



# International, North American and European Statistical Classifications for Space Economy Measurement

- A co-publication by the Organisation for Economic Co-operation and Development (OECD), the United States Bureau of Economic Analysis (BEA), the European Space Agency (ESA), Eurostat and the European Commission's Joint Research Centre (JRC)

Image: Webb confirms accuracy of Universe's expansion rate measured by Hubble.  
NASA, ESA, CSA, and A. Riess (Space Telescope Science Institute).

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**International, North American and European  
Statistical Classifications for Space  
Economy Measurement**

## Foreword

The evolution of the space economy is attracting more attention, as space products and services expand their presence in the daily work of public authorities and lives of citizens. In parallel, the emergence of new space systems, as well as public and private investment in space activities, have grown markedly, leading to the creation of new firms and new commercial products.

These developments have also increased the demand for reliable and timely statistics on the space economy. Yet, the measurement of the sector's contribution to, notably, economic growth and employment, remains a challenging exercise due to the scarcity of appropriate data and specific methodologies.

A thematic account, which is based on the System of National Accounts (SNA), can provide new and robust indicators on the space economy, with data comparable with different economic sectors in a national economy. The construction of statistical thematic accounts (previously known as 'satellite accounts') is meant to highlight specific areas of the economy that are not visible in the current set of official statistics. Their development requires the participation of sectoral experts and specialists of national accounts (official statistics).

Under the auspices of the United States' Department of Commerce (DOC) in 2020, the thematic accounting approach was first explored by the U.S. Bureau of Economic Analysis (BEA) to improve the measurement of the U.S. space economy. In December 2020, the BEA successfully published a first ever set of results showing the contribution of the U.S. space economy to the U.S. economy in fully comparable terms. Updated results were published by the BEA in both 2022 and 2023.

In Europe, in 2022, the European Space Agency (ESA) set up a cooperation with Eurostat and the Joint Research Centre (JRC) of the European Commission to develop a European space economy thematic account. This tripartite cooperation is the first of its kind at the European level and has received continuous support and interest from all ESA and EU Member States, with more than 250 representatives from space agencies and national statistical offices attending the five workshops organised by the ESA, Eurostat and JRC team.

Both the American and European experiences were highlighted by the Organisation for Economic Co-operation and Development (OECD) in its *2022 Handbook on Measuring the Space Economy*.

Within this context, ESA, Eurostat and the JRC together with the OECD and the U.S. BEA are publishing the first-ever list of statistical codes to measure the space economy. The tables presented in the report provide the first necessary step towards the construction of space economy thematic accounts: a comparable definition of the space economy for statistical purposes.

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# Introduction

## 1. INTRODUCING THEMATIC ACCOUNTS FOR MEASURING THE SPACE ECONOMY

The space sector has experienced rapid and fundamental changes in the past decades. Space became a crucial pillar to tackle societal and environmental issues, such as climate change, the digitalisation of the economy, or crises responses. The space sector has also experienced increased strategic and economic interests by policy-makers in recent years<sup>1</sup>. To tap into the potential of space for societal, economic, and security implications, while fostering cutting edge innovation, the space sector receives increasing attention, investment, and commitment by its public and private stakeholders.

In this context, robust and reliable data are needed to support decision makers, as well as to measure and evaluate the trends of the space economy. Most studies seeking to measure the space economy currently rely on industry surveys and bottom-up analyses to estimate the economic value of space activities. The analyses usually focus on specific parts of the space value chain (e.g., upstream manufacturing and launch activities) and ensure a consistent methodological approach across time (e.g., the 27 editions of the Eurospace Facts and Figures provide the most robust available time series on the European upstream space industry<sup>2</sup>). However, challenges persist to compare and properly consolidate the data across the different studies and segments of the value chain. Gaps remain and lead to a continuous debate about the actual size of the space economy and its real evolution. Furthermore, most of the currently available data fall short of measuring the contribution of space to the overall economy through comparable measures of employment, output, and gross value added (GVA).

Possible approaches to overcoming these challenges include the use of official statistics to create a *thematic account*. Thematic accounts (previously referred to as satellite accounts)<sup>3</sup> are linked to the core national accounts but provide a more detailed description of a specific economic function or theme (e.g., focussed on the environment, tourism, health, ocean economy, transport). In line with previous thematic accounts, the development of a space economy thematic account would fill gaps in understanding the space economy, by isolating space-related economic activities and products within the existing national accounts.

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<sup>1</sup> Elysée, 2021. Discours du Président de La République à l'occasion de la Présentation du Plan France 2030 <https://www.elysee.fr/front/pdf/elysee-module-18543-fr.pdf>; Swiss Space Policy, 2023. Ambition <https://www.sbf.admin.ch/sbfi/en/home/research-and-innovation/space/swiss-space-policy.html>; Rymdstyrelsen, 2018. The strategy of the Swedish National Space Agency [https://www.rymdstyrelsen.se/contentassets/3d8de30dbebb406c8f375c267ed04fe8/rymdstrategi-eng\\_web.pdf](https://www.rymdstyrelsen.se/contentassets/3d8de30dbebb406c8f375c267ed04fe8/rymdstrategi-eng_web.pdf); The Danish government, 2021. Denmark's national space strategy <https://ufm.dk/en/publications/2021/files/denmarks-national-space-strategy.pdf>

<sup>2</sup> Every year, Eurospace, the association of the European space manufacturing industry, issues the annual update of its facts & figures statistical series. Since its inception, the statistical collection aims at measuring the value of the market for space systems design, development and production in Europe <https://eurospace.org/publication/eurospace-facts-figures/>

<sup>3</sup> The System of National Accounts (SNA) 2008 is currently being updated with a new version to be published in 2025 (SNA 2025). Whereas the 2008 SNA referred to 'satellite accounts', the 2025 SNA will introduce new terminology that refers to the type of accounts that are the subject of this paper as 'thematic accounts'. The term 'thematic account' will therefore be used throughout this document apart from when the term 'satellite account' is used in the official names of existing accounts for the space economy.

Besides providing more comparable and robust space economy statistics to industry, investors, and policy-makers, space economy thematic accounts also create new opportunities for researchers to analyse the performance of the space sector.

The United States was the first in the world to develop an account of this type through its experimental U.S. Space Economy Satellite Account (U.S. SESA) with an initial set of results published in 2020<sup>4</sup>.

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<sup>4</sup> Tina Highfill, Annabel Jouard, and Connor Franks, 2020. Preliminary Estimates of the U.S. Space Economy, 2012–2018 <https://apps.bea.gov/scb/issues/2020/12-december/1220-space-economy.htm>



## 2. PROGRESS IN DEFINITIONS AND MEASUREMENT OF THE SPACE ECONOMY

The development of space economy thematic accounts that are comparable internationally relies in part on an agreed (statistical) definition for the space economy. Through the years, multiple definitions have been used to describe the space economy. The most common definition used in international literature was established by the OECD Space Forum and its partners, space agencies, and ministries, as the starting point for the 2012 first *Handbook on Measuring the Space Economy*<sup>5</sup>:

*“The space economy is the full range of activities and the use of resources that create and provide value and benefits to human beings in the course of exploring, understanding, managing and utilising space.*

*Hence, it includes all public and private actors involved in developing, providing and using space-related products and services, ranging from research and development, the manufacture and use of space infrastructure (ground stations, launch vehicles and satellites) to space-enabled applications (navigation equipment, satellite phones, meteorological services, etc.) and the scientific knowledge generated by such activities. It follows that the space economy goes well beyond the space sector itself, since it also comprises the increasingly pervasive and continually changing impacts (both quantitative and qualitative) of space-derived products, services and knowledge on economy and society.”*

Since its introduction, the definition has been widely used by industry and governments alike and remains the key reference at international level. However, space activities have become increasingly entwined with other activities from the overall economy making the distinction between space and non-space increasingly challenging. This blurs the line of value created through activities within and beyond the borders of the space economy.

For the creation of its space economy thematic account, a definition that would fit statistical purposes was needed and consequently developed by the U.S. Bureau of Economic Analysis (BEA)<sup>6</sup>:

*“The space economy consists of space-related goods and services, both public and private. This includes goods and services that:*

- *Are used in space, or directly support those used in space;*
- *Require direct input from space to function, or directly support those that do;*
- *Are associated with studying space.”*

The BEA definition of the space economy is similarly applied for the identification of the European space economy thematic account.

