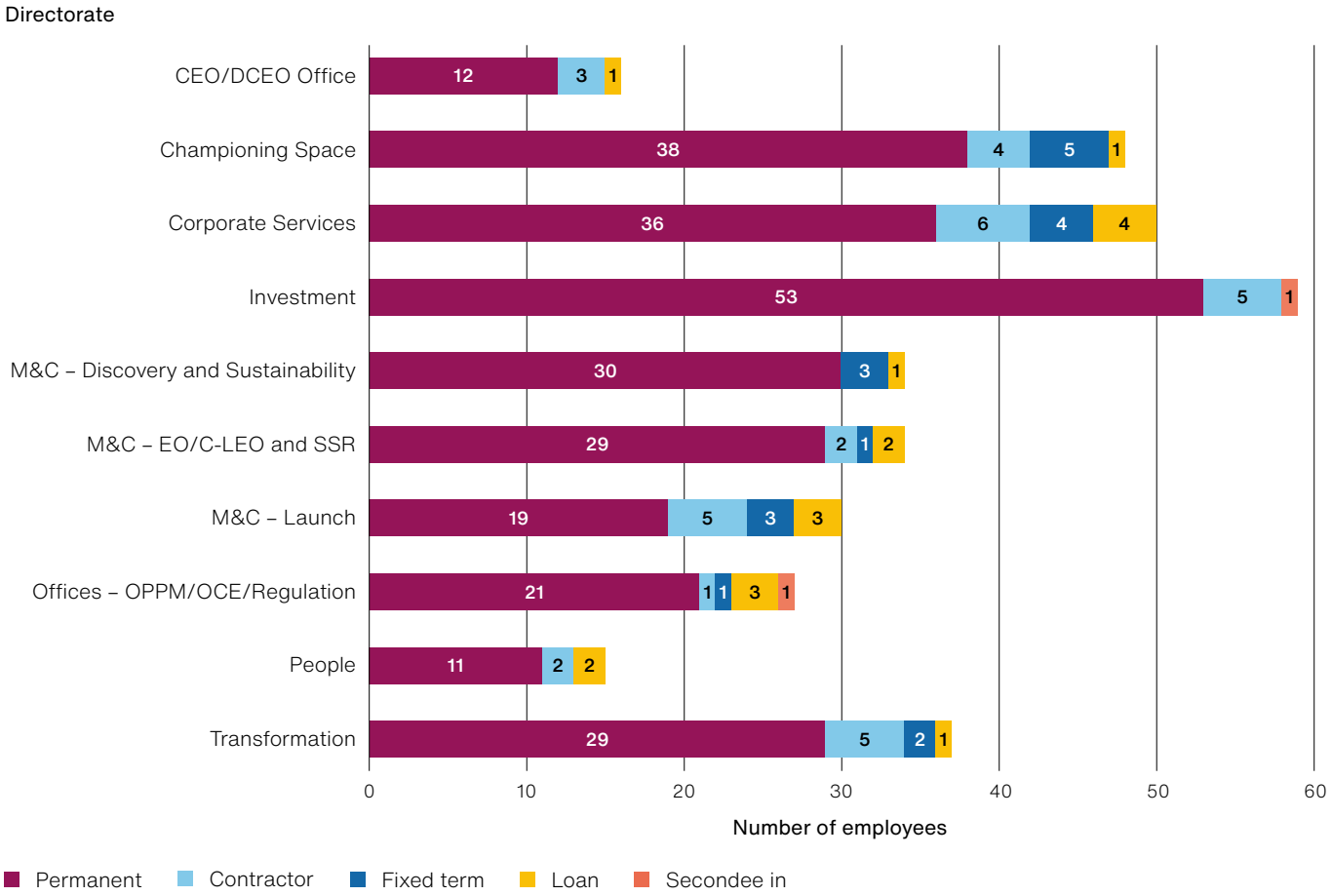
2.27 UKSA has predominantly used grants to support the sector, with contracts representing only a small percentage of its non-ESA budget. However, in line with the government's ambitions, it believes its approach of predominantly using grants will not be sufficient in future and that it will need to move towards undertaking more public procurement to agree contracts to support the sector. Industry stakeholders we spoke to also stated that contracts would give them longer-term certainty and greater confidence in forward planning.

