



AFRICA  
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FOUNDATION

# AN AFRICA EUROPE PARTNERSHIP ON SPACE

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*A scoping report by the Africa-Europe Foundation*



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# Executive summary

This report examines the evolving landscape of the space sector in both Africa and Europe, the already ongoing collaborations, and the potential for strengthening the partnership between these two continents. The African Union (AU) plans to establish the African Space Agency in 2023, based on the African Space Policy and Strategy adopted in 2016. The continent's growing space economy, driven by significant national investments and advancements in satellite technology and big data, is expected to bridge connectivity gaps and stimulate other economic sectors.

Europe, on the other hand, is a global leader in space advancement, with a space economy contributing significantly to the global space market. The European Space Agency (ESA) plays a pivotal role in shaping Europe's space capability, with its Agenda 2025 aiming to fortify EU partnerships, stimulate 'green' and digital commercialisation, enhance safety and security in space, and support commercial success of European companies in the space industry.

Africa and Europe share common goals of leveraging space technologies to stimulate economic development, benefit citizens, and facilitate international cooperation. Current collaborations, such as the Global Monitoring for Environment and Security (GMES) and Africa programme, have already demonstrated the potential for mutual growth and development. These programmes focus on managing water resources, natural resources, and marine environments using earth observation data.

There are opportunities for catalytic partnerships focused on shared strategic goals. These include promoting women's leadership and participation in the space industry, accelerating and facilitating youth-led initiatives based on space technologies, and providing strategic leadership on space initiatives and regulatory frameworks. There is significant potential in leveraging the AU-EU summit commitments on digital transformation and research and development, and the anticipated role of the African Space Agency.

An Africa-Europe partnership on space can unlock significant opportunities for growth and development, harnessing the potential of space technologies for social, economic, and environmental benefits.

# Introduction

Space can become a key area of focus for the Africa-Europe collaboration in the spirit of a renewed partnership announced at the 6th AU-EU Summit hosted in Brussels in February 2022. The space industry is growing across the world and governments on every continent are investing massively in developing space technologies in their countries. Human activity in space is being led by an increasing number of stakeholders from regional and national space agencies to entrepreneurs.

Both Africa and Europe are increasing their investments and diversifying their activities in space and collaboration between the two continents has the potential for transformative impact. In addition to accelerating achievement of several Sustainable Development Goals by 2030, an Africa-Europe partnership on space can contribute to shaping a new narrative and model for cooperation between the two continents. Harnessing the full potential of the partnership between Africa and Europe in the development of space ventures requires investments both in technical capacity and human resources.

The potential scope of an Africa-Europe partnership on space is wide ranging – from the collection, exchange, and use of earth observation data, the deployment of telecommunication satellites to improve and increase connectivity, and the exchange of knowledge and expertise. Strategic investments in space could expedite achievement of Africa and Europe's goals in climate adaptation, the energy transition, resilient agrifood systems, health, ocean governance and blue economy, and transport and connectivity. The [launch](#) of the African Space Agency in January, the European Space Agency's continued focus on space entrepreneurship, and significant advancements in space technologies and applications in the past two years, makes 2023 a critical year for defining and advancing an Africa-Europe partnership on space.

This report sets the scene for an Africa-Europe partnership on space by providing an overview of the emerging African space industry, an outline of the European space policy and priorities, and identifying specific opportunities for an Africa-Europe partnership on Space.

## UNDERSTANDING SATELLITES AND SPACE APPLICATIONS

Satellites are artificial objects sent into space by launchers that orbit the earth at high speed. They can weigh from a few grams to several hundred kilograms and can cost anywhere from tens of thousands of dollars to millions of dollars.

There are several types of satellites:



**Telecommunications satellites** support communication irrespective of location and are typically used for television, radio, telephone, and internet



**Positioning satellites** provide positioning, navigation, and timing and data services; the best-known application of these satellites is for global positioning system (GPS) data



**Earth observation satellites,** and more particularly remote sensing satellites, provide images and data used for meteorology, cartography and environmental monitoring.

A Space application is an activity in which the use of signals or data from satellites can improve existing societal services or inform new services across public and private users.

