Size & Health of the UK Space Industry 2023

Summary report

July 2024

LE London Economics

UK SPACE AGENCY

About London Economics

London Economics (LE) is a leading independent economic consultancy, with a dedicated team of professional economists specialised in the space sector.

As a firm, our reputation for independent analysis and client-driven, world-class and academically robust economic research has been built up over 30 years. From our headquarters in London, and associate offices in five other European capitals, we advise an international client base.

As a team, we have been pioneering innovative analytical techniques to provide trusted economic advice to decision-makers across the space industry, space agencies and international governments across more than 140 projects since 2008. Drawing on our solid understanding of the economics of space, expertise in economic analysis, industry, and technical knowledge, we use our expertise to reduce uncertainty and guide decision-makers in this most challenging operating environment.

Head Office: Somerset House, New Wing, Strand, London, WC2R 1LA, United Kingdom.

w: londoneconomics.co.uk e: info@londoneconomics.co.uk 𝕏: @LondonEconomics
t: +44 (0)20 3701 7700

Acknowledgements

We would like to acknowledge the useful guidance and feedback provided by the UK Space Agency and Department for Science, Innovation and Technology throughout this research, as well as the Royal Institute of Navigation, regional space clusters, and other industry bodies in promoting the survey. We would also like to thank all of the survey respondents for their informative questionnaire responses. Responsibility for the contents of this report remains with London Economics.

Authors

Rasmus Flytkjær Partner
Tom Goulding Senior Economic Consultant
Clio von Petersdorff Senior Economic Consultant
Katharina Knuth Economic Consultant
Philip Hagelberg Economic Analyst
Ethan Sorrell Research Assistant

Front cover: Pelletier, A. (2017, 13 September). Milky Way Galaxy [Photograph]. Unsplash. https://unsplash.com/photos/milky-way-galaxy-HWXSmUoP66E

Table of Contents

Table of Contents

Key findings

This edition of the 'Size and Health of the UK Space Industry' analysed the 2021/22 financial year. Despite ongoing macroeconomic challenges, the industry has demonstrated remarkable resilience with sector income growing by 2.7% since 2018/19. Methodological changes relating to the Direct-to-Home (DTH) segment mean sector-wide estimates of Gross Value Added (GVA) (the sector's contribution to GDP) are not comparable over time. Excluding DTH allows such comparisons to be made, with non-DTH GVA growing by 3.5% over the period compared to 1.3% GDP growth in the UK economy as a whole, evidence that the sector is outperforming the wider UK economy. The increasing industrial population, sustained levels of private investment, robust export figures, commercial orientation, and the expanding landscape of the UK space industry, particularly in emerging sectors like the In-space Economy, bode well for future growth. This optimism is reinforced by the positive outlook of survey respondents over the next three years.

These findings are estimated based on research and analysis of 1,765 UK-based organisations with space-related activities. The research comprised an industrial survey (achieving 209 responses), supplemented by secondary research of more than 1,500 organisations. Sources used include Companies House records, statutory financial accounts, annual reports, company websites, and databases from prior projects by London Economics.

Most data (income, Gross Value-Added, employment, and breakdowns of these by region, customer type, and other characteristics) is for the financial year ending in 2022 as this ensures maximal data availability. Survey data on employee characteristics and business outlook are reported as of the survey period in the second half of 2023. Data on external investment into organisations is presented for the calendar year 2023, directly extending the results presented in the previous Size & Health iteration.

The Organisation for Economic Cooperation and Development (OECD) define space 'sectors', setting what is considered to be best practice internationally. The OECD's recommended space sectors are less granular than the Size and Health segments and activities, but are fully reconcilable and breakdowns of key results are presented in OECD categories in this report.

Another key feature of how results are presented concerns Direct-to-Home (DTH) broadcasting, which constitutes a majority of the Space Applications segment. Sky in turn represents a majority of this activity. Results are presented throughout this report inclusive and exclusive of DTH, allowing greater comparability with previous reports.[1] This is particularly important in the context on ongoing and projected future movement away from satellite delivery and towards fibre-based delivery mechanisms.

[1] The definitions that underpin identification of 'the UK space industry' are continuously examined to ensure that the Size and Health series captures the full spectrum pf space activity. In the interests of maintaining consistency with previous reports in the series, one major methodological decision in this year's Size and Health study is the explicit non-inclusion of any part of the activities of Atomic Weapons Establishment plc ('AWE').
AWE is a non-departmental public body wholly owned by the Ministry of Defence since 2021. The organisation is responsible for the design, manufacture, and support of warheads for the UK's nuclear weapons. This therefore encompasses the warheads for the Trident nuclear deterrent, submarine-launched intercontinental ballistic missiles that leave the Earth's atmosphere on a sub-orbital trajectory.
The remainder of this report is presented with AWE excluded in order to maintain consistency of the Size and Health data series with previous editions, though we are working to better understand how they can be included in future years.

State of the UK space industry[2]

- Total UK space industry income was £18.9bn. Despite a decrease of £142m (-0.7%) from 2020/21, medium-term sector growth remains strong with income increasing by £503m (+2.7%) since 2018/19.
- Excluding Direct-to-Home (DTH) broadcasting, UK space industry income was £10.1bn, maintaining the share of non-DTH activities at 53% in 2021/22 (2020/21: 54%)
- The industry numbers 1,765 organisations, a net increase of 175 since last year
- Segments that experienced growth were: Space Manufacturing (+7%, +£168m) and Space Operations (+30%, +£505m)
- Segments that experienced decline: Space Applications (-5%, -£637m)[3] and Ancillary Services (-23%, £155m)
- A new segment was formed this year from activities previously included in Space Operations: In-Space Economy. This segment generated an estimated £39m in income, a small share of the overall UK space industry that is expected to grow in future years

Importance of the industry

- Direct employment constituted an estimated 52,000 Full Time Equivalents (FTEs), representing 6.7% growth versus 2020/21's 48,800 FTEs. This is equivalent to 0.16% of the total UK workforce, with a further 76,500 indirectly supported jobs across the supply chain giving a total of 128,500 jobs supported – this number is not directly comparable to 2020/21
- The industry contributed £7.2 billion of direct Gross Value-Added (GVA) to UK economic output in 2021/22 (38% of industry income), versus £7.7bn (40%) in 2020/21 and £7.5bn (41%) in 2018/19. Excluding DTH broadcasting, sector GVA grew by £84m over the past year.
- The industry contributed a total GVA effect of £16.9 billion when including indirect and induced effects in the wider UK economy (£19.9 billion in 2020/21)
- Labour productivity (GVA per employee) for the industry was £138,000 (£157,000 in 2020/21), more than double UK average labour productivity (£60,340)[4]
- The UK space industry workforce is particularly highly skilled, with 4 in 5 (80%) employees in responding organisations holding at least a bachelor's degree (77% in 2020/21)
- Exports fell in real terms to £5.8bn (from £6.4 billion in 2020/21), accounting for 31% of total income (versus 34% in 2020/21)
- Despite a reduction, Europe remains the most important export market for the UK space industry, representing 42% of total exports and 13% of total income (55% and 19%, respectively, in 2020/21)
- The UK space industry has a strong commercial focus – 83% of income is commercial, comprised of sales to consumers (including DTH broadcasting) at 49% and sales to other businesses at 34%. That said, there is a strong role for public demand and funding (17%), comprised of: Defence (9%), Other Civil Government (3.1%), European Space Agency (ESA)

[2] Short-term trends in the sector suffer from inherent fluctuation which the Covid pandemic only exacerbated. Therefore, for key headline figures, both year-on-year and longer-term (i.e. from 2018/19 as the last pandemic-unaffected year) comparisons are presented.
[3] The 2020/21 numbers are adjusted to account for the re-segmentation of some Space Operations activities under the new In-Space Economy segment.
[4] Labour productivity is calculated as GVA divided by FTEs.

(1.8%), Research/Science Funding bodies (1.1%), other Space Agencies (0.9%), and the European Commission (0.4%)

- Remaining the largest single activity, the share of income accounted for by DTH broadcasting was 47% in 2021/22 (46% in 2020/21). DTH income remained roughly constant in real terms while other segments of the UK space industry shrank, slightly increasing its share. This highlights the continued importance of satellites for signal distribution
- The industry is concentrated and dominated by a few large organisations, with just 20 organisations accounting for 75% of space-related income, 142 for the next 15%, and over 1,600 for the remaining 10%. Only three organisations each generated space revenues of over £1 billion and 243 other companies each generated over £5m in space revenue
- Industrial sites (and employment) are concentrated in London, the South East, South West and East of England, and Scotland, however all UK regions/nations are home to at least one headquarter of a space organisation

Outlook for the industry

- Half of survey respondents experienced negative impact of COVID-19 on growth (52%)
- The enablers of growth that were placed most frequently in survey respondent's top-3 rankings were support from and engagement with the UK Space Agency (UKSA), increased spend across UK national space programmes, and UK funding via ESA programmes
- Staff recruitment featured most frequently in survey respondents' top-5 rankings of growth constraints. Additionally, skills shortages, economic uncertainty, limitations on EU programme involvement, and an inability to increase prices were assessed to be important constraints to growth.
- That said, survey respondents indicated optimism with respect to near-term growth: 2 in 3 expect income to be higher in the coming three years (66%, a 43% subset of which expect much higher). Over half (56%) expect to employ more staff, and around 1 in 2 expect higher exports (47%) and increased Research & Development (R&D) expenditure (51%).
- An estimated £1bn was spent by UK space organisations in 2021/22 on research and development, equivalent to 5.1% of total industry income (2020/21: 4.5%)
- UK-headquartered space companies attracted investment of £8.85bn in total over 70 identified investment deals, with acquisitions accounting for the majority of the total investment value (97%, 9% of deals). Venture Capital investments represented 15/70 deals (21%) in 2023, but only 2% of the total invested in 2023. When filtering out mega-deals over £100m, Venture Capital represents that largest share of the remaining £295m investment volume (57%).
- 6 in 10 respondents had a positive view of their engagement with the UK Space Agency (though this may reflect bias in the sample of respondents).
- Some survey respondents reported contributing to at least one of the United Nations' Sustainable Development Goals, most notably:
  - Goal 9: Industry, Innovation and Infrastructure (45% of respondents)
  - Goal 13: Climate Action (44% of respondents)
  - Goal 8: Decent Work and Economic Growth (32% of respondents)
  - Goal 11: Sustainable Cities and Communities (31%)

1 Introduction

The UK Space Agency (UKSA), an executive agency within the Department for Science, Innovation and Technology (DSIT) and is at the heart of the UK efforts to explore and benefit from space by delivering the National Space Strategy. UKSA do so by catalysing investment to maximise long-term growth in the sector, delivering missions and capabilities that use space to meet national needs and help humanity understand the universe, and championing space and encouraging other sectors to use space sustainably.

Since its inception in 1992 by the British National Space Centre (BNSC), the *Size and Health of the UK Space Industry* study series has acted as the single most important source of data that delivers statistics and analysis on the performance, vitality, and challenges faced by UK companies operating in the space sector. Now implemented by the UKSA, this analysis serves as the foundation for evidence-based decision making and enables the tracking of progress on the *National Space Strategy*'s goals.

This report summarises the findings of the 2023 edition, covering the **2021/22** financial year, as well as providing insights into individual organisations' outlooks on the three years following the late-2023 survey period, where available. External investment data for the calendar year 2023 is also presented. By supplementing survey inputs with significant secondary research and adopting innovative frameworks and best practice techniques to measure the space economy, the study aims to give a **comprehensive, progressive, and accurate overview** of the size, performance, and characteristics of organisations engaged in space-related activities in the UK.

1.1 Approach

The **'space industry'** is defined to include all organisations (or part thereof) that are engaged in any space-related activity. It comprises both:

- **Commercial organisations** (i.e. businesses, companies, firms) that earn revenue from the manufacture, launch and operation of satellites/spacecraft, and from utilisation of the signals and data supplied by satellites/spacecraft to develop value-added applications; and
- **Non-commercial organisations** (e.g. universities, research institutes) that secure funding to contribute space-specific research and expertise throughout the industry supply chain, often in partnership with commercial organisations.

Consistent with previous editions the term **'income'** covers both commercial revenues and non-commercial funding. Organisations with no identifiable income from space-related activities were excluded, as were organisations with no identifiable UK-based operations. Lacking either of these characteristics was sufficient for an organisation to be excluded. Space-related activity is those activities that either construct, launch, or operate assets in space, or critically depend on such assets to function on the ground. Organisations that 'use' space assets (even commercially), to improve or refine their offerings, but would be able to function without space for an extended period of time are not included. E.g., a manufacturer of Global Navigation Satellite System (GNSS) devices for agriculture is in scope, but a farmer is not.

1.1.1 Revised segmentation

As the space industry is a dynamic sector, a **revised segmentation** of the industry is applied in this iteration to embrace the evolving industry landscapes, encompassing emerging sectors. An 'In-space

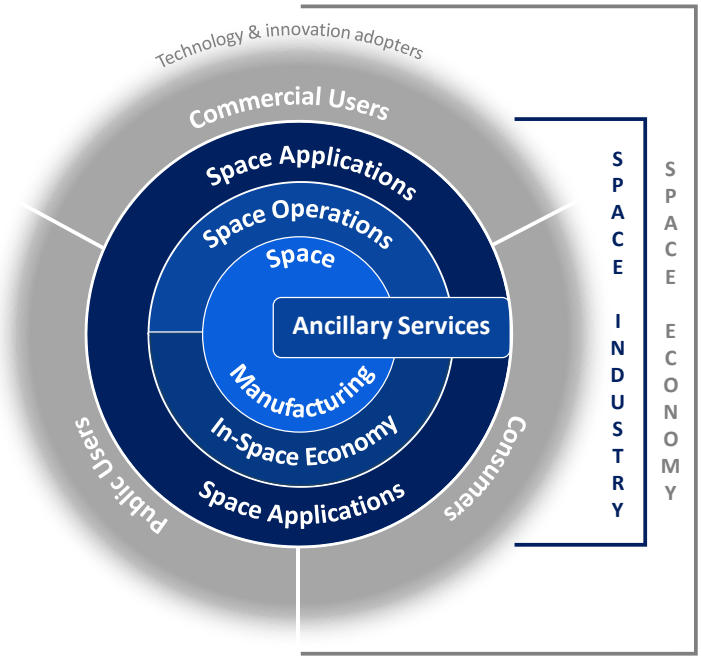
Economy' segment has been added this year, reorganising activities that were previously within other segments under a new umbrella, and adding specific emerging activities. This has been done to reflect the growing interest and activity in this area, setting an early baseline, and allowing more direct tracking of an increasingly important part of the UK space economy. Consistency between survey waves is of utmost importance, and so the new segmentation is fully reconcilable to the previous sector classification[5].

Figure 1 presents the space industry graphically, showing how space manufacturing companies trade with space operations and in-space economy firms. They in turn sell to space applications firms, which provide services for consumers, public users, and commercial users. Ancillary services are used in all other segments of the industry (manufacturing, operations, in-space, applications).

Following this new segmentation, a **'space-related activity'** is defined to be any one of the following sub-segments, including the listed activities:

- **<u>Space Manufacturing:</u> Design and/or manufacture of space equipment and subsystems**
  Including: launch vehicles and subsystems, satellites / payloads / spacecraft and subsystems, scientific instruments, ground segment systems and equipment (control centres and telemetry), suppliers of materials and components, scientific and engineering support, fundamental and applied research.
- **<u>Space Operations:</u> Launch and/or operation of satellites and/or spacecraft**
  Including: launch services, launch brokerage services, proprietary satellite operation (incl. sale/lease of capacity), third-party ground segment operation, ground station networks.
- **<u>In-Space Economy</u>**
  Including: in-orbit servicing (incl. space-tugs), in-space manufacturing, Space Surveillance and Tracking (SST), debris removal, space tourism, space resource utilisation, other in-space/lunar activities.
- **<u>Space Applications:</u> Applications of satellite signals and data**
  Including: Direct-To-Home (DTH) broadcasting, fixed and mobile satellite communications services (incl. Very Small Aperture Terminal (VSAT)), location-based signal and connectivity service providers, supply of user devices and equipment, processors of satellite data, applications

Figure 1 Segmentation of the UK space economy



Source: London Economics

[5] The reorganisation has been retroactively applied to the figures in this report where appropriate, moving In-Space activities out of space operations and into the new In-Space segment

relying on embedded satellite signals (e.g. Global Positioning System (GPS) devices and location-based services) and/or data (e.g. meteorology, commercial Geographic Information System (GIS) software and geospatial products), other (e.g. Quantum Key Distribution).

