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INTRODUCTION

Introduction



 The Space Strategy for Cyprus 2022-2027 is an operational document that was collectively developed by the Department of Electronic Communications of the Deputy Ministry of Research, Innovation and Digital Policy.

• Its aim is to structure and coordinate the space policy related matters in Cyprus, as well as to demonstrate the willingness of the stakeholders to work together for the strengthening of the national space ecosystem.

Introduction (2)



The strategy takes into account:

- ➤ The new EU Space Regulation, EU Space Strategy, and EU Council Conclusions
- > EU Secure Connectivity Programme
- > The ESA principles, initiatives, and programmes.
- ➤ The United Nations Committee on Peaceful Uses of Outer Space guidelines for the Long-term Sustainability of Outer Space Activities
- > The PECS study titled, "Cyprus spacE sectoR dEvelopment Study (CERES)".
- The ESA "End of Period Report" recommendations, regarding the first ECS/PECS Agreement (2017-2022).
- > The national particularities, needs and priorities.



CYPRUS VISION AND OBJECTIVES IN SPACE

Cyprus vision and objectives in space



- ➤ **Our vision** is Cyprus to become a Society of Information based on modern space technologies, skills, and infrastructure, in the context of the national objective to be established as a regional digital hub in the area of Easter Mediterranean.
- ➤ The Government of the Republic of Cyprus has verified its political will and commitment for the development of the space technology sector in Cyprus.
- Many synergies can be developed with other national strategies and actions such as the Digital Strategy, the National Strategy for Research and Innovation, the Blue Growth Strategy and the Green Development Strategy.
- > Space technologies, data and services have the potential to help achieve this strategic objective of diversification from the traditional sectors of the economy such us tourism, agriculture, and shipping.



GLOBAL SPACE TRENDS AND SPACE ECONOMY



Space Economy

- ➤ In the context of the "New Space" dynamic, in Europe and globally, there are new business models characterized by higher private-sector investment.
- ➤ The global space economy is worth more than 447 billion US dollars per year with additional products and services
- ➤ Additional players, public and private, are entering the scene and the volume of space economy (services and products) activities continues to rise.



Global Space Trends

- > The European Digital Decade
- > The European Green Deal initiative
- Also, while always strongly tied to defense, Space witnesses its relevance growing **as a component of defence programmes,** with space sovereignty to becomes key for an increasing number of nations.
- Finally, with space saturation and increased risk of collisions, the availability and safety of space infrastructure, which supports our daily lives, and our very ability to access, use and operate in space in a sustainable manner are at risk. Therefore new programmes like SSA/SST and STM(Space Traffic Management) are emerging.

Global Space trends and Space economy(3)



Global Space Trends

- ➤ Earth Observation: The Earth Observation market is rapidly growing with rise in both supply of imagery through NewSpace constellations as well as in demand.
- ➤ Satellite communications: Satcoms are critical to a wide range of businesses, governmental and leisure activities. Compared to terrestrial infrastructures, Satcoms provide an unmatched level of availability, coverage, confidentiality and resilience. (New Space LEO Operators, LEO Constellations, Mega Constellations, Quantum Communications, Optical Communications, Low latency and high throughput applications).
- Satellite navigation: Navigation satellites provide positioning and timing data to an ever-expanding user base. The development of multi-constellation receivers (compatible with multiple GNSS signals) is expected to result in greater uptake by end users and enhance performance in terms of accuracy and integrity.



NATIONAL SPACE ACTIVITIES AND GOVERNANCE



National Space Activities

In chapter 5 of the Strategy Cyprus priorities, activities and achievements are presented regarding:

- Satellite Communications
- Satellite Navigation
- Earth Observation
- Relation with other International Organizations
- Relations with ESA



<u>Governance – Cyprus Space Office and Cypriot Space Policy Advisory Group</u>

- ➤ Regarding space activities in Cyprus, major developments have been undertaken, based on the Council Decision of Ministers in 2008.
- ➤ Governance lies in the Deputy Ministry of research, Innovation and Digital Policy and its Department of Electronic Communications.
- > The Department of Electronic Communications acts as the Cyprus Space Office.
- The establishment of a Cypriot Space Policy Advisory Group will composed of representatives from the Cypriot academia and industry, in order to advise the Minister on space policy related issues.