Natural & industrial disaster relief	Food security	Informing decent living conditions	Protection of health	Provision of education	Support for economic development
Responding to natural disasters e.g., floods, forest fires, locust epidemics; Monitoring and tracking desertification, cyclones, seabed pollution	Mapping of agricultural zones, water management; Measuring of social degradation, fishing	Regional planning, managing urban populations; Measuring air and other pollution	Mapping disease risk and outbreak; remote monitoring, and medical imaging; connectivity for telemedicine	Distance learning or tele-education	Transportation development; search for mineral resources; internet access



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# **Setting the scene for an Africa Europe partnership on space**

# Africa

## AFRICA POLICY AND STRATEGY

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The African Union's roadmap for achieving the well-being of the population, [Agenda 2063](#), calls for the strengthening of Africa's economic pillars including across four development areas that are relevant for space technologies and applications: agriculture, natural resources, and water; energy, blue economy, and digital infrastructure.

Space applications already play a key role in the rapid evolution of Africa's economic, political, and societal landscapes. They inform and facilitate the African Union's work towards ensuring economic growth, raising democracy levels, managing evolving demographics and its goals to support a just and equitable digital transition at continent level. Africa is also increasingly affected by global challenges related to climate change and regional insecurity that space applications can contribute to solving. Africa's Space Policy reflects this diverse landscape across its six objectives:

- Addressing user needs
- Accessing space services
- Developing the regional market
- Adopting good governance and management
- Coordinating the African space arena
- Promoting intra-Africa and other international cooperation

These objectives informed the creation of the African Space Agency which was launched in January 2023 with support across the African Union member states. The African Space Agency was established to promote, advise, and coordinate the development and utilisation of space science and technology in Africa, including coordination with international and regional institutions for an African regulatory framework for space activities on the continent. African countries have already been cooperating and collaborating on space issues for several decades and the African Space Agency will play a coordinating role with the additional mandate to promote strategic international and multilateral partnerships.

## Regional Space Organisations in Africa

	HEADQUARTERS & DATE OF CREATION	GOAL	MEMBER COUNTRIES
Regional Center for Training in Aerospace Surveys	Nigeria, 1972	Provide theoretical and practical training and consultancy in geoinformatics, integrated photogrammetry, remote sensing, geographic information systems, mapping and airborne geophysical surveys	Benin, Burkina Faso, Cameroon, Ghana, Mali, Niger, Nigeria and Senegal.
Organisation Africaine de la Cartographie et de la Télédétection	Algeria, 1988	Coordination of the efforts of African states in the field of cartography and remote sensing	23 members*
Centre Régional de Télédétection des Etats d'Afrique du Nord	Algeria, 1990	To provide the necessary assistance to create national institutions specialised in remote sensing, mapping and Geographic Information Systems To coordinate and strengthen member states policies in these fields	Algeria, Libya, Morocco, Mauritania, Tunisia, Egypt and Sudan
Centre Régional Africain des Sciences et Technologies de l'Espace en Langue Française	Morocco, 1998	To organise regional training courses, workshops, seminars, conferences and expert meetings in the field of space technology applications.	Algeria, Cameroon, Cape Verde, Central African Republic, Democratic Republic of Congo, Côte d'Ivoire, Gabon, Mauritania, Morocco, Niger, Senegal, Togo, Tunisia
Regional African Satellite Communication organisation	Ivory Coast, 1992	Provision of large-scale, low-cost telecommunications infrastructure for rural areas; improvement and development of communications within each country concerned  Establishment of communications between all countries on the African continent; improvement of radio and television broadcasts so that they are accessible to all without exception; revision of services, data, multimedia, tele-education, tele-medicine, voice, video conferences	Regional organisation
African Resource Management Constellation	Algeria, 2004	This constellation of satellites will provide data to assist in natural disaster management, food security, public health, land use and water resource management; all applications are accompanied by continental-scale climate change monitoring and mapping.	Nigeria, South Africa, Algeria and Kenya