- **Ancillary Services**

  Including: launch and satellite insurance (incl. brokerage) services, financial and legal services, software and IT services, market research and consultancy services, business incubation and development, policymaking, regulation and oversight.

1.1.2 Methodology

This edition maintains a methodology in line with the previous editions to preserve the consistency of the time series and to support the UKSA's objectives of identifying patterns of growth and emerging trends.

The approach applied in this study employs a **combination of primary and secondary research methods** to deliver comprehensive coverage of the UK space industry. This includes 209 responses to an online survey from stakeholders. The online survey was open between September and December 2023, inviting all space organisations in the UK for which contact details were obtainable. The survey was also promoted on social media, by industry organisations and at the UK Space Conference by both the UK Space Agency and the London Economics team on-site. Desk-based research leveraged statutory annual reports on Companies House, Bureau van Dijk's Fame database, London Economics' existing databases and knowledge of the space industry[6], as well as wider GVA estimates from the Annual Business Survey (ABS) obtained from the Office for National Statistics (ONS). Specific effort was devoted to capturing the space-related activities of higher education institutions, as described in Box 1.

Box 1 Income analysis of Higher Education Institutions

Higher Education Institutions are home to a multitude of space-related activities, including fundamental and applied research, teaching and training, and as partners in European Space Agency (ESA) projects.

Where no survey data was available for universities, data from the Higher Education Statistics Agency (HESA) was used to assess the space-related income of higher education institutions. Information on the share of students studying a space-related subject[7] out of all students enrolled in the 2021/22 academic year was used to proxy the share of university activity that is space-related[8]. This share of space activity and data on the total university income[9], was used to estimate the space-related income for each higher education institution included in the analysis. This approach was found to be consistent with survey responses from higher education institutions in the sample.

Where specific survey responses were received pertaining to specific research groups, these were added as separate space activities for the university (additional to other income).

[6] Including data collected for previous Size and Health of the UK Space Industry reports, space industry analyses for home nations on the UK, industry databases of the downstream EO and GNSS sectors, and more than a decade of attendance and UK and international space conferences.
[7] This included subject such as Aeronautical engineering, astronomy, space technology, or satellite engineering.
[8] See the data at: https://www.hesa.ac.uk/data-and-analysis/students/table-49
[9] See the data at: https://www.hesa.ac.uk/data-and-analysis/finances/table-1

1.1.3 Survey sample

The survey sample includes all organisations that have been identified to have at least some space-related activity. Starting from the organisations included in the 2022 Size and Health, the identification of additional companies drew on member lists of industry organisations, extracted data identifying UK-based contractors or grantees to the European Space Agency (ESA), and attendees of the UK Space Conference.

Despite best efforts to decrease the burden of the survey while maintaining the level of information gathered, the voluntary nature of the survey means that the sample of responding organisations might not be representative of the whole industry. Out of the 1,765 organisations with identifiable space-relevant activities that were invited to fill out the online survey[10], we gathered 209 responses[11]. This includes 132 full responses that completed the entire questionnaire and 77 partial responses that contributed key information. These organisations were engaged via email, social media outreach, in person at conferences including the 2023 UK Space Conference, and via industry organisations and their own networks. Stakeholders were reminded on multiple occasions and finally given the option to provide a bare-minimum response covering only the high-level figures in this report. The resulting sample is therefore a convenience rather than random sample of organisations[12]. The 1,556 non-responding organisations were assessed through a combination of desk-based research and projection of historical survey responses where available and appropriate.

Where available, the metrics included in this report are based on a combination of survey response data and data from secondary sources reflecting the whole industry. This includes space-related income and employment numbers. However, some metrics are only available from the survey itself, e.g. Research & Development (R&D) spending. Numbers presented in this report on those metrics therefore only reflect the sample of organisations that have responded to the survey. The quality of this data was assured wherever possible with historical survey responses, internal consistency, comparisons with similar organisations, fundamental accounting identities, and cross-checks against annual reports and other information in the public domain. Taken together, these processes represent best practice to minimise potential bias that arises from self-selection into responding to survey questions. As such, the results presented in this report are the best current estimate of the UK Space Industry, and consistent with previous editions of the study.

1.1.4 Changes / novelty of this study

This iteration included new data to be collected through the survey including:

- Sentiment ratings of UKSA programmes, to understand actual and perceived impact in terms of ripple- and second-order effects of programme participation;
- Future-looking sentiments on barriers and enablers of growth with more nuance, to understand how the industry sees its likely evolution, priority areas and trade-offs;
- Staff education by academic area, to understand the sector's evolving workforce;
- Additional Public Sector Equality Duty (PSED) criteria;
- Quality of management (as proxied by CEO experience);

[10] Note: the survey was sent to substantially more organisations than ultimately entered the analysis database. Organisations supplying raw materials and other inputs, as well as specialised engineering organisations, often have a profile of products and services that may be relevant for the space industry, and so these organisations have been invited to complete the survey even if their websites do not clearly indicate that their customers are in space.

[11] This represents an increase of 176 organisations relative to the previous Size and Health study iteration. A breakdown of the reason for this net change in study population is covered in more detail in section 2.1.2

[12] A convenience sample is a non-random sampling method where respondents are included due to their convenience – in the case of this year's Size & Health study their willingness to participate in the research was the determining factor for inclusion in the sample

- University spin-outs, to understand the impact of UK research on the space sector; and,
- Business accelerator / incubator alumni, to understand the impact on UK space firms.

1.2 Caveats and limitations

Though the research has been conducted by a team of independent economists with specialist knowledge of the space sector, using best practice and best judgement to calculate robust and fair estimates, the following caveats apply:

- **Measurement error uncertainty:** As a survey-based data collection activity, the quality of report outputs is related to the quality of the inputs. The length and complexity of the survey has resulted in erroneous inputs. The quality assurance process captured a number of those errors. While it is not possible to know whether all erroneous inputs have been identified through this QA process, triangulation with all available data (from prior waves and official records) has minimised the impact of anything that may have slipped through.
- **Unidentified omissions:** Despite best efforts, there is a possibility that some organisations with space-related activities based in the UK have been missed, but any omissions are likely to be relatively small companies and would not have a meaningful impact on estimates.
- **Sample bias**: Since the survey was voluntary, the sample represents only those companies that are willing to provide information and insights about their organisation rather than a random sample of the industry. Indeed, a subset of questions within the survey were entirely optional. Representativeness of the sample (in terms of space-related income and breakdowns of this by segment, activity, income level, and region – each relative to historical Size and Health results) has been tested and additional effort was undertaken to reactively increase response rates among groups which were initially underrepresented. The final sample included sufficient organisations across each breakdown to justify the use of sample estimates for wider inference, but it should be noted that results throughout this report are based on what is ultimately a non-randomised and small (relative to total population) sample of organisations. Another key survey limitation is the continued non-response to the survey of the UK's largest space organisations, including Sky.
- **Exchange rate fluctuations:** The monetary values quoted in this report are expressed in GBP. Since the UK space industry sources inputs from overseas and exports goods/services for sale abroad (requiring conversion between GBP prices and foreign currency), the pattern of income over time therefore reflects both an actual change in sale volumes and fluctuations in currency values over time. The impact of these exchange rate movements may be delayed owing to a lag effect of forward contracts for imported inputs. There was relatively little movement in the EUR/GBP exchange rate over the period from January 2021 – December 2022 but the USD/GBP rate experienced variations of up to 23% over the study period. This variability means that the figures reported may reflect changes in the relative attractiveness of UK outputs due to currency movements as well as other considerations.
- **Financial years:** All companies (with formal requirements to report figures) estimate income and employment across financial years. The start and end dates of these reporting years vary between companies. Estimates of space-related income and employment recorded for this study therefore reflect the specific financial years of companies. Reference to years in this report similarly reflects financial years and not calendar years.

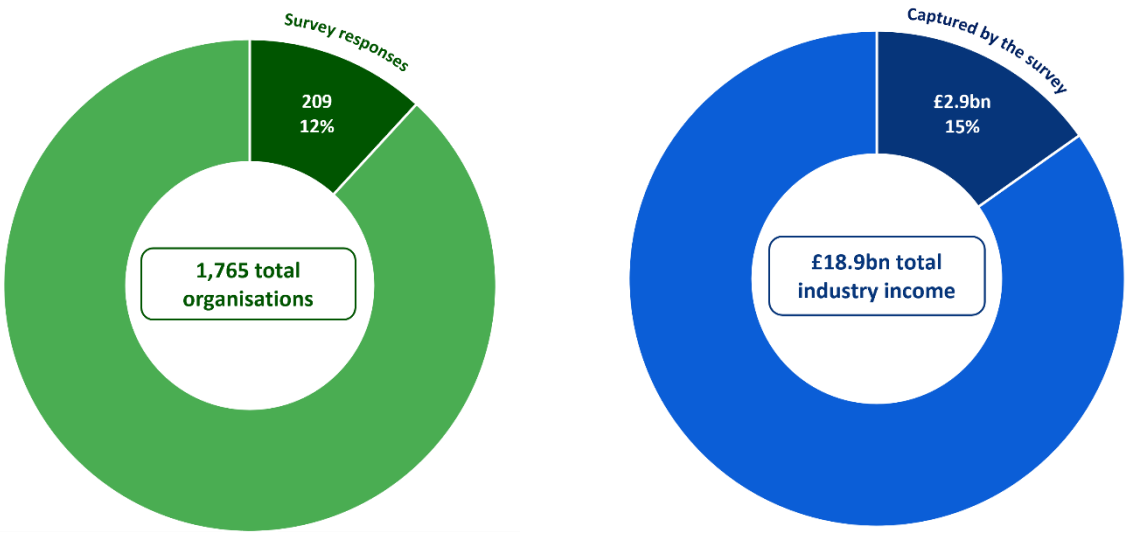
Note: All figures presented are in constant 2021/22 (financial year) prices. All growth rates are in real terms (inflation-adjusted), all average growth rates are compound annual growth rates (CAGR).

2 Size and Health of the UK space industry

2.1 Population

The industrial population (i.e. all UK-based organisations confirmed in our research to have space-related activities in the period of analysis) is 1,765 organisations with space-related activities. The 209 collected survey responses capture 15% of total industry income, accounting for £2.9bn of a total £18.9bn (2020/21: 19%). When excluding Direct-to-Home (DTH) broadcasting, 29% of industry income is captured by the survey (2020/21: 35%). Pre-revenue start-ups were among the respondents but 87% of the survey respondents reported a non-zero space-related revenue.

Figure 2 Survey representation of total organisations



Source: London Economics analysis

2.1.1 Industry composition

The UK space industry consists of organisations of all sizes (in terms of space-related income) and maturities. It is, however, highly concentrated. Just a few large organisations account for much of the income in 2021/22. In fact, 20 organisations account for 75% of the space-related income, 142 for the next 15%, and over 1,600 for the remaining 10%. Only three organisations each generated more than £1 billion pounds and 243 each generated more than £5m.

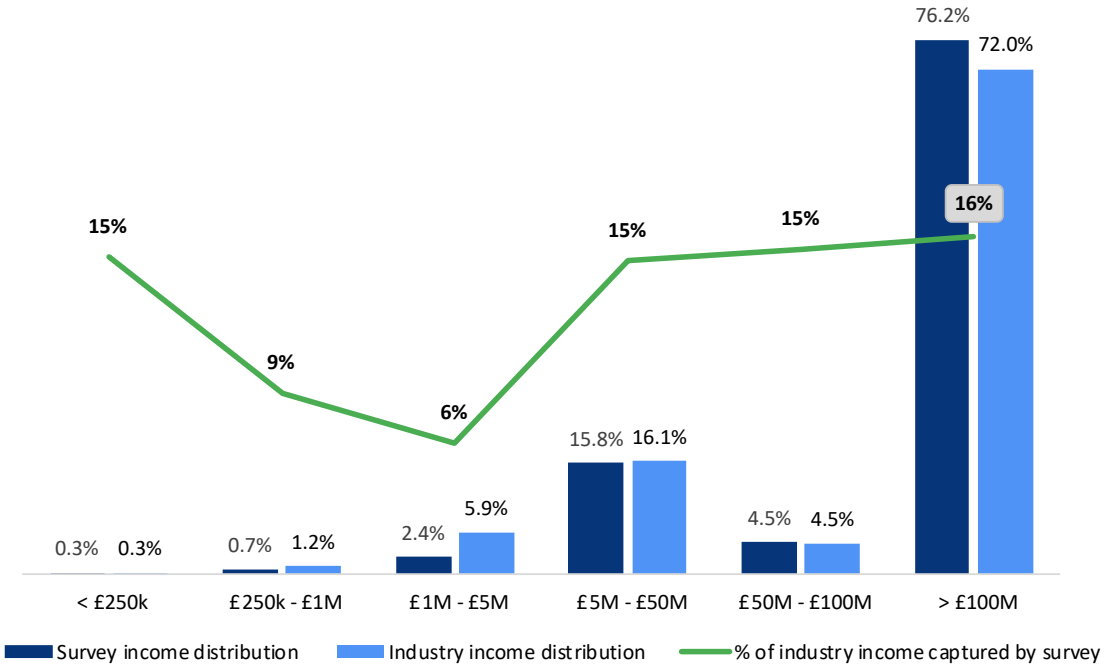
Table 1 Composition of the UK space industry, by space income band (2021/22 prices)

Income Bands	Total income (2020/21, £m)	Total income (2021/22, £m)	Total number of organisations (2021/22)
< £250k	56	48	621
£250k - £1M	228	226	427
£1M - £5M	843	1,123	471
£5M - £50M	1,978	3,052	221
£50M - £100M	564	842	13
> £100M	15,380	13,615	12
Total	**19,048**	**18,906**	**1,765**

Note: The income bands are provided in current prices (and unchanged), but the income by band has been inflated to 2021/22 prices.
Source: London Economics analysis

Figure 3 shows the distribution of income bands captured by the survey responses compared to the distribution of income bands within the overall industry.

Figure 3 Distribution of income bands of companies captured by the survey compared to the overall industry



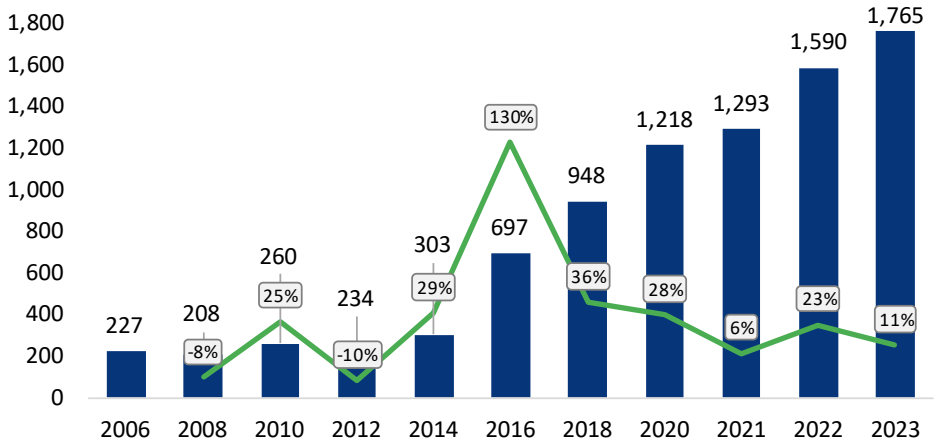
Source: London Economics analysis

Excluding Sky, the current year's survey captures 28% of the total income, and 64% of the income in large organisations (>£100m).

2.1.2 Population growth

A net total of 175 new UK organisations were identified as having space-related activities (an increase of 11% on 2022's Size and Health edition). This includes 18 new incorporations across 2022 and 2023, 329 newly captured organisations, and 172 exits. The total number of organisations identified and the year-on-year change are presented for the years 2006-2023 in Figure 4. The newly identified organisations are spread across the five industry segments and their activities.

Figure 4 Number and growth rate of identified UK space organisations, 2006-2023



Source: London Economics analysis

The number of identified new incorporations in 2022 increased by 14 from 5 listed in the 2022 study to 19 as well as 4 new incorporations identified in 2023[13].