2.28 In 2023, UKSA began to explore and prioritise how it could develop its commercial approach to the industry and use of alternative commercial interventions such as procurement to help grow the sector in line with the Strategy's ambitions. This project is also assessing and seeking to develop the processes, capabilities, structures and systems necessary to support a revised commercial approach. For example, UKSA is considering whether it will need to develop further commercial skills in any of the alternative interventions, and ensure appropriate permissions are in place in order to utilise them. At the time of our fieldwork in early 2024, UKSA was still in the early stages of exploring the options available.

Figure 8

Number of UK Space Agency (UKSA) employee contracts by directorate and type, 31 March 2024

In total, 21% of all UKSA staff are temporary employees



Notes

1 The directorates that relate to one or more UKSA priorities are:

- Missions and Capabilities (M&C) – Discovery and Sustainability;
- M&C – EO/C-LEO and SSR; EO stands for Earth Observation, C-LEO stands for Connectivity in Low-Earth Orbit, and SSR stands for Space Security and Resilience;
- M&C – Launch;
- the Championing Space directorate includes the Inspiration priority; and
- the Investment directorate includes the Innovation and Levelling-up priorities.

However, these may still also include employee numbers for other areas across UKSA.

2 OPPM stands for Office of Project & Programme Management and OCE stands for Office of Chief Engineer.

3 CEO stands for Chief Executive Officer and DCEO stands for Deputy Chief Executive Officer.

4 Temporary employees include all those on contractor, loan, fixed term or secondee contracts. All the fixed-term, contractors, loans, and secondments into UKSA are all due to end on or before 31 March 2025.

5 These data do not include the five employees that UKSA has out on loan or secondment and who are due to return to UKSA before 31 March 2025.

6 The figure details the total number of employees in UKSA, including staff who may be absent and their cover, for example those on maternity leave.

Source: National Audit Office analysis of UK Space Agency data

2.29 As well as meeting the practical and statutory requirements that support effective public procurement, public bodies should also have a commercial strategy, accountability and governance arrangements, effective stakeholder engagement arrangements, the required capabilities, and relevant and timely data.[31]

2.30 If UKSA is going to increase its use of procurement, it will need to develop its contract management capability, as a number of weaknesses were identified in a July 2023 GIAA report. The report found that UKSA's contract management was still developing, lacked maturity, and was not in line with best practice across government. It found the lack of a robust approach to contract management made it difficult for UKSA to demonstrate effective commercial risk management, value for money, and benefits realisation. It made nine recommendations covering contract tiering, its contract management framework, capability, its contract management plan, obligations tracking, performance management, managing contract risks, managing commercial pipeline, and governance and reporting. UKSA has been taking steps to respond to these recommendations and improve its contract management capabilities.

UKSA longer-term plans and funding to support the Strategy

2.31 The Strategy included an expectation that activity and investment would be scaled up for the period from 2023 to 2030. Following the launch of the Strategy, and in line with its ambitions, and in response to its increased budget in the 2022 to 2025 spending review period, UKSA (with contribution and oversight from DSIT) scaled up existing sector funding programmes, launched new ways to invest in science and technology, and signed up to long term international missions. Many of these projects are long term and extend well beyond the current spending review period.

2.32 UKSA also chose to increase its subscription to ESA to secure lead UK roles in missions. Before making this subscription, in November 2022 UKSA and DSIT identified UKSA would need to further increase its ESA budget due to higher inflation expectations, foreign exchange volatility, hedging costs and a previous modelling error of £377 million. In this spending review period, DSIT also asked UKSA to initiate more work. For example, in August 2023, DSIT announced a £160 million Connectivity in Low Earth Orbit programme, and asked UKSA to initiate work to prepare for initial funding calls.

2.33 As the current spending review period comes to an end, there is uncertainty over UKSA's longer-term funding arrangements, and UKSA is therefore planning for a range of scenarios ahead of the 2025 to 2028 spending review period.

31 National Audit Office, *Managing the commercial lifecycle, good practice guidance*, July 2021.

2.34 In November 2022, DSIT and UKSA identified a risk that UKSA's portfolio of activity could be unaffordable from March 2025 onwards. By September 2023 they estimated that if it rolled forward beyond March 2025 every ongoing mission and chose to keep making other national investments at current levels, these could cost substantially more than the funding level it currently receives.

2.35 UKSA and DSIT are therefore considering options to continue the delivery of the Strategy if UKSA's settlement does not increase above its current budget in the next spending review period. Should UKSA not receive an uplift in budget from March 2025, it will need to make some difficult decisions about which activities to prioritise and which to discontinue. Such decisions could reduce the total value secured from some of UKSA's activities undertaken in this spending review period. DSIT and UKSA's work is ongoing to prioritise existing programmes and to develop an understanding of which of its activities can be rescheduled, scaled down or discontinued. This is being factored into a new prioritisation framework that supports preparations for the next spending review.