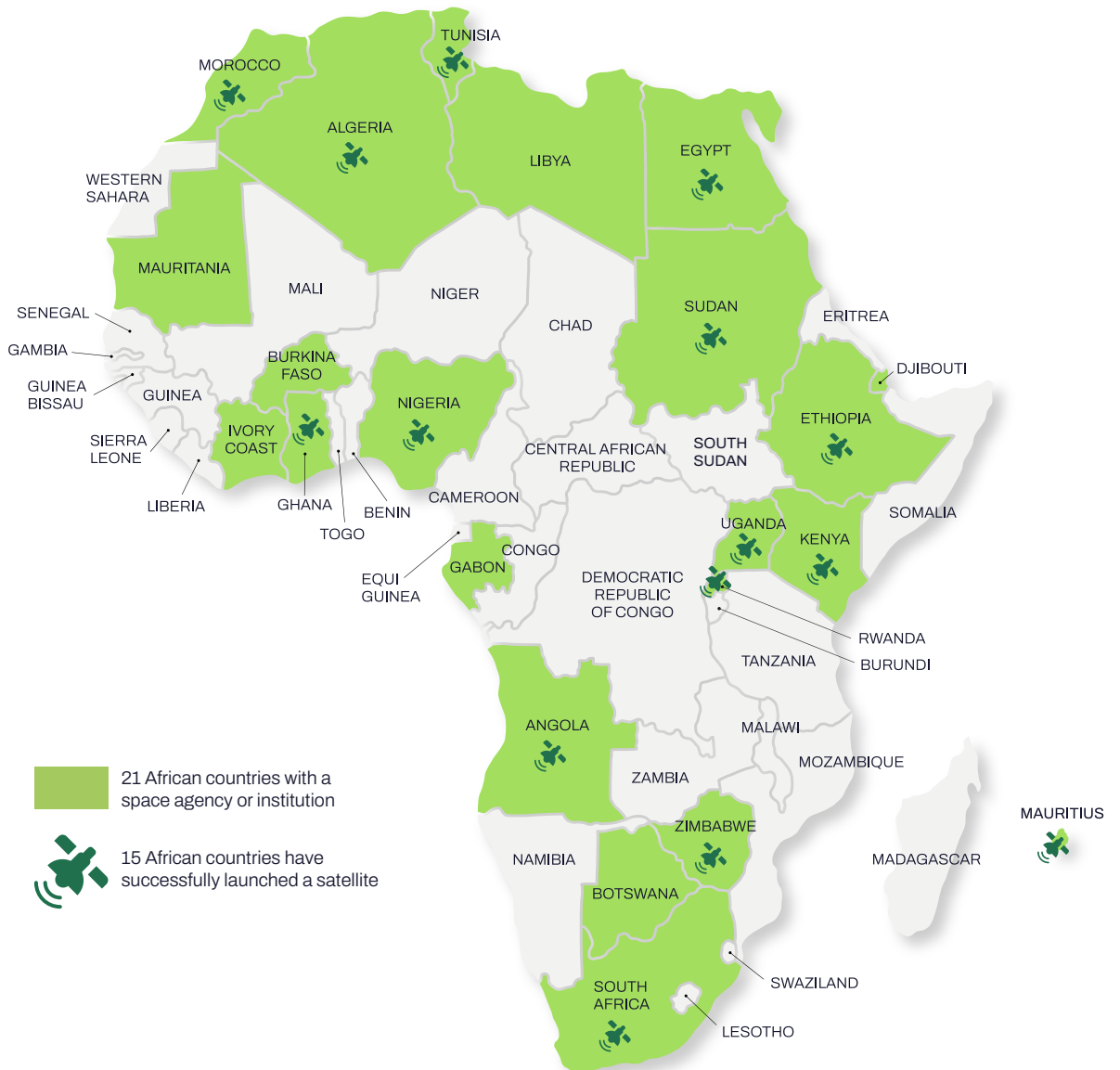
\* Algeria, Burkina Faso, Cameroon, Central African Republic, Congo, Democratic Republic of Congo, Ethiopia, Gabon, Ghana, Kenya, Liberia, Libya, Madagascar, Mali, Mauritania, Morocco, Niger, Senegal, Sudan, Tanzania, Togo, Tunisia, Uganda



## NATIONAL SPACE PROGRAMS

African countries with space programs, including those that have launched a national satellite, are the major stakeholders for the next chapter of Africa's space industry. 21 African countries have active space programs and 15 have launched satellites - primarily through European, Chinese, Russian, Indian, American, and Japanese launchers.

As of December 2022, 42 national satellites have been launched by African states. Egypt was the first country in Africa to launch a satellite in 1998 - the NILESAT 101. It was designed in collaboration with other countries and launched by ARIANE 4 - a European launcher. In 1999, the South African SUNSAT was the first satellite completely designed by African engineers.



Analysing the mission and goals of space programs across African countries reveals five key focus areas that are consistently prioritised.

**Earth Observation and Data Management:** Most African countries are invested in the acquisition, analysis, and application of Earth observation data for a multitude of purposes. These include agriculture monitoring, climate change assessment, resource management, environmental conservation, and urban planning. For example, [South Africa](#) concentrates on observing fields related to water, health, climate, agriculture, and ecosystems. Similarly, [Kenya](#) uses space technology for weather forecasting and land management. There remain many opportunities to use historic and new earth observation data for improved resource management and for new entrepreneurial ventures.