The 329 newly captured organisations encompass both organisations that have traditionally not been involved in the UK space sector before 2022 and have now commenced space-related activities as well as organisations that were not identified in previous editions. Due to data availability, it is not possible to break down the income on a company level and hence determine by how much companies that have been previously captured by the survey have contributed to the income growth in 2021/22 or how much revenue has 'left' the market through company exits. Table 2 therefore only shows how much newly added organisations (either newly captured or newly incorporated) have contributed to the income growth in 2021/22.

Table 2 Income change decomposition, by reason for industry entry/exit

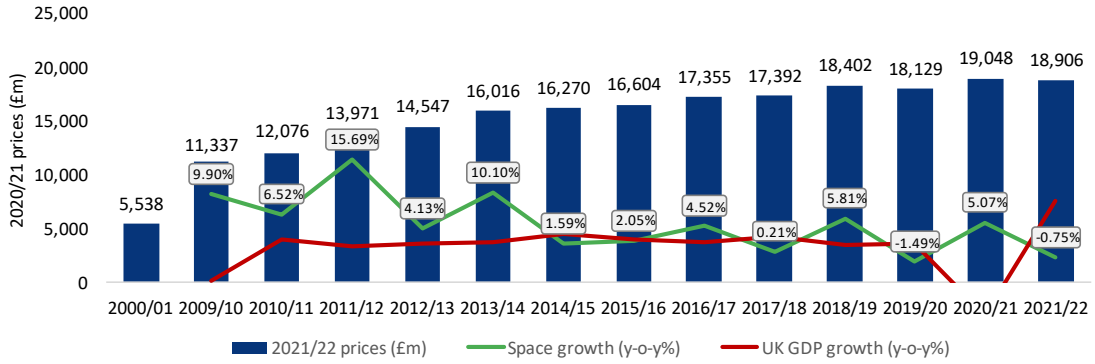
Organisation status	Number of organisations	Income growth 2021/22 prices (£m)
Attrition (exits)	- 172	-
Previously captured	1,590	-
New incorporations	18	2
New captures	329	625
Total	**1,765**	**627**

Source: London Economics analysis

2.2 Income

Total assessed UK space industry income amounted to £18.9bn in 2021/22. Despite a decrease of £142m (-0.7%) from 2020/21, medium-term sector growth remains strong with income increasing by £503m (+2.7%) since 2018/19.

Figure 5 Annual level and real growth rate of UK space industry income, 2000-2022



Source: London Economics analysis

2.2.1 Income by segment

As in previous years, the largest contributing segment is Space Applications (72% of total income). Space Applications is itself dominated by DTH broadcasting, which made up 47% of total industry income (from 46% in 2020/21). The newly-added In-Space Economy segment, which is largely made up of organisations and activities that were previously categorised as Space Operations, received just 0.2% of total industry income. The segmentation was still retained due to the growing activity

[13] New incorporations without a public presence will not have been captured yet, so this number is likely to grow in future editions as these organisations are identified.

observed in this segment and the resulting belief that it will grow to a larger share of the UK space industry in future.

Table 3 UK space industry income by segment, 2021/22

Segment	2021/22 (£m)	Share of total income
Space Applications	13,671	72%
- DTH broadcasting	*8,792*	*47%*
- Other applications	*4,879*	*26%*
Space Manufacturing	2,512	13%
Space Operations	2,169	11%
Ancillary Services	514	3%
In-space Economy	39	0.2%
Total	**18,906**	

Source: London Economics analysis

Excluding DTH broadcasting, the income of the UK space industry is £10.1bn. Space Applications would still be the largest segment of UK space activity (48%), followed by Space Manufacturing (25%), Space Operations (21%), Ancillary Services (5%), and In-Space Economy (0.4%).

Space Manufacturing and Space Operations both exhibit strong growth over the previous year (7% and 30% respectively). This expansion in real terms does not entirely compensate for a slight decline in Space Applications (-5%) over the period, with much of this reduction driven by a fall in income from Other Space Applications (-11%) and stagnation in DTH broadcasting (-1%).

Table 4 UK space industry income growth by segment, 2020/21 – 2021/22

Segment	Income 2020/21	Income 2021/22	Difference in income	Growth (y-o-y%)
	2021/22 prices (£m)			
Space Applications	14,308	13,671	-637	-4.5%
-DTH broadcasting	8,840	8,792	-48	-0.5%
-Other applications	5,469	4,879	-590	-10.8%
Space Manufacturing	2,344	2,512	168	7.2%
Space Operations	1,664	2,169	505	30.4%
Ancillary Services	669	514	-155	-23.1%
In-Space Economy	64	39	-25	-39.3%
Total	**19,048**	**18,906**	**-142**	**-0.7%**

Source: London Economics analysis; Know.Space (2022) 'Size and Health of the UK space industry 2022'

2.2.2 Income by activity

The table below shows the breakdown of income by activity, inclusive of DTH broadcasting.

Table 5 UK space industry income by segment and activity, 2021/22

Segment	Activity	2021/22 (£m)
Space Manufacturing (13%)	Launch vehicles and subsystems	227
	Satellites/payloads/spacecraft and subsystems	641
	Scientific instruments	118
	Ground segment systems and equipment	109
	Suppliers of materials and components	468
	Scientific and engineering support	114
	Fundamental and applied research	834
Space Operations (11%)	Launch services	38
	Launch brokerage services	0
	Proprietary satellite operation	1,312
	Third party ground segment	183
	Ground station network	637
In-space Economy (0.2%)	In-orbit servicing	2
	In-space manufacturing	10
	Space Surveillance and Tracking (SST)	1
	Debris removal	1
	Space tourism	0
	Space resource utilization	19
	Other in-space/lunar activities	4
Space Applications (72%)	Direct-To-Home (DTH) broadcasting	8,792
	Fixed satellite communication services	1,103
	Mobile satellite communication services	1,568
	Location-based service providers	133
	Supply of user devices and equipment	897
	Processors of satellite data	315
	Applications leveraging satellite signals/data	855
	Other	8
Ancillary Services (3%)	Launch and satellite insurance (incl. brokerage) services	51
	Legal and financial services	20
	Software and IT services	197
	Market research and consultancy services	136
	Business incubation and development	37
	Policymaking, regulation and oversight	73
Total	**All activities**	**18,906**

Source: London Economics analysis

2.2.3 Income by capability / Organisation for Economic Co-operation and Development (OECD) sector

Another way to break down UK space industry income is by 'capabilities', which are defined such that they are directly analogous to the Organisation for Economic Cooperation and Development (OECD) -defined space 'sectors'. The OECD's recommended space sectors are less granular than the Size and Health segments and activities. It should be further noted that these are also not analogous

to UK Space Agency (UKSA)'s 'Priority Capabilities'[14], but instead aligned with previous iterations of the Size and Health study series. This breakdown highlights the general types of space capabilities that UK organisations support with their space-related activities. As such, a strong focus on Broadcasting is evident as observed in previous years. Organisations with capabilities in Defence/Military, Satellite communication (excl. DTH Broadcasting), and Generic technologies/components also account for large shares of income.

Table 6 UK space industry income by capability/OECD sector (£m, 2021/22 prices)

Capability	2020/21	2021/22	Share
Broadcasting	9,457	9,511	50%
Satellite Communications (excl. broadcasting)	3,420	3,860	20%
Defence/Military	1,988	1,820	10%
Positioning, Navigation, Timing (incl. GNSS)	1,893	1084	6%
Generic technologies / components that enable space capabilities (e.g. AI)	480	917	5%
Earth Observation (excl. Meteorology)	485	733	4%
Other	-	312	2%
Science	205	284	2%
Space Transportation (incl. launch, space-tugs)	361	136	1%
Space technologies (used in multiple systems, e.g. solar)	494	92	0.5%
In-space Economy[15]	-	54	0.3%
Meteorology	86	51	0.3%
Space Exploration (incl. ISS, rovers, probes, excl. in-space economy)	181	52	0.3%
Total	**19,048**	**18,906**	

Source: London Economics analysis

Note: The OECD does not define 'Defence/Military' as a sector, though they do suggest the tracking of different types of procurers of space products and services including defence organisations. Multiple previous editions of the Size and Health study have included defence/military as a separate capability: this is retained to show the distinction between civil and military sectors.

2.2.4 Income by customer type

Analysis of income generated by customer type highlights that the UK space industry has a strong commercial focus, as in previous years. 83% of total income is commercial, comprised of sales to consumers ('Business to Consumers', or B2C) (49%) and sales to other businesses ('Business to Business, or B2B) (34%). Aside from commercial dealings, Defence and Military customers make up another 9% of UK space industry income. Combining all government customers and funding sources (including space agencies) the UK space industry only generates slightly less than 20% of its income from the public sector.

[14] UKSA. (2023). 'UK Space Agency Corporate Plan 2022-25'

[15] The income reported for the "In-space Economy capability" differs slightly from the income of companies in the "In-space Economy segment" for two reasons: 1) there is a difference classification in the OECD segmentation so some are placed in e.g. Space Transportation, and 2) ancillary service providers serving the in-space economy would categorise such services in the in-space economy capability.

Table 7 UK space industry income by customer type (£m, 2021/22 prices)

Customer type	2020/21	2021/22	Share of total income
Consumer (B2C)	9,478	9,300	49.2%
Business (B2B)	5,694	6,403	33.9.%
Defence/Military	1,945	1,703	9.00%
Other Civil Government	720	589	3.1%
European Space Agency (ESA)	441	344	1.8%
Research/Science Funding Body	316	213	1.1%
Other Space Agency	198	163	0.9%
UK Space Agency	181	122	0.6%
European Commission (EC)	73	70	0.4%
Total	**19,048**	**18,906**	**100%**

Note: Grant funding is considered within the 'customer type' that supplied the funding, although technically, there is no customer relationship per se.

Source: London Economics analysis

The total commercial income in the space industry, generated by B2B and B2C transactions, grew slightly in real terms from an inflation-adjusted £15.2bn in 2020/21 to £15.7bn in 2021/22 (a rise of 3.7%).

2.2.5 Income by income band

There was broad-based growth in the UK space industry among smaller organisations. Mid-sized companies performed the best, with year-on-year income increasing among companies earning £5m-50m and £50m-100m by 54% and 49%, respectively. This compensated for a smaller relative pull-back in income for the largest of UK space industry companies, who collectively experienced a reduction in real-terms incomes of 11%. The dynamism of the UK space industry is highlighted by the robust performance exhibited by the smallest of organisations: the total space income of organisations earning less than £5m of space-related income grew almost 25%, adding over £250m of space-related income to the UK total.

Table 8 UK space industry income by space income band, 2020/21 - 2021/22

Space income band	Space income 2020/21	Space income 2021/22	Growth (y-o-y%)
	2021/22 prices (£m)		
Less than £5M	1,127	1,397	24%
£5M-£50M	1,978	3,052	54%
£50M-£100M	564	842	49%
>£I00M	15,380	13,615	-11%
Total	**19,048**	**18,906**	**-1%**

Note: The income bands are provided in current prices (and unchanged), but the income by band has been inflated to 2021/22 prices.

Source: London Economics analysis; Know.Space (2022) 'Size and Health of the UK space industry 2022'.

2.3 Exports

2.3.1 Income by customer location

The UK space industry generated over 31% (£5.8bn) of its total income from abroad (2020/21: 34%). This share increases to 61% if DTH broadcasting is excluded (57% in 2020/21), due to DTH broadcasting having a strong domestic market focus (97.5% of 2021/22 DTH income was generated from customers in the UK).

Table 9 UK space industry income by customer location (£m, 2021/22 prices)

Location	2020/21	2021/22	Share of exports	Share of total income
UK	12,590	**13,092**	-	**69%**
Exports	6,459	**5,813**	**100%**	**31%**
Rest of Europe	3,558	2,463	42%	13%
Northern America	1,197	1,296	22%	7%
Central & South America	794	861	15%	5%
Asia & Oceania	299	662	11%	3%
Middle East & Northern Africa	392	284	5%	2%
Rest of Africa	219	249	4%	1%
Total income	**19,048**	**18,906**	-	-

Source: London Economics analysis

The UK is the primary market for the UK space industry. The total income generated from UK customers is equal to £13.1bn in 2021/22, more than double the total income generated from exports (£5.8bn). The observed reduction in exports to Europe (to 13% of total income, down from 19% in 2020/21) is likely driven by the trend towards relocation of economic activity to continental Europe. For example, the British software group SCISYS (now part of CGI[16]) announced in 2018 that it would relocate to Ireland in order to maintain its participation in EU-funded space work[17]. A more-than doubling of real-terms exports to Asia and Oceania aligns well with the Integrated Review's 'tilt' towards the Indo-Pacific region in security, defence, development, and foreign policy terms[18], and suggests the space industry is contributing to the realisation of its objectives.

2.4 Inputs

Based on survey responses, an estimated 52% of the industry's inputs are imported from suppliers overseas (2020/21: 57%). Inputs from UK suppliers are split around 2:1 between space sector companies and non-space sector companies. The estimated aggregate spend on inputs in the UK space industry is £11.4bn for 2021/22 (2020/21: £11.4bn in current prices).

[16] CGI. (2019). *CGI completes acquisition of SCISYS, a leading provider of IT services in the UK and Germany*. Available at: https://www.cgi.com/uk/en-gb/news/company-overview/cgi-completes-acquisition-of-scisys-a-leading-provider-of-it-services-uk-and-germany

[17] Reuters. (2018). *IT firm Scisys moves to Dublin to keep EU space work ahead of Brexit*. Available at: https://www.reuters.com/article/scisys-outlook-idUSL3N1WX3QA/

[18] HM Government. (2021). 'Global Britain in a competitive age: The Integrated Review of Security, Defence, Development and Foreign Policy'

Table 10 UK space industry inputs by supplier type (£m, 2021/22 prices)

Survey	2020/21	2021/22	2021/22 (share of total)
UK-based	4,890	5,465	48%
UK Space	*2,870*	*3,649*	*32%*
UK non-space	*2,020*	*1,816*	*16%*
Overseas (imports)	6,506	5,944	52%
Total	11,397	11,409	100%

Source: London Economics analysis
Note: Shares are based on non-representative and voluntary survey respondents.

2.5 Gross Value-Added (GVA)

Definition: Gross Value Added (GVA) is approximately equal to the value of sales net of the cost of goods and services sold. It estimates an industry's direct contribution to Gross Domestic Product (GDP).

In 2021/22, the UK space industry is estimated to have directly contributed **£7.2bn** (a reduction from an estimated £7.7bn in 2020/21 and £7.5bn in 2018/19, inflation-adjusted) of GVA to UK economic output. This is equivalent to 38% of space industry income (40% in 2020/21), with a decrease from historical levels largely driven by a large negative revision to the estimated GVA contribution of Sky. The UK space industry contributed an estimated 0.33% of the total UK Gross Domestic Product (0.34% in 2020/21), showing that the industry continues to outperform the wider economy in terms of growth.

2.5.1 Gross Value-Added by segment

The majority of UK space GVA is generated in the Space Applications segment with 68%; slightly less than the 72% of income accounted for by the segment. As with income, this segment is led by DTH broadcasting (which contributes 36% of total GVA). At 17%, Space Manufacturing accounts for a larger share of GVA than it does income. Ancillary services equal their income share (3%) to deliver 3% of the total GVA generated.

Table 11 UK space industry Gross Value-Added by segment (£m, 2021/22 prices)

Activity	GVA 2020/21	GVA 2021/22	Share of total
Space Applications	5,558	4,858	68%
Space Manufacturing	1,246	1,217	17%
Space Operations	520	837	12%
Ancillary services	294	239	3%
In-space economy	34	24	0.3%
Total	**7,651**	**7,175**	**100%**

Source: London Economics analysis

2.5.2 Gross Value-Added by activity

Table 12 indicates that most of the UK space industry's GVA is generated in the Space Applications segment - amounting to 68% of the total in 2021/22 (73% in 2020/21). Much of the year-on-year reduction is accounted for by a reduced share for DTH Broadcasting, which accounts for 36% of the total GVA generated versus 41% in 2020/21. This change is largely due to revised estimates of the GVA contribution of Sky, the major organisation in this activity, reflecting Sky's gradual transition towards fibre-based delivery mechanisms. Excluding DTH broadcasting, sector GVA grew by £84m

over the last year and £157m since 2018/19. The relative growth in sector GVA excluding DTH broadcasting since 2018/19 (3.5%) exceeds UK GDP growth over the same period (1.3%).