In this publication, ESA, Eurostat and the JRC together with the OECD and the U.S. BEA publish the first-ever comprehensive list of statistical codes to measure the space economy at the international level, for the United States of America and for Europe. [This report provides a first concrete step for different countries and regions of the world in exploring the feasibility of developing their own comparable space economy thematic accounts.](#)

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<sup>5</sup> OECD, 2012. OECD Handbook on Measuring the Space Economy. Paris: OECD Publishing [www.oecd-ilibrary.org/economics/oecd-handbook-on-measuring-the-space-economy\\_9789264169166-en](http://www.oecd-ilibrary.org/economics/oecd-handbook-on-measuring-the-space-economy_9789264169166-en)

<sup>6</sup> The US Bureau of Economic Analysis is a federal statistical agency within the US Department of Commerce responsible for producing many of the official macroeconomic statistics for the US, including gross domestic product (GDP) and gross output.

# Statistical codes to define the space economy

The sections below present the comprehensive list of comparable statistical codes to measure the space economy as follows:

- International statistical classifications for the space economy;
- North American statistical classifications for the space economy;
- European statistical classifications for the space economy.

## 1. INTERNATIONAL STATISTICAL CLASSIFICATIONS FOR THE SPACE ECONOMY

The OECD Space Forum sits within the OECD Directorate for Science, Technology and Innovation and gathers experts on the space economy from national space agencies and ministries. The Space Forum published in 2022 the second edition of the *Handbook on Measuring the Space Economy*<sup>7</sup>. The handbook encourages the use of common top-level definitions to improve the quality and international comparability of statistics on the space economy. It includes guidelines for developing industry surveys at national and/or regional levels. It also encourages involving national statistical agencies in projects focused on identifying the contribution of space activities to national economies, including through experimental thematic accounting frameworks.

### *The importance of official classifications*

International statistical classifications are instrumental in guiding countries in developing the evidence they need to support national policies. They cover a wide range of topics such as economic activities, goods and services, trade, employment, education, etc. International statistical classifications serve two primary purposes. Firstly, they provide a framework for countries to create their own national classifications. Secondly, they form the foundation for international statistical data collection, ensuring that data produced by countries around the world can be made comparable. The classifications at both international and national levels are revised periodically to consider changes in the structure of the economy and to introduce new categories or remove obsolete ones as necessary. For instance, ongoing revision processes are taking into account the growing digitalisation of the economy.

Multiple statistical classification systems will need to be considered during the development of experimental thematic accounts for the space economy, but two particular international classifications are important in the initial stages: the International Standard Industrial Classification of All Economic Activities (ISIC) and the Central Product Classification (CPC).

ISIC is an internationally agreed system for categorising productive activities. Its primary objective is to provide a comprehensive list of economic activities that can be used to collect and report statistics, divided into four levels of detail. Since its inception in 1948, countries worldwide have used it to classify internationally comparable economic statistics (see Figure 1 below). The Statistical Classification of Economic Activities in the European Community (NACE<sup>8</sup>) corresponds with ISIC Rev.4 at higher levels but adds more detailed categories

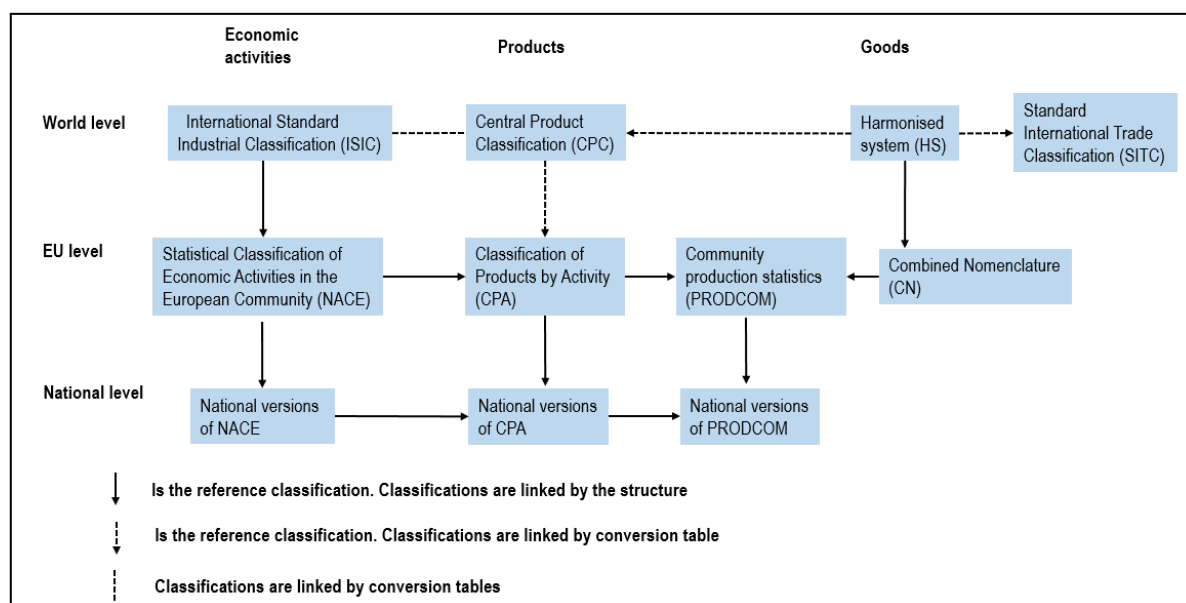
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<sup>7</sup> OECD, 2022. OECD Handbook on Measuring the Space Economy, 2nd Edition, OECD Publishing, Paris <https://doi.org/10.1787/8bfef437-en>

<sup>8</sup> The 'statistical classification of economic activities' in the European Community, abbreviated as NACE, is the classification of economic activities in the European Union (EU). The term NACE is derived

suitable for European users of the classification at lower levels. The North American Industry Classification System (NAICS<sup>9</sup>) also partially relates to ISIC Rev.4 so that data classified according to NAICS can be aggregated into the two-digit divisions of ISIC Rev. 4. There is also concordance with the Australian and New Zealand Standard Industrial Classification (ANZSIC) and other regional and national classifications. The United Nations Statistics Division (UNSD) maintains a database of national classifications from 125 countries, allowing analysts to check comparability<sup>10</sup>.

**Figure 1 Illustration of relationships between international, regional and national classifications<sup>11</sup>**



A separate internationally agreed classification system, the Central Product Classification (CPC) Version 2.1, exists for statistics on goods and services. It is used as an international standard for collecting and organising data that requires product details (e.g., industrial production, national accounts, domestic and foreign commodity trade). Like ISIC, it can then be more granular at regional and national levels.

### **The challenge of measuring the space economy**

A major challenge to the use of official statistics for measuring the space economy is that space activities cannot be isolated from others in statistics classified according to existing statistical classification systems. Space activities, along with their goods and services, are often found in much larger aerospace, electronics, telecommunications, and armaments categories (e.g., rockets are based on missile technology and considered as weapons in most countries). Findings from space industry surveys and studies indicate that the bulk of space activity have so far tended to be measured under ISIC Rev.4 *Section I: Information and*

from the French title: **Nomenclature statistique des activités économiques dans la Communauté européenne.**

<sup>9</sup> The North American Industry Classification System (NAICS) is the standard used by Federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy.

<sup>10</sup> United Nations Statistics Division (UNSD), (2023. National Classifications Database

<https://unstats.un.org/unsd/classifications/nationalclassifications/>

<sup>11</sup> Eurostat (2008), "NACE Rev. 2: Statistical classification of economic activities in the European Community" <http://ec.europa.eu/eurostat/documents/3859598/5902521/KS-RA-07-015-EN.PDF>

*communications* and *Section C: Manufacturing*, broad sections which also contain a lot of economic activity unconnected to space.

Concentrating on the most detailed four-digit classes of ISIC Rev.4, economic activities are grouped together by shared production processes using related technologies. Most notable for the space economy are:

- ISIC Class 6130: *Satellite telecommunications activities*, which is the only ISIC four-digit class entirely in-scope of the space economy.
- Other classes with a notable space dimension include 3030: *Manufacture of air and spacecraft and related machinery*, 6020: *Television programming and broadcasting activities* and 2651: *Manufacture of measuring, testing, navigating and control equipment*, which covers the manufacture of chipsets and devices for global navigation satellite systems.