**Sustainable Resource Management and Environmental Monitoring:** Many countries leverage space technologies for sustainable resource management, particularly in agriculture and land use planning. Coupled with environmental monitoring, this focus emphasises the role of space technologies in informing and measuring the impact of sustainable practices at nation and regional scale. [Gabon](#) uses spatial observation data for the sustainable management of the environment, natural resources, and land use while [Tunisia](#) uses satellite imagery for sustainable agriculture and land use planning. All these current use cases highlight the vital role of space applications for the achievement of sustainability goals and highlight the potential for their utilisation in new climate adaptation and resilience initiatives.

**Space Technology Development and Capacity Building:** A prominent goal across African space programs is the development of national space technology capabilities and skilled human resources. This capacity building includes technical studies, technology transfer, engineering training, and fostering a culture of research and innovation. [Sudan](#) emphasises local research and development in space science and aerospace engineering, contributing towards a future Sudanese space agency. South Africa's space agency is more business - focused and invests in creating and developing skills to position the country at the forefront of space service technology development and competitiveness. African space agencies' commitment to building a skilled workforce and robust technical infrastructure for their space programs coupled with a young population, presents many opportunities for dynamic and valuable long-term partnerships.

**International Cooperation:** Numerous African national space agencies underscore the importance of international cooperation in their space exploration and data utilisation efforts whether it is through global research collaboration, technology sharing, or representing their country on the international stage. For instance, [Egypt](#) maintains close research relations with various international organisations and has 53 cooperation agreements in space sciences and remote sensing. In the same region, Tunisia prioritises partnerships in scientific research projects with the European Union and countries of the southern shore. The launch of the African Space Agency highlights the increasing significance of international cooperation on space for the African Union and its member states. The African Space Agency will facilitate robust engagement and cooperation on space issues of regional and international importance.

**Policy Alignment and Advisory Role:** Several space programs align their activities with broader national science and technology policies and advise governments on policy, demonstrating their strategic role in achieving national development goals. The [Rwanda](#) Space Agency advises the government on space policy and represents the country at the international level, illustrating the significance of policy integration and international diplomacy in space activities.

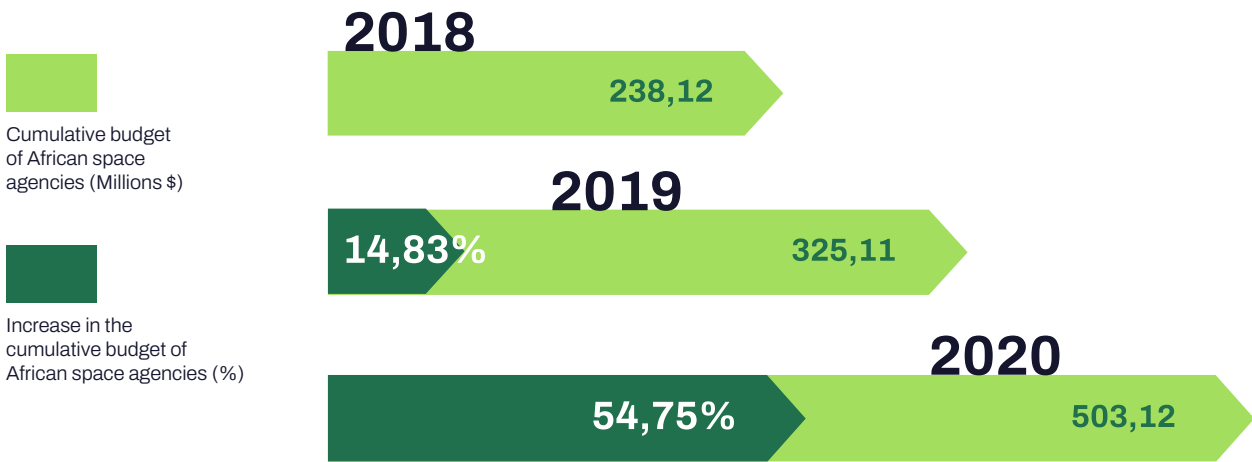
**African countries and satellite launches**