<u>Governance – Cyprus Space Office</u>

In general, the functions of the Cypriot Space office will be:

- to coordinate the participation of Cyprus in Copernicus, Galileo/EGNOS, GOVSATCOM and SSA/SST EU space programmes and exploit all the opportunities offered;
- to coordinate the Cypriot delegation in ESA;
- to work on operational measures, personnel and funds concerning the implementation of the space strategy;
- to implement "Cyprus Space Law";
- to strengthen the National space ecosystem and to facilitate international collaboration;
- to increase awareness and inspiration regarding Space;
- and to support the inclusion of space related courses and education in Cyprus education system.



ASSESSMENT OF CYPRUS KEY COMPETENCES

Assessment of Cyprus key competences



The key existing competences, as identified in ESA 'End of Period Report' are in:

- Materials (specifically CFRP, Carbon Fiber Reinforced Polymers) and electrical components -Hardware
- Electro-magnetic measurements
- Earth-Space-Earth communication links
- Earth observation data exploitation (like ground movement, weather forecasting, water and agriculture) –Software/applications

As we are advancing and getting more projects from ongoing ESA PECS Calls the spectrum of competences is growing.



PILLARS, GOALS AND NEXT STEPS

Pillars, Goals and Next steps



- The Deputy Ministry of Research, Innovation and Digital Policy considers the accession of Cyprus to the ESA and participation in all EU space programmes, as an urgent and paramount need
- Space has an important role, through the use of data, services, and applications, in many different sectors such as Mobility, Connectivity, Agricultural, Climate, Tourism and Health, Emergency Management and Humanitarian aid, Environmental monitoring, Maritime, Urban Development, Cultural Heritage, Energy and Finance.
- > Space is an enabler tool that contributes to their monitoring and mitigation measures increasing society's resilience and capacity to recover from crises.
- > This strategy addresses 8 major pillars that have to be explored in order for Cyprus to become a space faring nation.



<u>Pillar 1:</u> Education, skills, and awareness

> Our goal is that Cyprus higher education institutions will ensure the development of an adequate base of world class trained engineers to be able to support Cypriot space industry.

Current Status

- A knowledge-based society requires well-trained scientists and technical experts, which makes it even more important to stimulate the enthusiasm of young people for science and technology at an early stage
- Despite Cyprus having highly valued Scientific Institutes and Universities, the students lack space application opportunities or relevant space-based degree courses such as space engineering, astrodynamics, astrophysics etc.



Strategic Actions

- > Identifying education and training opportunities to meet industry needs
- > Nurture a stream of graduates and post-grads to support the space sector
- Boost awareness
- > Enable upskilling to support industry demands of space enterprises
- > Development of schemes for attracting skilled human capital to Cyprus

All the above actions are thoroughly explained in the Space Strategy Document and monitored through specific KPI's.



Pillar 2: Entering in the space supply chain and international impact

Pour goal is that Cyprus businesses and research organizations will collaborate with the key players in the global space industry to deliver world-class space activities, in close cooperation with EU and ESA, in order to develop recurring products and services that have high commercial potential and eventually to foster a resilient and sustainable National space ecosystem.

Current Status

- Companies in the space sector are faced with high costs of qualification of technologies and processes, as well as long investment cycles, which create barriers to entry into the industry.
- > Cyprus should capitalize on the expansion of specific actions in the areas of research and development and help encourage and nurture start-ups.

Pillars, Goals and Next steps – <u>Pillar 2:</u> Entering in the space supply chain and international impact



Strategic Actions

- > Explore the feasibility of a Space Technology Park
- Support start-ups, spin-offs, and SME's (BIC and Space Cluster)
- ➤ Boost International cooperation
- ➤ Develop Cyprus Space Website

All the above actions are thoroughly explained in the Space Strategy Document and monitored through specific KPI's.