Part Three

Monitoring and evaluating progress against the Strategy

3.1 In this part, we focus on the extent to which there are sufficient monitoring and evaluation arrangements in place and learning lessons. It examines:

- how UK Space Agency (UKSA) is monitoring and evaluating its progress against its priorities; and
- whether there are mechanisms for monitoring and evaluating progress against the Strategy.

3.2 In December 2021, we reported on the government's progress in developing the provision and use of evaluation evidence across government.[32] Our work highlighted the importance of performance monitoring to provide real-time insights into the delivery of an intervention and how evaluation is crucial to understanding the effectiveness and efficiency of interventions. Evaluation is a systematic assessment of the design, implementation and outcomes of an intervention. Its purpose is to provide insights into how an intervention has been implemented and what effect it had, for whom, how and why.

UKSA's arrangements for monitoring and evaluation

Monitoring and evaluating UKSA's projects

3.3 UKSA does not have an established centralised approach to monitoring and evaluation. It has arrangements in place to monitor progress at the programme-level using programme specific metrics.[33] This enables UKSA to understand how individual programmes are progressing, but does not enable the comparison of performance. UKSA has also conducted some project and programme evaluations, but these have been limited in number, and evaluation plans have sometimes been completed late in the programme cycle. UKSA therefore may have missed opportunities to learn. UKSA also told us that it does not currently conduct long-term monitoring and evaluation beyond the conclusion of a programme. These limitations in programme monitoring and evaluation make it difficult for UKSA to make comparisons across its work and implement improvements by applying lessons learnt from its previous work.

32 Comptroller and Auditor General, *Evaluating government spending*, Session 2021-22, HC 860, National Audit Office, December 2021.

33 In November 2023 UKSA decided to change the way it refers to 'projects' and 'programmes' to 'initiatives' and 'priorities' respectively. For consistency, the terms 'project' and 'programme' are used throughout this report.

Monitoring progress against UKSA's priorities

3.4 UKSA has established a delivery board to manage, deliver, and report on the projects that deliver UKSA's priorities. The board plays a key role in monitoring progress at the priority level and can take actions to resolve identified risks and issues. UKSA has identified 22 output-based metrics to monitor across its eight priorities at its delivery board. It brings these together in an online application where the data can be analysed and used to provide regular updates at UKSA's delivery board meetings. These data do, however, have different reporting frequencies and there have also been concerns raised at the delivery board around their quality and accuracy.

3.5 The 22 metrics monitored by the board provide some visibility of progress at the priority level, but do not monitor progress against outcomes. This, along with the data limitations set out in paragraph 3.4, means the delivery board does not have a complete view of how it is progressing against its priorities, and will limit the board's effectiveness.

3.6 UKSA has recognised these limitations and has accepted that the deficiencies in its monitoring and evaluation may have meant it has missed opportunities to learn. At the time of our fieldwork in early 2024, UKSA was taking steps to improve its monitoring and evaluation, including developing a benefits framework and an evaluation strategy that it intends to publish in Summer 2024.

UKSA's North Star metric

3.7 UKSA has also developed a principal measure for success known as the North Star metric, which is intended to measure the total revenue and investment generated within the UK space sector that is attributable to UKSA support. It is not designed to capture other benefits driven by UKSA activity and is therefore not the only measure of success. It intends to use this metric at different levels within the organisation to provide assurance and aid in decision-making. This includes at the priority level, as an additional measure of progress to ensure UKSA is achieving part of its overarching role of catalysing investment.

3.8 UKSA has begun using the metric, but has identified that it has limitations, in that the metric is subject to influence from external factors and does not provide a comprehensive picture. In June 2023, UKSA commissioned a consultancy firm, know.space, to support UKSA in the collation, collection and reporting of the North Star metric data. The scope of the study included all relevant national programmes and selected European Space Agency (ESA) programmes, and used a mix of primary and secondary research to collect evidence on metric impacts. An interim report in December 2023, highlighted challenges regarding the use of the North Star metric. It found that there was heterogeneity in the amount of data available for the metric and the approach to data collection across programmes. In response to these concerns, UKSA set out its intentions to engage with teams to clarify reporting practices and improve consistency across UKSA.