COUNTRY	YEAR OF FIRST SATELLITE LAUNCH	TOTAL SATELLITES LAUNCHED (DEC 2022)
Algeria	2002	6
Angola	2017	1
Ghana	2017	1
Egypt	1998	9
Ethiopia	2019	1
Kenya	2018	1
Morocco	2001	3
Mauritus	2021	1
Nigeria	2003	6
Rwanda	2019	1
South Africa	1999	9
Sudan	2019	1
Tunisia	2021	1
Uganda	2022	1
Zimbabwe	2022	1

## SPACE ECONOMY IN AFRICA

In 2021, the African space economy was valued at \$19,49 billion and projected to grow by 16,16% to USD 22,64 billion by 2026. According to [Space in Africa](#), there were 8500 people working in the space sector including 2000 in the private sector. The value of space technology and its various applications in the African context has been demonstrated by increasing investments in the sector with budgets for space initiatives increasing by 54,75% between 2018 and 2020 and a 368% increase in African satellites launched between 2017 and 2022. African nations allocated a total of \$534,9 million for the operation of their respective space programmes in 2022.

### African space agency budgets, 2018 - 2020



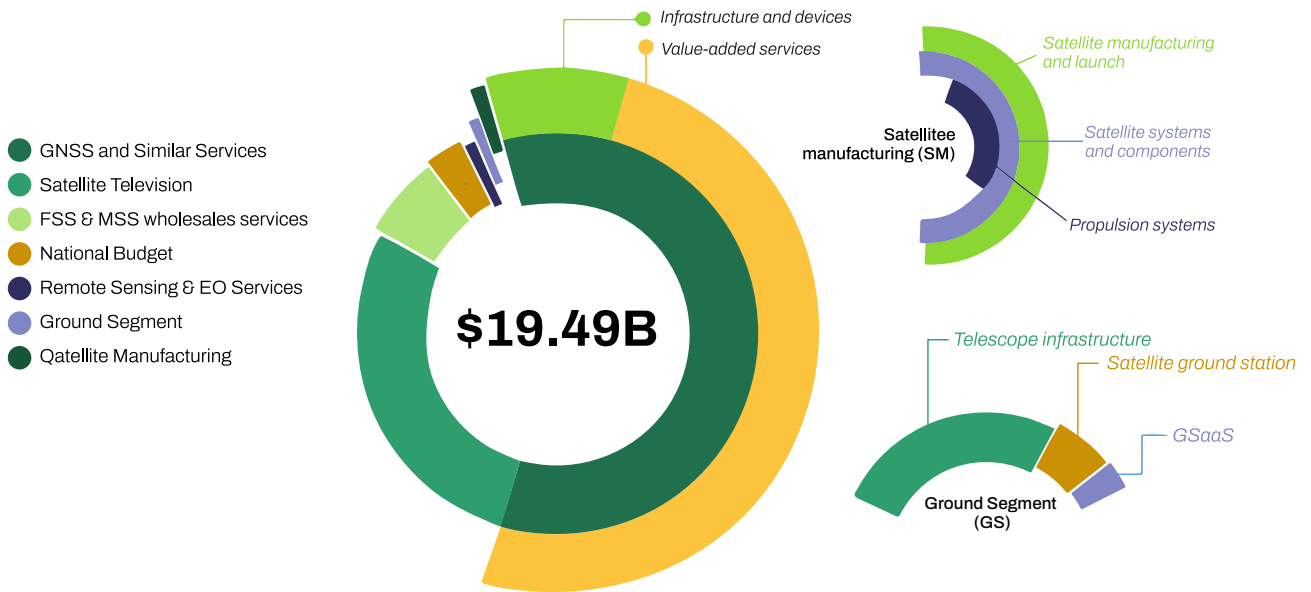
In addition to significant national investments in space, the growth of the African space economy has been driven by advancements in the development of space infrastructure and industry that have reduced the size and cost of satellites and increased capacity for processing big data. These developments have lowered the barrier of entry into space activities and applications for entrepreneurs and low to middle income countries. Satellite communication is expected to play an essential part in bridging the connectivity gap in Africa, while global navigation satellite system (GNSS) services and the satellite television segment remain the most significant contributors to the African space economy.

There are more than 280 companies in Africa operating in the space industry, the majority founded in the last decade and relying on images produced by African and European satellites. African entrepreneurs are using space applications to provide a variety of services, including establishing digital cadasters, herd security, territory management, water management, telemedicine, and remote education among others. There remain many opportunities to use space applications to inform and deliver public and private services in Africa.