Pillar 3: Research and product commercialization

➤ Our **goal** is that Research organizations and universities operating in Cyprus <u>will</u> participate in the leading space projects and generate excellence and world-class knowledge in space and related science disciplines.

Current Status

Several Cypriot research institutions are already significantly involved in development and research activities in the space domain through relevant projects, amongs other by creating their CoE's (Centres of Excellence).



Current Status (cont.)

- There is a great potential to further increase Cyprus visibility and reputation in the international arena
- Strategic Actions fall under this pillar aim to the support of the space related R&I activities to facilitate the development of upstream and downstream, products and services through the use of several instruments and funding opportunities. In turn, this will contribute towards the creation and development of innovative businesses and commercial applications in and around the space sector.



Strategic Actions

- ➤ Support space R&D and CoE
- > Focus on product commercialization

All the above actions are thoroughly explained in the Space Strategy Document and monitored through specific KPI's.

Pillars, Goals and Next steps – <u>Pillar 4:</u> Governmental services for National Security and Socioeconomic Sustainability



<u>Pillar 4:</u> Governmental services for National Security and Socioeconomic Sustainability

> Our **goal** is that based on Cyprus social, economic, security and environmental needs, satellite-based services and applications will be developed and built in Cyprus and these will increasingly integrate within the public sector at local and national level.

Current Status

- > Space technologies and its applications in the public sector provide valuable contributions to meeting the social needs of our time with a toolbox of innovative technologies, mainly through information on security, emergency and disaster management and resilience, search and rescue, land use and other delivered both independently and jointly by Copernicus (Earth Observation) and Galileo (navigation)
- These services are of enormous economic and security-related strategic interest and should increase the safety of citizens, facilitate decision-making in certain policy areas and improve methods and procedures when integrated with other technologies contributing to citizens social prosperity.

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Pillars, Goals and Next steps – <u>Pillar 4:</u> Governmental services for National Security and Socioeconomic Sustainability(2)



<u>Pillar 4:</u> Governmental services for National Security and Socioeconomic Sustainability

Current Status (cont.)

- > the national use of space technologies can increase Cyprus's political influence and image since space is the new frontier and therefore being seen as a spacefaring nation increases the national image.
- > Strategic Actions which fall under this pillar aim to integrate Space technologies and its applications in the public sector in order to provide valuable contributions to meet the social, security and economic needs by using Copernicus (Earth Observation) Galileo (navigation) and other EU Space Programmes (GOVSATCOM and the new Secure Connectivity Programme).



Strategic Actions

- > Cypriot Government to become an early adopter of space applications
- ➤ Establish an Optical Gateway to exploit opportunities in EU GOVSATCOM, Euro QCI and Secure Connectivity programme

All the above actions are thoroughly explained in the Space Strategy Document and monitored through specific KPI's.



Pillar 5: ESA Associate Member

➤ Our goal is that Cyprus has to become an ESA Associate member by 2025 but no later than 2027. The Deputy Ministry of Research, Innovation and Digital Policy of Cyprus considers the accession of Cyprus to the ESA as an urgent and paramount need from an overall perspective.

Current Status

- ➤ In November 2021, Cyprus and ESA signed the new ECS+ Agreement.
- This new ECS+ Agreement gives the opportunity of a mid-term review in the third year in order to assess our potential readiness to transition earlier to associate membership along with many other improvements.
- Our subscription for 2023 will be increased by 500.000 Euros reaching to a total of 2.650.000 Euros.
- > Accession of Cyprus in ESA Membership will provide for a balanced growth and ensure the competitiveness of the Cypriot space ecosystem



Pillar 6: Satellite Communications

> Our **goal** is to materialize Cyprus' goal **to become a regional digital hub** and to be in line with EU goal to become a world-class data hub where data is stored, shared, and processed in a secure way.

