

Portugal Space 2030

A research, innovation and growth strategy for Portugal

A. STRATEGIC OBJECTIVES:

- Promote economic growth and the creation of skilled jobs in Portugal by promoting space-related markets, namely through market uptake and exploitation of satellite data and signals cutting across multiple activity sectors and addressing societal challenges, including in agriculture, fisheries; in monitoring infrastructures, in urban development, in defence and home security, and in the public health sector;
- Foster the generation of satellite data through new space technologies and space-related infrastructures in Portugal, leveraging international scientific and technological cooperation and turning Portugal into a stronger player in the space sector, with emphasis on new space industries (i.e., “New Space”).
- Contribute to the development of the country and to the strengthening of diplomatic relations and international scientific cooperation, taking into account the advantages of Portugal's geo-strategic position for the Space sector, and also with a view to sharing the return of space activities with countries and not yet developed capacities in the space domain, with emphasis on Portuguese-speaking countries;
- Ensure the development and evolution of the legal, financial, institutional, cultural/educational internationalization frameworks capable of boosting the development of the Space sector in Portugal through national initiatives and international cooperation for the next decade.

B. STRATEGIC AXES:

Three main strategic axes are proposed to be implemented including in close cooperation with ESA, the European Commission and other relevant international partners:

1. Boosting the exploitation of space data and signals through space-based services and applications, promoting new markets and highly-skilled jobs in a diversity of areas;
2. Fostering the development, construction and operation of space equipment, systems, infrastructure and space data generation services, with an emphasis on mini, micro and nano satellites, but also opening up new areas of intervention in Portugal for launchers services, including and extending existing satellite monitoring and tracking and Earth observation activities;
3. Continuing to build national capacity and skills, through scientific research, innovation and education and scientific culture, allowing the long-term sustainability of infrastructures, services and space applications.

Axis 1.

Economic growth and the creation of skilled jobs can be achieved by stimulating the market uptake of space-based and space-enabled services that deliver a wealthy amount of space data and signals. For that to happen it is key to break the boundaries between space and other sectors and to find ways to exploit multiple sources of data and massive data systems (i.e., “big-data”). The integration with communication networks (including 5G technologies), information networks (internet and scientific networks), energy and mobility infrastructure networks, among others, is essential to achieve an impact beyond the limited scope of institutional markets. Global internet coverage, smart agriculture, autonomous vehicles, remotely operated vehicles (known as drones) and the “internet of things” (IoT) are some of the technological trends that will inevitably push for the development of a new generation of space-based services that reach far beyond the traditional use of satellite navigation and Earth observation systems, and open the way to limitless business opportunities.

New space-based services have the intrinsic potential of scaling-up to global markets – a notion that is important to highlight given the limitations of the markets at domestic and even at European levels. Thus, it is strategically interesting to exploit the natural alliances with Portuguese-speaking communities all over the world, as well as to develop new strategic alliances and international partnerships and to tap into the growth potential of Asian markets that are quickly expanding.

The engagement of end-users and clients is critical to boost the use of space data and ultimately to fuel the growth of “downstream” public and private markets in all areas of activity. It includes areas such as maritime monitoring and surveillance; agriculture, fisheries, natural resources monitoring, desertification and wildfire protection; reduction of the digital divide; climate change monitoring and meteorological services; improvement and deployment of communication, energy and mobility networks; health assistance; monitoring of migratory flows.

Axis 2.

Portugal already hosts important space infrastructures with which it contributes to ESA and European Union space programmes and initiatives. A notorious example is the ground-based infrastructure located in the Azores. On top of that, Portuguese companies and research organisations take part on important innovation and technology development projects also in the frameworks of ESA and European Union space programmes, demonstrating that national players hold competitive and reliable skills. It is now time to step-up the efforts and raise the ambition of developing and promoting the space infrastructures of the future, to address the challenges and opportunities of the space sector at global level.