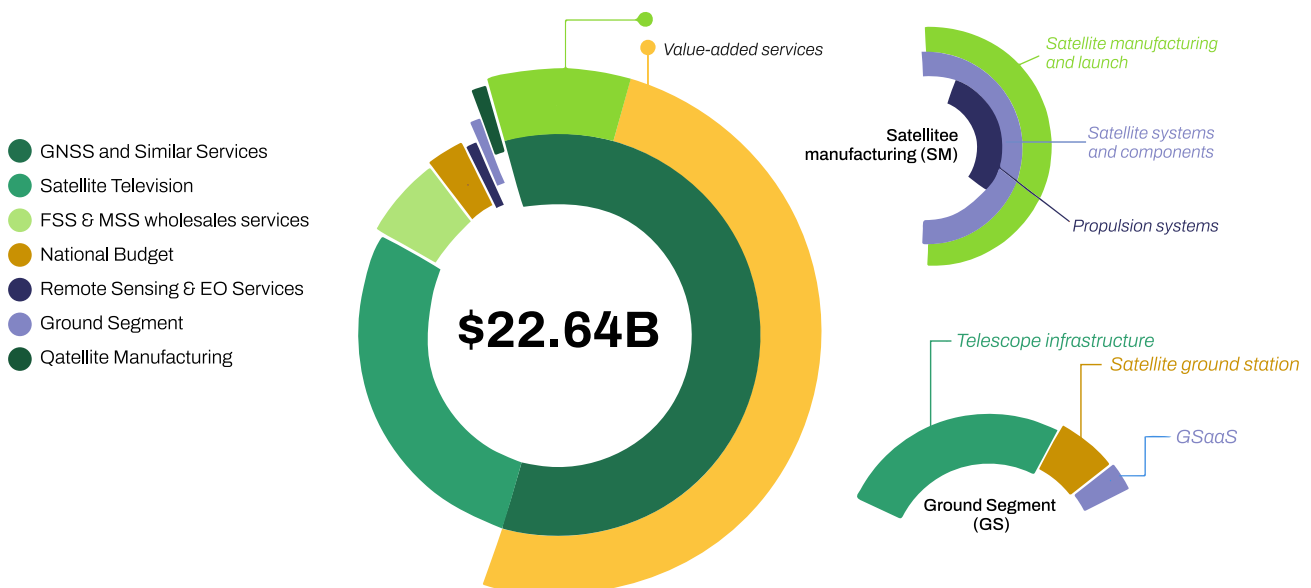
### 2021 African Space Industry Projection

The african space and satellites industry in numbers (U.S. dollars)



### 2026 African Space Industry Projection

The african space and satellites industry in numbers (U.S. dollars)



Source: Space in Africa, 2021

# Europe

## EUROPE POLICY AND STRATEGY

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The mission of the European Space Agency (ESA) is to shape the development of Europe's space capability and ensure that investment in space continues to deliver benefits to the citizens of Europe and the world. The Space 19+ resolution established the partnership framework between the ESA and the European Union. While the ESA is an autonomous agency, it shares a Financial Framework Partnership Agreement with the EU's Space Programme Agency to optimise public investment in the European space sector and support the implementation of European space programmes. The ESA's activities fall into two categories:

- mandatory programmes covering general administration, space science and technology, funded in proportion to members' gross domestic product; and,
- optional programmes funded according to the specific interests of member states such as satellite communications, human spaceflight and exploration, space transportation, earth observation, navigation, and space security.

In April 2021, the ESA unveiled its 'Agenda 2025', a comprehensive strategic blueprint to position Europe as a continued leader in the global space industry. This strategy concentrates on several key pillars. Firstly, it aims to fortify the relationship between the ESA and its European Union counterparts, emphasising an integrated approach to space exploration and innovation. The agenda further envisions stimulating the 'green' and digital commercialisation of the space industry, acting as a catalyst for sustainable and technologically advanced growth. Crucial to this endeavour is the retention of talent within Europe and facilitating access to capital through refined contractual mechanisms and strategic partnerships. An essential component of the agenda is the emphasis on safety and security in space, achieved through assessing the capabilities and needs of Member States to determine potential complementary activities the ESA can undertake. The creation of the Commercialisation, Industry and Procurement Directorate in 2021 further highlights the ESA's commitment to creating an enabling environment for the commercial success of European companies in the commercial space industry.