Despite a lack of space-specific detail, existing statistical classification systems remain an important starting point for economic analysis of the space economy and for targeted surveys of organisations operating in the space economy. Many companies developing downstream space applications are for instance registered as data-processing companies under the much broader ISIC class 6311: *Data processing, hosting and related activities*.

Table 1 contains ISIC two-digit categories that partially include space activity for high-level international comparisons<sup>12</sup>.

Some national and regional classification systems provide more space-related detail than the international classifications, as described in sections 2 (North America) and 3 (Europe).

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<sup>12</sup> For clarity purposes, the space-related international classifications are provided in two separate tables which present complementary information. Table 1 provides space-related two-digit ISIC categories, with their overall description. Table 2 provides space-related four-digit ISIC codes, along with CPC and HS codes.

Table 1 Selected space-related ISIC codes for international comparisons (two-digit)

Examples of space activities	ISIC Rev. 4 section	ISIC Rev. 4, two-digit code	ISIC description
Fundamental and applied research	M: Professional, scientific and technical activities	72	Scientific research and development
Ancillary activities (e.g., space insurance)	K: Financial and insurance activities	65	Insurance, reinsurance and pension funding, except compulsory social security
Research and development services, engineering services (testing, design)	M: Professional, scientific and technical activities	71	Architectural and engineering activities; technical testing and analysis
Supply of components and equipment for space systems	C: Manufacturing	20	Manufacture of chemicals and chemical products
		22	Manufacture of rubber and plastics products
		25	Manufacture of fabricated metal products, except machinery and equipment
		26	Manufacture of computer, electronic and optical products
		27	Manufacture of electrical equipment
		28	Manufacture of machinery and equipment n.e.c.
Integration and supply of full space systems (e.g., launchers, satellites)		30	Manufacture of other transport equipment
Construction of space facilities (e.g., spaceports and other ground facilities, observatories)	F: Construction	42	Civil engineering
Space launch activities (freight transport and space tourism)	H: Transportation and storage	51	Air transport
		52	Warehousing and support activities for transportation
Operation of space systems	I: Information and communication	61	Telecommunications
Supply of devices and products supporting consumer markets (e.g., GNSS chipsets and devices) <sup>1</sup>	C: Manufacturing	26	Manufacture of computer, electronic and optical products
Supply of services supporting consumer markets (e.g., DTH providers, data-derived commercial services) <sup>2</sup>	I: Information and communication	60	Programming and broadcasting activities
		61	Telecommunications
		63	Information service activities
	M: Professional, scientific and technical activities	71	Architectural and engineering activities; technical testing and analysis
		74	Other professional, scientific and technical activities

Notes: 1. Includes both intermediary inputs to final products such as cars (e.g., GNSS receivers) and consumer devices (GNSS devices, satellite phones). 2. Only includes activities that directly rely on the provision of a space capacity (space technology, signals or data) to exist and function.

Beyond ISIC and CPC, the issue of aggregated categories can be found also in other international classifications such as the 2017 Harmonized Commodity Description and Coding System (HS 2017) of the World Customs Organization. Table 2 provides ISIC four-digit, CPC and HS codes for space activities.

**Table 2 International ISIC (four-digit), CPC and HS codes for space activities**

Space activity	CPC Ver.2.1	ISIC 4	HS 2017
Fundamental and applied research	81111 Basic research services in physical sciences	7210	-
	81114 Basic research services in engineering and technology	7210	-
	81121 Applied research services in physical sciences	7210	-
	81124 Applied research services in engineering and technology	7210	-
Ancillary services	71332 Marine, aviation, and other transport insurance services (Includes underwriting of satellite launching insurance policies)	6512	-
Scientific and engineering support	81131 Experimental development services in physical sciences	7210	-
	81134 Experimental development services in engineering and technology	7210	-
	83322 Engineering services for industrial and manufacturing projects (includes equipment for space vehicles)	7110	-
	48253 Instruments and apparatus for physical or chemical analysis, for measuring or checking viscosity, porosity, expansion, surface tension or the like, or for measuring or checking quantities of heat, sound or light	2651	9027.1, 9027.2, 9027.3, 9027.5, 9027.8
	83442 Testing and analysis services of physical properties (of materials such as metals, plastics, etc.)	7120	-
	83443 Testing and analysis services of integrated mechanical and electrical systems (of complete machinery and equipment)	7120	-
	83449 Other technical testing and analysis services (does not alter the object being tested, e.g., certification of aircraft, etc.)	7120	-
Supply of materials and components	34210 Hydrogen, nitrogen, oxygen, carbon dioxide and rare gases; inorganic oxygen compounds of non-metals n.e.c.	2011	2804.1, 2804.21, 2804.29, 2804.3, 2804.4
	89200 Moulding, pressing, stamping, extruding and similar plastic manufacturing services (includes carbon fibre)	2220	-
	89330 Metal forging, pressing, stamping, roll forming and powder metallurgy services	2591	-
	48315 Liquid crystal devices n.e.c.; lasers, except laser diodes; other optical appliances and instruments n.e.c.	2610, 2670	9013.1, 9013.2, 9013.8
	47150 Diodes, transistors and similar semi-conductor devices; photosensitive semi-conductor devices; light emitting diodes; mounted piezo-electric crystals	2610	8541.1, 8541.21, 8541.29,

			8541.3, 8541.4, 8541.5, 8541.6
	46212 Electrical apparatus for switching or protecting electrical circuits, for making connexions to or in electrical circuits, for a voltage not exceeding 1000 V	2710	8536.1, 8536.2, 8536.3, 8536.41, 8536.49, 8536.5, 85.61, 8536.69
	46320 Coaxial cable and other coaxial electric conductors	2732	8544.2
Design and manufacturing of space equipment and subsystems	48219 Other surveying, hydrographic, oceanographic, hydrological, meteorological or geophysical instruments and appliances	2651	9015.4, 9015.8
	4828 Parts and accessories for the goods of classes 4821 and 4823 to 4826	2651	
	48211 Direction finding compasses; other navigational instruments and appliances	2651	9014.1, 9014.2, 9014.8
	48242 Cathode-ray oscilloscopes and cathode-ray oscillographs	2651	9030.2
	48314 Binoculars, monoculars and other optical telescopes; other astronomical instruments, except instruments for radio-astronomy; compound optical microscopes	2670	9005.1, 9005.8
	48244 Instruments and apparatus (except cathode-ray oscilloscopes and oscillographs) for telecommunications	2651	9030.4
	49640 Parts of aircraft and spacecraft	3030	8803
	4313 Motors and engines for aircraft and spacecraft	3030	-
Integration and supply of full systems	49630 Spacecraft and spacecraft launch vehicles	3030	8802.6
Space launch	53290 Other civil engineering works (includes. satellite launching sites)	4290	-
	65320 Space transport services of freight (i.e. launching and placing of satellites in space)	5120	-
	64250 Space transport services of passengers	5110	-
	67640 Supporting services for space transport	5223	-
	83323 Engineering services for transportation projects (includes space transportation projects)	7110	-
Satellite operations	84150 Data transmission services	6130	-
	84190 Other telecommunications services (includes satellite tracking services)	6110, 6120, 6130, 6190	-
Downstream products and devices (and related services)	47223 Other telephone sets and apparatus for transmission or reception of voice, images or other data, including apparatus for communication in a wired or wireless network (such as a local or wide area network) (includes: Field telephones (military))	2610, 2630	8517.18 8517.61 8517.62 8517.69
	48220 Radar apparatus, radio navigational aid apparatus and radio remote control apparatus (includes "satellite linked auto security device used to send signals via satellite to a specific vehicle to	2651	8526.91

	carry out electromechanical commands on that vehicle based on an encoded signal)		
	54614 Residential antenna installation services (includes Installation of satellite dishes)	4321	-
Downstream services for earth observation; navigation, timing; and satellite telecommunications	83159 Other hosting and IT infrastructure provisioning services	6311	-
	83430 Weather forecasting and meteorological services (more than satellite data activities)	7490	-
	83931 Environmental consulting services		
	83421 Surface surveying services (includes collection of data by satellite)	7110	-
	83325 Engineering services for telecommunications and broadcasting projects (includes satellite radio systems and direct-broadcast satellite systems)	7110	-
	84131 Mobile voice services (includes satellite phones)	6120	-
	84140 Private network services	6130	-
	84150 Data transmission services	6130	-
	84190 Other telecommunications services (includes satellite tracking services)	6110, 6120, 6130, 6190	-
	84221 Narrowband Internet access services, downstream speeds < 256 kbits/s (includes satellite fixed wireless Internet services)	6110	-
	84222 Broadband Internet access services, downstream speeds > 256 Kbits/s (includes satellite fixed wireless Internet services)	6110	-
	84290 Other Internet telecommunications services	6130	-
	8463 Broadcasting services and multi-channel programme distribution services (includes home programme distribution services, basic and discretionary programming)	6010, 6020	-
	91134 Public administrative services related to transport and communications (includes administrative services related to satellite communications)	8413	-

Note: The classification codes usually include more than just space activities and/or space-related goods and services. N.e.c. means "not elsewhere classified".