Current Status

- Cyprus have seen major developments in satellite communications infrastructure. Important gateway facilities and monitoring stations have been deployed in Cyprus serving major European satellite operators. These facilities are now expanding to support new satellites that are scheduled for launch in the coming years.
- ➤ Telecommunications affect the way people communicate on a global scale and have become the foundation for industry, governments, academia, and citizens to seamlessly, reliably and timely connect and share information.



Pillar 6: Satellite Communications

Current Status(cont.)

➢ it is more than critical to leverage the existing Cypriot infrastructures and develop new ones when this is necessary. To make it feasible, focused and efficient, dedicate funding schemes are necessary either from the government either from ESA. Further to that it is essential for Cyprus government to create specific initiatives to strengthen the sector. Strategic Actions which fall under this pillar aim to succeed the above.



Strategic Actions

- > Leverage the existing Cypriot infrastructures and develop new ones
- Develop national Initiatives to strengthen the sector and attract new companies
- Improve Satellite Coordination procedures

All the above actions are thoroughly explained in the Space Strategy Document and monitored through specific KPI's.



Pillar 7: Astronomy

➤ Our goal is Cyprus to become an attractive destination for Astronomers and develop the appropriate infrastructures for that reason. Also, part of that vision is to educate and create a cross disciplinary experience for a cross generational audience with emphasis on education of primary and secondary school students as well and young graduates.

Current Status

- ➤ It is widely acknowledged that Astronomy can play a very important role in inspiring young people to pursue a career in Science and Engineering.
- ➤ It is worth noting that in the last 10 years, 4 of the Nobel prizes in Physics were awarded for discoveries in Astronomy.
- The potential for discovery is still huge and there are several big multi-national astronomy projects in progress or in the planning phase. Hence supporting professional astronomy is very important.



Pillar 7: Astronomy

Current Status (cont.)

- For the last 20 years several private organizations and associations have been organizing Astronomy events on their own quite successfully but without collaborating with each other.
- There are different organizations with different strengths and weaknesses and it is key to identify which of these organizations are actually active in the outreach sector and of course which ones do it well.
- In addition, Cyprus has PhD graduates in Astrophysics and Astronomy that are currently working in irrelevant to their studies jobs. These people could be the critical mass for the upgrade of Astronomy and space research in Cyprus.



Strategic Actions

- ➤ Introduce Astronomy education in Schools
- ➤ Support Professional Astronomy
- ➤ Leverage existing Infrastructures and Programs

All the above actions are thoroughly explained in the Space Strategy Document and monitored through specific KPI's.



Pillar 8: Earth Observation

The earth observation **sector is a very important priority for Cyprus**. Having in mind that Cyprus has one of the best climate conditions for earth observation, we can secure funds and attract investments in this sector. Of course, it is very important that the expertise gained from the academia and the research to be transferred to the industry **for the commercial development of related services**.

Current Status

- > Earth observation along with the telecoms are the technologies that are largely developed in Cyprus.
- Especially EO has a broad network in Cyprus and many of the entities have developed cutting edge technologies.
- ➤ During the last decades, earth observation has become more sophisticated with the development of remote-sensing satellites and the ever-increasing high-tech instruments



Pillar 8: Earth Observation

Current Status (cont.)

- > Cyprus should rely on the respective space assets for several reasons, e.g. security against invasions, protection against natural crisis, environmental (land and water changes) and physical resources (energy resources) sustainability.
- Consequently, it is important to maintain and further enhance the EO existing capacities, as well as even develop new ones. Considering this, Cyprus's collaboration with ESA will help the country towards this direction



Strategic Actions

- > Cypriot Government to exploit EO applications
- ➤ Leverage the existing Cypriot EO infrastructures and develop new ones

All the above actions are thoroughly explained in the Space Strategy Document and monitored through specific KPI's.



STRATEGY IMPLEMENTATION ACTION PLAN



- For the Purpose of the implementation of this strategy an executive overview was created and presented in Annex III.
- This overview encapsulates the strategy, the actions and initiatives, the timeline, the ownership, the stakeholders mapping, the resources, the dependencies etc., based on the Strategy SMART model (Specific, measurable, achievable, resources and time-bound).
- > A detailed Action Plan will be prepared based on this overview.