The ESA works closely with the European Union and the European Union Agency for Space Programme (EUSPA) on the construction of new and recurrent satellites for the Galileo and Copernicus programmes. The Matosinhos Manifesto, released during the ESA's Ministerial Council in November 2021, emphasises the vital role of space solutions in addressing societal challenges. These range from leveraging satellite technology for climate change mitigation to enhancing crisis response capabilities during natural disasters.

## SPACE ECONOMY IN EUROPE

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Europe is one of the global leaders in space advancement. The European space [economy](#) generates €9 billion in upstream revenues and €70 billion of downstream revenues which represents 25% and 35% of the global space market. At the end of 2022, there were 230 thousand jobs in the European space economy. In addition to its coordination and harmonisation functions, the ESA is European Union's technical manager for the development of its flagship space programs Copernicus (earth observation) and Galileo (satellite navigation). The ESA's budget in 2022 was €7.15 billion, rising to €14,4 billion over the next 3-5 years funded by European Union member state contributions. The main contributors to the ESA's budget today are Germany (22.9%), France (18.5%), Italy (15.9%) and the United Kingdom (11.5%).

In 2022 the ESA produced a comprehensive [report](#) on the European space economy across three domains: science and exploration, space safety, and enabling and support.

# Strengthening an Africa-Europe partnership on space

Common goals of leveraging space technologies to stimulate economic development, benefit citizens, and to facilitate international cooperation present opportunities for an Africa Europe partnership on space. While there is already some collaboration and cooperation between European and African space agencies and stakeholders, these can be expanded and diversified by leveraging the launch of the Africa Space Agency and through the development of ESA's strategy beyond 2025. Further, Africa and Europe can benefit from cooperation on space to shift the narrative towards mutual opportunities for growth.

## EXAMPLES OF CURRENT COLLABORATION AND JOINT INITIATIVES

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The Global Monitoring for Environment and Security (formerly GMES, now [Corpenicus](#)) and Africa [programme](#) is the primary initiative providing a framework for sustained cooperation between Europe and Africa in space science and technology and earth observation. The GMES and Africa programme aims to improve the capacity of African decision-makers, scientists, businesses, the private sector, and the public to design and implement national, regional, and continental policies and to promote the sustainable management of natural resources using earth observation data. The programme, co-funded by the African Union Commission and European Commission, builds on the achievements of previous earth observation programmes in Africa including the Monitoring for Environment and Security in Africa (MESA) and the African Management of the Environment for Sustainable Development (AMESD).

The objectives of this programme, now in its second phase (2021 – 2025) are to:

- Implement the earth observation segment of the African Space Policy and Strategy
- Enhance long-term strategic cooperation for the integration and deployment of African requirements and needs in Copernicus Services
- Promote the development of local capacities for access and utilisation of earth observation - based services for sustainable development in Africa
- Enable the two continents to jointly solve and address specific and global challenges and contribute to the attainment of their overarching development goals
- Provide policymakers, scientists, business, and the public with earth observation services



Through the GMES and Africa Programme, data and services from the EU Copernicus programme have been adapted for use in the African context. The programme, with its collaborative consortia of over 100 institutions, is channelling development efforts into earth observation applications focusing on the management of water resources, natural resources, and marine environments. The consortia leading these initiatives are becoming instrumental players in Africa's water, natural resources, and marine management sectors, leveraging their expertise and dedication to drive sustainable management practices enabled by space technology. Applications are being developed across several critical sectors, such as surface water monitoring, river navigability, groundwater management, seasonal monitoring of tropical lands, land degradation, and water and agro-ecological zoning. Marine applications informed by earth observation data include oceanographic variable forecasting, fishing area monitoring, coastal vulnerability assessment, and oil spill and maritime traffic monitoring. These applications, aligned with the strategic goals of most African space agencies and the ESA's goals of a 'green' and digital commercialisation of the space industry, further emphasize the broad scope and potential of an Africa Europe partnership on space.

Outside the GMES and Africa programme, there are numerous European-African space initiatives. The [Space Climate Observatory](#) (SCO), initiated by the National Center for Space Studies in 2015 in France and officially established in 2019, unites 29 international organizations. It aims to create indicators of climate change by combining satellite and field data to aid local adaptation strategies, with 15 projects already underway in France. The SCO includes projects like OSS Sénégal, Stock Water Burkina Faso, and ECLAT in Chad. The Intra-ACP Program on [Climate Services and Related Applications](#) (ClimSA), an €85 million initiative African, Caribbean and Pacific States (OACPS) and the European Union that focuses on strengthening the climate services value chain. This involves technical assistance, financial aid, and infrastructure support to boost climate information access, generation, and delivery. Construction of the [Square Kilometer Array](#) telescopes in South Africa and Australia, with expected completion in 2028, is intended to transform our understanding of the universe. Lastly, the Space Generation Advisory Council (SGAC), founded in 1999, advocates for the voice of students and young professionals in the space sector at the United Nations and other international organizations. With over 15,000 members in 150 countries, it is the largest global network of students and young professionals in the space industry.