## 2. NORTH AMERICAN STATISTICAL CLASSIFICATIONS FOR THE SPACE ECONOMY

Part of the U.S. Department of Commerce, the BEA has developed the first ever Space Economy Satellite Account (U.S. SESA) in 2020, providing comprehensive figures of the contribution of the U.S. space sector to the U.S. economy.

Table 3 below contains the commodities, or goods and services, that provide the basis for the 2012-2021 U.S. space economy statistics released by BEA in June 2023<sup>13</sup>. The commodity codes are proprietary codes developed by BEA that are based on the 2012 North American Industry Classification System (NAICS). The first 2-6 numbers of each commodity code reflect the primary NAICS industry where the commodity is produced.

Commodities were chosen based on industries identified by the OECD, products identified in a Bureau of Industry and Security report describing the U.S. space industry supply chain<sup>14</sup>, various reports from the private sector<sup>15</sup>, input from U.S. and international space agencies (for example, the National Aeronautics and Space Administration (NASA), the Canadian Space Agency, and the Australian Space Agency), BEA industry analyst input, and industry expert feedback.

BEA's space economy statistics are developed using BEA's comprehensive supply and use tables (SUTs). The SUTs provide insight into the internal workings of the U.S. economy and detail the contribution of specific industries and commodities to GDP. The SUTs detail the flows of goods and services purchased by each industry, the incomes earned from production in each industry, and the distribution of sales for each commodity. Commodities fall into two categories: intermediate inputs and final demand. Intermediate input commodities are goods and services used up in the production of other commodities. Final demand commodities are goods and services purchased or consumed for "final use" and comprise GDP. Final use consists of the personal consumption expenditures (PCE); gross private fixed investment; change in private inventories; exports of goods and services; imports of goods and services; and government consumption expenditures and gross investment.

The commodities included in this table represent final demand commodities in most cases. The intermediate input commodities are not separately identified because they are accounted for within BEA's SUTs. For example, the commodity "complete space vehicles" inherently includes the intermediate inputs used to make the space vehicle, such as the electronic equipment and metal body. In some cases, intermediate input commodities are included. This happens when an intermediate input is used to produce a final demand commodity that is not considered a space commodity. For example, GPS-related equipment (found within commodity codes starting with "334220") are intermediate inputs to final demand commodities like cell phones and cars. While BEA's space economy statistics include the value of GPS-related equipment in cell phones and cars, the overall value of cell phones and cars are not included.

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<sup>13</sup> Tina Highfill and Christopher Surfield, 2023. New and Revised Statistics for the U.S. Space Economy, 2012–2021 <https://apps.bea.gov/scb/issues/2023/06-june/0623-space-economy.htm>

<sup>14</sup> Bureau of Industry and Security, 2013. Defense Industrial Base Assessment: U.S. Space Industry 'Deep Dive.' U.S. Government Survey <https://www.bis.doc.gov/index.php/documents/other-areas/617-space-survey-pdf/file>

<sup>15</sup> For example, Satellite Industry Association, 2019. 2019 State of the Satellite Industry Report. Washington, DC: Satellite Industry Association [www.sia.org/news-resources/state-of-the-satellite-industry-report](http://www.sia.org/news-resources/state-of-the-satellite-industry-report); Space Foundation, 2019. The Space Report 2019, Quarter 3. Colorado Springs, CO: Space Foundation [www.thespacereport.org](http://www.thespacereport.org)

As with intermediate inputs, commodity codes for inventory change and trade margins are not separately identified because those values are captured by default in the SUTs. Trade margins are the value added by wholesalers and retailers in the distribution of a commodity from producers to final purchasers and the transport costs paid separately by the purchaser in taking delivery of goods.

**Table 3 North American NAICS-based commodity codes for space activities**

NAICS-based commodity code	Commodity description
<b>Construction</b>	
23326221	New other educational structures, including museums and libraries - private
23326222	New other educational structures, including museums and libraries - federal
23326223	New other educational structures, including museums and libraries - state and local
2332711	New air transportation structures - private
2332712	New air transportation structures - federal
2332713	New air transportation structures - state and local
23370121	Private residential maintenance and repair
<b>Manufacturing</b>	
3251203251 20C1	Argon and hydrogen
33231M3323 13346	Weldments and fabricated steel plate for other purposes
3327103327 10T	Machine shops
33281M3328 12T	Metal coating, engraving (except jewellery and silverware), and allied services to manufacturers
33291N3329 121	Aerospace type hydraulic fluid power valves
33291N3329 123	Aerospace type pneumatic fluid power valves
3333143333 143	All other miscellaneous optical instruments and lenses
33399N3339 9671	Aerospace type fluid power pumps and motors
3341113341 111	Host computers, multiusers (mainframes, super computers, medium scale systems, UNIX servers, PC servers)
3341113341 117	Single user computers, microprocessor-based, capable of supporting attached peripherals (personal computers, workstations, portable computers)
3341183341 181	Computer terminals (excluding parts/attachments/accessories/etc.)
3341183341 1841	Parts, attachments, and accessories for computer terminals (except point-of-sale and funds-transfer devices)
3341113341 11D1	Other computers, including array and other analog, hybrid, and special purpose
3341113341 11W	Electronic computers not specified by kind, total
334111AO	Electronic computer manufacturing other miscellaneous receipts

NAICS-based commodity code	Commodity description
3341183341 18W	Computer terminals, not specified by kind, total
334118AO	Computer terminal manufacturing other miscellaneous receipts
3342203342 2014X	Other communication systems and equipment
3342203342 202199	Broadcast, studio parts and accessories
3342203342 202X	Broadcast, studio, and related electronic equipment
3342203342 203X	Wireless networking equipment
3342203342 205	Radio station equipment including satellite, airborne and earth-based (fixed and mobile)
3342203342 209109	Antenna systems, sold separately
3342203342 20W	Radio and television broadcasting and wireless communications equipment, not specified by kind
334220AO	Radio and television broadcasting and wireless communications equipment manufacturing other miscellaneous receipts
3342903342 903	Intercommunications systems, including Inductive paging systems (selective paging), except telephone and telegraph
3342903342 90W	Other communications equipment, not specified by kind
334290AO	Other communications equipment manufacturing other miscellaneous receipts
3344133344 13T	Semiconductor and related device manufacturing
334413AO	Semiconductor and related device manufacturing other miscellaneous receipts
3344173344 17T	Electronic connectors
334417AO	Electronic connector manufacturing other miscellaneous receipts
3344193344 19AO	Electron tube manufacturing other miscellaneous receipts
3344193344 19T	Electron tubes and parts, excluding glass blanks
3344193344 19W	Other electronic component manufacturing
334419AO	Other electronic component manufacturing other miscellaneous receipts
3345113345 111	Aeronautical, nautical, and navigational instruments not sending or receiving radio signals
3345113345 113	Search, detection, navigation, and guidance systems
3345113345 11W	Search, detection, navigation, and guidance systems, not specified by kind
334511AO	Search, detection, navigation, guidance, aeronautical, and nautical system and instrument manufacturing other miscellaneous receipts
3345133345 13012X	General-purpose control system instruments (commonly called receiver-type), operating from standardized transmission signals