It is, thus, essential to adopt a differentiation strategy, taking advantage of Portugal’s geographical and Atlantic positioning, capitalising on the country’s scientific and technological base and its national entrepreneurial capabilities. This strategy must take into consideration the rapid rate of technological evolution, the growth prospects of the space

sector and the barriers that still holds it down, requiring a careful consideration of the following issues:

- Reduction of the cost of access to space, resorting to innovative, environmentally responsible and safe launching technologies, enabling the growth of the nano, micro and mini-satellite markets and envisaging disruptive operational approaches and the installation of new launch services for small satellites, open to international cooperation with a wide range of operators, including an open spaceport;
- Development and construction of the next generation of satellites, following the trend of miniaturisation of satellite platforms, with an increasing use of COTS components, flexible multi-purpose sensors and energy, communications and orbit management technologies beyond the current state-of-the-art;
- Deployment of large inter-connected satellite constellations for multiple and integrated applications, in domains such as Earth observation, satellite navigation and satellite communications;
- Contributing to the European capacity to monitor space assets and space debris, going as far as enabling future “space traffic” management services;
- Hosting strategic ground-based infrastructures that enable the operation of current and future spacecrafts with a view of enabling security sensitive services, improve access to satellite data and signals, catering for the needs of data dissemination to end-users and clients, and also to the agents that deliver value-added services.

Since space technologies are evolving at such a fast pace with technological breakthroughs that are difficult to forecast, the uptake of public and private markets can only be achieved if a user-driven approach, addressing concrete socioeconomic challenges is systematically encouraged and thus augmenting the impact of the investments in current and future space infrastructures.

Axis 3.

Despite the progress made so far in the development of the national space sector, there are still major challenges to tackle and barriers to overcome in order to further increase its dimension, influence, the competitiveness of national actors and their capacity to further impact the economy and society. On one hand, it is important to strengthen and broaden the range of current public and private actors, on the other hand, it is still necessary to ensure the mobilization of other sectors by strengthening the support for the development of new competences in Earth and Space sciences and in space technologies. The use of Space must also be pursued by companies and scientific and technological institutions, where the process of democratization of access to Space that we have been witnessing is of great importance.

In this context, space technologies are indispensable for the future of Humanity, requiring continuous investment in education and culture for Space in order to attract future

generations more and more, through the dissemination of educational, scientific and cultural contents to populations in remote areas and with difficult access to knowledge about Space.

That objective should be attained by making the best use of national participation in ESA and in the European Union, as well as the participation in international scientific organisations such as the European Southern Observatory and the European Meteorological Satellite Organisation (EUMETSAT), or in international organisations that are now being established (such as is the case of the Square Kilometer Array – SKA).

Therefore, research, development and advanced training initiatives should be strengthened enabling the sustainable and long-term development of all activities related to Space in Portugal, which means namely:

- Increasing the participation of research institutions and companies in ESA and European Union programmes. This includes:
 - Supporting science and technology development and innovation and the participation of Portuguese partners in key segments of space technology, space services and applications value chains at European and global level;
 - Encouraging technical skills, training and attracting qualified human resources and promoting activities in collaboration with European and international partners.
- Reinforcing the collaboration of the Portuguese space scientific community with international partners and with industry enabling advances in the understanding of the Universe, Earth sciences, space exploration and space weather, among other scientific areas;
- Bearing in mind that Space naturally inspires the fascination and enthusiasm that lead young people to take an interest in disciplines in science, technology, engineering and mathematics, continue to support education, scientific culture and awareness-raising activities aimed at all citizens, particularly students and educators, so that future generations of scientists, engineers and managers are attracted to participate in space activities.

C. FRAMEWORK PROGRAMME FOR ACTION FOR SPACE:

For the development of the three axes mentioned above, the Portugal Space 2030 Strategy calls for the development of a framework programme involving five lines of action - legal, financial, institutional, internationalization, and scientific culture:

1. Legal Framework - Creation of a regulatory regime and adequate implementation of specific legislation applicable to space activities to be developed in Portugal:

- Objective: Stimulate economic activity and scientific and technological development, attracting foreign investment and mobilizing national and foreign actors, as well as facilitating the possible establishment of satellite launch services in Portugal, including a spaceport, with adequate and internationally competitive regulation.
- Measure: Create a competitive legal regime at international level, taking into account the comparative experience of countries such as the United Kingdom, France and Luxembourg, among others.
- Calendar:
 - Preparation, public discussion and approval of the bill proposed by the Council of Ministers - until September 2018;
 - Discussion and approval by the Assembly of the Republic - until June 2019.