3.9 The study ran from June 2023 to April 2024. The final report found evidence of substantial impacts in terms of new revenues and investment both at programme level, and in aggregate across UKSA's activities. It stated that UK companies who received UKSA or ESA funding also collectively went on to secure hundreds of millions in investment. The report found that while aggregate analysis of the data alone could not be used to determine attribution or a causal relationship, it was strongly suggestive of a link between UKSA's funding activity and sector wide outcomes, such as companies receiving UKSA funding going on to secure private investment. The report made five recommendations aimed at improving the flow of new data and robust evidence in the future, but UKSA is yet to set out how it plans to address these going forward.

Monitoring and evaluating the Strategy

3.10 The Department for Science, Innovation and Technology (DSIT) has oversight of UKSA's progress through its corporate reporting, but has faced challenges monitoring progress against the Strategy. As set out in paragraphs 1.13 to 1.15, the Strategy did not set out specific aims or outcomes that the government is seeking to achieve. DSIT had intended to develop an implementation plan, including a monitoring and evaluation framework, to fill that gap. However, DSIT told us the minister at the time decided not to continue with this work as originally planned. DSIT instead identified an initial set of indicators to aid the monitoring and evaluation of progress in the government's 2023 National Space Strategy in Action policy paper. Many of these indicators have been derived from metrics calculated by an annual UKSA-commissioned report that quantifies and tracks changes in the UK space industry. DSIT does not have a framework for evaluation as it believes that strong monitoring data need to be in place before this can occur. Without this, the government will not understand the full impact of its programmes.

3.11 The National Space Board (the Board) is responsible for driving the delivery of the Strategy. Due to the limitations in monitoring and evaluation at the strategy level, the Board has received updates on some of the activities undertaken by public bodies with delivery responsibilities, but has not been able to systematically monitor progress against the 69 commitments underlying the strategy.

3.12 In October 2023, DSIT initiated a monitoring and insight workstream, which is seeking to provide updates on progress made against the Strategy to the Board. It began by reviewing the commitments and goals mentioned within the Strategy and the National Space Strategy in Action with the intention of revising the objectives to be more defined, and therefore measurable. The expectation is that, once a finalised set of strategic objectives has been agreed, it will create a standardised focus with which to monitor and evaluate progress towards the Strategy's goals. DSIT originally intended to complete this work in March 2023, but is currently behind schedule and now expects to complete the work in July 2024. Until this work is complete and a systematic process for monitoring is established, the government will not know whether it is making sufficient progress against the Strategy.

Appendix One

Our audit approach

Our scope

1 In September 2021, the Department for Science, Innovation and Technology (DSIT) and the Ministry of Defence (MoD) jointly published the government's National Space Strategy (the Strategy).[34] It set an ambition to make the UK one of the world's most innovative and attractive space economies. The government did not set out the costs for implementing the Strategy, instead it stated that the Comprehensive Spending Review process would set budgets for government space activities for the coming years.

2 Earlier, in February 2021, drawing on the preparatory work of the Strategy, the government had completed a Space Landscape Review, which examined the existing distribution of space functions across government. It made recommendations aimed at improving the distribution of responsibilities across government. Prior to this review, the UK Space Agency (UKSA) led on civil space strategy and policy. Subsequent to this review, DSIT has been responsible for coordinating civil space policy and UKSA has been the government's key delivery agency, responsible for developing and delivering UK civil space programmes across the UK space sector and with international space institutions. The MoD is the lead for defence space policy and UK Space Command is the defence lead for space operations, space workforce, and space capability. Several other government departments and public bodies also continue to play an important role.

34 On 7 February 2023 the government announced that the Department for Business, Energy & Industrial Strategy (BEIS) would close, and its responsibilities would transfer to new departments, including the Department for Science, Innovation and Technology (DSIT). References to DSIT that relate to events prior to this date therefore refer to BEIS.

3 This report examines whether DSIT and UKSA are set to secure value for money from their work overseeing and delivering the National Space Strategy. It covers:

- **Strategy and objectives:** Whether DSIT has clearly defined its objectives for the civil space sector in the Strategy, and is effectively overseeing and coordinating its delivery (Part One);
- **Delivery:** UKSA's role and progress in delivering the Strategy, and the extent to which it has the required capacity and capability (Part Two); and
- **Monitoring and evaluation:** Whether there are appropriate mechanisms to monitor progress against the Strategy and evaluate outcomes (Part Three).

4 This report focuses on the civil domain of space and does not examine the defence activities which fall under the remit of the MoD.

Our evidence base

5 In examining these issues, we drew on a variety of evidence sources, including interviews, site visits, document review and data analysis.