NAICS-based commodity code	Commodity description
3345133345 13021F	Continuous process instruments (pneumatic systems, including all system-type control, display and computing instruments)
3345133345 130256X	Pressure and draft measuring instruments
3345133345 130267X	Flow and liquid level measuring instruments
3345133345 1302X	Temperature measuring instruments, thermocouples, and humidity instruments
3345133345 1303X	Parts for process control instruments
334513AO	Instruments and related products manufacturing for measuring, displaying, and controlling industrial process variables other miscellaneous receipts
334513RW	Instruments and related products manufacturing for measuring, displaying, and controlling industrial process variables repair work
3345153345 15T	Instruments to measure electricity
334515AO	Instrument manufacturing for measuring and testing electricity and electrical signals other miscellaneous receipts
334515RW	Instrument manufacturing for measuring and testing electricity and electrical signals repair work
3345163345 16167	Parts-components and accessories for analytical and scientific instruments, sold separately
3345163345 160X	Analytical and scientific instruments, except optical
334516AO	Analytical laboratory instrument manufacturing other miscellaneous receipts
334516RW	Analytical laboratory instrument manufacturing repair work
3345193345 192	Aircraft engine instruments (except flight)
3345193345 194	Physical properties testing and inspection equipment and kinematic testing and measuring equipment
3345193345 195120	Physical properties testing and inspection equipment and kinematic testing and measuring equipment
3345193345 195A	Nuclear radiation detection and monitoring instruments
3345193345 197C	Seismic instruments
3345193345 199	Survey/drafting instruments/apparatus, including photogrammetric
3345193345 1991	Parts and components for drafting and photogrammetric and geodetic instruments
3345193345 19W	Watches, clocks, parts, other measuring and controlling devices, not specified by kind
3359913359 91T	Carbon and graphite products
335991AO	Carbon and graphite product manufacturing other miscellaneous receipts
3364133364 131	Aircraft propellers and helicopter rotors

NAICS-based commodity code	Commodity description
3364133364 136	Aircraft parts and auxiliary equipment, excluding hydraulic and pneumatic subassemblies
3364133364 13W	Aircraft parts and auxiliary equipment, not elsewhere classified, not specified by kind total
336413AO	Other aircraft parts and auxiliary equipment manufacturing other miscellaneous receipts
3364143364 1411	Complete guided missiles
3364143364 1451	Other services on complete guided missiles
3364143364 1473	Complete space vehicles (excluding propulsion systems)
3364143364 14A101	All other services on complete space vehicles for US government military customers
3364143364 14A104	All other services on complete space vehicles for other customers
3364143364 14AY	All other services on complete space vehicles, not specified by kind
3364143364 14W	Guided missile and space vehicle manufacturing, not specified by kind
336414AO	Guided missile and space vehicle manufacturing other miscellaneous receipts
3364153364 1511	Complete missile or space vehicle engines - US military
3364153364 1512	Complete missile or space vehicle engines - US nonmilitary
3364153364 1513	Complete missile or space vehicle engines - other customers
3364153364 157Y	Missile and space vehicle engines or propulsion parts and accessories, not specified by kind
3364153364 15W	Space propulsion units and parts, not specified by kind
3364153364 155100	Other services, complete missiles/space vehicle engine/propulsion units
3364153364 157101	Missile and space vehicle engines or propulsion parts and accessories - US military
3364153364 157104	Missile and space vehicle engines or propulsion parts and accessories - US nonmilitary
3364153364 157107	Missile and space vehicle engines or propulsion parts and accessories - other customers
336415AO	Guided missile and space vehicle propulsion unit and propulsion unit parts manufacturing other miscellaneous receipts
3364193364 19112	Missile/space vehicles airframes/capsules - US military
3364193364 191311	Missile/space vehicle components, etc. - US nonmilitary
3364193364 191413	Missile/space vehicle components, etc. - other customers
3364193364 19W	Other guided missile and space vehicle parts and auxiliary equipment, not specified by kind

NAICS-based commodity code	Commodity description
336419AO	Other guided missile and space vehicle parts and auxiliary equipment manufacturing other miscellaneous receipts
3391133391136Y	Personal industrial and nonindustrial safety equipment and clothing, not specified by kind
<b>Transportation</b>	
48100011	Air transportation, passenger transport - domestic
48100041	Air transportation, other
<b>Information</b>	
51121011	Application software publishing (other than games)
51121012	System software publishing
5151102	Air-time sales for the broadcasting of radio program content
51511035	Licensing of rights to broadcast radio programs
5151104	Public and non-commercial programming services - radio (includes contributions, gifts, and grants)
5151202	Air-time sales for the broadcasting of television program content
51512035	Licensing of rights to broadcast television programs
5151204	Public and non-commercial programming services - television (includes contributions, gifts, and grants)
51521035	Licensing of rights to distribute specialty television or audio programming content
5171101	Basic fixed local telephony (other than telecom resellers) - (includes subscriber line and calling feature charges)
51711010	Internet telephony
51711011	Force account, telephone equipment installation
5171102	Basic fixed long distance and all distance telephony (other than telecom resellers)
51711039400	Licensing of rights to use intellectual property of wired telecom carriers
5171104	Multichannel programming distribution services (analog and digital) (includes startup and reconnect fees)
5171109	Broadband (always on) internet access services
5174101	Satellite telecommunications services - (includes carrier services and private network services of satellite telecommunications)
51791139400	Licensing of rights to use intellectual property of telecom resellers
51791939400	Licensing of rights to use intellectual property of all other telecommunications
<b>Finance and Insurance</b>	
5241XX2810	Aircraft insurance (property and casualty)
<b>Professional, Scientific, and Technical Services</b>	
5413301	Engineering services
54133039400	Licensing of rights to use intellectual property of engineering services
541330CM	Construction management services
541360T	Geophysical surveying and mapping services

NAICS-based commodity code	Commodity description
54137039400	Licensing of rights to use intellectual property of surveying and mapping (except geophysical) services
541370T	Surveying and mapping (except geophysical) services
541380T	Testing laboratories
5415111	Custom computer programming
5415113	Own-account software
541512T	Computer systems design services
541519T	Other computer related services
541611T	Administrative management and general management consulting services
541690T	Other scientific and technical consulting services
54170AFS3364	For sale auxiliary scientific R&D (taxable) aerospace product and parts manufacturing
54170AFSM	For sale auxiliary scientific R&D (taxable) all other manufacturing industries
54170AFSNM	For sale auxiliary scientific R&D (taxable) all other non-manufacturing industries
54170NEFS3364	For sale academic scientific R&D (tax exempt) aerospace product and parts manufacturing
54170NEFS5417	For sale academic scientific R&D (tax exempt) scientific R&D services
54170NEFSFED	For sale academic scientific R&D (tax exempt), federal funded
54170NEFSM	For sale academic scientific R&D (tax exempt) all other manufacturing
54170NEFSNM	For sale academic scientific R&D (tax exempt) all other non-manufacturing
54170NFS3364	For sale scientific R&D (tax exempt) aerospace product and parts manufacturing
54170NFS5417	For sale scientific R&D (tax exempt) scientific R&D services
54170NFSM	For sale scientific R&D (tax exempt) all other manufacturing
54170NFSNM	For sale scientific R&D (tax exempt) all other non-manufacturing
54170NFSNPFED	For sale scientific R&D (tax exempt) all other non-profit industries, federal funded
54170NOAFGD	Own account scientific R&D (tax exempt) federal government defense
54170NOAFGND	Own account scientific R&D (tax exempt) federal government non-defense
54170PFS3364	For sale scientific R&D (taxable) aerospace product and parts manufacturing
54170PFS5417	For sale scientific R&D (taxable) scientific R&D services
54170PFSM	For sale scientific R&D (taxable) all other manufacturing industries
54170PFSNM	For sale scientific R&D (taxable) all other non-manufacturing Industries
54170POA3364	Own account scientific R&D (taxable) aerospace product and parts manufacturing
54170POA5417	Own account scientific R&D (taxable) scientific R&D services

NAICS-based commodity code	Commodity description
54170POAM	Own account scientific R&D (taxable) all other manufacturing
54170POANM	Own account scientific R&D (taxable) all other non-manufacturing
5418XX11	Radio, television, and cable advertising
5419909	All other professional, scientific, and technical services
Educational Services	
61123N01	Expenses of colleges, universities, professional schools, and junior college education services (tax exempt)
61123N02	Expenses of colleges, universities, professional schools, junior college incidental to education activities (tax exempt)
61123N03	Expenses of colleges, universities, professional schools, and junior college R&D (tax exempt)
61123NR01	Tax exempt receipts from sales of colleges, universities, professional schools, and junior colleges education services (tax exempt)
61123NR02	Tax exempt receipts from sales of colleges, universities, professional schools, junior colleges incidental to education activities (tax exempt)
61123P01	Colleges, universities, professional schools, and junior colleges higher education services (taxable)
61123P02	Sales and services, colleges, universities, professional schools, junior colleges incidental to education activities (taxable)
Arts, Entertainment, and Recreation	
71210N1	Cultural institutions - expenses
71210NRT	Cultural institutions - tax exempt receipts
71210PT	Cultural institutions (taxable)
Government	
99FD02T	Federal defense government services
99FN02T	Federal nondefense government services
99S392T	State and local other general government services



### 3. EUROPEAN STATISTICAL CLASSIFICATIONS FOR THE SPACE ECONOMY

In March 2022, ESA launched a 2-year cooperation project with Eurostat, to investigate the development of a European space economy thematic account. In July 2022, the European Commission's Joint Research Centre (JRC) joined the project team. This tripartite cooperation is the first of its kind at the European level. The project is receiving strong and continuous support from all ESA and EU Member States, as well as from the OECD and the U.S. BEA.