In a reduction relative to previous years, the manufacture of satellites, payloads, spacecraft, and subsystems has fallen behind to become the activity within Space Manufacturing that contributes the *second* most GVA at 26% of total manufacturing GVA (2020/21: 34%) and 4% of total space industry GVA (2020/21: 6%). In the Space Operations segment the single largest contributing activity to GVA is proprietary satellite operations, with 62% of segment GVA (2020/21: 67%) and 7% of total space industry GVA (2020/21: 5%).

Table 12 UK space industry Gross Value-Added by activity, 2021/22

Segment	Activity	2021/22 (£m)
Space Manufacturing (17%)	Launch vehicles and subsystems	97
	Satellites/payloads/spacecraft and subsystems	311
	Scientific instruments	63
	Ground segment systems and equipment	46
	Suppliers of materials and components	185
	Scientific and engineering support	45
	Fundamental and applied research	470
Space Operations (12%)	Launch services	18
	Launch brokerage services	0
	Proprietary satellite operation	517
	Third party ground segment	88
	Ground station network	214
In-space Economy (0.3%)	In-orbit servicing	2
	In-space manufacturing	6
	Space Surveillance and Tracking (SST)	1
	Debris removal	1
	Space tourism	0
	Space resource utilization	12
	Other in-space/lunar activities	2
Space Applications (68%)	Direct-To-Home (DTH) broadcasting	2,577
	Fixed satellite communication services	516
	Mobile satellite communication services	820
	Location-based service providers	66
	Supply of user devices and equipment	344
	Processors of satellite data	103
	Applications leveraging satellite signals/data	429
	Other	3
Ancillary Services (3%)	Launch and satellite insurance (incl. brokerage) services	28
	Legal and financial services	10
	Software and IT services	82
	Market research and consultancy services	57
	Business incubation and development	19
	Policymaking, regulation, and oversight	43
Total	**All activities**	**7,175**

Source: London Economics analysis

2.6 Employment

Direct employment in the UK space industry was 52,028 Full Time Equivalents (FTE)s in 2021/22. The single largest employer in the space industry is Sky, with an estimated 40% of the sector's employees.

There was organic growth in major UK space companies (with just 10 organisations adding a cumulative 2,600 FTEs), and some employment was added through methodological updates including a more thorough treatment of universities' space-related activities (adding approximately 850 FTEs). This implies organic growth in employment of approximately 5%.

In 2021/22 the space industry employed approximately 0.16% of the total UK workforce.

Table 13 UK space industry employment, 2000/01 – 2021/22

Year	Employees	Growth (y-o-y%)	UK economy employees	Space industry share of workforce
2000/01	15,256	-		
2009/10	28,995	16.5%		
2010/11	28,942	-0.2%		
2011/12	32,024	10.6%	29,368,484	0.11%
2012/13	33,882	5.8%	29,754,233	0.12%
2013/14	37,391	10.4%	30,164,675	0.12%
2014/15	38,522	3.0%	30,861,129	0.12%
2015/16	41,690	8.2%	31,349,580	0.13%
2016/17	41,929	0.6%	31,796,861	0.13%
2017/18	44,052	5.1%	32,136,681	0.14%
2018/19	44,040	0.0%	32,515,171	0.14%
2019/20	46,995	6.7%	32,850,653	0.14%
2020/21	48,772	3.8%	32,382,784	0.15%
2021/22	**52,028**	**6.7%**	32,862,606	0.16%

Source: London Economics analysis; Know.Space (2022) 'Size and Health of the UK space industry 2022'; Office for National Statistics 'A01: Summary of labour market statistics'

2.6.1 Employment by segment and activity

A majority of space-related employees were employed in Space Applications, which accounted for 65% of the industry total (2020/21: 67%). Of this, DTH broadcasting is a major component (41% of the total). Space Manufacturing employs the next most (20%), followed by Space Operations (9%). Ancillary services employ a small but important share (5%), while the nascent In-Space Economy segment employs just 0.4%.

Table 14 UK space industry employment by segment

Segment	Employees (2020/21)	Employees (2021/22)
Space Applications	32,810	33,827
DTH broadcasting	*21,944*	*21,460*
Other applications	*10,866*	*12,367*
Space Manufacturing	9,490	10,586
Space Operations	2,947	4,914
Ancillary services	3,234	2,500
In-space economy	291	201
Total	**48,772**	**52,028**

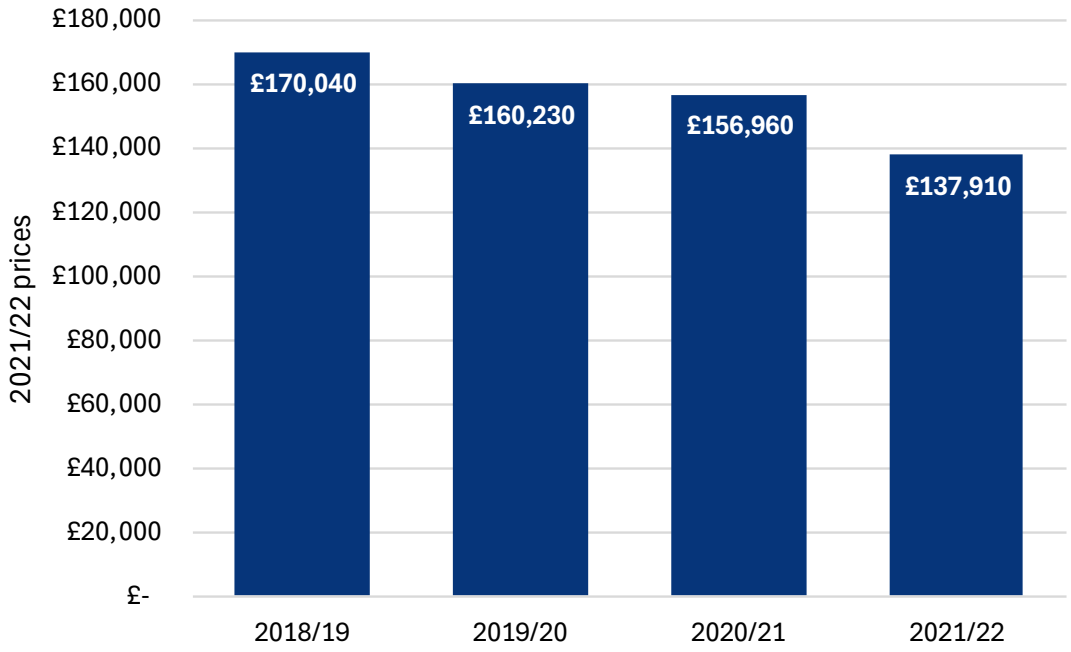
Source: London Economics analysis

DTH Broadcasting (41%), Supply of user devices and equipment (7%), and Applications leveraging satellite signals/data (7%) collectively constitute more than 50% of the UK space industry's total employment. As observed in previous years, DTH broadcasting's employment share is lower than its share of total income and higher than its share of total GVA (47% and 36% respectively).

2.7 Productivity

The labour productivity (GVA per employee) for the UK space industry in 2021/22 is estimated at £137,910 (the inflation-adjusted value was £156,960 in 2020/21). This is 2.3 times the UK's average labour productivity (£60,340)[19]. This high level of labour productivity reflects the highly skilled workforce of the UK space industry. The present-year figures represent a continued decline in labour productivity in the UK space industry over the past few years as the roles within the sector broaden and expand beyond a smaller number of high-skill and highly productive roles.

Figure 6 UK space industry labour productivity, 2018/19 – 2021/22



Source: London Economics analysis; Know.Space (2022) 'Size and Health of the UK space industry 2022'

2.8 Research and Development (R&D)

Investment into Research & Development (R&D) is a key leading indicator of a sector's future economic performance. By investing today, companies ensure an ongoing pipeline of product and service improvements that leverage new knowledge, products, and processes. Each of these can also continue to support competitive advantage within the international space industry and within the UK economy as a whole.

[19] Estimated UK GVA per filled job in 2021. ONS (2023). Subregional Productivity: Labour Productivity (GVA per hours worked and GVA per filled job) indices by UK NUTS2 and NUTS3 regions. Available from: https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/labourproductivity/datasets/subregionalproductivitylabourproductivitygvaperhourworkedandgvaperfilledjobindicesbyuknuts2andnuts3subregions

An estimated £965m was spent on space-related R&D (equivalent to 5.1% of total industry income) in 2021/22. This is an increase versus 2020/21 (4.5%) and 2019/20 (5.0%). This increase is driven by an increase in external R&D[20], which grew to an estimated £549m (57% of the total). This estimate was constructed by applying the ratio of space-related R&D investment to space-related income among the 76 survey respondents providing data on their R&D investment amounts and sources. As such it should be treated with caution as this subsample only accounts for 4% of the total study population by count and 15% by share of space-related income (2020/21: 11%).

The equivalent of 13.5% of direct space industry GVA was invested in R&D (2020/21: 11%, 2019/20: 12%). This 13.5% means that the UK space industry's R&D as a share of GVA is more than 6 times the UK average of 2.2%[21,22]. Estimates for R&D expenditure of the UK manufacturing sector as a whole average 4.5% for the UK between 2010-2019, while the next highest two sectors in terms of R&D/GVA were 'weapons and ammunition' with 28% and 'motor vehicles, trailers and semi-trailers' at 16.5% on average for the period 2015-19[23].

Table 15 Research and Development spending in the UK space industry over time

	R&D intensity	Internal share	External share	% of direct GVA
2018/19	4.3%	48%	52%	10.7%
2019/20	5.0%	36%	64%	12%
2020/21	4.5%	49%	51%	11%
2021/22	5.1%	43%	57%	13.5%

Source: London Economics analysis of survey data and overall sample; historical Size and Health studies

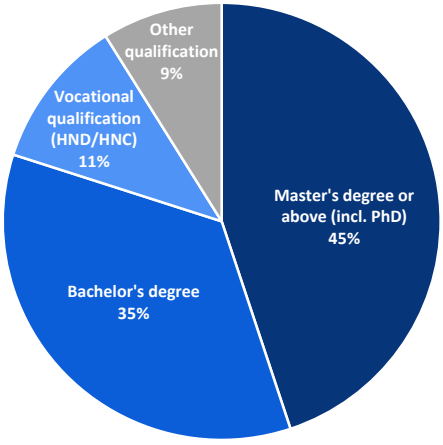
2.9 Qualifications and training

Table 16 UK space industry employment by qualification

Highest attained qualification	2021/22 # of employees in sample
Master's degree or above (incl. PhD)	917
Bachelor's degree	715
Vocational qualification (HND/HNC)	227
Other qualification	181
Total	**2,042**

Note: Based on 2023 survey responses.

Source: London Economics' analysis



Survey respondents indicate that most employees have undertaken university education, with 80% of employees possessing at least a bachelor's degree; 11% of employees hold vocational qualifications (i.e., a Higher National Certificate (HNC) or Higher National Diploma (HND)), and the

[20] External R&D is that which is funded by an outside source – i.e. not by retained profits, investment from company owners, or other internal sources of funding. It is sometimes referred to as 'extramural' R&D.
[21] ONS (2024). Business enterprise research and development, UK (designated as official statistics).
[22] ONS (2024). Gross Value Added (Average) at basic prices. Available from: https://www.ons.gov.uk/economy/grossvalueaddedgva/timeseries/abml/pn2
[23] Economic and Social Research Council. (2022). 'R&D Intensity at industry level: how does UK compare with top performing OECD countries?'

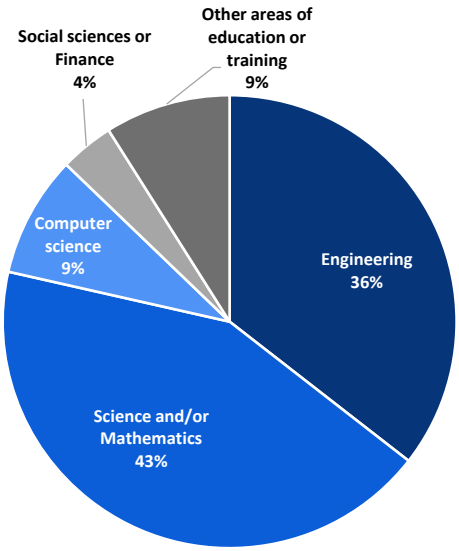
remaining 9% possess other qualifications. In terms of the 'share of employees holding a higher degree, first degree or HNC/HND and equivalent qualifications,' the **average qualification level of space industry employees is higher than any sector covered by Office for National Statistics (ONS) Census data for England and Wales**. This applies to the whole sample of survey respondents and all five of the value chain segments.

Table 17 UK space industry employment by subject

Subject-related training possessed by space-related employees	2021/22 # of employees in sample
Engineering	756
Science and/or Mathematics	915
Computer science	184
Social sciences or Finance	82
Other areas of education or training	190
Total	**2,127**

Note: Based on 2023 survey responses.

Source: London Economics' analysis



The subject that most respondents possessed training in was Science and/or Mathematics (43%), with 36% of the sample indicating training in Engineering. A further 9% of respondents had training in Computer science, with Social sciences and Finance being the subject area with the least number of responses (4%). 9% of the sample indicated training or education in other areas.

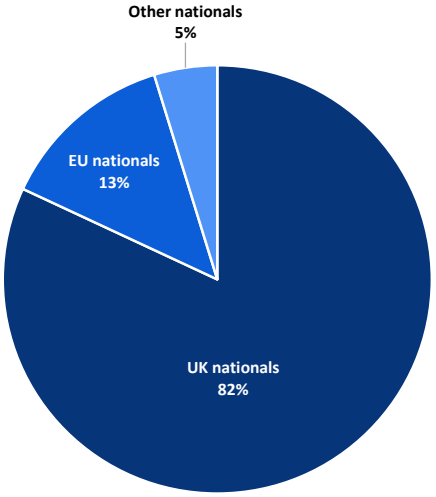
2.10 Workforce composition

Table 18 UK space industry employment by nationality

Nationality of space-related employees	2021/22 # of employees in sample
UK nationals	3,740
EU nationals	607
Other nationals	217
Total	**4,564**

Note: Based on 2023 survey responses.

Source: London Economics' analysis



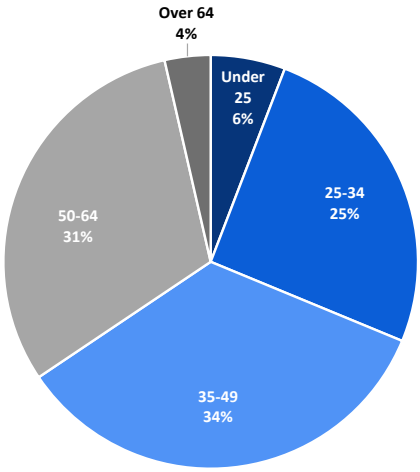
Amongst survey respondents, UK nationals make up 82% of space-related employees in the sample. EU nationals make up 13% of employees, with other nationals making up 5% of the sample. For the UK working population at large, the equivalent figures are similar for UK nationals (81%), but the non-UK nationalities are reversed at 7% EU nationals and 12% non-EU nationals in Q1 2022.

Table 19 UK space industry employment by age

Age of space-related employees	2021/22 # of employees in sample
Under 25	289
25-34	1,264
35-49	1,707
50-64	1,533
Over 64	178
Total	**4,971**

Note: Based on 2023 survey responses.

Source: London Economics' analysis



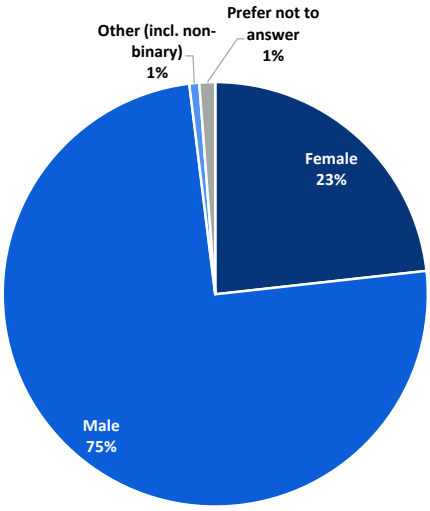
Survey respondents indicate that space companies employ a balanced mix of age groups with 31% of employees indicated to be under the age of 34, and the remaining 69% being over the age of 34. The largest age category was found to be 35-49, which made up 34% of space-related employees in the sample. Compared with the UK average[24], the space industry's composition differs the most in young workers under 25 years of age (6% vs. 11% national average)[25] but is very similar to the rest of the economy for all other age groups (differing by a maximum of 3 percentage points).