FUNDING

Funding



The Implementation of this strategy will be mainly funded from the following sources:

- Cyprus annual contributions to the ESA ECS+ Agreement
- > Through participation in the EU Horizon Europe, Digital Europe and CEF2 programmes
- ➤ Through relevant national support programmes of the Research & Innovation Foundation (like Smart Specialization Strategy)
- > EU Structural Funds programmes for research, innovation and start-ups like CASSINI Initiative
- > Through the allocated national budget of the involved ministries.

The Action Plan, based on this strategy, will include all the allocated available funding.





Cyprus Space Policy Advisory Group will review performance of the Space Strategy of Cyprus 2022-2027 in achieving its results against related Key Performance Indicators (KPIs).

Cyprus Space Policy Advisory Group will provide a report to the Deputy Minister of Research, Innovation and Digital Policy every year, reporting on the performance of the strategy and recommending changes to the strategy, including suggested new KPIs for improved measurement.



Outcome 1: Sufficient numbers of Cypriot-educated and suitably skilled new workers are available for employment in the Cypriot Space Sector.

KPIs:

- > [1.1] Number of PhD and Master's students with space-related theses at least 6 PhD theses and 20 MSc theses until 2027
- ➤ [1.2] Number of Young Graduate trainees and International Research fellows at ESA at least 3 Young Graduate trainees and International Research fellows at ESA until 2027
- ➤ [1.3] Number of space-related modules (courses) offered by Cypriot universities at least 6 new or improved space-related modules (courses such as space engineering, astrodynamics, astrophysics etc) offered by Cypriot universities until 2027
- > [1.4] Number of trainee placements in Cypriot Space companies at least 6 until 2027.
- > [1.5] Develop a detailed Skills Needs Assessment (SNA) by end of 2023.
- > [1.6] Number of Trainings throughout the period of 2022-2027 at least 30 until 2027
- > [1.7] Introduce Space activities that promote the Space awareness Number of Conferences (8), Trainings (12), Seminars (12) and School Visits(8) throughout the period of 2022-2027
- > [1.8] Attract a Number of highly skilled talent (10) for local Space related industries by the end of 2027



Outcome 2: At least 5 new companies benefit from the ESA engagement (Through PECS+ or Associate Membership)

KPI:

> [2] Number of New Cypriot companies or research institutions, which won a contract in any ESA programme (Through PECS+ or Associate Membership) – at least 5 until 2027

Outcome 3: Establish a Space BIC (later to be an ESA BIC) in Cyprus by 2024. At least 10 (if Space BIC established) new start-up or spin-off companies created and benefit from the ESA engagement. Also assess the feasibility of a dedicated Space Technology Park to boost the Space Ecosystem

KPI:

- > [3.1] Establish a Space BIC (later to be an ESA BIC) in Cyprus by 2024.
- ➤ [3.2] Number start-up or spin-off companies created and benefit from the ESA engagement, in terms of contracts won, loans or technical support that impact their product development and IPR at least 10 (if Space BIC established) until 2027.
- > [3.3] Feasibility Study of a dedicated Space Technology Park by 2026.



Outcome 4: At least 3 commercial space contracts won by Cypriot entities outside the ESA and EU programmes.

KPI:

➤ [4] Number of commercial space contracts won by Cypriot entities outside the ESA and EU programmes — at least 3 until 2027.

Outcome 5: Cypriot companies have products in the supply chain of the Large System Integrators.

KPI:

> [5] Number of Cypriot companies which have products in the supply chain of the Large System Integrators – at least 4 until 2027.

Outcome 6: Become an ESA Associate Member.