The cooperation project consists of three initial work packages, forming a pragmatic, stepped approach with concrete deliverables at completion of each work package. While one refers to the definition of the space economy for statistical purposes (work package 2), which results in the present publication, another one consists in the development of the methodology for the construction of the European space economy thematic account at the national and aggregated European level, following guidelines from the United Nations (2021)<sup>16</sup>. This methodology (outcome of work package 1) is being published by Eurostat, JRC and ESA at the same time as the present report<sup>17</sup>. The third work package is combining the results obtained from the first two work packages, while testing their applicability and fine-tuning them. This work is still ongoing at the time of the publication.

In order to elaborate a definition of the European space economy fit for statistical purposes, ESA built upon past research and definitions used by U.S. BEA and OECD to identify the relevant space products in European statistics. The work of U.S. BEA identified a selection of space product codes (U.S. commodities, see Table 3) in the United States, which were aggregated into unique economic activities, expressed in North American Industry Classification System (NAICS) codes. ESA then translated these NAICS codes into European economic activity (NACE Rev. 2) codes, using the official correspondence table<sup>18</sup> and ESA's knowledge of space activities.

The Statistical Classification of Economic Activities (NACE) is the standard for classifying economic activities within Europe<sup>19</sup>; it is fully aligned with the European Statistical Classification of Products by Activity (CPA) that categorises the goods and services; these two classifications are identical up to the four-digit level. At each level of aggregation, CPA reflects the principal products of the activities according to the NACE codes.

Given the alignment between the two classifications, the NACE codes identified by ESA from the NAICS codes, are linked to a set of product codes (CPA 2.1<sup>20</sup>) that were considered as candidates for space-related products in the European space sector. Among this list of candidates, multiple products were readily considered as part of the space economy based on prior identification efforts reported in the OECD *Handbook on Measuring the Space*

<sup>16</sup> United Nations, 2021. Accounting for Global Value Chains: GVC Satellite Accounts and Integrated Business Statistics. Department of Economic and Social Affairs. United Nations Statistics Division. Studies in Methods. Series F No. 120. New York [https://unstats.un.org/unsd/business-stat/GVC/Accounting\\_for\\_GVC\\_web.pdf](https://unstats.un.org/unsd/business-stat/GVC/Accounting_for_GVC_web.pdf)

<sup>17</sup> Eurostat, European Commission's Joint Research Centre (JRC), European Space Agency, 2023. Developing a space economy thematic account for Europe.

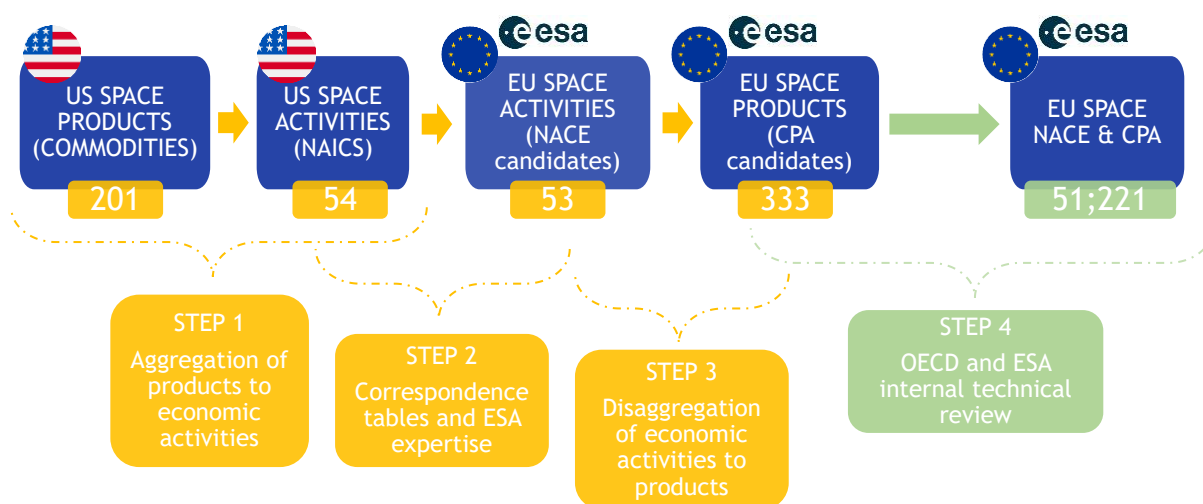
<sup>18</sup> NACE Rev. 2 - US NAICS 2007 Correspondence Table [https://circabc.europa.eu/ui/group/c1b49c83-24a7-4ff2-951c-621ac0a89fd8/library/571d97aa-fd88-49b2-9c7a-c708ee7ca02c?p=1&n=10&sort=modified\\_DESC](https://circabc.europa.eu/ui/group/c1b49c83-24a7-4ff2-951c-621ac0a89fd8/library/571d97aa-fd88-49b2-9c7a-c708ee7ca02c?p=1&n=10&sort=modified_DESC)

<sup>19</sup> Norway, the United Kingdom and Switzerland, which are ESA but not EU Member States, are also using NACE and CPA classifications.

<sup>20</sup> The statistical classification of products by activity, abbreviated as CPA, is the classification of products (goods and services) in the European Union. The newest is CPA version 2.1. It was adopted in 2014 and is used for European statistics from 2015 onwards.

*Economy* (both editions). For the remaining candidates, ESA conducted an extensive critical review with experts representing all ESA technical competence domains as well as from the fields of navigation, Earth observation, and telecommunication, with the purpose of identifying the CPA codes corresponding to the original U.S. space product codes. This evaluation process also led to the identification of additional European space products, not included in the original correspondence table, due to some divergence of classifications between the European and North American codes.

Figure 2 Process overview to identify European space-related CPA and NACE<sup>21</sup>



Thanks to the continuous and open exchange between ESA, Eurostat, the JRC, OECD and U.S. BEA during this evaluation, a list of NACE codes and CPA codes has been identified as relevant for the European space economy, as presented in Table 4 below.

The majority of the CPA codes fall under section C Manufactured products, section J Information and communication services, and section M Professional, scientific and technical services. Moreover, CPA codes were identified within sections F Construction and construction works, O Public administrative and defence services; compulsory social security services, P Educational services, H Transportation and storage services, K Financial and insurance services, and R Arts, entertainment and recreational services.

<sup>21</sup> Illustration by ESA, Eurostat and JRC.

Table 4 European NACE and CPA codes for space activities

NACE four-digit	NACE description	CPA sixdigit	CPA description
<b>C - Manufactured products</b>			
20.11	Manufacture of industrial gases	20.11.11	Hydrogen, argon, rare gases, nitrogen and oxygen
		20.11.13	Liquid air and compressed air
		20.11.99	Sub-contracted operations as part of manufacturing of industrial gases
25.11	Manufacture of metal structures and parts of structures	25.11.23	Other structures and parts of structures, plates, rods, angles, shapes and the like, of iron, steel or aluminium
		25.11.99	Sub-contracted operations as part of manufacturing of metal structures and parts of structures
25.29	Manufacture of other tanks, reservoirs and containers of metal	25.29.11	Reservoirs, tanks, vats and similar containers (other than for compressed or liquefied gas), of iron, steel or aluminium, of a capacity > 300 litres, not fitted with mechanical or thermal equipment)
		25.29.12	Containers for compressed or liquefied gas, of metal
		25.29.99	Sub-contracted operations as part of manufacturing of tanks, reservoirs and containers of metal
25.61	Treatment and coating of metals	25.61.11	Metallic coating services of metal
		25.61.12	Non-metallic coating services of metal
		25.61.21	Heat treatment services of metal, other than metallic coating
		25.61.22	Other surface treatment services of metal
25.62	Machining	25.62.10	Turning services of metal parts
		25.62.20	Other machining services
26.11	Manufacture of electronic components	26.11.12	Magnetrons, klystrons, microwave tubes and other valve tubes
		26.11.21	Diodes; transistors; thyristors, diacs and triacs
		26.11.22	Semiconductor devices; light-emitting diodes; mounted piezo-electric crystals; parts thereof
		26.11.30	Electronic integrated circuits
		26.11.40	Parts of electronic valves and tubes and of other electronic components n.e.c.
26.11.99		26.11.91	Services connected with manufacturing of electronic integrated circuits
		26.11.99	Sub-contracted operations as part of manufacturing of electronic components
26.20	Manufacture of computers and peripheral equipment	26.20.17	Monitors and projectors, principally used in an automatic data processing system
		26.20.22	Solid-state non-volatile storage devices
26.30	Manufacture of communication equipment	26.30.11	Transmission apparatus incorporating reception apparatus