## OPPORTUNITIES FOR AN AFRICA EUROPE PARTNERSHIP ON SPACE

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While there is an impressive number of ongoing initiatives bringing together African and European stakeholders together, there remain opportunities for a catalytic partnership focused on shared strategic goals. The AU-EU summit in February 2022 reconfirmed the importance of collaboration on space, but also opened specific avenues on strengthening collaboration through commitments on digital transformation and research and development. In addition to the anticipated coordination and leadership role of the African Space Agency, the [EU Africa Global Gateway Investment Package](#) may provide the necessary funding to unlock opportunities for a strengthened and progressive Africa-Europe partnership. An Africa Europe partnership on space could focus on the following areas:



### Promoting women's leadership and participation in the space industry and economy

In Africa and in Europe, the space industry and economy are dominated by men. While there are initiatives to encourage women's participation in Africa and Europe, these could be enhanced by a focused partnership on female participation and leadership in the space industry and economy. While the Women in GMES and Africa successfully experts across both continents, an Africa Europe partnership in this area could focus on generating interest in space technologies among young women, creating accessible space education platforms, and connecting young women to expert mentors who can guide them through a space-focused career. Such a partnership, through its advocacy and joint communication initiatives, would align with the African Union and ESA's goals of building human resource capacity for the development and use of space science and technology.



### Accelerating and facilitating youth-led initiatives based on space technologies

Although space technologies have a wide scope of application in many different sectors, but this knowledge is often limited to expert circles that young people do not have access to. An Africa Europe partnership, co-created by young people, could be a mechanism for catalysing young people's engagement in the development and use of space applications to address global challenges such as climate change, digital transformation, and the transition to green energy. In collaboration with the private sector, an Africa Europe partnership could develop a framework for increased investment in accessible space education and youth-led initiatives that use space applications to generate economic and social value. Such a partnership would concentrate efforts to develop and retain technical capacity in the space industry which aligns with Africa and Europe's strategic goals.



### Strategic leadership on space initiatives

The space ecosystems in Africa and in Europe are comprised of several key stakeholders including national space institutions and agencies non-governmental and institutional partnerships that play a significant role in building bridges between the two continents. However, there is gap in strategic leadership across the space ecosystems particularly in the development of international regulatory frameworks, that an Africa Europe partnership on space could address. This partnership on space could provide strategic and thought leadership on the development of regulatory frameworks, accountability mechanisms for government and private actors in space, facilitate knowledge generation and transfer, and enable venture partnership opportunities for different stakeholders that advance the continents' common strategic goals.

The space industry's potential to transform African and European economies, societies, and lives is vast and largely untapped. An Africa-Europe partnership on space would harness this potential, leveraging the strengths and resources of both continents to generate cross-cutting benefits. The partnership would amplify ongoing initiatives and drive new ones, create a vibrant and inclusive space sector, and rewrite the Africa-Europe narrative. As we look towards the future, space offers a platform for innovation and cooperation that can help us address some of the most pressing challenges of our time. Harnessing the potential of space will require a shared vision and commitment to a strategic partnership between Africa and Europe.

The Africa-Europe Foundation (AEF) is an independent platform for multi-stakeholder dialogue, frank debate and strategic analysis, working as a ‘network of networks’ in bringing together citizens and leaders from all walks of life united by a passionate belief in a deeper partnership between Africa and Europe.

AEF was co-founded by a leading European thinktank, Friends of Europe, and a leading African Foundation, the Mo Ibrahim Foundation, in partnership with the African Climate Foundation and the ONE Campaign.

Founded by:



In Partnership with:





**Brussels Office**

Treesquare  
De Meeûssquare 5/6  
1000 Brussels  
Belgium

**Cape Town Office**

The Oval  
1st Floor Oakdale House  
1 Oakdale Road, Claremont  
Cape Town 7708  
South Africa

[www.africaeuropfoundation.org](http://www.africaeuropfoundation.org)