Table 20 UK space industry employment by gender

Gender of space-related employees	2021/22 # of employees in sample
Male	3,697
Female	1,149
Other	37
Prefer not to say	59
Total	**4,942**

Note: Based on 2023 survey responses.

Source: London Economics' analysis



In terms of the gender breakdown of the UK space sector, amongst survey respondents, 75% were indicated as being male, with 23% being female. 1% of respondents were each reported as "other" and "prefer not to say". This compares with 52% men and 48% women in the UK workforce.[26]

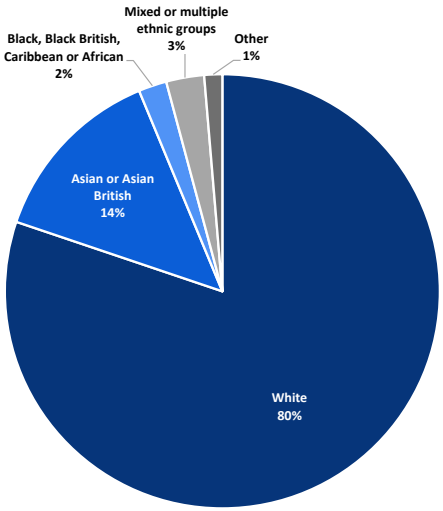
Figure 7 Ethnicity of workforce

[24] ONS (2024), *A05 SA: Employment, unemployment and economic inactivity by age group (seasonally adjusted)*. Available at: https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/datasets/employmentunemploymentandeconomicinactivitybyagegroupseasonallyadjusteda05sa/current

[25] The higher average education level in responding space organisations likely explains this discrepancy as employees in the space industry enter the world of work later than the national average.

[26] ONS (2024), *A05 SA: Employment, unemployment and economic inactivity by age group (seasonally adjusted)*. Available at: https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/datasets/employmentunemploymentandeconomicinactivitybyagegroupseasonallyadjusteda05sa/current. Note other/prefer not to say is not available from ONS.

The proportions of various ethnic groups amongst survey respondents are broadly consistent with figures from the 2021 census for England and Wales[27]. People from white ethnic groups made up the largest percentage at 80% (compared to 82% from the census), with Asian or Asian British making up the second most prevalent ethnic group at 14% of the sample (9% in the census). Black, Black British, Caribbean, or African were slightly underrepresented at 2% (4% in the census), along with other ethnic groups at 1% (2% in the census). Mixed ethnic groups were consistent with census data at 3%.



Note: Respondents answering "don't know/prefer not to say" were not included in the chart.

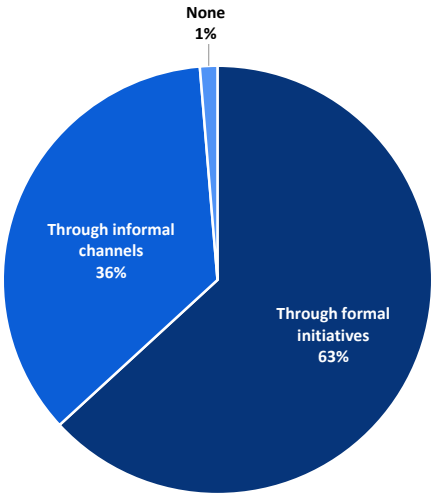
Source: London Economics analysis

The results obtained are generally consistent with other surveys of the UK space industry, which suggest that there could be disparities in outcome according to gender (as women are underrepresented) and ethnicity (as Black, Black British, Caribbean, or African were slightly underrepresented).

Respondents were also asked whether their organisation acknowledges equality, diversity, and inclusion (EDI) opportunities and challenges. From the sample, 63% of the organisations stated that these were considered through formal communications and initiatives, such as the company vision/mission, an EDI strategy, flexible HR policies, and participation in EDI initiatives and events. 36% of organisations indicated that these were considered through informal channels, such as discussions with managers or talks from senior leaders. 1% of respondents indicated that EDI opportunities and challenges were not openly discussed or acknowledged.

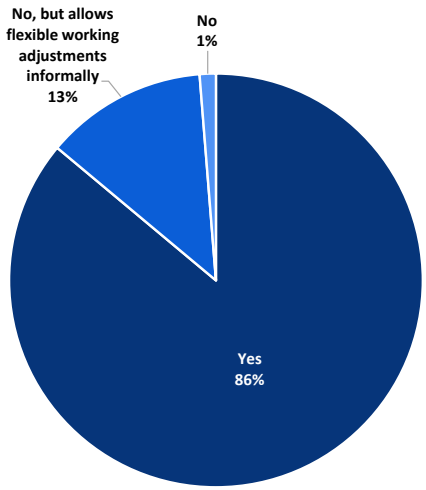
[27] Office for National Statistics. (2022). *Ethnic group, England and Wales: Census 2021*. Available at: https://www.ons.gov.uk/peoplepopulationandcommunity/culturalidentity/ethnicity/bulletins/ethnicgroupenglandandwales/census2021 [Accessed on 27/02/2024}

Figure 8 **Organisational acknowledgement of equality, diversity, and inclusion (EDI) opportunities and challenges**



Source: London Economics analysis

Figure 9 **Organisations with a flexible working policy**



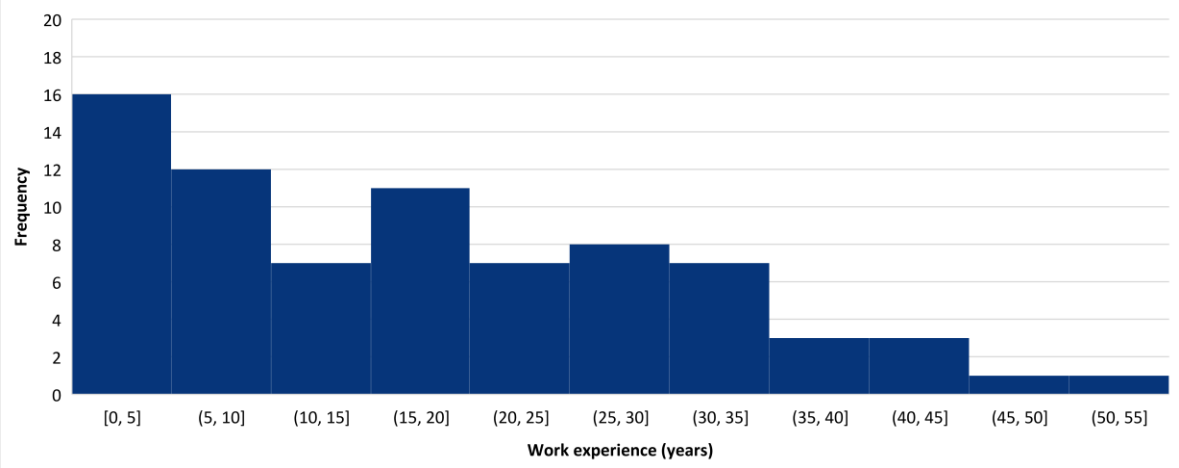
Source: London Economics analysis

Further, respondents indicated whether companies and organisations had a flexible working policy. For the sample of respondents, 86% stated that their company did have a flexible working policy. 13% indicated that their company did not have such a policy, although allows flexible working adjustments informally. 1% of the sample indicated that there was no flexible working policy, nor the allowance of informal adjustments.

2.11 Management experience

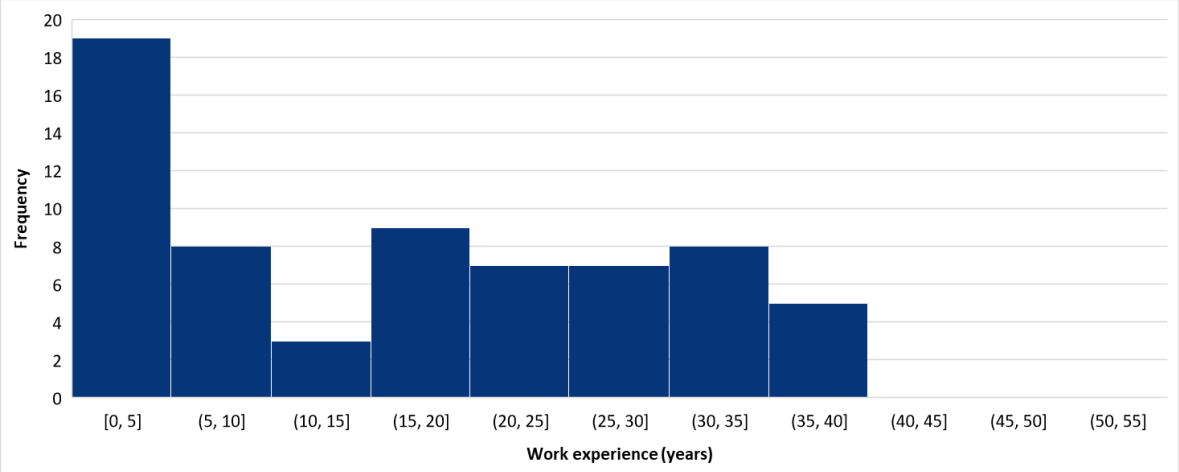
Organisations were asked about the leaders of their space operations. Specifically, the years of professional work experience and the years of experience within the space industry were collected. Within the sample, the median years of professional experience for leaders in the space sector is lower than outside the space sector, at 18.5 and 20 years, respectively. This implies that most leaders began their careers outside of the space industry but have spent the vast majority of their time within it: the 'average' leader has worked just 1.5 years more outside of the space industry than within it. This in turn suggests that leaders of space organisations tend to be recruited from within the industry, rather than looking outside. Figure 10 and Figure 11 show that the distributions of each measure of experience differ. Experience in the space sector had a higher maximum value than outside the space sector and exhibited a slightly more even distribution of professional years' experience.

Figure 10 Histogram of professional working experience in the space sector



Source: London Economics analysis

Figure 11 Histogram of professional working experience outside the space sector



Source: London Economics analysis

Note: The categories for each bar span 5 years of professional working experience. A square bracket, "[", denotes that the number is included in the range, so that [5, 10] would include both 5 and 10 years of experience. A curved bracket, "(", denotes that the number is not included in the range, so that (5, 10) would not include 5 or 10.

2.12 Sector comparison

Another important source of contextual information on the UK space industry is other economic sectors in the country. The other sectors within the UK economy are subject to many of the same headwinds and tailwinds that impact the UK space economy, in a way that examples from international space sectors may not be. In this section the performance of the UK space industry relative to other sectors deemed relevant is investigated for the period 2020-2022.

Table 21 Sector-level summary data

Sector	GVA (£, bn)			Employment			GVA/employee (£, '000)			% degree or higher
	2020	2021	2022	2020	2021	2022	2020	2021	2022	
Space	6.9	7.0	7.2	46,995	48,800	52,028	146	144	138	80
Programming and broadcasting activities	6.7	6.7	6.9	35,527	33,025	43,070	189	202	160	71.32
Information service activities	8.3	8.7	9.7	83,784	94,834	103,711	99	92	93	65.46
Artificial Intelligence			3.7			50,040			74	
FinTech			11.0			76,000			145	
Cyber Security		6.2			107,400				58	

Sources: London Economics analysis; Office for National Statistics. (2021). 'How workforce qualification levels differ across England and Wales'; Department for Science, Innovation and Technology (DSIT). (2023). 'Artificial Intelligence Sector Study'; International Trade Administration. (2023). 'Financial Technology (FinTech)' in United Kingdom Country Commercial Guide; Department for Science, Innovation and Technology. (2023). 'UK cyber security sectoral analysis 2023'

The Gross Value Added by the UK space industry is estimated at approximately £7.2bn in 2022. It therefore falls between 'programming and broadcasting activities' and 'information service activities' in each year 2020-2022. The compound annual growth rate (CAGR) for the space industry's GVA over the period is 2%; again falling between the comparison sectors (1% and 8% respectively for 'programming and broadcasting services' and 'information service activities').

The total number of employees in the UK space industry is estimated at slightly more than 52,000. This value is in all years between the comparable figures for Programming and broadcasting activities (43,000 in 2022) and Information service activities (104,000 in 2022).

The space industry's values for GVA per employee (£138,000 in 2022) are greater than those for 'Information service activities' (£93,000 in 2022) and less than those for 'Programming and broadcasting activities' (£160,000 in 2022).

The 2021 UK Census data identifies educational attainment by Standard Industrial Classification (SIC) code. This was compared to the survey data provided by UK space sector organisations. The most recent survey data suggests that four in five (80%) UK space sector employees has a bachelor's degree or higher. This compares favourably to the other sectors identified (i.e. Programming and broadcasting activities, Information service activities, Cyber security) - none of which exceed 75%. This also compares very favourably to the UK average, which stands at around 42% in England and Wales[28].

2.13 International context

An additional way to contextualise the UK's space activities is through comparison to the global space economy. These comparisons should be caveated by the fact that different countries may have different definitions of space. For example, some countries only measure their upstream manufacturing base (e.g. France, Japan) while others include a broader set of space-adjacent organisations (e.g. the United States). This unavoidably undermines the comparability of data collected in this section.

[28] Office for National Statistics. (2021). 'How workforce qualification levels differ across England and Wales'

A range of estimates on the value of the global space economy are available from various sources produced in recent years. There is broad agreement that the value of the global space economy was in excess of £300bn per year in 2021/22. This year's Size and Health estimate of UK space industry income (£18.9bn) therefore represents a share of between 4.3% and 6.1% of the global total.

Table 22 Collected measures of size of the global space economy

Measure	Value (£bn)	Year	Source
Income	341	2021	Space Foundation (2023) 'The space report'
Revenue	312	2022	Bryce Tech (2022) '2022 Global Space Economy'
Space economy	377	2022	Euroconsult (2023) 'Space Economy Report'
Space market size	363	2022	McKinsey (2023) 'A giant leap for the space industry'
Value	341	2021	McKinsey (2022) 'How will the space economy change the world?'
Commercial revenue	367	2021	Space Foundation (2023) 'The space report'
Commercial revenue	443	2022	Space Foundation (2023) 'The space report'

Breakdowns are further available by segment, generally indicating that user ("ground") equipment and satellite services dominate in terms of global income (£127bn and £111bn respectively, out of an estimated global total of £349bn). This breakdown aligns with the current year's Size and Health data, where user equipment (i.e. 'supply of user devices and equipment', £897m income) and a range of satellite-derived services (the remainder of the Space Applications segment, accounting for £12,773m without 'supply user devices and equipment') constitute 72% of total industry income.

Table 23 Space industry income breakdown by segment, global (2020)

Segment	Global income (£bn)
Ground equipment	127
Satellite manufacturing	11
Government space budget and commercial human spacecraft	95
Satellite services	111
Launch	5
Total	**349**

Source: EY (2022) 'Developing the space ecosystem in India: focusing on inclusive growth'

When considering global data by customer type, it is clear that commercial revenues dominate. Again, this aligns with current and past Size and Health findings for the UK. It should be noted that the UK actually has a lower commercial share of revenues than the reported global total, indicating stronger domestic support from civil government and the defence sector.

Table 24 Space industry income breakdown by client type, global (2022)

Segment	Global income (£bn)
Commercial	294
Civil government	25
Defence	25
Total	**344**

Source: Euroconsult (2023) 'Space Economy Report'

Finally, the share of different global regions in the total space economy can be considered. At almost £19bn in 2021/22, the UK captures a sizeable share of European income (25%) and even of global income (5%).