NACE four-digit	NACE description	CPA sixdigit	CPA description
		26.30.12	Transmission apparatus not incorporating reception apparatus
		26.30.22	Telephones for cellular networks or for other wireless networks
		26.30.23	Other telephone sets and apparatus for transmission or reception of voice, images or other data, including apparatus for communication in a wired or wireless network (such as a local or wide area network)
		26.30.40	Aerials and aerial reflectors of all kind and parts thereof; parts of radio and television transmission apparatus and television cameras
		26.30.50	Burglar or fire alarms and similar apparatus
		26.30.60	Parts of burglar or fire alarms and similar apparatus
		26.30.99	Sub-contracted operations as part of manufacturing of communication equipment
<b>26.51</b>	Manufacture of instruments and appliances for measuring, testing and navigation	26.51.11	Direction-finding compasses; other navigational instruments and appliances
		26.51.12	Rangefinders, theodolites and tachymetres (tachometers); other surveying, hydrographic, oceanographic, hydrological, meteorological or geophysical instruments and appliances
		26.51.20	Radar apparatus and radio navigational aid apparatus
		26.51.41	Instruments and apparatus for measuring or detecting ionising radiations
		26.51.43	Instruments for measuring electrical quantities without a recording device
		26.51.44	Instruments and apparatus for telecommunications
		26.51.45	Instruments and apparatus for measuring or checking electrical quantities n.e.c.
		26.51.51	Hydrometers, thermometers, pyrometers, barometers, hygrometers and psychrometers
		26.51.52	Instruments for measuring or checking the flow, level, pressure or other variables of liquids and gases
		26.51.53	Instruments and apparatus for physical or chemical analysis n.e.c.
		26.51.66	Measuring or checking instruments, appliances and machines n.e.c.
		26.51.81	Parts of radar apparatus and radio navigational aid apparatus
		26.51.85	Parts and accessories of instruments and apparatus of 26.51.65, 26.51.66 and 26.51.70
		26.51.99	Sub-contracted operations as part of manufacturing of measuring, testing and navigating equipment

NACE four-digit	NACE description	CPA sixdigit	CPA description		
26.52	Manufacture of watches and clocks	26.52.13	Instrument panel clocks and clocks of a similar type for vehicles		
26.70	Manufacture of optical instruments and photographic equipment	26.70.11	Objective lenses for cameras, projectors or photographic enlargers or reducers		
		26.70.21	Sheets and plates of polarising material; lenses, prisms, mirrors and other optical elements (except of glass not optically worked), whether or not mounted, other than for cameras, projectors or photographic enlargers or reducers		
		26.70.22	Binoculars, monoculars and other optical telescopes; other astronomical instruments; optical microscopes		
		26.70.23	Liquid crystal devices; lasers, except laser diodes; other optical appliances and instruments n.e.c.		
		26.70.24	Parts and accessories of binoculars, monoculars and other optical telescopes, of other astronomical instruments, and of optical microscopes		
		26.70.25	Parts and accessories of liquid crystal devices, lasers (except laser diodes), other optical appliances and instruments n.e.c.		
		26.70.99	Sub-contracted operations as part of manufacturing of optical instruments and photographic equipment		
		27.90	Manufacture of other electrical equipment	27.90.13	Carbon electrodes and other articles of graphite or other carbon for electrical purposes
				27.90.20	Indicator panels with liquid crystal devices or light emitting diodes; electric sound or visual signalling apparatus
27.90.40	Other electrical equipment n.e.c. (including electro-magnets; electro-magnetic couplings and brakes; electro-magnetic lifting heads; electrical particle accelerators; electrical signal generators)				
27.90.51	Fixed capacitors for 50/60 Hz circuits having a reactive power handling capacity $\geq 0,5$ kvar				
27.90.52	Other fixed capacitors				
27.90.53	Variable or adjustable (pre-set) capacitors				
27.90.60	Electrical resistors, except heating resistors				
27.90.81	Parts of electrical capacitors				
27.90.82	Parts of electrical resistors, rheostats and potentiometers				
27.90.99	Sub-contracted operations as part of manufacturing of other electrical equipment				
28.12	Manufacture of fluid power equipment	28.12.11	Linear acting hydraulic and pneumatic motors (cylinders)		
		28.12.12	Rotating hydraulic and pneumatic motors		
		28.12.13	Hydraulic pumps		
		28.12.14	Hydraulic and pneumatic valves		
		28.12.15	Hydraulic assemblies		

NACE four-digit	NACE description	CPA sixdigit	CPA description
		28.12.16	Hydraulic systems
		28.12.20	Parts of fluid power equipment
		28.12.99	Sub-contracted operations as part of manufacturing of fluid power equipment
30.30	Manufacture of air and spacecraft and related machinery	30.30.11	Aircraft spark-ignition engines
		30.30.12	Turbo-jets and turbo-propellers
		30.30.13	Reaction engines, excluding turbo-jets
		30.30.15	Parts for aircraft spark-ignition engines
		30.30.16	Parts of turbo-jets or turbo-propellers
		30.30.20	Balloons and dirigibles; gliders, hang gliders and other non-powered aircraft
		30.30.40	Spacecraft (including satellites) and spacecraft launch vehicles
		30.30.50	Other parts of aircraft and spacecraft
		30.30.60	Overhaul and conversion services of aircraft and aircraft engines
		30.30.99	Sub-contracted operations as part of manufacturing of air and spacecraft and related machinery
32.99	Other manufacturing n.e.c.	32.99.11	Safety headgear and other safety products
33.16	Repair and maintenance of aircraft and spacecraft	33.16.10	Repair and maintenance services of aircraft and spacecraft
<b>F - Construction and construction works</b>			
41.00	Buildings and building construction works	41.00.25	Traffic and communication buildings
		41.00.45	Construction works in traffic and communication buildings
42.11	Roads and motorways; construction works for roads and motorways	42.11.10	Motorways, roads, streets and other vehicular or pedestrian ways and airfield runways
		42.11.20	Construction works for motorways, roads, streets and other vehicular or pedestrian ways and airfield runways
42.22	Construction of utility projects for electricity and telecommunications	42.22.11	Long-distance electricity power lines and communication lines
		42.22.12	Local electricity power lines and communication lines
		42.22.21	Construction works for long-distance electricity power lines and communication lines
		42.22.22	Construction works for local electricity power lines and communication lines
42.99	Constructions and construction works for	42.99.11	Mining and manufacturing constructions

NACE four-digit	NACE description	CPA sixdigit	CPA description
	other civil engineering projects n.e.c.		
		42.99.19	Other civil engineering constructions n.e.c.
		42.99.21	Construction works for mining and manufacturing
		42.99.29	Construction works for civil engineering constructions n.e.c.
43.12	Site preparation	43.12.11	Soil and land preparation works; clearance works
		43.12.12	Excavating and earthmoving works
43.13	Test drilling and boring works	43.13.10	Test drilling and boring works
43.21	Electrical installation	43.21.10	Electrical installation works
<b>H - Transportation and storage services</b>			
51.22	Space transport	51.22.11	Space transport services of passengers
		51.22.12	Space transport services of freight
52.23	Service activities incidental to air transportation	52.23.20	Services incidental to space transportation
<b>J - Information and communication services</b>			
58.11	Book publishing	58.11.11	Printed educational textbooks
		58.11.12	Printed professional, technical and scholarly books
		58.11.13	Printed children books
		58.11.14	Printed dictionaries and encyclopaedias
		58.11.15	Printed atlases and other books with maps
		58.11.19	Other printed books, brochures, leaflets and the like
		58.11.20	Books on disk, tape or other physical media
		58.11.30	On-line books
		58.11.50	Publishing of books on a fee or contract basis
58.29	Other software publishing	58.29.11	Operating systems, packaged
		58.29.12	Network software, packaged
		58.29.13	Database management software, packaged
		58.29.14	Development tools and programming languages software, packaged
		58.29.31	System software downloads
		58.29.32	Application software downloads
		58.29.40	On-line software
		58.29.50	Licensing services for the right to use computer software
60.10	Radio broadcasting	60.10.11	Radio programming and broadcasting services
		60.10.12	Radio broadcasting originals
		60.10.20	Radio channel programmes