2. Financial framework – Stimulating an investment strategy:

- Complementing and extending the current level of public investment in ESA, financially supported through FCT, I.P., with the support of IAPMEI and ANACOM;
- Adjusting the use of structural funds and public funding programs for the development and capacity building of the space sector so that investment in the sector can reach a multiplication factor of five over the next five years;
- Promoting the diversification of investment sources, including access to the European Investment Bank, among other international funds;
- Attracting direct foreign investment within the framework of existing tax benefits and incentives, especially for the possible establishment of space launch services and the creation of promising partnerships in the area of Space.

3. Institutional framework – Facilitate and promote institutional development with a view to creating:

- A "regulatory agent" for space activities in Portugal, in charge of carrying out actions to monitor and regulate space activities in Portugal, in line with the draft bill on access to space and exercise of space activities;
- An adequate and specific "promoter" for the Space sector, with a view to the future creation of the Portuguese Space Agency, taking the form of a "mission structure" (*estrutura de missão*).

The "mission structure" has, among other competences, the mission of preparing the creation of the space agency with the support of ESA, international experts and involving the main national actors, considering two distinct and independent but interlinked lines of action: the

promotion of investment and the provision of services. It shall in particular ensure a financing strategy for the Agency, including:

- Promote the new antenna of 15 meters to be installed in the island of Santa Maria, which will be owned by FCT, I.P.;
- Promote services related to the development of the European SST program in Portugal;
- Explore the possibilities of creating a data center of the Copernicus program in Portugal, providing data dissemination services as well as the possibility of hosting other terrestrial infrastructures associated to the Galileo program;
- Encourage interface institutions to promote technological capacity and qualified employment, including the establishment and promotion of a space consortium in the form of a collaborative laboratory (CoLAB), based on international best practices;
- Continue to support and strengthen R&D units and Associated Laboratories with relevant scientific and technological intervention in the area of Space;
- Continue to support and strengthen support services for the incubation of new technology-based companies with relevant intervention in the area of space, in close collaboration with ESA.

4. Internationalization Framework – Strengthen an internationalization strategy:

- Development and promotion of the Atlantic interactions agenda, according to the Resolution of the Council of Ministers no. 29/2018, of 12 March;
- Development and promotion of an agenda for the Mediterranean, ensuring the integration of spatial data for agro-industrial development, energy sustainability and water management, through cooperation with countries in North Africa and the Middle East, in particular in the context of the emerging PRIMA Program (Partnership for Research and Innovation in the Mediterranean Area) at European level;
- Ensure a diversified range of international partnerships with countries where space capabilities already exist, including through agreements and protocols, for the development of space infrastructures and space-based services and applications;
- Strengthen and initiate new international partnerships with countries that do not yet have, or that are in the process of developing, space capabilities targeting educational actions, exploiting satellite data and sharing the benefits of using space technologies in terms of socio-economic development, with an emphasis on international cooperation with countries in Africa and South America.

5. Framework for education and scientific culture for Space – Strengthening a humanist strategy for Space:

- Promote and disseminate programs for the dissemination of scientific and technological culture for Space, namely deepening and broadening the scope of those already developed by the Agência Nacional “Ciência Viva” through the European Space Education Resource Office (ESERO) of ESA;
- Continue to support and participate in ESA and NASA technology traineeship programs, enlarging them to include other space agencies, as deemed possible, and in a manner that is suitable for those space agencies;
- Encourage the enrichment of school curricula with space-related educational materials and space technologies, with a particular focus on their applications in a variety of fields, such as Earth observation and communications;
- Launch and promote an Internet portal that provides public access to information on space programs, scientific and technological activities, satellite image dissemination resources, training opportunities, exhibitions and conferences, among other contents.