KPI:

> [6] become an ESA Associate Member by 2025, but not later than 2027

Outcome 7: Create Cyprus Space Website and an assessment of the infrastructure available in Cyprus, needs and gaps by 2023

KPI:

- > [7.1] Create Online Directory and Cyprus Space Website by the end of 2023 (DONE)
- > [7.2] Have an assessment of the infrastructure available in Cyprus, needs and gaps by 2023 (DONE)



Outcome 8: The number of above the threshold evaluated project proposals through the EU Horizon Europe programmes in space-related activities are doubled (from years 2022 to 2027). Also Boosting existing Government programmes and launch initiatives aimed at supporting collaboration between academia and private enterprise within the space sector in order to have Commercial applications.

KPI:

- ➤ [8.1] Number of project proposals evaluated above the threshold through the EU Horizon Europe programme in space-related activities (from years 2021 to 2027) at least 15.
- > [8.2] Number of project proposals financed through Research Promotion Foundation's RESTART Programme or equal national scheme (from years 2022 to 2027) at least 15.
- > [8.3] Build and develop new Space funds to ensure that start-ups and SMEs continue to have access to local funding by 2024. (KPI 8.3)
- ➤ [8.4] Number of Cypriot companies operating in non-space markets to have integrated space-based capabilities into their commercial service portfolio (e.g. civil/geotechnical engineering, consulting engineering, health services, transport services, infrastructure providers, and financial services) by 2024 —at least 4 until 2027



Outcome 9: At least five new sustainable Earth Observation or navigation services (applications) that are based on advanced data analytics capabilities of space data are developed and integrated into the public or private sector

KPI:

➤ [9] Number of Earth Observation or navigation services (applications) that are based on advanced data analytics capabilities of space data developed and integrated in the public or private sector — at least 5 until 2027.

Outcome 10: Establish an Optical Gateway in Cyprus in order to interconnect with EuroQCI and the upcoming Space Based Secured Connectivity Initiative

KPI:

> [10] Establish an Optical Gateway in Cyprus by 2025.



Outcome 11: Establish a Space Policy Advisory group

KPI:

> [11] Establish a Space Policy Advisory Group in Cyprus by 2022.

Outcome 12: Establish Cyprus Space Office

KPI:

> [12] Establish the Cyprus Space Office, through the strengthening of DEC, by 2023

Outcome 13: New Satellite communications infrastructures

KPI:

> [13] A Number of new Satellite Communications infrastructures will be created by 2027

Outcome 14: Improve Satellite coordination section

KPI:

> [14] Hire 3 (three) well trained professionals in the field of satellite communications or outsource the whole procedure to Companies specialized in such field by 2024

Outcome 15: Develop government initiatives to attract sat comms companies

KPI:

> [15] Keep a clear and simple tax regime, and improve legislation on space and satellite registers by 2027



Outcome 16: All responsible ministries must raise awareness of the potential of space applications in the public sector for various governmental fields through the provision of trainings for different governmental level specialists and key decision-makers.

KPI:

> [16] Organization of a Number of Trainings (20) throughout the period of 2022-2027

Outcome 17: All ministries, agencies and public services involved shall assess the need to set up collaboration with other Eastern Mediterranean National Entities (i.e Greece and Israel) in the areas of common interest, e.g. – sea border monitoring, water quality monitoring, fire detection, Search and rescue, etc.

KPI:

> [17] Sign a Number MoU (8) throughout the period of 2022-2027

Outcome 18: Introduce Astronomy activities that promote the Astronomy awareness

KPI:

➤ [18] Introduce Astronomy activities that promote the Astronomy awareness through a Number of Conferences (4), Trainings (4), Seminars(4) and School Visits(8) throughout the period of 2022-2027 with the help of Local Astronomy Organizations and Institutes



Outcome 19: Leverage the Use of National Infrastructure in EU Programs

KPI:

> [19] Get the National Telescopes involved in Optical Communications, EuroQCI and SSA/SST EU Programme by 2025.

Outcome 20: New Earth Observation infrastructures

KPI:

> [20] A Number of new Earth Observation infrastructures will be created by 2027



Ευχαριστώ πολύ για την προσοχή σας!