NACE four-digit	NACE description	CPA sixdigit	CPA description
		60.10.30	Radio advertising time
<b>60.20</b>	Television programming and broadcasting activities	60.20.11	On-line television programming and broadcasting services, except by subscription
		60.20.12	Other television programming and broadcasting services, except by subscription
		60.20.13	On-line television subscription programming and broadcasting services
		60.20.14	Other television subscription programming and broadcasting services
		60.20.20	Television broadcasting originals
		60.20.31	Television channel programmes, except for subscription television
		60.20.32	Subscription television channel programmes
		60.20.40	Television advertising time
<b>61.10</b>	Wired telecommunications activities	61.10.11	Fixed telephony services - access and use
		61.10.12	Fixed telephony services - calling features
		61.10.13	Private network services for wired telecommunications systems
		61.10.30	Data transmission services over wired telecommunications networks
		61.10.41	Internet backbone services
		61.10.42	Narrow-band Internet access services over wired networks
		61.10.43	Broad-band Internet access services over wired networks
		61.10.49	Other wired Internet telecommunications services
<b>61.20</b>	Wireless telecommunications activities	61.20.11	Mobile telecommunications services - access and use
		61.20.12	Mobile telecommunications services - calling features
		61.20.13	Private network services for wireless telecommunications systems
		61.20.20	Carrier services for wireless telecommunications
		61.20.30	Data transmission services over wireless telecommunications networks
		61.20.41	Narrow-band Internet access services over wireless networks
		61.20.42	Broad-band Internet access services over wireless networks
		61.20.49	Other wireless Internet telecommunications services
		61.20.50	Home programme distribution services over wireless networks



NACE four-digit	NACE description	CPA sixdigit	CPA description
61.30	Satellite telecommunications activities	61.30.10	Satellite telecommunications services, except home programme distribution services via satellite
		61.30.20	Home programme distribution services via satellite
61.90	Other telecommunications activities	61.90.10	Other telecommunications services
62.01	Computer programming activities	62.01.11	IT design and development services for applications
		62.01.12	IT design and development services for networks and systems
		62.01.21	Computer games software originals
		62.01.29	Other software originals
62.02	Computer consultancy activities	62.02.10	Hardware consultancy services
		62.02.20	Systems and software consultancy services
		62.02.30	IT technical support services
62.09	Other information technology and computer service activities	62.09.20	Other information technology and computer services n.e.c.
<b>K - Financial and insurance services</b>			
65.12	Non-life insurance	65.12.33	Other aircraft insurance services
		65.12.36	Freight insurance services
<b>M - Professional, scientific and technical services</b>			
70.22	Business and other management consultancy activities	70.22.11	Strategic management consulting services
		70.22.12	Financial management consulting services (except corporate tax)
		70.22.13	Marketing management consulting services
		70.22.14	Human resources management consulting services
		70.22.15	Production management consulting services
		70.22.16	Supply chain and other management consulting services
		70.22.17	Business process management services
		70.22.20	Other project management services, except construction project management services
		70.22.30	Other business consulting services
		70.22.40	Trademarks and franchises
71.12	Engineering activities and related technical consultancy	71.12.11	Engineering advisory services
		71.12.17	Engineering services for industrial and manufacturing projects

NACE four-digit	NACE description	CPA sixdigit	CPA description
		71.12.18	Engineering services for telecommunications and broadcasting projects
		71.12.19	Engineering services for other projects
		71.12.34	Surface surveying services
		71.12.35	Map-making services
72.19	Other research and experimental development on natural sciences and engineering	72.19.11	Research and experimental development services in mathematics
		72.19.12	Research and experimental development services in computer and information sciences
		72.19.13	Research and experimental development services in physical sciences
		72.19.14	Research and experimental development services in chemistry
		72.19.29	Other research and experimental development services in engineering and technology, except biotechnology
72.20	Research and experimental development on social sciences and humanities	72.20.11	Research and experimental development services in economics and business
		72.20.12	Research and experimental development services in psychology
		72.20.13	Research and experimental development services in law
		72.20.19	Research and experimental development services in other social sciences
		72.20.29	Other research and experimental development services in humanities
		72.20.30	Research and development originals in social sciences and humanities
73.11	Advertising agencies	73.11.11	Full service advertising services
74.90	Other professional, scientific and technical activities n.e.c.	74.90.11	Bill auditing and freight rate information services
		74.90.13	Environmental consulting services
		74.90.14	Weather forecasting and meteorological services
		74.90.15	Security consulting services
		74.90.19	Other scientific and technical consulting services n.e.c.
		74.90.20	Other professional, technical and business services n.e.c.
<b>O - Public administrative and defence services; compulsory social security services</b>			
84.11	General public administration activities	84.11.13	Overall economic and social planning and statistical services
		84.11.14	Government services to fundamental research

NACE four-digit	NACE description	CPA sixdigit	CPA description
		84.11.19	Other general (overall) public services
		84.11.21	General personnel services for the government
84.13	Regulation of and contribution to more efficient operation of businesses	84.13.12	Administrative fuel- and energy-related services
		84.13.14	Administrative transport- and communications-related services
		84.13.16	Administrative services related to tourism affairs
		84.13.17	Administrative multipurpose development project services
84.21	Foreign affairs	84.21.13	Foreign military aid-related services
84.22	Defense Services	84.22.11	Military defence services
		84.22.12	Civil defence services
84.24	Public order and safety services	84.24.19	Other public order and safety affairs-related services
<b>P - Educational services</b>			
85.41	Post-secondary non-tertiary education	85.41.11	On-line post-secondary non-tertiary general education services
		85.41.12	Other post-secondary non-tertiary general education services
		85.41.13	On-line post-secondary non-tertiary technical and vocational education services
		85.41.14	Other post-secondary non-tertiary technical and vocational education services
85.42	Tertiary education	85.42.11	On-line short-cycle tertiary education services
		85.42.12	Other short-cycle tertiary education services
		85.42.21	On-line Bachelor's or equivalent level tertiary education services
		85.42.22	Other Bachelor's or equivalent level tertiary education services
		85.42.31	On-line Master's or equivalent level tertiary education services
		85.42.32	Other Master's or equivalent level tertiary education services
		85.42.41	On-line Doctoral or equivalent level tertiary education services
		85.42.42	Other Doctoral or equivalent level tertiary education services
<b>R - Arts, entertainment and recreation services</b>			
91.02	Museums activities	91.02.10	Museum operation services
		91.02.20	Museum collections

## Conclusion

The availability of reliable data and comparable time series on the space economy is becoming a necessity to provide the evidence supporting decision makers and policy objectives. The OECD encourages space administrations and statistical agencies to explore the use of national accounting approaches, such as thematic accounting, to measure the space economy.

Applying thematic accounting for space for the first time, the U.S. BEA provided the first ever set of statistics presenting the contribution of the US space economy to the US economy, in fully consistent and comparable terms. It is the objective of the ESA, Eurostat and JRC cooperation project to successfully develop comparable statistics for the European space economy.

The present report publishes the first step towards thematic accounting for space, with a definition of the space economy for statistical purpose, and consistent across the three geographical levels: the world, the U.S. and Europe. While current international statistical classification systems do not provide the detail required to isolate the space economy from other areas of the economy, these classification systems remain the basis to classify statistics used for cross-country comparisons and will play an important role for international comparability of results of current and possibly future experimental thematic accounts for the space economy.

The cooperation between space and statistical agencies, in the U.S., Europe and within ESA and EU Member States will be continued to strengthen existing, and develop future, thematic accounts for space. Since the cooperation started at the European level between ESA, Eurostat and JRC, several European countries have already set up cooperation agreements between the space and statistics experts to work on national space economy thematic accounts. This publication will be a critical input for their national work.





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