Table 25 Space industry income breakdown by region, global (2022)

Segment	Global income (£bn)
North America	106
Russia & CIS	15
Europe	76
Asia	83
Latin America	28
MEA	28
Oceania	2
Total	**344**

Source: Euroconsult (2023) 'Space Economy Report'

3 Investment in the UK space industry

3.1 External investment

To explore the investments into the UK space industry[29] we utilised data from Crunchbase.[30] Information on UK-headquartered space companies[31] between 2022 and 2023[32] was analysed to identify the types, volume, magnitude, and sources of investments. The main findings from this analysis are:

- In 2023, over £8.85bn was invested in the UK space industry which totalled 70 identified investments deals[33]. Cumulative investments since 2013 stood at £19.3bn in 361 deals.
- Overall, the number of investments has continuously increased since 2013. The number of investment deals reached an all-time high of 70 in 2023 (see Figure 12).
- The vast majority of investments was accounted for by acquisitions (97%), despite representing slightly more than 8.5% of total deals (6/70 deals). This is largely explained by two highly-anticipated 'mega-deals' that occurred in 2023:
  - Viasat-Inmarsat: £5.9bn
  - Eutelsat-OneWeb: £2.8bn
- Venture Capital investments represented 15/70 deals (21%) in 2023, but only 2% of the total invested in 2023. When filtering out mega-deals over £100m, Venture Capital dominates total investment value (see Figure 14).

[29] This section presents investment into all organisations identified as part of the UK space industry population, irrespective of their space intensity. It has not been attempted to separate investment into space-related business units and other business units within an organisation.

[30] Investment types covered by Crunchbase are: Funding Round, Equity Crowdfunding, Product Crowdfunding, Angel, PreSeed, Seed, Series A, Series B, Series C, Series Unknown, Convertible Note, Grant, Non-Equity Assistance, Post-IPO Equity, Debt Financing, Post-IPO Debt, and acquisition (including acquisition, merger, management buyout, leveraged buyout and empty). Also includes Corporate Round, Series D, Series E, Series F, Series G, Private Equity, Post-IPO Secondary, Secondary Market. (Series F and G have 0 for UK companies. There are also Initial Coin Offering (ICO) and Non-equity assistance that have 0 for any of the companies.

[31] Of the 1,765 organisations captured by the 2023 analysis, 1,007 organisation were found on Crunchbase and reported to be UK-headquartered.

[32] Investments are dated according to year of announcement, rather than completion.

[33] Note: Investments by or into companies included in the UK space organisation population that were judged to have a 'space activity' share of their overall business of less than 20% were excluded from the investment figures.

Figure 12 Number of investments, 2013-2023

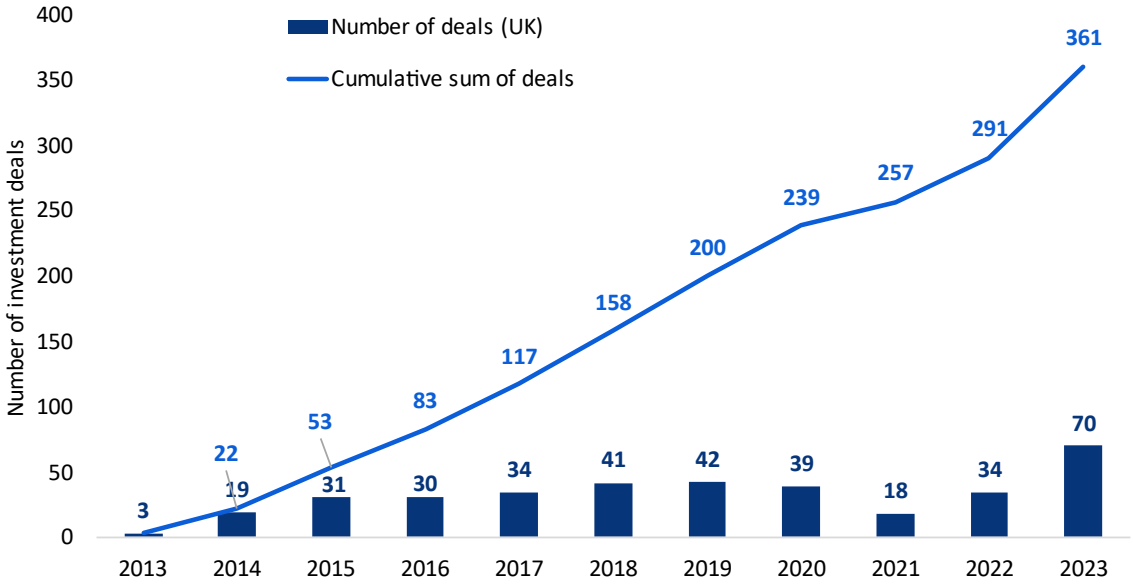


Figure 13 Total invested (all deals), 2013-2023

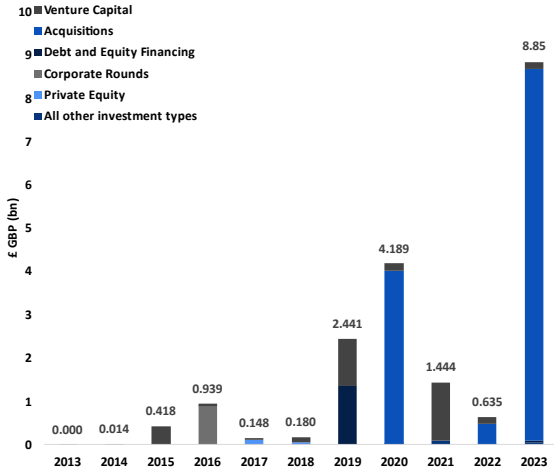
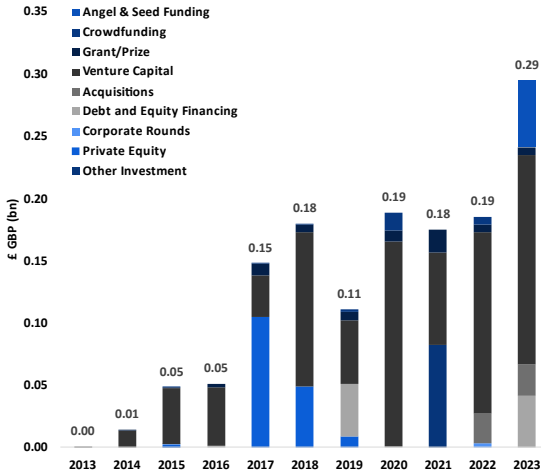


Figure 14 Total invested (deals <£100m only), 2013-2023



Source: London Economics analysis using Crunchbase data; Know Space (2022) 'Size and Health of the UK space industry 2022'

3.2 Obstacles to securing external investment

In an open question, survey respondents were asked to provide information on their main obstacles to attracting investments from external private investors. From regulatory hurdles to market dynamics and corporate structures, the responses provide nuance on the hurdles faced by organisations seeking external investment in the space industry. While there are a number of organisations that have indicated a lack of necessity for external investment, the main barriers[34] mentioned include:

[34] The list is ordered by the frequency of the barriers being mentioned, going from most frequently mentioned to least frequently mentioned.

- Lack of government support which is required to signal stability and growth potential
- Regulatory and procurement challenges (including regulatory approvals, licence availability, navigating procurement processes)
- Risk aversion of investors given the current economic climate as well as the perceived high risk and uncertain returns on investments in the industry
- Market conditions including uncertainty in industry evolution and competing international satellite projects
- Incompatibility between existing corporate structures and requirements for receiving private investments, e.g. ownership by larger parent companies
- Limited funding opportunities through lack of specialisation of investors in the space sector
- Difficulty in demonstrating proof-of-concept evidence

3.3 Internal investment reported by survey respondents

Survey respondents were questioned on their internal investments (e.g. from reserves, founders, group, or HQ). A total of 76 organisations responded to this question with non-zero space-related Research & Development (R&D) and valid internal/external funding shares (i.e. that sum to 100%).

These 76 organisations reported a total of £63m internal investment for 2021/22 and expected that figure to increase to £65m in 2022/23.

4 Regional distribution of the UK space industry

This section represents a regional analysis of the UK space industry. Based primarily on postcode data from survey responses and desk-based research (including Companies House data), we assess the UK space industry across the 12 'International Territorial Level 1' (ITL1) regions of the UK. These consist of nine regions in England plus Scotland, Wales, and Northern Ireland. A further category, 'Other', includes organisations located beyond the 12 ITL1 regions, such as those in Crown Dependencies (e.g. Isle of Man, Channel Islands).

Note that the regional breakdowns are, in many cases, still based on Head Office (or HQ) location. This is due to the inherent difficulty in ascribing specific location shares to value generating processes, especially when locations differ in headcount, R&D spend and various company activities complementarily work together to generate economic value.

London consistently represents a large share of population, income, and employment (18%, 68%, and 33%, respectively). The South East is the next most significant contributing region, with shares of 22%, 11%, and 18% for population, income, and employment. The South West represents an important share of the company population (11%), but has much lower shares in terms of income (3%) and employment (6%).

A small number of organisations could not be located due to missing information. As a result, totals may not exactly match UK aggregate figures.

4.1 Population by region

Table 26 presents a regional breakdown of the locations of UK space companies. As observed in previous years, space-related activities continue to be concentrated in the South of England.

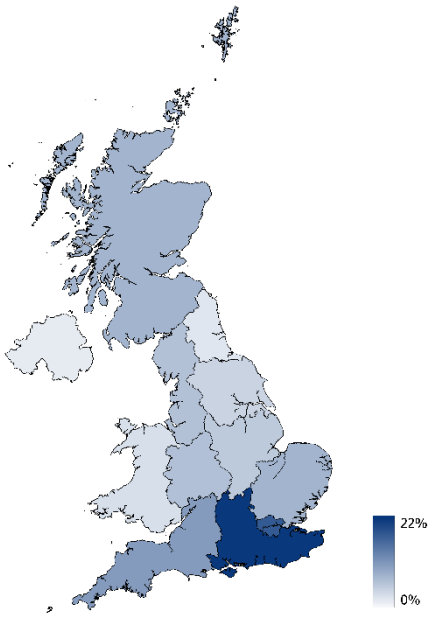
Together, the South East (603 sites), London (501 sites), and South West (304 sites) account for 51% of the total (2020/21: 52%).

Across all regions, Space Applications and Space Manufacturing dominate the number of organisation sites. In a few instances Space Manufacturing has a greater share than Space Applications (Yorkshire and the Humber, Northern Ireland, and North West England). In all segments, London and South East England are the top two locations for organisations.

Table 26 UK space organisation population by region, 2021/22

Region	Number of sites	% of total
South East (England)	603	22%
London	501	18%
South West (England)	304	11%
Scotland	228	8%
East	228	8%
West Midlands (England)	192	7%
North West (England)	188	7%
East Midlands (England)	162	6%
Yorkshire and The Humber	134	5%
Wales	99	4%
North East (England)	77	3%
Northern Ireland	62	2%
Total	**2765**	

Note: Percentages have been rounded and may not sum to 100%.
Source: London Economics analysis

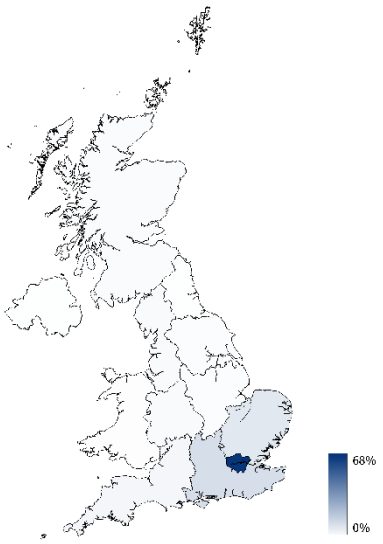


4.2 Income by region

London accounted for the majority (£12.9bn, 68%) of income, and the three regions in the south of England together contributed £15.6bn (83%) of the national total. This means that they have a higher ratio of income per location than the rest of the country.

Table 27 UK space industry income by region, 2021/22

Region	2021/22 Income (£m)	% of total
London	12,889	68%
South East (England)	2,148	11%
East	1,524	8%
South West (England)	595	3%
West Midlands (England)	332	2%
North West (England)	329	2%
Scotland	298	2%
East Midlands (England)	209	1%
Yorkshire and The Humber	207	1%



Region	2021/22 Income (£m)	% of total
Wales	145	1%
North East (England)	124	1%
Northern Ireland	104	1%
Total	**18,906**	

Note: Income is wholly attributed to headquarters. Percentages have been rounded and may not sum to 100%.
Source: London Economics analysis

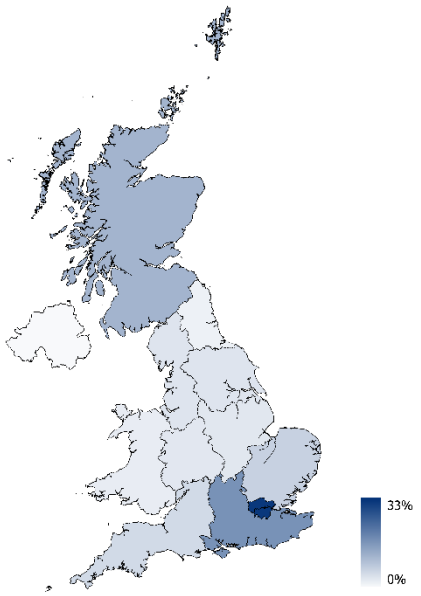
There is variation in which segments generate the most income for each region. Most regions generate most of their income from Space Manufacturing, though London, the North East, the South East and Wales buck this trend (most of their income comes from Space Applications). No single segment constitutes more than 50% of a region's income, highlighting a strong degree of diversity within each individual region. Some regions do, however, dominate individual segments: London constitutes more than 85% of Space Applications income, and over one third of both Space Operations (35%) and Ancillary Services (34%). Likewise, East of England represents over 25% of Space Manufacturing income.

4.3 Employment by region

London and the South East dominate UK space industry employment, collectively representing over half (51%) of the total. Scotland has a higher share of UK space industry employment (12%) than company population (8%) or income (2%). The East of England and the South West jointly represent almost one seventh of the total (8% and 6% respectively). Space industry employment outside of these five regions is much more evenly distributed – the seven next highest employment regions each have between 1% and 4.5% of the total.

Table 28 UK space industry employment by region, 2021/22

Region	Number	% of total
London	16,986	33%
South East (England)	9,368	18%
Scotland	6,404	12%
East	3,941	8%
South West (England)	3,237	6%
Yorkshire and The Humber	2,325	4%
North West (England)	2,309	4%
East Midlands (England)	2,113	4%
West Midlands (England)	1,858	4%
Wales	1,620	3%
North East (England)	1,278	2%
Northern Ireland	545	1%
Total	**52,028**	



Note: Percentages have been rounded and may not sum to 100%

Source: London Economics analysis

5 Supply chain effects

In order to capture the full economic impact of the UK space industry it is important to consider the indirect (secondary demand created for UK suppliers) and induced impacts (derived demand from employee expenditure) across the wider UK economy. This is achieved through estimating and applying a series of economic multipliers using Input-Output analysis and the space-related Gross Value-Added (GVA) share of more than 100 different sectors (as identified by 2-digit Standard Industrial Classification (SIC) codes, with some added granularity in certain sectors). Key definitions, consistent with previous Size and Health reports, are:

- **Direct effect:** The employment within space organisations and the value added directly through by these employees.
- **Indirect effect**: Employment supported and value added within domestic organisations that supply to the space industry. The procurement of space organisations from the domestic supply chain supports employment and demands value creation in the supplying organisations and industries. Supplying organisations will in turn increase demand from their supply chain resulting in a chain of reaction of subsequent rounds of intra- and interindustry spending.
- **Induced effect:** The induced impact is defined as the economic activity supported by the spending by employees of part or all of their income on goods and services within the national economy. This generates income for organisations within the industries meeting their demand, who in turn demands value creation and supports employment. The employees within the supplying industries, in turn, spend their own salaries to buy goods and services. Again, this leads to subsequent rounds of economic activity in the economy as a whole.

5.1 Multipliers

The space industry encompasses many different activities, and as such organisations in this study were active in over 60 different industries (as defined by 2-digit SIC codes, out of a total of 105 SIC codes). Each SIC sector's standard input-output multiplier is weighted based on the proportion of direct GVA generated in each of the space-representative SIC sectors. We therefore assume that all space organisations in each specific SIC sector have the same input share and spending pattern as the sector as a whole.

The economic activity in other sectors supported by space-related employees and its supply chain can be determined by augmenting Office for National Statistics (ONS) input-output tables with compensation of employees and household spending patterns, which enables induced effects to be estimated.