Interviews

6 We undertook over 50 interviews with 30 different organisations. We used information from these interviews to build our understanding of the relevant topics and to inform further interview and document requests and follow-up questions. Interviewees were often identified by the organisations themselves and were selected based on the fit between their job role and expertise and the focus of each interview.

7 The majority of our interviews were conducted virtually using Microsoft Teams, with a small number taking place in person. We did not record the interviews. We took notes during each interview.

Interviews with government

8 We interviewed key individuals from UKSA and DSIT to explore the impact of the Strategy and UKSA's and DSIT's progress against it so far. Topics in the interviews included: how the Strategy was produced; purpose of UKSA's Corporate Plan 2022–25 (the Corporate Plan); DSIT and UKSA's role in the coordination and delivery of the Strategy; UKSA's capacity and capability; DSIT's relationship with UKSA; DSIT's work with other government organisations; and monitoring and evaluation in both UKSA and DSIT.

9 We also carried out interviews with other government organisations with responsibility for delivering parts of the Strategy. This included the Department for Transport, UK Research & Innovation (UKRI), the Department for Business & Trade, the Department for Environment, Food & Rural Affairs and the Ministry of Defence. Interviews covered their relationships with DSIT and UKSA, and how DSIT was coordinating and monitoring delivery across government.

10 To explore the funding options available for organisations in the space sector, we held interviews with the UK Infrastructure Bank and the British Business Bank.

11 We interviewed HM Treasury to further understand government funding controls and the 2025 to 2028 spending review processes. We also discussed UKSA's plans for amending their business case approvals processes as HM Treasury is responsible for setting guidance on producing business cases for funding approval.

12 We also interviewed the Cabinet Office to build understanding of good practice in cross-government working, evaluation across government, and the results of the Civil Service People Survey.

Interviews with industry and academic stakeholders

13 We interviewed 12 industry and academia organisations to explore the challenges facing the space sector and for their views on DSIT's and UKSA's support for the sector and progress so far. Stakeholders we interviewed were:

- ADS;
- Association of Universities for Research in Astronomy (AURA);
- know.space;
- Lockheed Martin;
- PwC (PricewaterhouseCoopers);
- RAND Europe;
- Satellite Applications Catapult;
- Seraphim;
- Space Partnership;
- UKspace;
- University of Edinburgh; and
- University of Leicester.

Site visits

14 We undertook three site visits to build more in-depth understanding of the opportunities and challenges for the space sector and their views on DSIT's and UKSA's support for the sector and progress so far.

- **Sutherland SpacePort:** We visited the SpacePort in Sutherland, Scotland, which is currently being built by Orbex, with support from the Highland and Islands Enterprise (HIE). While on the visit we interviewed both Orbex and HIE.
- **University of Leicester:** We visited the Space Park Leicester facilities located at the University of Leicester, where a mix of academia and industry are based together. While on the visit we held five interviews with representatives from both academia and industry.
- **Harwell Science and Innovation Campus:** We visited the Science and Innovation Campus in Harwell, Oxfordshire, where a mix of government academia and industry are based together. While on the visit we interviewed UKRI's Rutherford Appleton Laboratory (RAL) Space, Astroscale, Oxford Space Systems and Open Cosmos.

Document review

15 We reviewed more than 600 documents provided by UKSA, DSIT and by industry and academia following interviews with them. Documents included:

- governance documents such as board and council meeting papers and minutes;
- relevant business cases for UKSA programmes, and documents detailing plans for future funding approval processes;
- documentation on governance, organisational structures, financial management and risk management processes;
- briefings for ministers on government's support for the space sector;
- published documentation including key government strategy documents and UKSA's Corporate Plan and annual report and accounts;
- documentation on the background of the space sector and the key opportunities and challenges for the sector; and
- documentation on DSIT's and UKSA's monitoring and evaluation provision for their support for the sector and for tracking progress against the Strategy.

Data analysis

16 We analysed a range of data provided by DSIT and UKSA, and published data including:

- results from the Civil Service People Survey to explore UKSA's results and to understand how its culture has changed over time;
- data on UKSA current and past spend and future commitments for the 2025 to 2028 spending review period; this helped us understand where UKSA has prioritised its funding and the future challenges it may face depending on the next spending review settlement;
- data on the number of temporary staff and vacancies at UKSA to explore some current barriers to progress and risk of future capacity and capability issues;
- European Space Agency (ESA) data demonstrating the return on investment from UKSA funding to help understand the impact of the ESA funding; and
- international spend on space to show how the UK compares to other countries.

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