Indirect and induced employment effects are estimated using the indirect and induced GVA estimates and applying the ration of GVA per employee in each sector that is impacted.

An estimate of the total economic impact in terms of employment and GVA (without consideration for any displacement effects) of the UK space industry can thus be obtained by adding together direct, indirect, and induced impacts.

5.2 Gross Value-Added (GVA)

Direct GVA has been estimated by subtracting the cost of inputs from space-related income. This is estimated using survey response data augmented by desk-based research – generally utilising the cost of sales (less employment costs).

The Type II multiplier, which measures direct, indirect, and induced effects is estimated at 2.35. This implies that each £1 of space industry GVA generates a further £1.35 of GVA in the supply chain and supporting sectors. This is a decrease versus the previous edition of this report, and a modest increase from the 2.3 of the 2021 edition.

Table 29 Estimated Type II multipliers for UK space industry GVA, 2018-2024 editions of Size and Health

Year	2018	2020	2021	2022	2023
Type II GVA multiplier	2.3	2.4	2.3	2.63	2.35

Source: London Economics analysis
Note: The reported years are the year that the report was published, not necessarily the year of GVA data to which the multiplier was applied

The contribution of the UK space industry including indirect and induced effects is therefore estimated at £16.9bn in 2021/22. This implies that the industry's direct GVA of £7.2bn generated an additional GDP contribution of £9.7bn in the UK economy through these indirect and induced impacts.

5.3 Employment

Direct employment is the total estimated space-related employment in the industry. This is estimated using survey response data augmented by desk-based research.

The Type II multiplier, which measures direct, indirect, and induced effects is estimated at 2.47. This is a modest decrease versus the previous edition of this report (2.64), and a large decrease from the 4.0 of the 2021 edition.

Table 30 Estimated Type II multipliers for UK space industry employment, 2018-2024 editions of Size and Health

Year	2018	2020	2021	2022	2023
Type II employment multiplier	2.79	2.8	4.0	2.64	2.47

Source: London Economics analysis, previous Size and Health of the UK space industry reports
Note: The reported years are the year that the report was published, not necessarily the year of GVA data to which the multiplier was applied

This implies that the activity of 100 employees in the space industry supports 147 additional employees among suppliers and in other economic sectors (e.g. retail and services).

Using this multiplier, we estimate that the total UK-based employment supported by the activities of the UK space industry in 2020/21 is 128,500. Direct employment in the space industry is 52,028, and this supports an estimated further 76,500 UK jobs through indirect and induced effects.

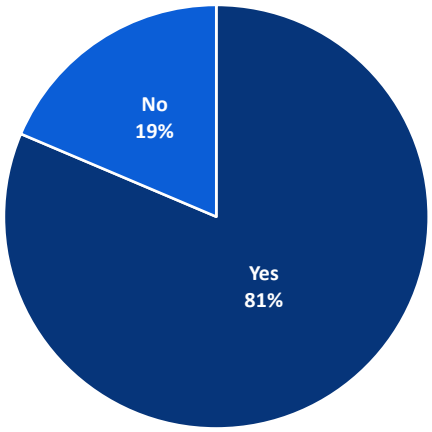
6 Private-public partnership in the UK space industry

6.1 Engagement with UK Space Agency (UKSA) sentiment

Respondents answered questions regarding engagement with the UKSA. It is important to note that this question was not mandatory, and hence there is likely selection bias present and conclusions drawn from these responses should not be taken as indicative of the wider industry.

Of the 86 respondents, 70 (81%) stated that they had engaged with the UK Space Agency (UKSA) in the most recently completed financial year. These respondents were then asked what their satisfaction with their engagement was. All 70 respondents who stated they had engaged with the UKSA answered this question. Most responses indicated a positive experience (61%), with 17% indicating that they were neither satisfied nor dissatisfied. Roughly 1 in 5 (21%) respondents stated that they were dissatisfied with their engagement.[35]

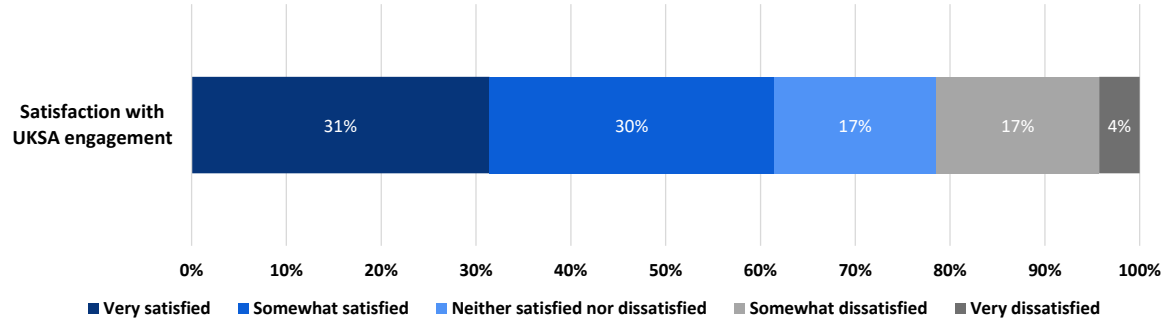
Figure 15 Share of survey respondents that directly engaged with the UKSA



Note: Percentages rounded to the nearest whole number.

Source: London Economics analysis

Figure 16 Satisfaction with UKSA engagement according to survey respondents



Note: Percentages rounded to the nearest whole number.

Source: London Economics analysis

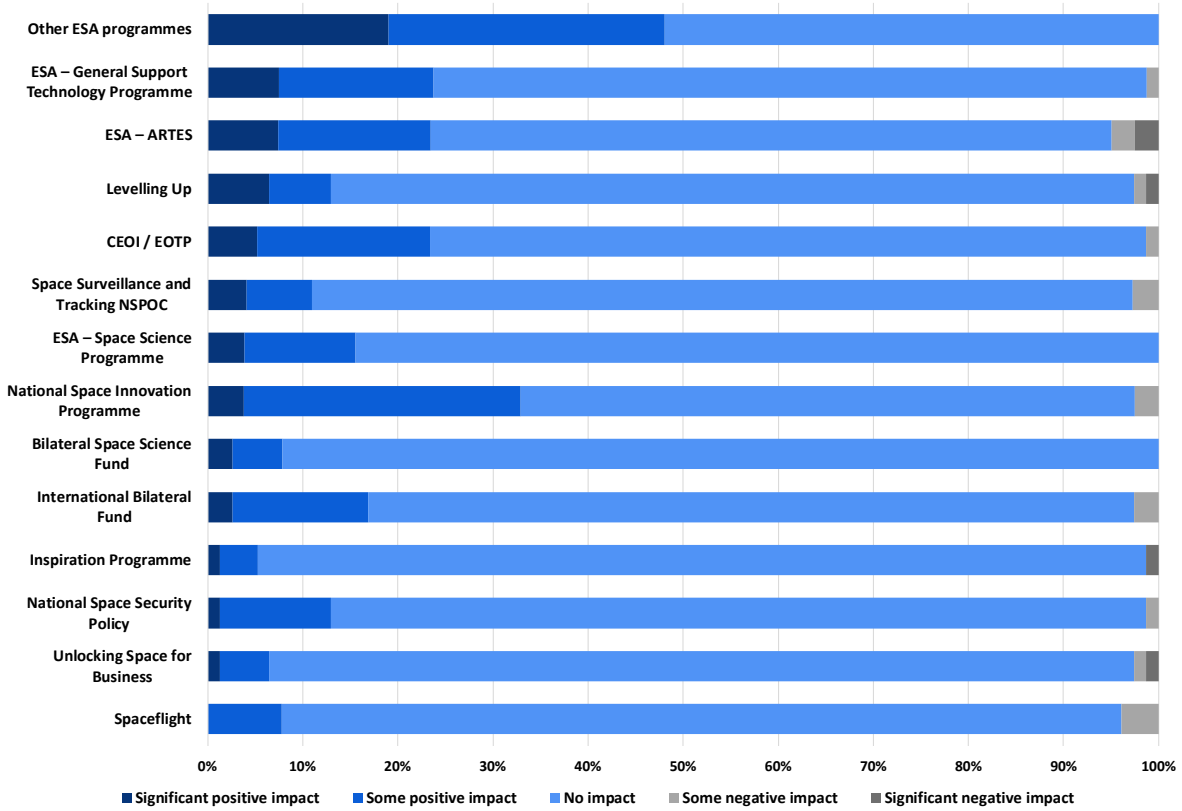
6.2 Engagement with specific UK Space Agency (UKSA) programmes

A total of 81 respondents indicated preferences regarding specific UKSA programmes. Given that the question is not mandatory, there may be sampling bias present. As a result, findings may not be

[35] Some degree of sample selection would be expected on a question like this. The sample of survey respondents is already not likely to be representative, with companies closer to the UK Space Agency more likely to respond than those further away. Furthermore, the sample of respondents that complete the survey are more likely to have a strong opinion on their engagement, with the more neutral option less likely to be selected.

representative of the wider industry, and caution is advised when using the figures presented. For each programme, a majority of organisations (i.e. greater than 50%) indicated that the programmes had no meaningful impacts on their particular business – ranging from slightly more than 50% for 'other ESA programmes' to over 90% for the Inspiration Programme. It should be noted that this is likely due to the fact that each organisation only interacted with a subset of programmes, meaning most had no impact on their business. The most positively rated programme was 'other ESA programmes', where nearly 50% of all respondents said that had a positive impact on their business.

Figure 17 Organisational sentiment towards specific UKSA programmes



Note: A number of abbreviations are used in the chart above. These include: NSPOC National Space Operations Centre; ARTES, Advanced Research in Telecommunications Systems; CEOI, Centre for Earth Observation Instrumentation; EOTP, Earth Observation Technology Programme.

Source: London Economics Analysis

Excluding responses that identified no meaningful impacts on their business, all projects were overall viewed positively by respondents, with programmes involving the European Space Agency (ESA) displaying higher favourability scores. It is important to note that participation in a given programme was not recorded as part of the survey, and so we do not know if respondents actually applied for, were accepted by, or participated in the programmes they rated. For non-ESA projects, the National Space Innovation Programme (NSIP) was viewed most favourably with 29% of respondents indicating the programme has had some positive effects, and 4% indicating significant positive effects. The programme receiving the largest volume of negative responses was the Advanced Research in Telecommunications Systems (ARTES) with 2% of respondents stating it had some negative impact, and 2% indicating it has had a significant negative impact. The programme was however viewed favourably overall, implying this programme had a larger variation in favourability amongst respondents relative to other programmes.

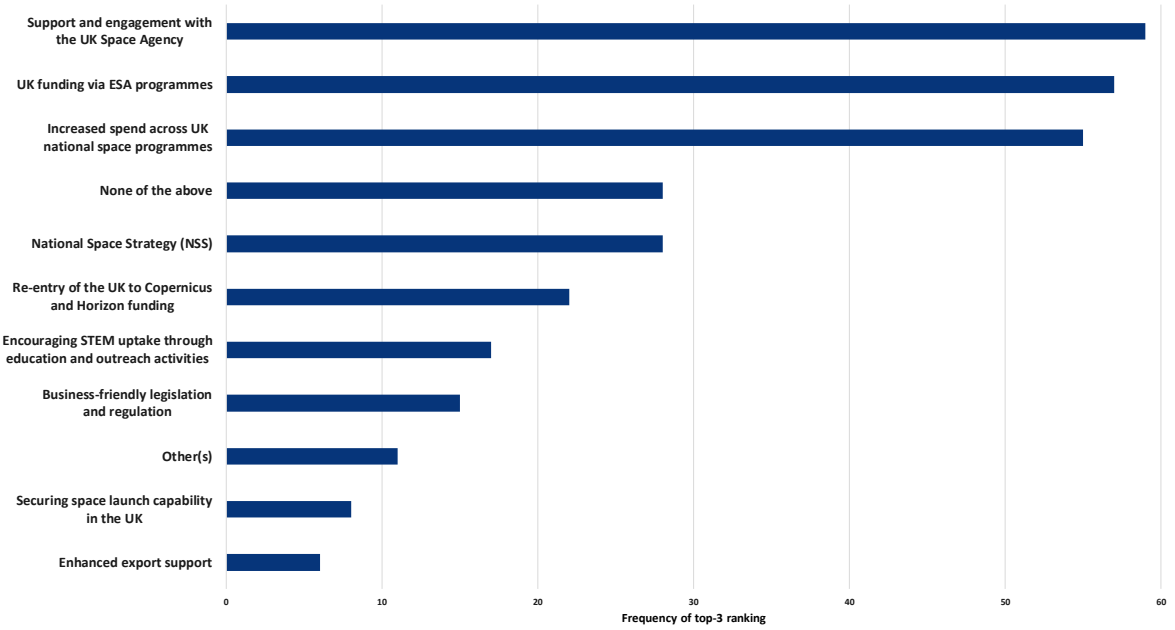
7 Future growth potential

The analysis from this section draws from survey questions that were not compulsory to answer. As a result, sampling bias may be present and conclusions drawn from this section should not be taken as fully indicative of the wider space industry.

7.1 Enablers to growth

A total of 118 respondents ranked various enablers of growth in terms of their relative impact on company performance. Figure 18 shows the relative frequency at which respondents ranked various enablers of growth in their top 3 choices.

Figure 18 Frequency of a top 3 ranking for enablers of growth



Note: The figure aggregates the number of times respondents placed an enabler of growth in their top-3 position for their ranked preferences.

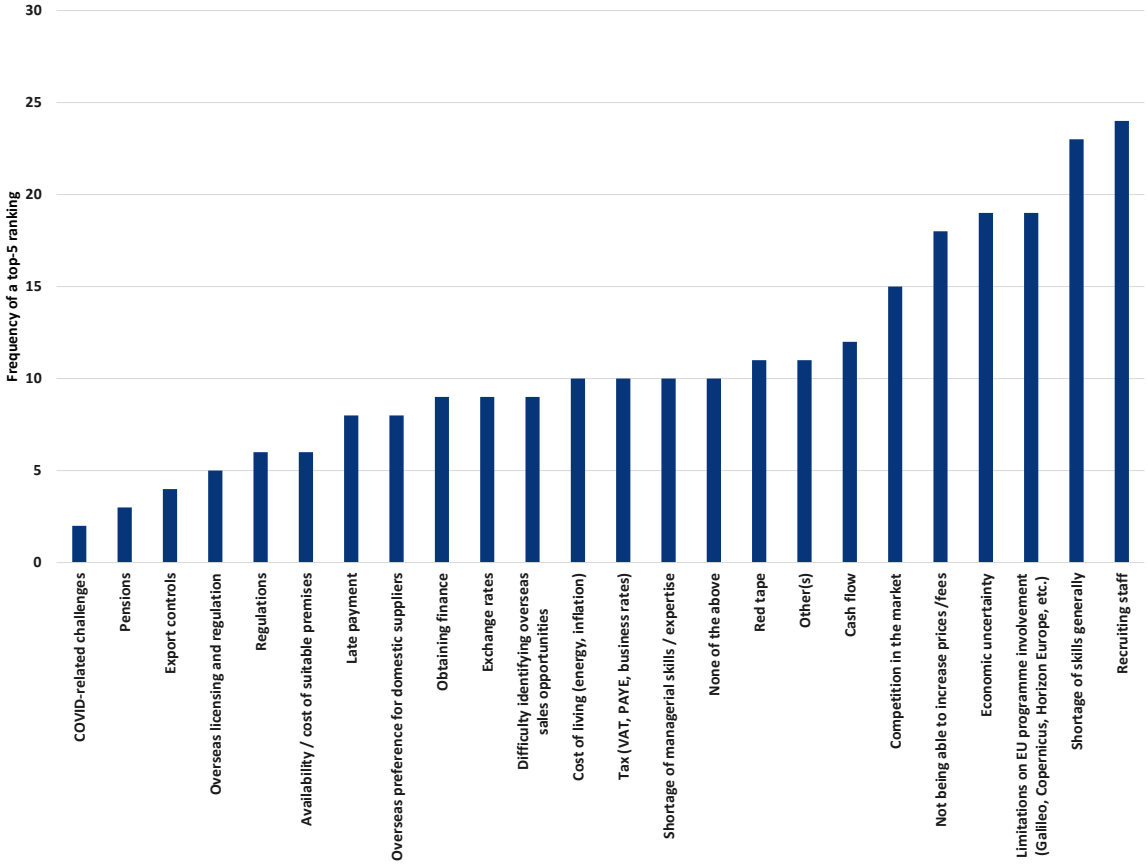
Source: London Economics analysis

Respondents most frequently placed UK funding via European Space Agency (ESA) programmes as having the most significant impact on firm growth, followed by increased spending across UK national space programmes, and support and engagement with the UK Space Agency (UKSA).

7.2 Barriers to growth

On a forward-looking question, 58 respondents ranked various barriers of growth in terms of their relative impact on company performance. Figure 19 shows the relative frequency at which respondents ranked various enablers of growth in their top 5 choices.

Figure 19 Frequency of a top 5 ranking for growth constraints



Note: The figure aggregates the number of times respondents placed a growth constraint in their top-5 position for their ranked preferences.

Source: London Economics analysis

Around 1 in 5 respondents indicated that the recruitment of staff was the most significant constraint to growth. Around 1 in 10 respondents indicated that the limitations on EU programme involvement and obtaining finance were the most significant blockers. Economic uncertainty, and the inability to increase prices were indicated to be the most significant constraint by around 1 in 20 respondents.

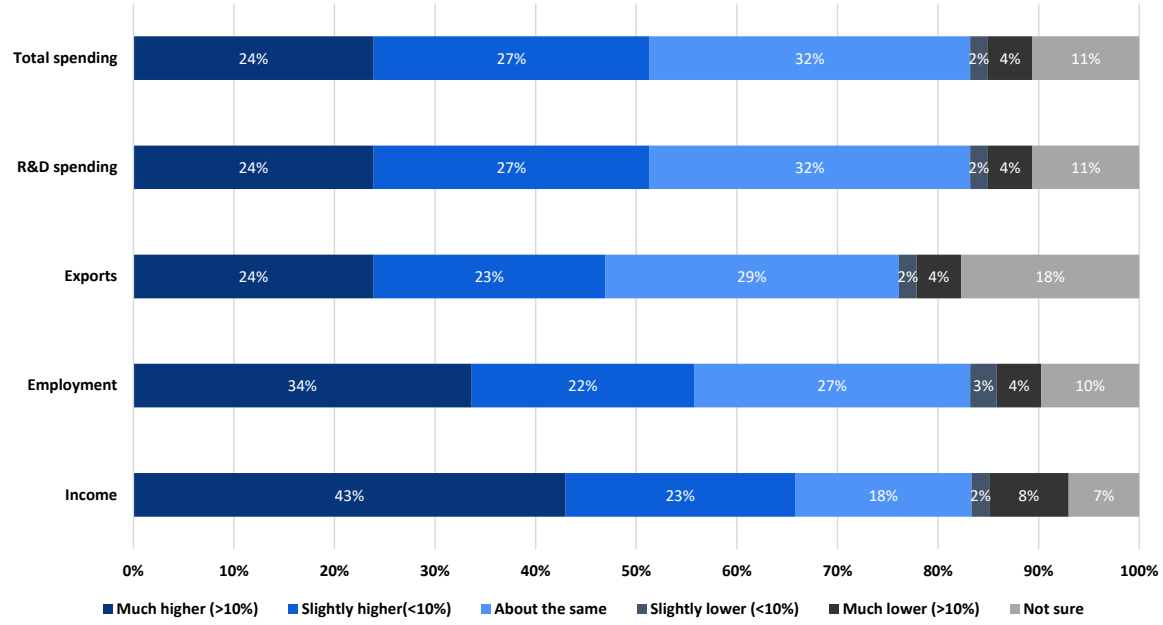
7.3 3-year outlook

From a sample of 114 respondents, there was a clear expression of **optimism** with respect to **near-term growth** over the three years from late-2023. The results are presented in Figure 20, and comparisons with the last iteration of the Size and Health study are given in the text below.

- **2 in 3** respondents (66%) expect higher incomes in the coming years, with **2 in 5** (43%) expecting incomes to be significantly higher (compared to 63% and 39% respectively in the previous study).
- **Over half** of the respondents (56%) expect employment to be 'much' or 'slightly' higher (58% previously).
- **Just under half** (47%) expect exports to be higher in the coming years (42% previously).
- **Around half** of the respondents (51%) expect Research & Development (R&D) expenditure to increase, with **1 in 4** (24%) expecting this expenditure to be much higher (47% and 24% respectively in the previous study).
- **Over half** of respondents (51%) expect total expenditure to increase (50% previously).

Despite this positive outlook, there were widespread increases in the proportion of respondents with a less optimistic view of the coming years. Around one-third of respondents expected R&D spending and exports to stay the same in the next few years (previously: 24% and 25% for R&D and exports respectively), with 1 in 5 respondents (18%) expecting a lower income in the near future (previously: 16%). 1 in 10 respondents (8%) expected income to be much lower in the next few years (previously: 7%). Aside from income, there was a very low share of respondents who expressed expectations of lower employment, exports, R&D spending, and total expenditure.

Figure 20 3-year outlook according to survey respondents



Note: Percentages rounded to the nearest whole number.

Source: London Economics analysis

From a sample of 102 respondents, the impact of certain factors on forward-looking growth was assessed. In terms of the impact of COVID-19, most respondents (54%) suggested it had a negative impact on growth, with only a minority (12%) suggesting it had a positive impact. The impact of the cost of living was expressed by respondents as overwhelmingly negative (71%). The entry of the UK to Copernicus and Horizon funding saw over 2 in 5 (41%) respondents express positive impacts, with only a very small minority (3%) expressing negative impacts. The war in Ukraine saw the most respondents (45%) imply no effect on firm performance, with roughly 1 in 4 (28%) expressing negative impacts and 1 in 10 (14%) expressing positive impacts.

8 Wider impact of space activities

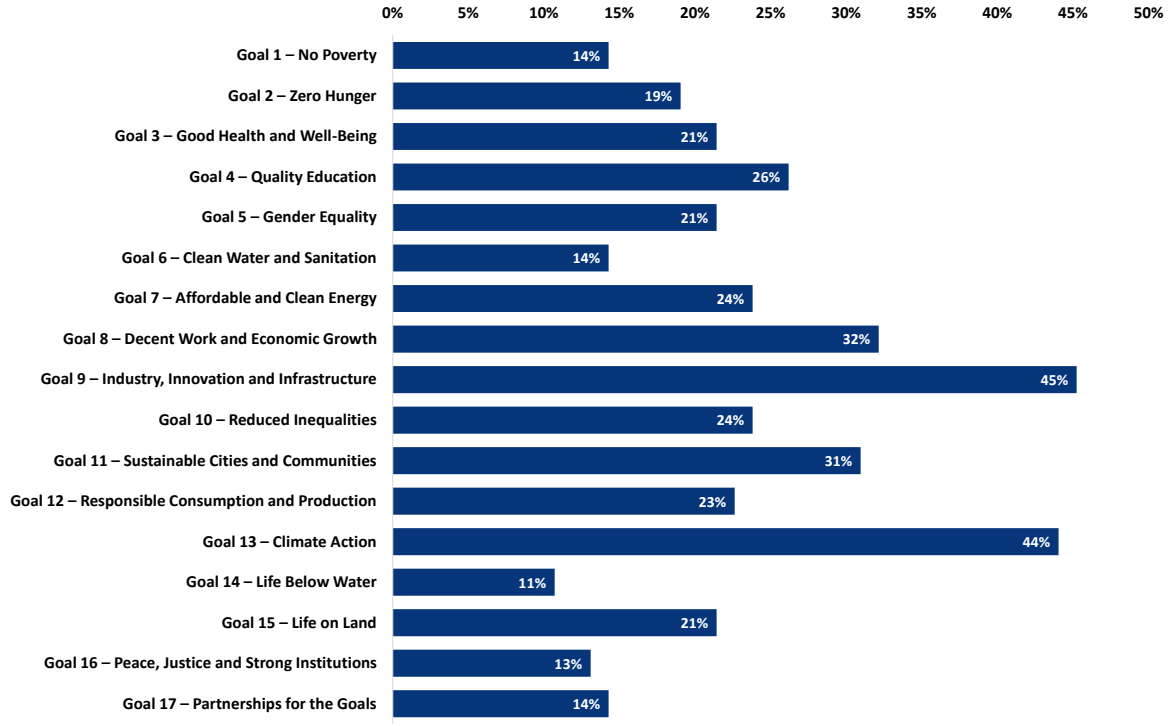
8.1 Contribution to Sustainable Development Goals (SDGs)

The United Nations' 17 Sustainable Development Goals (SDGs) are intended to measure progress towards sustainable environmental, social, and economic development. 62 of the 84 respondents to the relevant survey question reported **tracking and contributing to at least one of the United Nations (UN)'s SDGs**. Owing to the non-compulsory nature of the question, sampling bias may be present and therefore conclusions drawn from this analysis should not be taken as fully indicative of the wider space sector. The goals that the most respondents self-perceived their space-related activities to contribute towards are:

- Goal 9: Industry, Innovation and Infrastructure (45% of respondents)
- Goal 13: Climate Action (44% of respondents)
- Goal 8: Decent Work and Economic Growth (32% of respondents)
- Goal 11: Sustainable Cities and Communities (31%)

The SDG receiving the least self-perceived support from UK Space companies responding to this question was Goal 14, 'Life below water'. This goal is concerned with the conservation and sustainable use of the world's oceans, seas, and marine resources.

Figure 21 Share of survey respondents contributing toward each UN SDG goal, 2021/22



Source: London Economics analysis

While the contribution of the UK space industry to the achievement of the SDGs is out of scope for this study, it is clear that UK space-related activities are playing a role in reaching international and national sustainable development targets.

8.2 Industry carbon emissions

The 2021 Net Zero Strategy outlined a set of policies and commitments to allow the UK to reach net zero by the year 2050[36]. In accordance with this, companies are in the process of setting up initiatives and data collection strategies to help achieve this objective.

As part of this edition's survey, organisations were asked to provide an estimate of their carbon emissions. Given that the question is not mandatory, there may be sampling bias present (e.g., organisations choosing to not report unfavourable emissions). As a result, findings are taken as not fully indicative of the wider industry, and caution is advised when using the figures presented.

28% of survey respondents indicated that they estimate carbon emissions, with 72% stating that they do not estimate carbon emissions. Half of those who indicated they measure carbon emissions provided an estimate.

Among the **14 respondents** who shared their emissions, the median carbon emissions were 792 tonnes of carbon dioxide equivalent (CO_2e). The mean was 16,936 tonnes CO_2e, which demonstrates the wider trend that larger organisations account for the majority of carbon emissions. Data from the Carbon Trust indicates that the average small-to-medium enterprise in the UK generates around 15 tonnes CO_2e per year[37]. Though this is far smaller than the survey results obtained, it is important to note that the energy-intensive nature of manufacturing processes commonly found within the UK space industry are likely to drive the gap between this and the survey results.

8.3 UK GDP supported by satellite services

To understand the wider impacts of the space industry, an assessment was made of which UK industries use satellite services in their commercial operations, in order to estimate the proportion of UK GDP that is supported by satellite services.

The estimates do not claim to be a valuation of the economic value contributed by, or attributed to, the space and satellite services industry. The estimates instead indicate the value of the output of those industries that are supported by space and satellite services.

Caveat: The analysis does not cover the full UK economy, being limited to the coverage of the ONS's Annual Business Survey (ABS). This is limited to the UK Non-Financial Business Economy which accounts for approximately two thirds of the UK economy in terms of Gross Value Added. It therefore excludes: financial and insurance, public administration and defence, public provision of education, public provision of health, and all medical and dental practice activities.

Using ABS data (based on 2021 data), it is estimated that space and satellite services support wider industrial activities across the UK economy that contributed **£364 billion to GDP[38] (16.0%) (down from £370 billion and 17.7% when last calculated with reference to 2020)**

[36] HM Government. (2021). *Net Zero Strategy: Build Back Greener*.
[37] Carbon Trust. (2024). 'SME Carbon Footprint Calculator'

[38] ONS. (2024). *Gross Domestic Product at market prices: Current price: Seasonally adjusted £m*. Available at: https://www.ons.gov.uk/economy/grossdomesticproductgdp/timeseries/ybha/ukea

Analysing the specific satellite services, and their individual contributions to the value of GDP supported by these services[39], this yields:

- GNSS (positioning, navigation and timing) are estimated to support industries that contribute **£284 billion to GDP (12.5%).**
- Meteorological satellite services support industries contributing **£195 billion to GDP (8.5%)**
- Telecommunication satellite services are estimated to support industries with a contribution of **£116 billion to GDP (5.1%).**
- Earth Observation satellite services are estimated to support industries with that contribute **£109 billion to GDP (4.8%).**

[39] Note, that multiple industries use more than one satellite service. Hence, the values of these do not add up to the overall GDP supported by satellite services figure.

9 Conclusion

This edition of the 'Size and Health of the UK Space Industry' analysed the 2021/22 financial year. Despite ongoing macroeconomic challenges, the industry demonstrated remarkable resilience. The total number of unique investments into the UK space industry grew, as did the total value of investments under £100m (i.e. excluding less regular 'mega-deals').

In addition to aligning with the objectives of the National Space Strategy, the UK space industry is contributing to broader government agendas, including the Net Zero Strategy and the aim to become a Science Superpower. A majority of survey respondents are actively involved in initiatives addressing Climate and Innovation Sustainable Development Goals. Moreover, the industry is pivotal in the agenda of Levelling Up the United Kingdom, with regions such as England's North West, South West, East Midlands, Scotland, and Wales showing notable growth in space-related income.

The increasing industrial population, sustained levels of private investment, robust export figures, commercial orientation, and the expanding landscape of the UK space industry, particularly in high-growth sectors like space surveillance and tracking, space travel and habitation, in-orbit servicing, and active debris removal, bode well for future growth. This optimism is reinforced by the positive outlook of survey respondents over the next three years.

Index of Tables, Figures and Boxes

Tables

Figures

Boxes

ANNEXES

Annex 1 Updated segment mapping

The goal with sectoral definitions in the Size & Health series has long been to preserve consistency and traceability of results with previous editions while still capturing data in useful categories that reflect the evolving UK space industry. As such, the sectoral breakdown adopted in previous editions has been augmented this year through the addition of a new segment, 'In-Space Economy'. This is in recognition of observed and expected growth in this area.

Figure 22 Updated segmentation reflecting addition of 'In-Space Economy'

Historical segmentation	Historical activities		In-Space Economy
Space Manufacturing			
Space operations	Launch services		
	Launch brokerage services		
	Proprietary satellite operation		
	Third-party ground segment operation		
	Ground station networks		
	~~In-orbit servicing~~	→	In-orbit servicing (inc. space-tug activities)
	~~Debris removal~~	→	Debris removal
	~~Space Surveillance & Tracking~~	→	Space Surveillance & Tracking
	~~Space tourism~~	→	Space tourism
	~~In-space manufacturing~~	→	In-space manufacturing
		→	Space Resource Utilisation
		→	Cis-lunar activities
Space applications			
Ancillary services			

To aid international comparisons, we provide below a detailed overview of how the findings in this report can be mapped to the Organisation for Economic Co-operation and Development (OECD) definitions as per the 2022 *Handbook on Measuring the Space Economy*[40]. This is in addition to the breakdown by OECD 'sectors' that has been explicitly reported throughout the report. Table 31 below identifies which OECD sectors map to which Size & Health 'capabilities', which are reported throughout the report's main body.

Table 31 OECD sector – Size & Health capabilities mapping

OECD Sector	Size & Health capabilities
Satellite communications	Satellite communications (excluding broadcasting)
	DTH broadcasting
Position, navigation and timing	Position, navigation and timing
Earth Observation	Earth Observation (excluding meteorology)
	Meteorology
Space transportation	Space transportation (including launch)
Space exploration	Space exploration
Science	Science
Space technologies	Other (generic technologies and components)
Generic technologies that enable space capabilities	

Source: London Economics analysis, previous Size & Health reports

[40] OECD (2022). 'OECD Handbook on Measuring the Space Economy, 2nd Edition'

LE London Economics

Somerset House, New Wing, Strand,
London, WC2R 1LA, United Kingdom
info@londoneconomics.co.uk
londoneconomics.co.uk
𝕏 @LondonEconomics
+44 (0)20 3701 7700